Citywide Integrated Fecal Sludge Management through a PPP approach

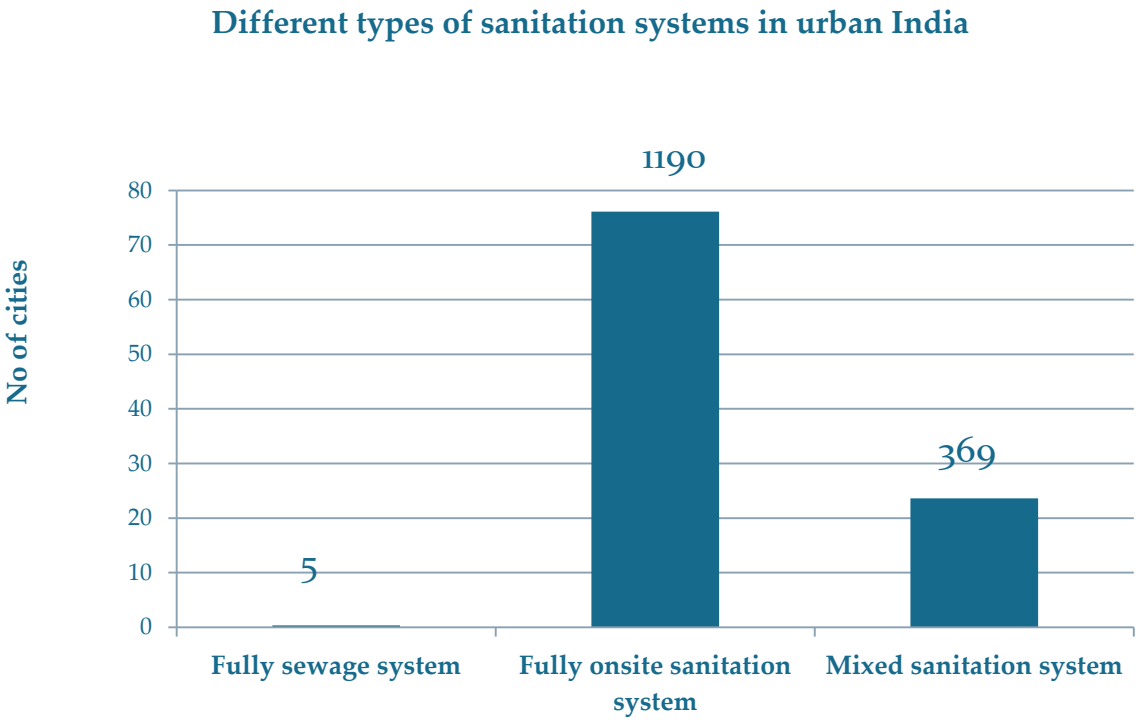
Introduction to On-site Wastewater management – Septage Management

Bengaluru, September 22nd 2015

pas performance assessment system

PAS Project, CEPT University, INDIA

Sanitation systems in Urban India



- ✓ Only 5 cities are reported to have 100% sewerage system
- ✓ Nearly 1200 cities have fully onsite sanitation systems

76 % of cities in India are fully dependent on on-site sanitation systems

24% are dependent on mixed sanitation systems

Source: Based on the SLB data submitted to GOI by 16 states covering 1564 cities

Onsite sanitation and FSM – emerging questions

38.2% URBAN HHs HAVE SEPTIC TANKS

Are septic tanks linked to soak pits

Are they built as per Codes / Specifications ?

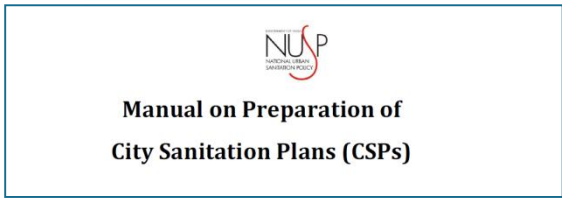
How often are they cleaned ?

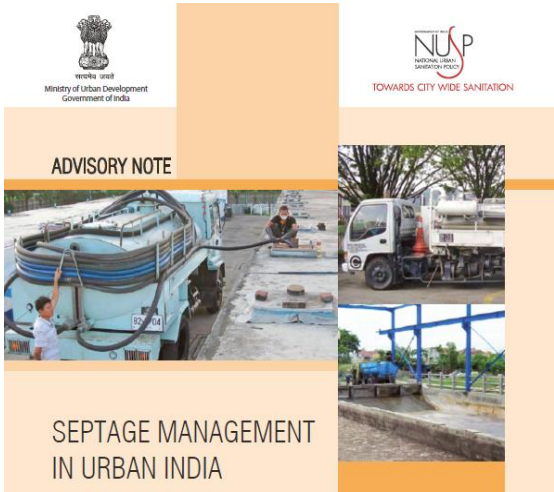
Where does the effluent flow ?

What happens to the SLUDGE?

Emerging recognition of septage management

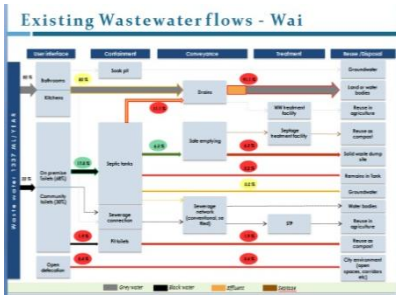
- One of the major **thrust areas** of **AMRUT** is **Septage Management**
- **NUSP** has accorded **high importance** to **plan and implement** actions for the organized and **safe management** of **fecal matter** from **on-site installations**.
- It highlights the **importance of safe and hygienic facilities with proper disposal**. It emphasizes proper disposal and treatment of sludge from on-site installations (septic tanks, pit latrines, etc.); and proper operations & maintenance (O&M) of all sanitary facilities.
- **Recommends** developing a **Septage Management Plan** (SMP) as a **part** of city sanitation plans (**CSP**)
- **Septage Management Advisory** of Government of India provides references to CPHEEO guidelines, BIS standards, and other resources for preparing SMP / FSM plan.





Citywide Strategies

Key activities in preparation of CSP

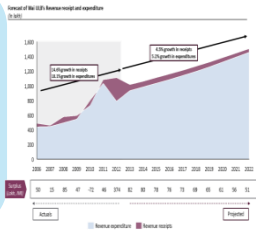


Assessment of Sanitation situation in cities using the framework

Development of sanitation options

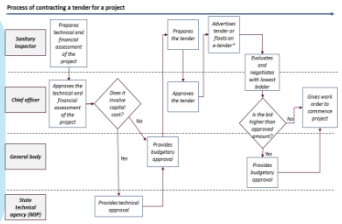
Key activities

Analysis of city budgets



Continuous stakeholder engagement

Institutional Capacity assessment



Outcome:

A City Sanitation plan through which Universal access to Sanitation is achieved and the option is financially viable for ULB

Citywide sanitation improvement plans

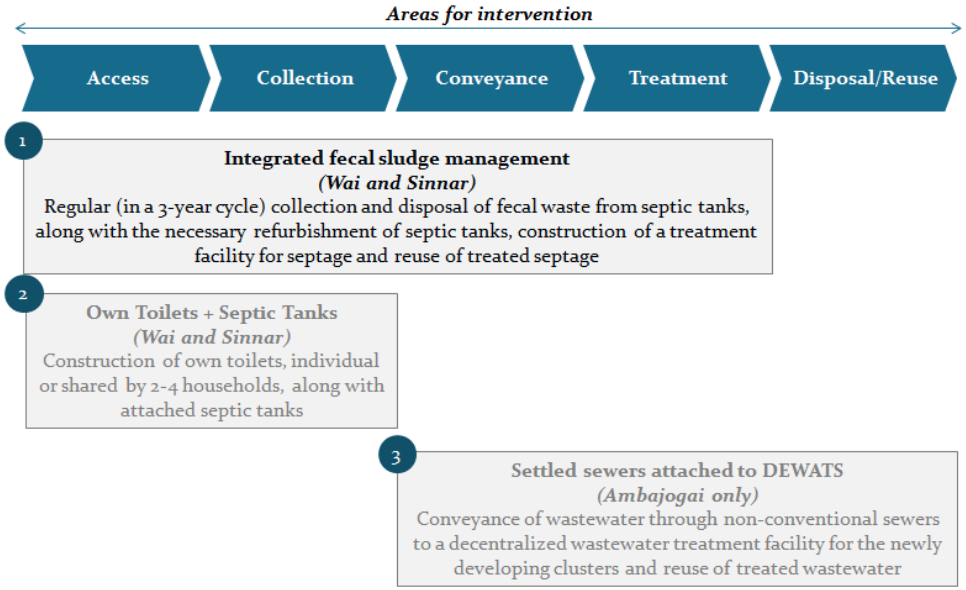
City Sanitation plan options for the cities

Centralized and Decentralized solutions having *same Outcomes. . .*

Develop **citywide sanitation** improvement **plans with non-conventional systems** that would have the **same outcomes**

Implementation of **citywide solutions** based on local **priorities**

Based on local priorities the following solutions have been short-listed for each city



Need to assess septage management situation (1/2)

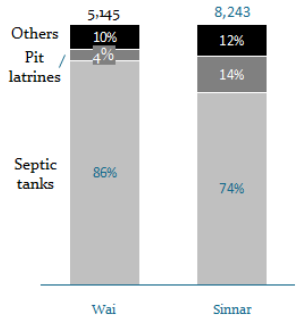
City Profile of selected cities for IFSM

	Wai	Sinnar
District	Satara	Nashik
Geographic Location	Latitude 17°56'N and Longitude 73°53' E	Latitude 19°51'N and Longitude 74°00'E
Civic status	Nagar Parishad 'C' class	Nagar Parishad 'C' class
Total Area	3.64 sq km	51.4 sqkm
Population	36025	65299
Households	7580	13112
Slum HHs	456 (6%)	837 (6%)
No of Wards	19 wards managed through 5 Prabhags	23 wards managed through 6 Prabhags

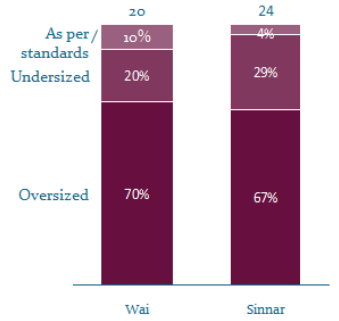
Small and Medium towns in Maharashtra

A majority of personal toilets in Wai and Sinnar are connected to septic tanks, which are larger than recommended standards

Method of collection of waste for all households *(HH)*



Assessment of size of septic tanks connected to personal toilets *(Number of toilets)*

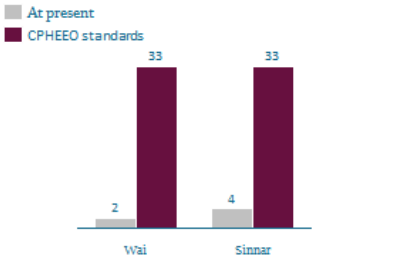


- ~75-85% of households in these cities depend on septic tanks
- A sample survey conducted in Wai and Sinnar found that septic tanks connected to individual toilets are largely

Major dependency on septic tanks which are oversized

Consequently, households get their septic tanks cleaned only once in 8-10 years, resulting in the release of effluent with solids into the drainage system

Estimated number of septic tanks cleaned annually by the local ULBs *(As a % of total septic tanks)*



- The CPHEEO[1] manual and the MoUD septage management advisory recommend that household septic tanks be cleaned **every ~2-3 years, i.e. ~33% of them should be cleaned each year**

Resulting issues

- Septic tanks **often overflow** and fecal matter along with effluent is released into drains
- In addition, **septage hardens and cannot be easily suctioned off**, often requiring manual intervention or

8-10 Year cleaning frequency of septic tanks

Chambered tank

Some places septic tanks are below the toilets

Vent pipes

Septic tanks tops are sealed

Need to assess septage management situation (2/2)

Both towns rely on a single vacuum emptier truck which is owned and operated by the ULB, and cleans both personal and community toilets

Existing septage conveyance mechanism in Wai and Sinnar

- Both Wai and Sinnar **have only one suction emptier truck** each with a capacity of 5kl and 3kl respectively
- The trucks are **owned and operated by the ULBs**, and also clean septic tanks connected to **community and public toilets once a week**
- The ULBs charges households ~**INR 400 - 800** in Sinnar and ~**INR 1000** in Wai per cleaning
- There is **no regulated schedule for cleaning**, and households call the ULB when required, once in >8-10 years
- **Each tank emptier can clean ~4-5 septic tanks per day**, just enough to clean the community and public toilets each week

Existing septage conveyance mechanism

Suction emptier truck of 5KL capacity in Wai

Suction emptier truck of 3KL capacity in Sinnar

Demand based emptying services provided by ULB

Septage is disposed off at the solid waste dump site without treatment in both towns

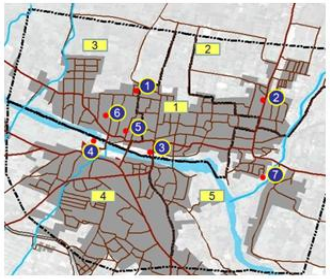
Location of the dumping ground in Wai

Location of dump site in Sinnar

Crude disposal of septage at solid waste dump site

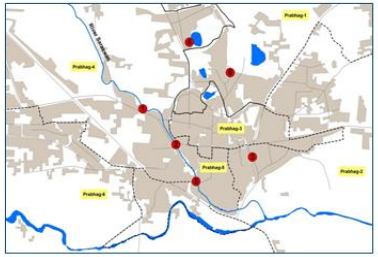
Sample tests of wastewater show that key indicators of pollution exceed the prescribed limits by the Central Pollution Control Board (CPCB)

Test results of sample wastewater testing in Wai



- Wastewater samples were tested from **7 locations** in Wai and checked the levels of **Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS) and pH count**

Test results of sample wastewater in Sinnar

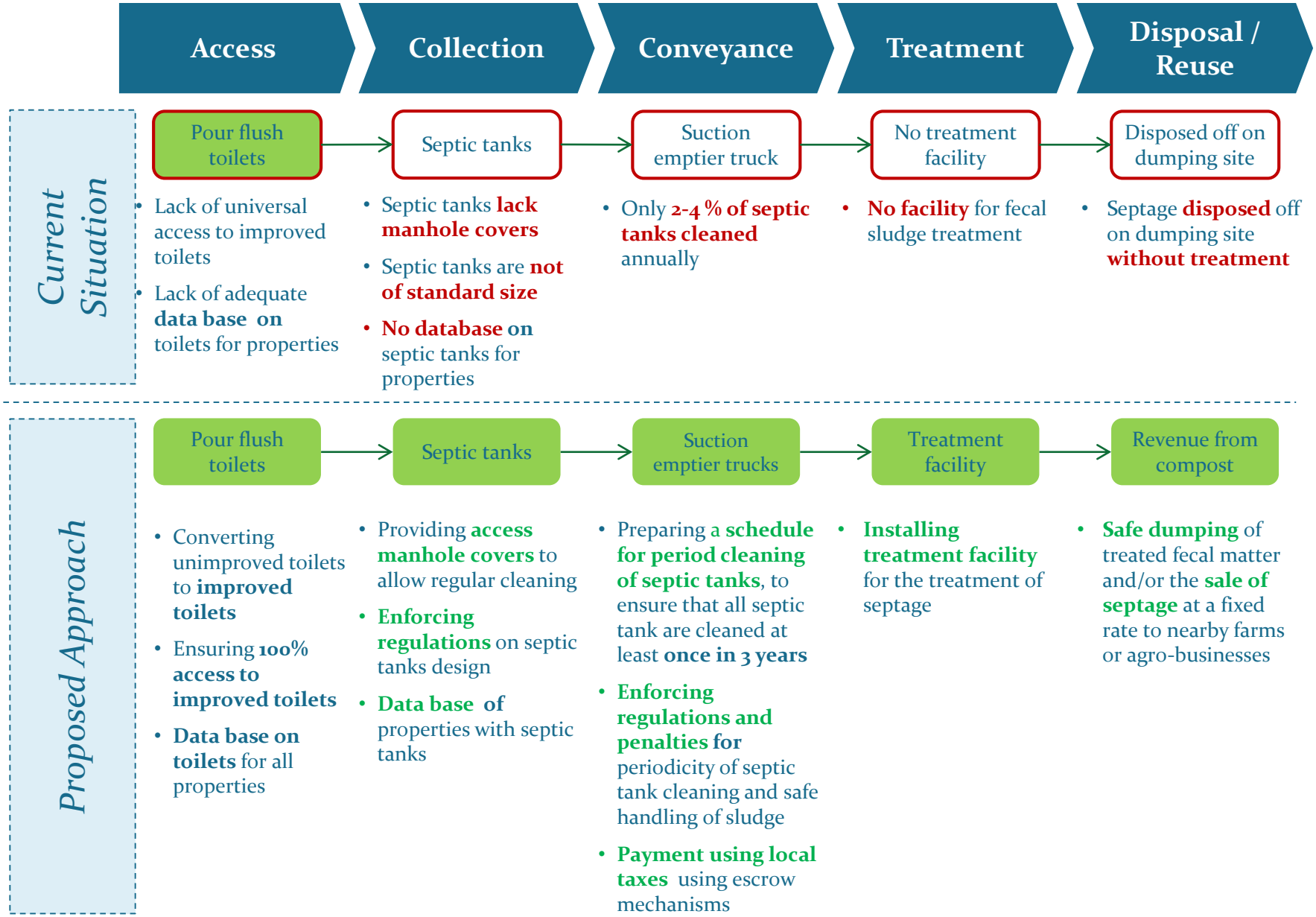


- Wastewater samples were tested from 5 locations in Sinnar and checked the levels of **BOD, COD, TSS and the pH count**

Quality tests results are way beyond prescribed limits

Situation **ASSESSMENT** suggests, there is an **URGENT** need to **improve** the **onsite sanitation situation** of the city

To tackle these issues, need to explore an end-to-end integrated fecal sludge management (IFSM) solution- Moving from red to green

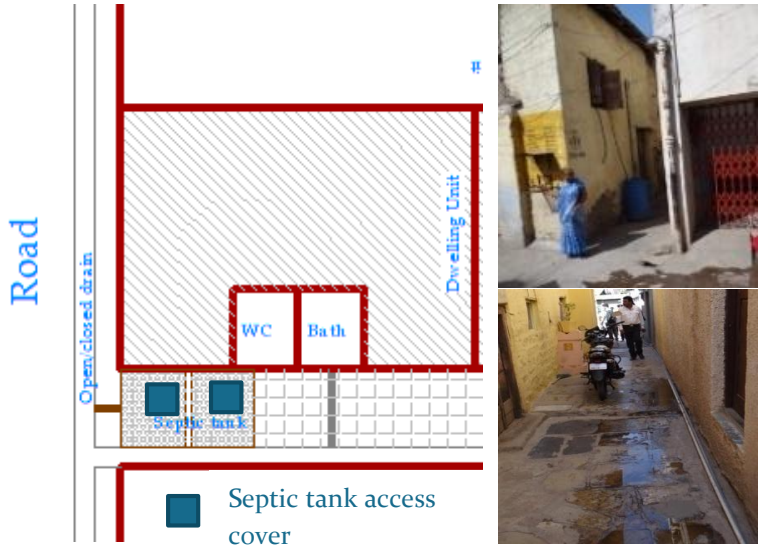


First, septic tanks will need to be refurbished to enable easy access for cleaning

Details of proposal

- Based on a sample technical assessment done in 2013, it was noticed that many **septic tanks in Wai and Sinnar had sealed covers or *farsis* (tiles) placed over** them
- This **prevented regular cleaning**, as the seal had to be broken each time to access the septic tanks
- **RCC access manhole covers** (60 cm X 45 cm) can be constructed to allow easy access during emptying, at a cost of **INR 500-800 per tank**
- The ULBs will do a **household level assessment** to assess the number of septic tanks that can be refurbished for access and also create a data base of households/properties with septic tanks.

Location of manhole of cover



RCC access manhole cover

Second, tanks will be required to be cleaned on a regulated schedule, and financed through taxation to ensure periodic cleaning

Current septage management practice

~2-4% of tanks cleaned per year
(once in >8-10 years)

Recommended septage management practice

~33% of tanks cleaned per year
(once in 3 -5 years)

Current barriers

1. Cleaning is done **on-call** by the household, who do not see the need for regular cleaning

   The **cleaning services** of the ULB are currently treated as a **complaint redressal** system for overflowing septic tanks rather than a regular cleaning and maintenance service

2. Each town has only **1 truck, owned and operated by the ULB**

3. Households pay **~INR 400-1000** to get **tanks cleaned**, but only once in >8-10 years when the tanks overflow

Proposed solution

1. Septic tanks will be cleaned on a **pre-determined schedule**

   Regulations and **penalties** will be set in place to **ensure periodic cleaning**

   Awareness generation activities will educate households about the need for regular cleaning

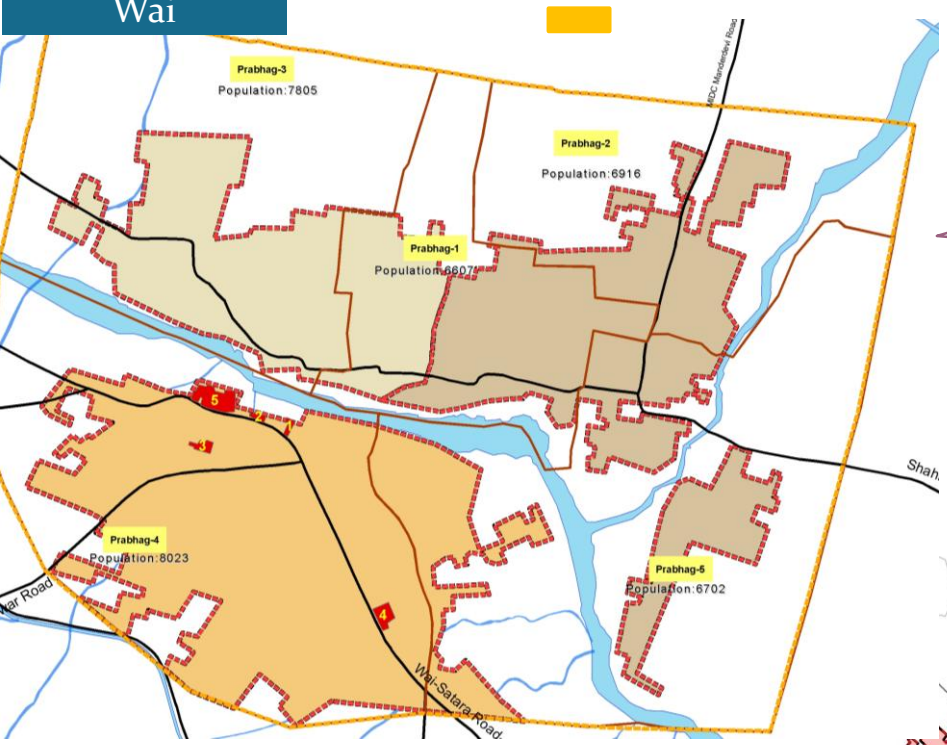
2. Each town will get an additional **1- 3 trucks to meet service standards**, which will be **operated by a private player**

3. **Local taxes levied** by the ULB as **per municipal act**[1] will be used to **recover** the **operating expenses** for regular cleaning

Note (1) Maharashtra Municipal Councils, Nagar Panchayats and Industrial Townships Act, 1965, Chapter IX : Municipal taxation, Section 108

Need to plan for a regulated schedule of three year septic tank cleaning cycle

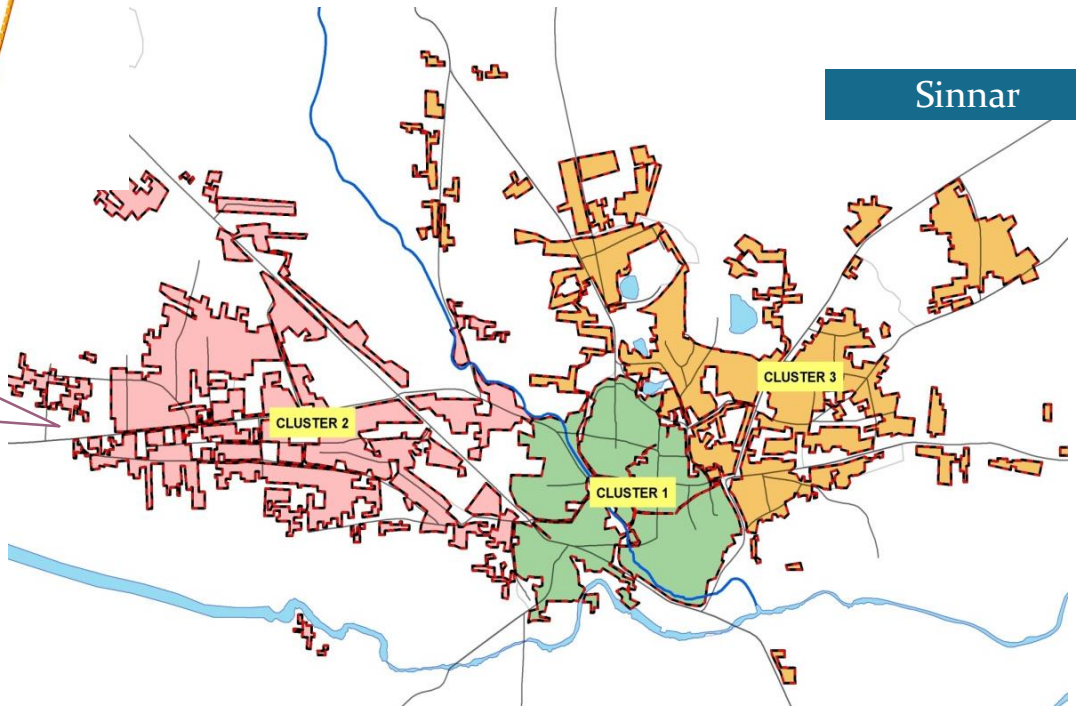
Wai



Wai requires 1 more additional suction emptier truck

~1760 septic tanks need to be cleaned annually on scheduled basis

Sinnar



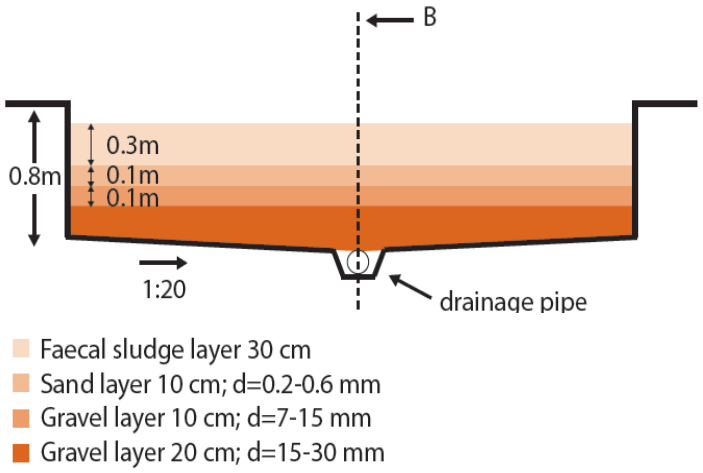
Sinnar requires 3 more additional suction emptier truck

~2800 septic tanks need to be cleaned annually on scheduled basis

Third, treatment facility needs to be constructed for the treatment of sludge

Technical details of sludge drying bed

Technical illustration of a sludge drying bed

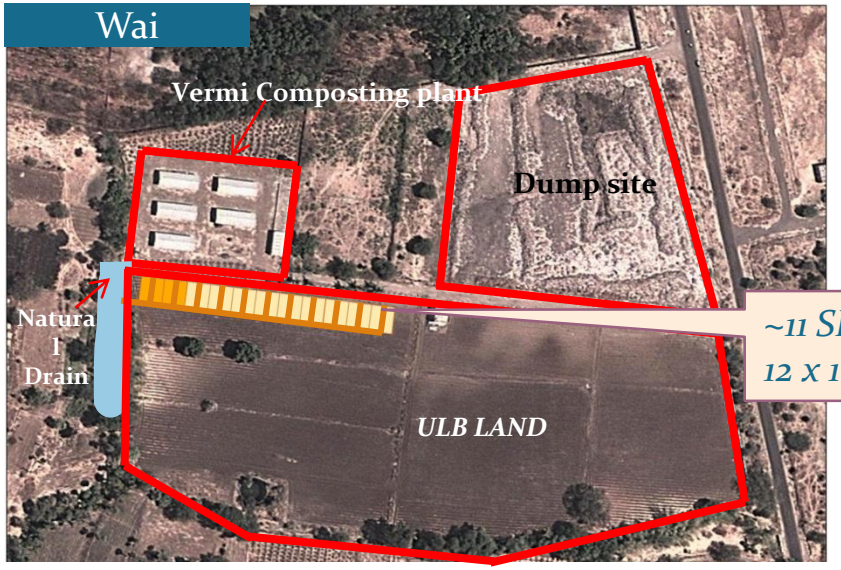


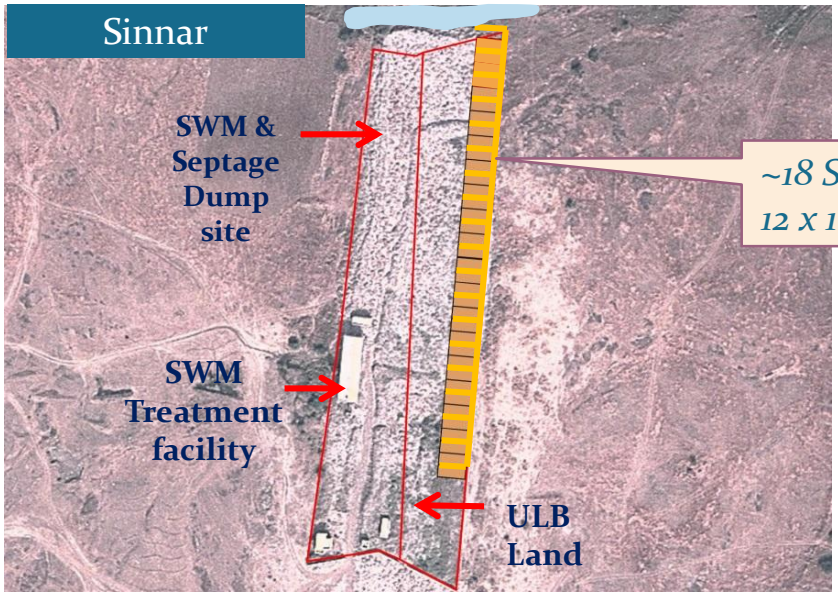
- The MoUD advisory recommends the use of unplanted **sludge drying beds (SDB)** for the treatment of collected septage
- The sludge will be allowed to dry for **15 days to form sludge cakes**, which can be disposed safely in the open
- In India, SDBs are being used in **100 villages in Punjab** the World Bank's **Punjab Rural Water supply & Sanitation scheme**

The total cost of construction would be INR 71 lakhs in Wai and INR 95 lakhs in Sinnar

Note: (1) Excluding the cost of land, which will be provided by the ULB

Description of proposal



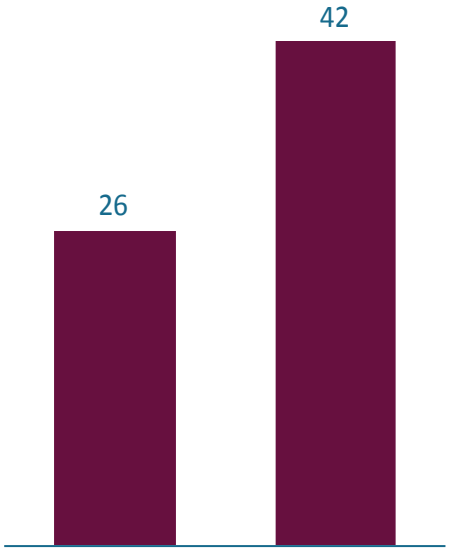


Fourth, treated septage needs to be disposed off safely in fields, or sold to nearby farms or agri-businesses

Examples of septage re-use

- **Land application of raw or dewatered fecal sludge**
  - In areas around Bangalore city, sludge compost sells for ~INR 650/cum and is commonly used to cultivate fruit trees
  - In Kenya, a company called Sanergy produces organic fertilizers from waste collected daily from its pre-fabricated toilets
- **Fecal sludge digestion for biogas production**
  - In India, the non-profit SKG Sangha has implemented over 64,000+ small scale anaerobic digesters for fecal waste in villages
  - Sulabh International has been utilizing waste to generate biogas for heating and electricity at 200 of its 8000+ facilities in India
- **Dried fecal sludge can also be incinerated as fuel**, but there are limited examples in India
- **Urine diverting dry toilets (UDDT)** have been piloted in several countries such as Kenya, Uganda and South Africa for the re-use of urine and dehydrated fecal matter in household gardening or farming, but there are limited examples in India

Amount of septage generated in each town (Cum/day)



*If **30% of septage is sold after treatment** at INR 0.5/Kg, it could lead to an annual revenue of INR 1.4 Million in Wai and INR 2.2 Million in Sinnar, **almost offsetting the yearly O&M cost of septic tank cleaning and maintenance of SDBs***

Source: Vishwanath Srikantaiah, "Sludge Reuse from Mega-Cities, Presentation from Workshop on Innovations for Scaling up Citywide Sanitation", EAI, "Sustainable Recovery of Energy fro Fecal Sludge in India"

Fifth, appropriate regulation and IEC for successful implementation

To ensure adoption of the integrated fecal sludge management plan, the ULB has to make regulatory changes

- The key issue in ensuring regular and safe septage management is **lack of implementation of government regulations and advisories**
- This will need the **formulation of ULB bye-laws** and rules to ensure implementation of each aspect of the IFSM plan
- The rules should address:
  1. **Septic tank design**: to ensure septic tanks of standard size are installed in new constructions
  2. **Periodicity of de-sludging**: to ensure septic tanks are cleaned every 3 years as per the MoUD's advisory
  3. **De-sludging procedures**: to ensure safe handling of fecal sludge
  4. **Sanitation tax**: to persuade households to clean septic tanks regularly
  5. **Penalties:** to deter irregular cleaning and use of substandard septic tanks
- There is also a need for **regular monitoring and inspection** of septic tanks and de-sludging procedures to facilitate the implementation of bye-laws

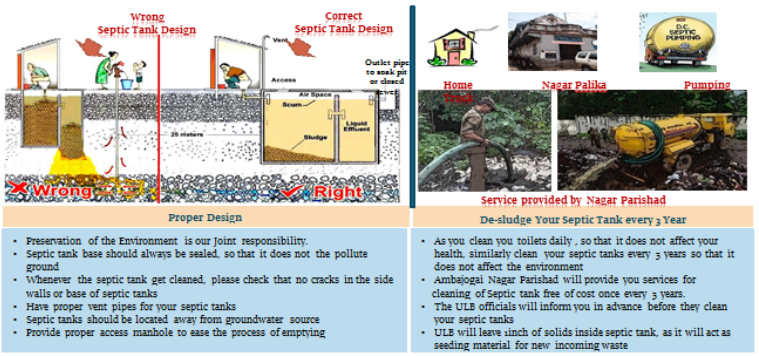
Set up **regulation** for **Onsite Sanitation** management and **strict implementation**

IEC and **Awareness** generation **campaigns for community acceptance** and **adherence** to **regulations** and **IFSM plan and service**

These activities also need to be supported by campaigns for awareness generation

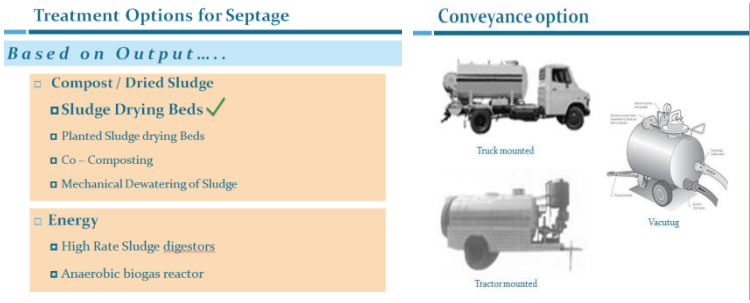
- To ensure **adoption of government regulations and ULB bye-laws**, there is a need to **generate awareness** about regular septic tanks emptying
- **To educate people about IFSM** we can involve :
  1. Print and electronic media
  2. Civil Society organizations such as NGOs and RWAs
  3. Academic institutions such as schools and colleges
  4. Opinion influencers such as doctors and religious leaders

Illustrative posters to generate awareness

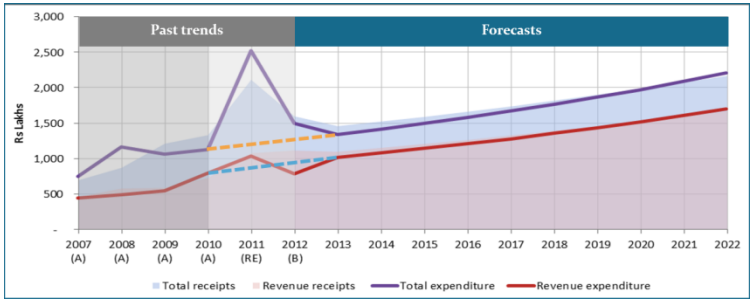


Need to undertake financial analysis for funding IFSM activities

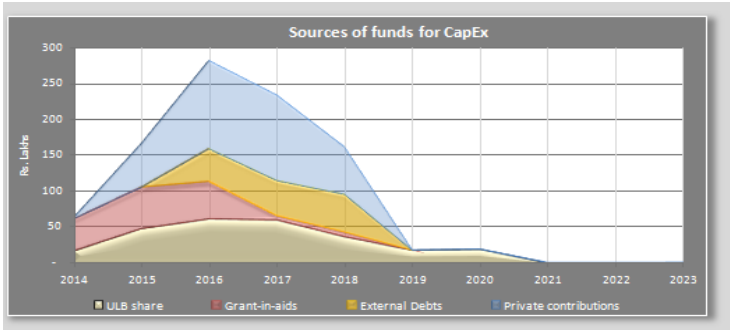
- **Financial Analysis** of **options** for **conveyance** and **treatment** need to be carried out and **linked** to the **ULB budget** for financing



- **Analysis** of **ULB budget** needs to be undertaken, to **understand ULB** capacity to **fund** the **IFSM activities**.



- Various **other sources** of **finances** needs to be looked into for **funding IFSM** activities



Need to create citywide information for successful implementation of PPP and improving monitoring by ULB for IFSM activities (1/3)

Present system

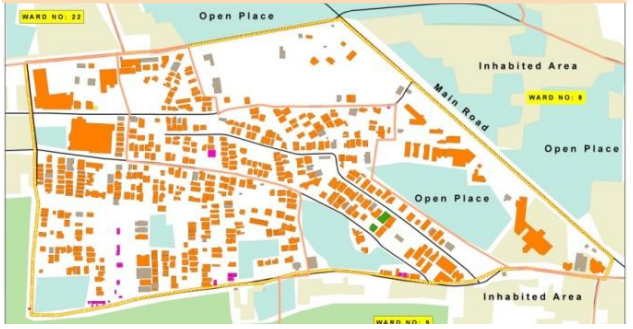
- **No database** of toilets, septic tanks for HHs
- **No ready database** to show how often a septic tank is being cleaned and at which location in the city

Creating database and improving monitoring :

- **Create GIS database** for each HHs / property depicting **details** on **Toilets, septic tanks**, soak pits details
- **Update of HHs / property** on server through mobile application or reporting systems **once** the **septic tank** is **cleaned**
  - Automatic reminder sent to the HHs after 3 years to clean the septic tank

System required

Details of toilets



Details of where toilets are connected

Details of where bathroom and kitchen are connected

Need to create citywide information for successful implementation of PPP and improving monitoring by ULB for IFSM activities (2/3)

Assessment should capture the following aspects

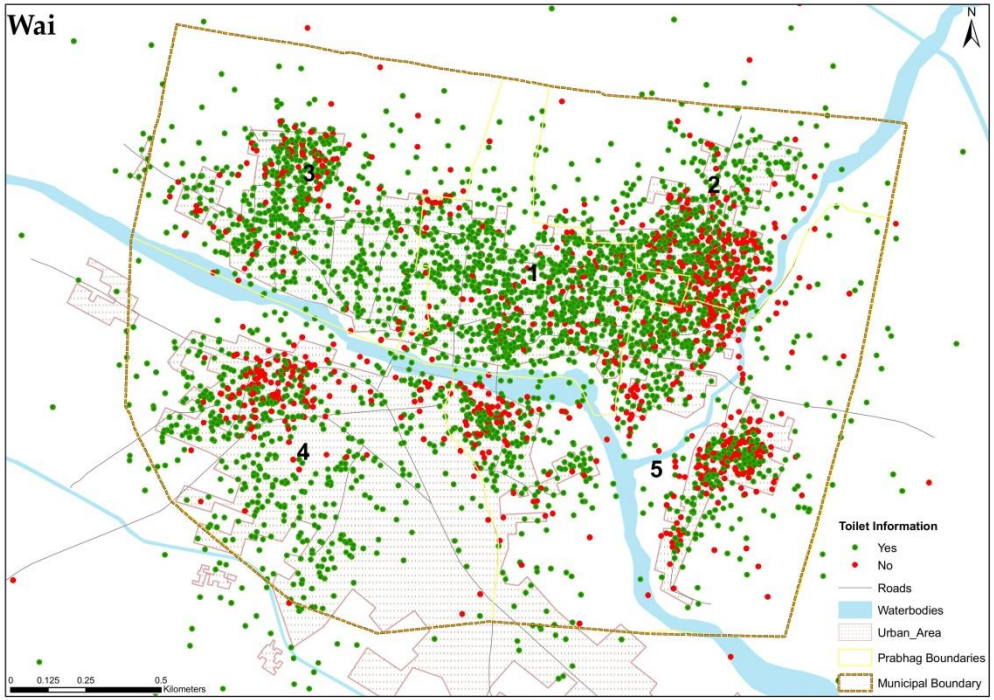
- Toilet availability
- Where is the toilet connected to
- Size and shape of septic tank
- Number of chambers in septic tank
- Access covers to septic tanks
- Accessibility of septic tanks
- When was the septic tank last cleaned.
- Cleaning frequency of septic tanks
- Problems encountered while cleaning of septic tanks
- Reasons for emptying septic tanks

Sample Questionnaire

	Toilet availability assessment
19	Where do you dispose greywater from kitchen and bathroom? (1. Sewer, 2. Septic tank, 3. Soak Pit, 4. Covered drains, 5. Open drains, 6. Others, specify, 7. Don't Know)
20	Do you have your own toilet on your premises? 1. Yes 2. No.
21	**If 20=1,** Does any member of the household still go for defecation in the open? (1. Men. 2. Women. 3. Children. 4. No one)
	Septic tank assessment
22	**What is the type of toilet facility is being used?** (1. Flush/pour flush toilet connected to piped sewer system, 2. Flush/pour flush toilet connected to septic tank, 3. Flush/pour flush toilet connected to other system, 4. Single Pit toilet with slab, 5. Single pit toilet with ventilated improved pit, 6. Single pit toilet without slab / open pit, 7. Twin/Double pit toilet , 8.Night soil disposed into open drain, 9.Service toilet with night soil removed by humans, 10. Service toilet with night soil services by animals
	If Q22 is 2 (toilet connected to Septic tank) answer 23 to 46
	If Q22 is not 2 (toilet connected to Septic tank) go to B
23	No. of septic tanks in the property (1.Number_____, 2. Don't know)
24	Distance of septic tank from the nearest well/bore (1. Distance _____ft. to on-site system, 2.Don't know)
25	Septic tank outfall is connected to (1. Soak pit, 2. Open drain, 3. Covered drain, 4. Others (Specify) 5. Don't Know)
26	What is the average frequency of cleaning of septic tank? (1. 1 year, 2. 2 years, 3. 3 Years, 4. 4 Years 5. More than 5 years, 6. Don't Know)
27	What is the shape of your septic tank (1. Rectangular, 2. Circular, 3. Don't Know)
28	Can you provide the dimensions of the septic tank? (1. Yes 2. No.)
29	**If Q. no 27= 1 and Q.no 28= 1,** provide L _____ft, B _____ft., H_____ft.
30	**If Q. no 27= 2 and Q.no 28=1,** provide Diameter _____ft., Depth_____ft.
31	How many chambers are there in the septic tank (1. one, 2. two , 3. three, 4. Don't Know)
32	The base of septic tank is (1. Sealed with concrete and /or plaster, 2.No base – only soil, 3.Other, please specify, 4. Don't know)
33	Are there ventilation pipes for septic tanks (1.Yes, 2. No)
34	What construction materials have been used for constructing septic tanks? (1. R.C.C, 2. Cement concrete and brick, 3. Prefabricated unit, 4. Don't Know, 5. Other, specify)
35	What is the age of septic tank? (1. No. of years_____, 2. Don't know)
	Where is septic tank located? (1.Front yard, 2.Back yard (easy access), 3.Back yard (no access/through house), 4. House

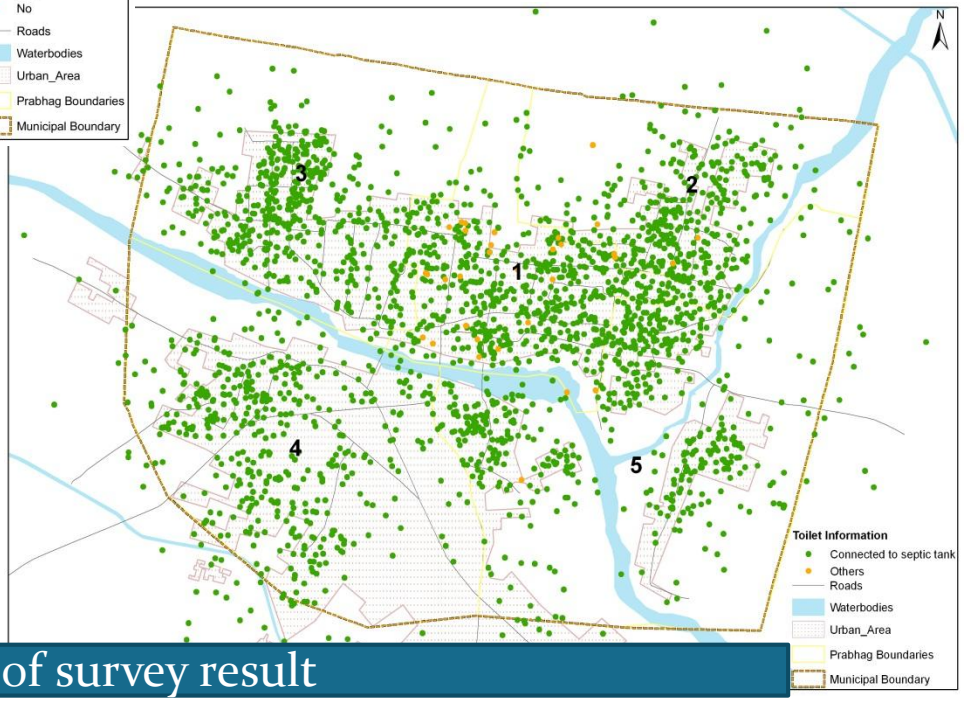
PAS has developed a Mobile App- **"SaniTab"** for conducting household level sanitation surveys, which can be used by the ULBs

Need to create citywide information for successful implementation of PPP and improving monitoring by ULB for IFSM activities (3/3)



Map depicts HHs with toilets
&
Major areas where HHs don't have toilets

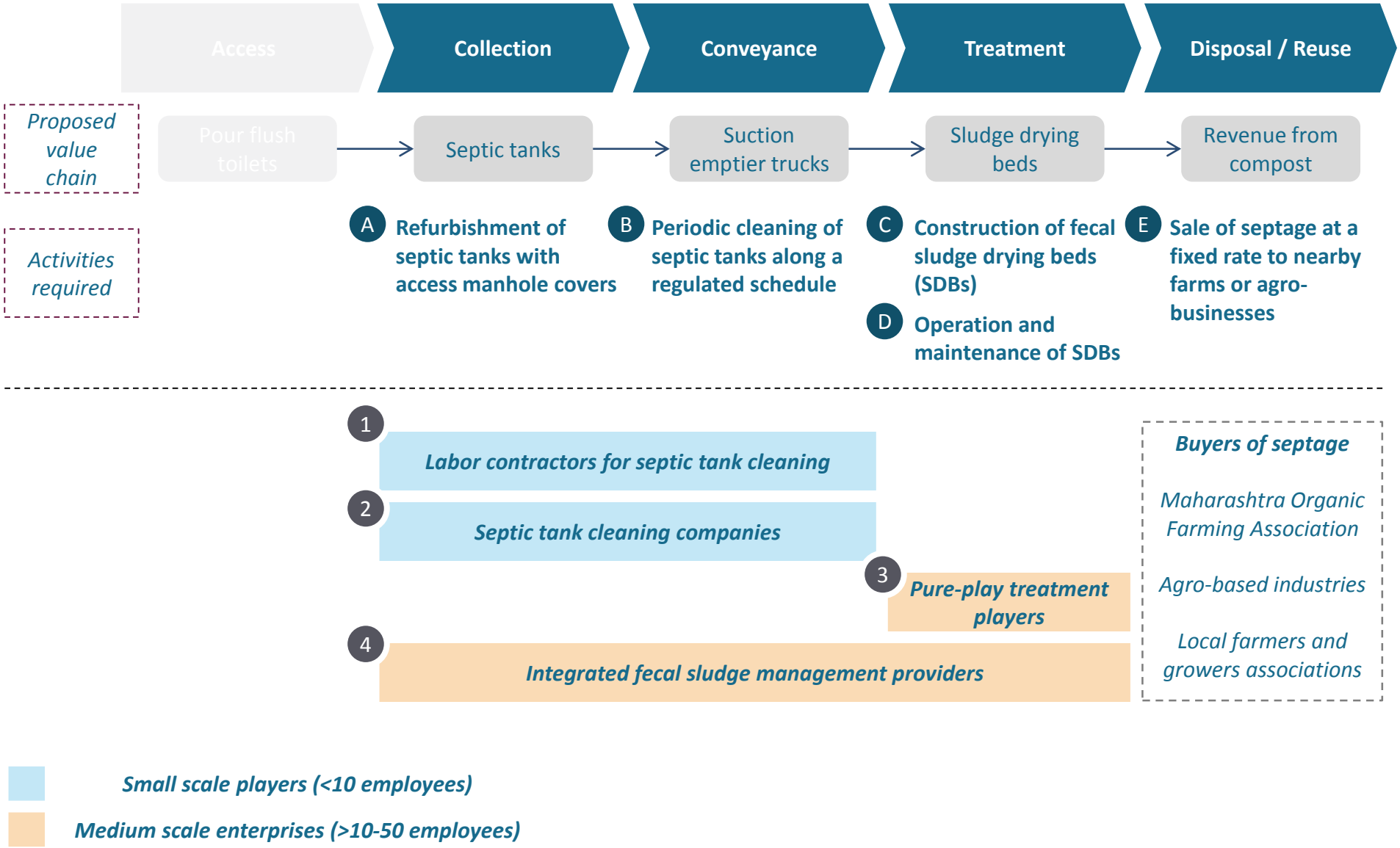
Map depicts HHs with toilets connected to septic tanks



Outputs of survey result

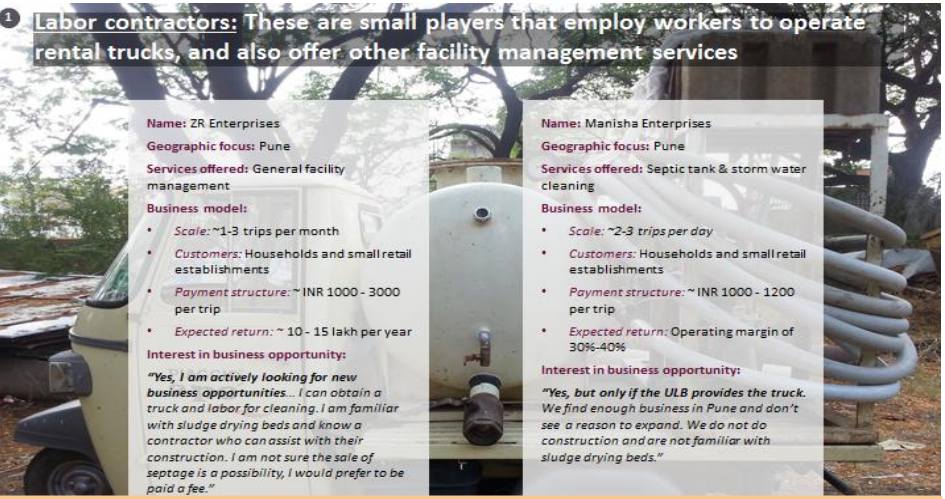
PPP in IFSM activities

Need to identify private players offering septage management services within and nearby towns



Source: Field visits, online business listings

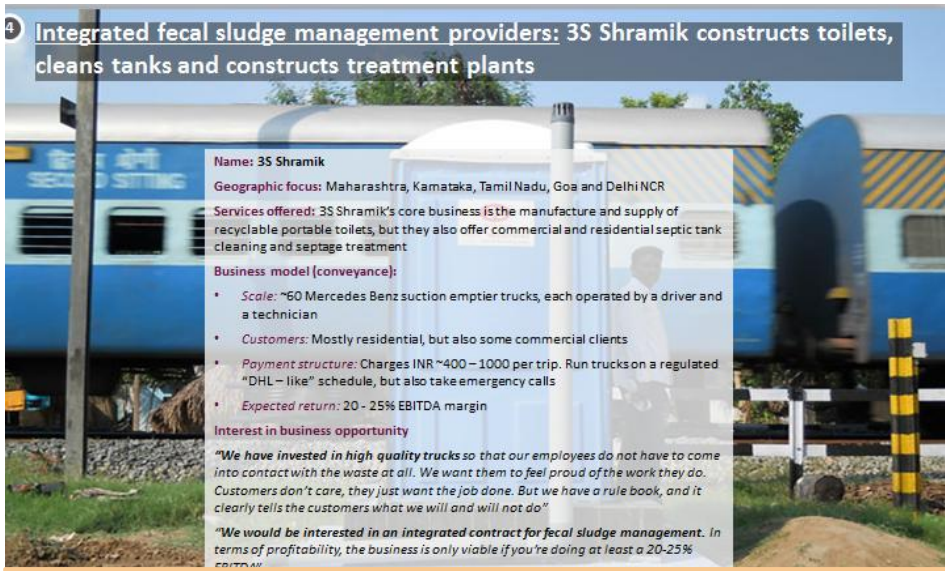
Need to assess work profile, interests and capacity of private sector doing IFSM activities



Labour contractors

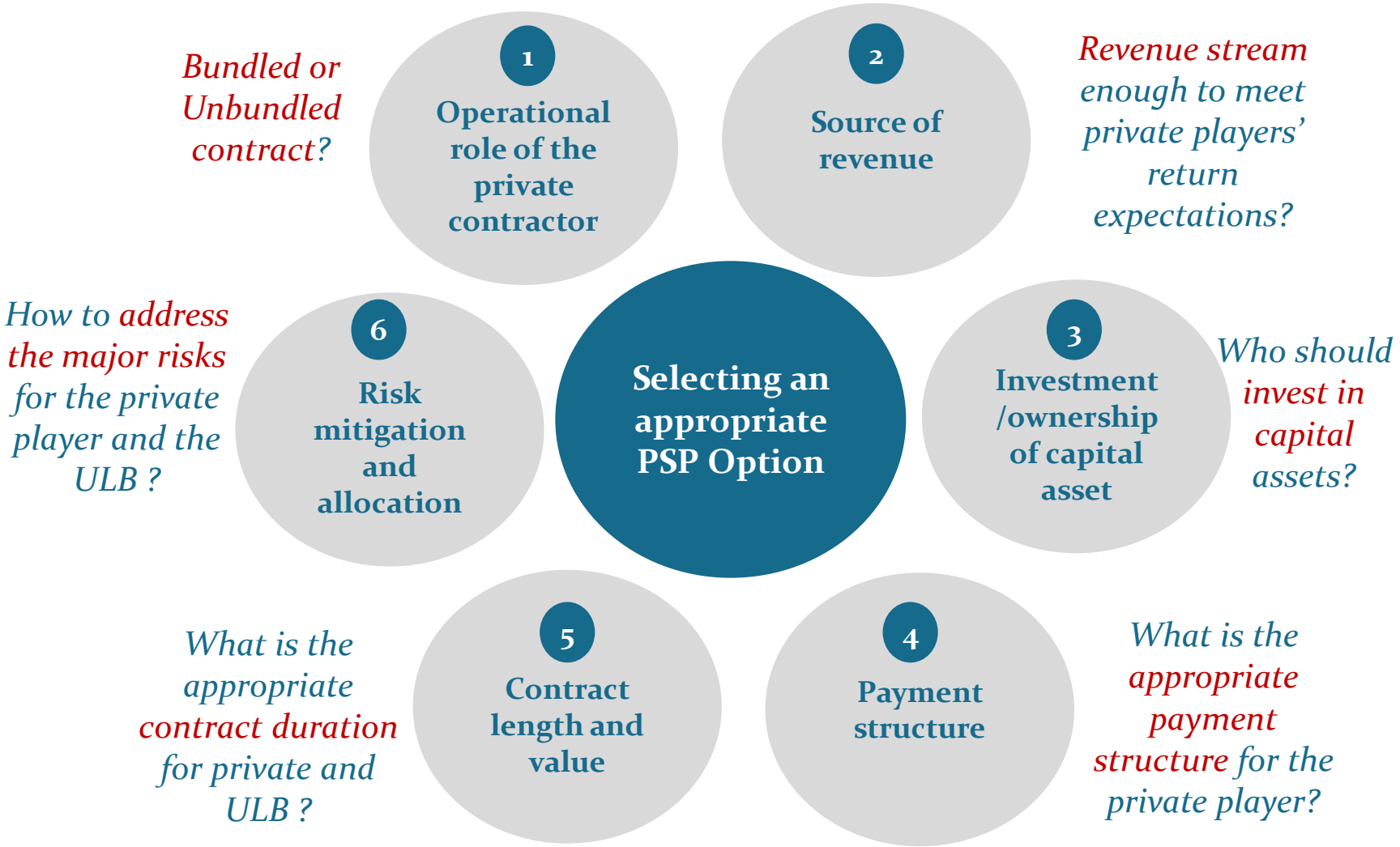
Septic tank cleaning companies

Pure play treatment players



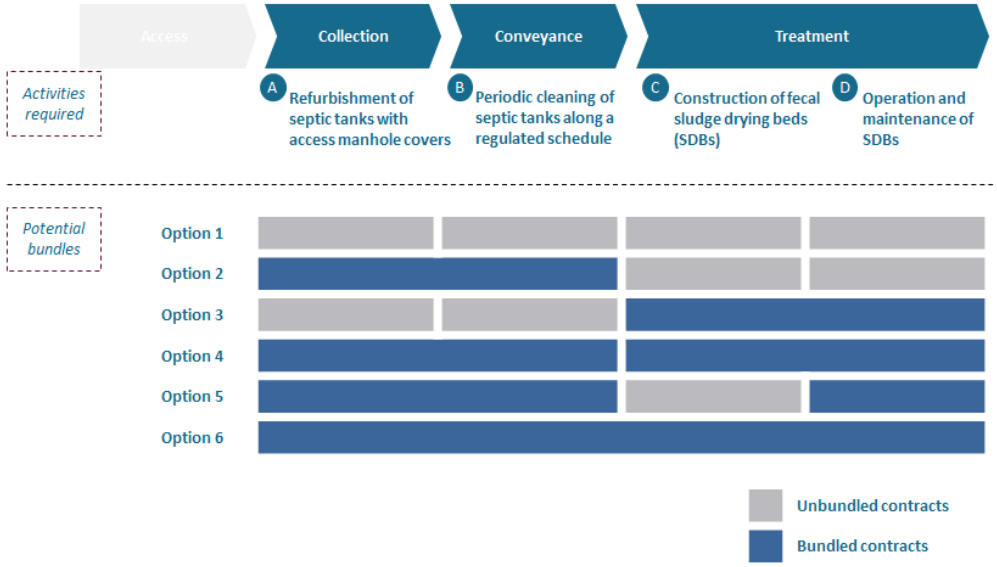
IFSM service providers

An iterative six step process to structure a private sector engagement for integrated fecal sludge management



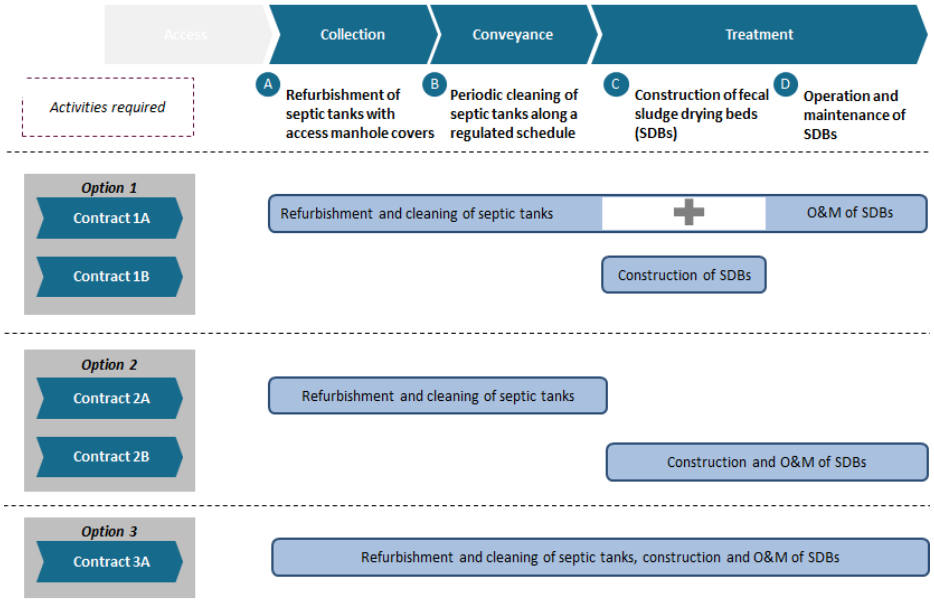
Need to assess contract options for IFSM activities

Operational role: There are various possible contract combinations depending on how IFSM activities are bundled together



Assessed possibilities of **bundling** and **unbundling** of **contracts**

Given the interest and capabilities of identified players, there are three possible options for contract bundles



Possible **contracts** based on **interests** and **capacities** of **private sector**

Formulate possible PPP structures for Integrated Fecal sludge management (IFSM) activities

Contracts	Source of revenue	Ownership of asset	Payment method	Contract length and value
1A **Refurbishment and cleaning of septic tanks + O&M of SDBs**	*ULB*	Private player	Recurring fixed fee with Fixed fee per unit for refurbishment	2-3 year, ~INR 32-36 lakhs in Sinnar and ~INR 15-17 lakhs in Wai
1B **Construction of SDBs**	*ULB*	ULB	Overall fixed fee on a pre-decided schedule	~ INR 96 lakhs in Sinnar and ~71 lakhs in Wai lasting the time period of construction
2A **Refurbishment and cleaning of septic tanks**	*ULB*	Private player	Recurring fixed fee with Fixed fee per unit for refurbishment	2-3 year, ~INR 27-32 lakhs in Sinnar , ~INR 11-13 lakhs in Wai
2B **Construction and O&M of SDBs**	*ULB*	ULB	Overall fixed fee on a pre-decided schedule + recurring fixed fee for O&M	12-18 months, Construction cost plus ~5-6 lakhs annually for O&M in Sinnar and ~4-5 lakhs in Wai
3A **Integrated contract involving refurbishment, cleaning of septic tanks, construction and O&M of SDBs**	*ULB*	Trucks – Private SDBs- ULB	Recurring fixed fee for cleaning and O&M with Fixed fee for Construction and Fixed fee per unit for refurbishment	Payment for refurbishment, cleaning and O&M as in 1A above; payment for construction as in 1B above

Need to assess contact values and taxes to be committed/ levied

Contract valuations for Wai and Sinnar

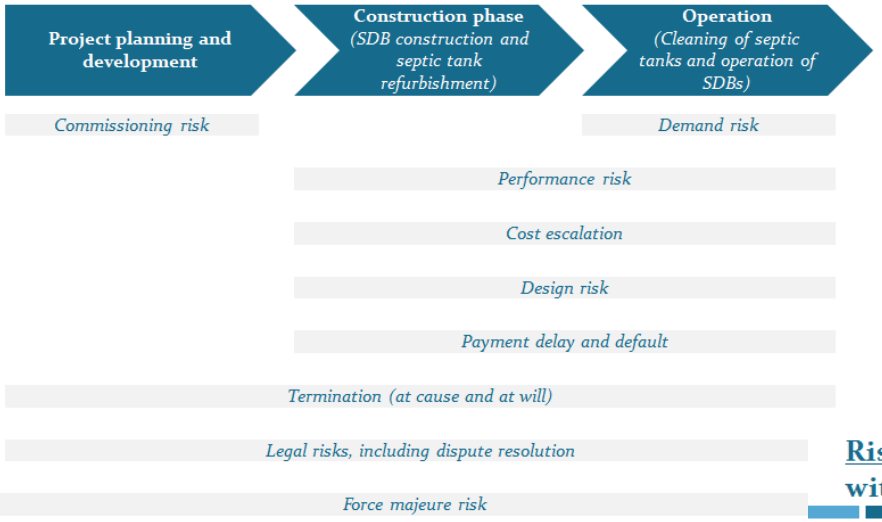
S. No.	Types of contract	Contract length	*Wai*			*Sinnar*		
			Annual contract value *(INR, Lakhs)*	**Sanitation tax per residential property** *(INR)*	**Sanitation tax per non-residential property** *(INR)*	**Annual Contract value** *(INR, Lakhs)*	**Sanitation tax per residential property** *(INR)*	**Sanitation tax per non-residential property** *(INR)*
1A	Refurbishment and regular cleaning of septic tanks with O&M of SDBs	2 - 3 years	15-17	~190	~230	32-36	~270	~320
1B	Construction of SDBs	Duration of construction	~71	N.A.	N.A.	~96	N.A.	N.A.
2A	Refurbishment and regular cleaning of septic tanks	2 - 3 years	11-13	~140	~170	27-32	~230	~270
2B	Construction and O&M of SDBs	1 year	75-76	N.A.	N.A.	101-102	N.A.	N.A.
3A	Refurbishment and regular cleaning of septic tanks with construction and O&M of SDBs	2 - 3 years	86-88	~190	~230	128-132	~270	~320

Property owners currently have to **pay local taxes** of about **Rs 2600/annum** in Wai and Sinnar

To cover the costs of a cleaning cycle of ~3 years would require **an increase in annual tax** spend for a household of about **7% in Wai and 11% in Sinnar.**

Good risk mitigation and allocation can attract good contractors and help reduce contract price

Risk mitigation: There are several types of risks that must be managed across the lifecycle of any public private partnership



Source: ADB, "Toolkit for Public Private Partnerships in Urban Water Supply for the State of Maharashtra, India; Ministry of Finance, Government of India, "PPP Toolkit for Improving PPP decision-making processes in water and sanitation, PPIAF, Vijay Sarma, 'Risks in PPP projects in Western India'"

Several **risks** involved during **lifecycle** of the **project**, where **PPP** is involved. These need to be **addressed**

Concerns about **addressing** the **risks** were **raised** by **private sector** during interactions

Risk mitigation: Private players highlighted a number of concerns with public private partnerships that need to be addressed

Termination

"The contract should have a clause defining a 3 month notification period in case of termination. It should also have a dispute resolution mechanism."
– Kadam Enterprises

Delayed payments

"Ideally, bills should be cleared in 30 days, and for late payments, interest should be paid at the rate of 8% per annum."
– Manisha Enterprises

Transparent procurement

"We would rather not deal with the ULB directly, there are always issues with internal politics. If there is a mediator in between then we would be interested."
- Envicare

Cost escalation

"For a fixed-fee contract for regulated schedule, we cannot offer 24 hour emergency service. We will only work 8 hours a day, otherwise it is likely that we will over-use our truck."
- Aditya Enterprises

"Another key issue is the escalation of fuel costs. The contract should clearly account for that."
– ZR Enterprises

Performance risks

"If we work on a regulated schedule, it will be difficult to get household signatures. That will become complicated, and I don't want my payment to suffer."
– Ugale Septic Tank Cleaning Services

"I have tried to do a regulated schedule on my route, but that has been difficult. People always say, "come back later", and it falls apart."
– Aditya Enterprises

Address the risks involved in PPP engagement for IFSM activities

Risk mitigation: Building a strong system for performance based monitoring and payment is critical to managing performance risk (1/2)

	Risk	Mitigation	Allocation of remaining risk
Emptying of septic tanks	Private player uses manual scavenging for cleaning septic tanks or sludge drying beds	• Require safety gear for all personnel • Include a clear description of activities that constitute manual scavenging	• Contract terminated if complaints of manual scavenging are received from households or ULB staff
	Private player does not clean household tanks as per the schedule	• Portion of the monthly payment should be tied to the number of household signatures collected from households whose septic tanks have been cleaned satisfactorily • ULB to undertake random inspections of households whose signatures have been submitted • A complaint redress mechanism to be opened where grievances can be lodged by the HH with the ULB	• Penalties to be imposed if the reported number of cleanings is lower than specified in the contract, or if discrepancies are found during random sampling, or if complaints are not dealt with in a timely manner • Large or persistent breaches can lead to termination
	Private player transportation	• As above	• Work on faulty septic tanks would have to specified period, to avoid a fine • In case the number of complaints exceeds a specified number in a given time period, the contract can be terminated
	Private player dumps septage at places other than the treatment site	• A portion of monthly payment is tied to signatures collected from the SDB operator	

Risk mitigation: Building a strong system for performance based monitoring and payment is critical to managing performance risk (2/2)

	Risk	Mitigation	Allocation of remaining risk
Refurbishment of septic tanks	Septic tanks are damaged during or as a result of refurbishment	• Specify the type of materials required • Payment tied to the number of signatures from households whose septic tanks have been repaired to their satisfaction • ULB to undertake random inspections of households whose signatures have been submitted • A complaint redress mechanism to be opened where grievances can be lodged by the HH with the ULB	• Damaged septic tanks must be repaired within a specified period days of complaint and the cost shall be borne by the private player • Penalties will be imposed if discrepancies are found during random sampling, or if complaints are not dealt with in a timely manner • Persistent breaches may lead to termination
Construction of SDBs	Sludge drying beds do not meet specified design	• The ULB will specify the design and materials to be used in consultation with town consultants • Payment made in installments on the completion of specific construction	• If the work is found to be faulty at any stage, the payment will be withheld until the corrections are made
O&M of SDBs	from SDBs is not sufficiently treated	sanitation department to measure sludge properties • X% of O&M payment to be conditional on the sludge meeting specified qualities	standards, a warning would be given, followed by fines. • Persistent breaches may lead to termination

Managing performance risk through performance based monitoring and payment

Risk mitigation: Contracts must also clearly manage at will and at cause termination by the private player and the ULB

	Risk	Mitigation	Allocation of remaining risk
Termination at cause	• ULB does not fulfill contract conditions	• Establishing a clear reporting and monitoring mechanism to ensure transparent contract execution • Ensuring that disputes are handled amicably through frequent communication and by appointing an agreed upon third party meditator	• Private player compensated for investments, the cost of winding down and foregone profits
	• Private player is unable to meet service standards	• As above	• ULB can compensate the private player for some portion of its capital investments but seize the performance bank guarantee[1]
	• ULB decides discontinue the	• Up-front discussions with key stakeholders to create buy-in for	• X month notice period required • Private player compensated for
Termination at will	• Private player wants to terminate the contract due to reasons unrelated to ULB compliance with contract terms	• Frequent communication between ULB and private player	• X month notice period required • Private player forfeits the performance bank guarantee

Managing termination risk

Risk mitigation: Provisions need to be made for payment delays and cost escalation to protect private player and public interests

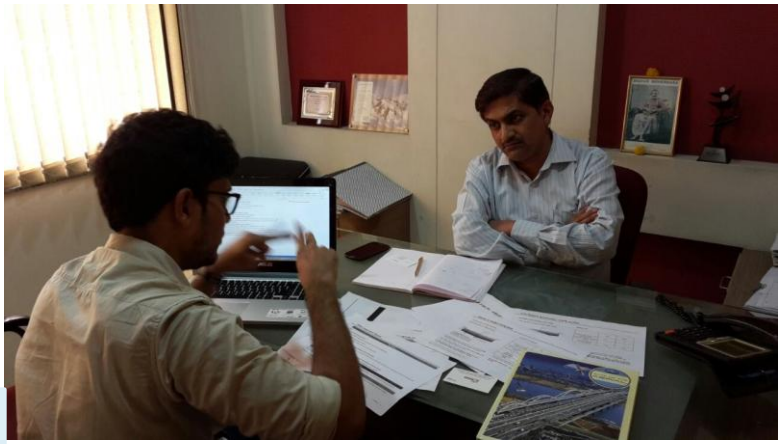
	Risk	Mitigation	Allocation of remaining risk
Payment delays	• ULB is unable to make timely payments towards the project	• Ensuring budgetary allocation for contracts before procurement • Establishment of an escrow account for payment	• ULB to pay interest for the payment, delayed by X months or more, at a negotiated rate of interest
Cost escalation	• Cost of inputs increase over the course of contract	• Adjustment of contract value annually for inflation	• Private player would be responsible for bearing the cost escalations within

Managing payment and cost escalation risk

Each contract option along with draft tender clauses needs to be discussed with the private sector and ULB to understand their concern and requirement. . .

Aspects covered with Private & ULB

- Obligations before and after signing of contract
- Scope of work for contract
- Payment mechanism of contracts
- Critical performance standards – linked to payment terms
- Termination clauses
- Payment delay clauses
- Cost escalation



Additional Aspects covered with ULB

- Pros & Cons of each option
- Contract costs
- Taxes to be levied
- Bid document process and requirements

Develop bid documents. . .

Wai Municipal Council, Wai

TENDER DOCUMENT

Name of Work
"Scheduled cleaning of septic tanks and Operation and Maintenance (O&M) of sludge drying beds (SDBs), Wai"

Estimated Cost: To be given by the bidder

E.M.D. :

Office of the

Chief Officer,
Wai Municipal Council, Wai

Municipal Engineer | Chief Officer | Vice President | President

Septic tank cleaning & O & M of SDB Tender document

Wai Municipal Council, Wai

(B-1/ 31 for 2015-16) TENDER DOCUMENT

Name of Work
"Proposed Construction of 11 Sludge Drying Beds at WMC Solid Waste Dump Site, Wai"

Estimated Cost:

E.M.D. :

Office of the

Chief Officer,
Wai Municipal Council, Wai

Municipal Engineer | Chief Officer | Vice President | President

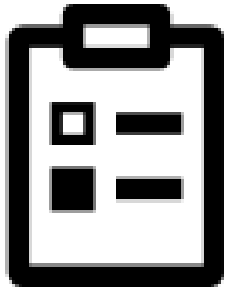
Construction of SDB Tender document

Quick summary – city level

- Assessment, plans and regulation for the **full service chain** – from toilets to reuse
- Need to **assess potential and concerns of private sector** in the city /region context
- Risk assessment, **risk management** and appropriate **contract design**
- **Awareness** among residents about IFSM service and regulation
- Set up **citywide information system** and strengthen local capacity for **contract management and monitoring**

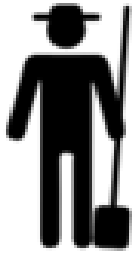
National / State level activities

- **Guidelines for citywide IFSM** with private sector participation



- Need for a **regulatory framework** at state level for implementation and monitoring of **IFSM activities**

- **Empanel private sector** for taking up **IFSM** activities and create a **conducive environment** for private sector participation



- **Financing IFSM** activities through **Viability Gap Funding** (VGF)

Thank you

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