Report on opportunities for private sector engagement in Wai, Sinnar and Ambajogai

CEPT University

With support from Dalberg Global Development Advisors

30th June 2014

CEPT University

Summary – three key highlights

This proposal aims to develop and implement three innovative and scalable ideas for private sector engagement in sanitation with small cities in Maharashtra:

- The first is for **citywide integrated fecal sludge management (IFSM)** developed in partnership with private sector to move from the current outlook of complaint grievance redressal to a financially and environmentally sustainable service

- The second is a programme led by the local city government to make **cities open defecation free (ODF)** that uses partial subsidies and awareness generation to unlock the latent demand for toilets , and facilitates access to **household credit through private micro-lenders, SHGs and housing finance companies**

- The third is the development of an innovative financing mechanism – **Urban Sanitation Fund** – to leverage new sources such as CSR, social investors, foundations and donors – (comprising both grants and returnable capital) through a performance based mechanism

Executive summary: Project and document objectives (1/2)

- **Our project aims** to develop and implement a scalable, end-to-end methodology to enable ULBs in small and medium towns in Maharashtra to effectively engage the private sector in sanitation service provision
- **We have been working in collaboration** with state government agencies and local city governments in three cities across Maharashtra – Wai (population 36,000), Sinnar (population 65,000) and Ambajogai (population 75,000)
- **We have conducted an in-depth assessment of the gaps** across the sanitation value chain in these towns and developed city sanitation plans to achieve universal sanitation coverage
- **Based on local priorities, the cities are exploring the following initiatives:**
  - **Own toilets:** A large proportion of households depend on community toilets in Wai (~30%) and Sinnar (~24%), even among non-slum households. Community toilets are often poorly maintained and cost the ULBs ~INR 1-2 million per year to maintain. The ULBs have launched a partial subsidy scheme for own toilets (individual or a group toilet shared by up to 4 households) to uncover latent demand and encourage pooling of resources
  - **Integrated fecal sludge management (IFSM):** All three towns rely on septic tanks, which are cleaned infrequently and release effluent into drains. Wai and Sinnar plan to explore the cleaning of septic tanks on a regulated schedule to ensure periodic emptying. This will be backed by low-cost sludge drying beds to treat septage before it can be dumped safely or re-used as manure
  - **Settled sewers with DEWATS:** Ambajogai city officials has planned a conventional sewerage system for the central part of the city. For the remaining three clusters, the city is exploring a low-cost settled sewer system connected to a decentralized wastewater treatment system (DEWATS)

Executive summary: Project and document objectives (2/2)

- For these short-listed solutions, cities want to involve in the private sector in the following ways:

  1. **Private sector engagement in IFSM:** Cities are considering involving private players in the provision of the integrated fecal sludge management activities covering the full value chain that will be regulated and paid for by fees or taxes

  2. **Consumer financing for own toilets:** While the partial subsidy scheme by the city can help unlock the latent demand, access for households to credit providers will be facilitated to enhance affordability and encourage take-up

  3. **Attracting private sector investment through an urban sanitation fund** The proposed urban sanitation fund intends to bring together a range of finances that are potentially available. The new corporate social responsibility law in India has created opportunities to attract investment in sanitation from companies with local interests in these cities, as well as those interested in sanitation more broadly. In addition, there is interest among donors and foundation in mechanism that help leverage their funds, even using 'returnable capital' concepts. It is proposed to bring these funds together in a results-based urban sanitation fund.

- **In this document, we have analyzed the feasibility of private sector engagement for areas 1 through 3 by reviewing three questions:**

  1. **What is the rationale for private sector engagement?**

  2. **Are there players available who are willing and able to provide these services?**

  3. **How can we structure these engagements to incentivize private players while ensuring performance?**

Executive summary: Private sector engagement in integrated fecal sludge management (1/4)

Rationale for private sector engagement: The Wai and Sinnar ULBs are exploring private sector engagement for all integrated fecal sludge management activities because they are facing a severe staff crunch, and have obtained higher service standards with previous private engagements than they were able to provide internally

Availability of private players: We found four types of players offering septage management services in these towns

- Labor contractors, who operate suction emptier trucks on rent, and also generally offer other allied services
- Small players who own 1-2 trucks, and are generally specialized in septic tank cleaning
- Pure-play treatment players who specialize in constructing and maintaining sewage and water treatment technologies, including SDBs
- Large septic tank cleaning companies (Sumeet Group and 3S Shramik), who own multiple trucks and operate across Maharashtra. 3S Shramik also has the capacity to construct SDBs

Structure of private sector engagement: We followed a six step process to defining the structure of private sector engagement

1. Define the operational role of the private sector in terms of which activities should be bundled together
2. Identify the source of revenue
3. Allocate the responsibility for capital investment between the private player and the ULB
4. Define the payment structure
5. Analyze the required contract length and value to incentivize private players
6. Identify risks and required mitigating actions

Executive summary: Private sector engagement in integrated fecal sludge management (2/4)

Structure of private sector engagement: Bundled v. unbundled contracts

- Since the success of various IFSM activities are highly interconnected, bundled contracts are preferable because they promote greater coordination and accountability
- However, player interest and experience limits us to three possible options for bundled contracts:
  1. (a) Contract for refurbishment and cleaning of septic tanks and the O&M of SDBs + (b) Contract for construction of SDBs
  2. (a) Contract for refurbishment and cleaning of septic tanks + (b) Contract for construction and O&M of SDBs
  3. (a) Integrated contract for refurbishment and cleaning of septic tanks, and the construction and O&M of SDBs

Structure of private sector engagement: Revenue source

- With the proposed regulated cleaning of septic tanks, it would be appropriate to have regular payments by properties paid to the ULB and have a management fee paid to the contractor by the ULB. This would also help mitigate demand risk for the contractor which may arise due to the new approach of regulated emptying.
- There is a demand for sludge as fertilizer among small and marginal farmers, but it is seasonal and farmers are unlikely to consistently pay for sludge
- Thus the ULB needs to compensate players directly for both refurbishment and cleaning of tanks, as well as the construction and O&M of SDBs

Structure of private sector engagement: Capital investment

- Players are willing to invest in a truck because it can be re-deployed to other areas
- However, they were unwilling to invest in the sludge drying beds and prefer milestone based payments for construction. This is because the sale of septage was believed to an unreliable income stream, and the asset was not re-deployable

Executive summary: Private sector engagement in Integrated fecal sludge management (3/4)

Structure of private sector engagement: Payment structure

- Refurbishment: While the type of refurbishment needed is known, the exact number of septic tanks to be refurbished is unknown. Hence the ULB can negotiate a fixed fee per unit for refurbishment
- Cleaning: Given that the number of septic tanks to be cleaned will be specified in a regulated schedule, a recurring monthly fixed fee payment can be used. Emergency cleanings will be managed by the ULB with a high fixed fee as a deterrent
- Construction of SDBs: Since the number, size and type of beds are known, players can be paid a fixed overall amount on a pre-decided payment schedule
- O&M of SDBs: Since the O&M cost is ongoing and predictable, it can be reimbursed with a recurring fixed fee

Structure of private sector engagement: Options for contract length and value

1a. Contract for refurbishment and cleaning of septic tanks + O&M of SDBs: a 2-3 year contract with an annual minimum value of ~INR 32-36 lakh in Sinnar, and ~INR 15-17 lakh in Wai will be required to compensate private players

1b. Contract for construction of SDBs: Given private payment preferences, ULBs will likely incur a contract cost of ~40-45 lakh for 18 beds in Sinnar and ~24-28 lakh for 11 beds in Wai (assuming a 15-25% gross margin)

2a. Contract for refurbishment and cleaning of septic tanks: a 2-3 contract with a minimum value of INR ~ 27-32 lakh in Sinnar and INR ~11-13 lakh in Wai will be required to compensate players

2b. Contract for construction + O&M of SDBs: Construction charges will be structured as above, along with an additional annual O&M cost of ~5-6 lakh in Sinnar, and ~4-5 lakh in Wai

3a. Contract for integrated fecal sludge management: A 2-3 year contract for all activities, with a contract structure similar to contract 1a and 1b, but the only difference would be that it will be the same private contractor who does all these activities.

Executive summary: Private sector engagement in Integrated fecal sludge management (4/4)

Structure of private sector engagement: Risks and mitigation

- **The key risk is performance risk for different activities,** which can be managed by (1) clearly specifying the desired service levels in the contract, (2) developing a system for monitoring service levels, and (3) tying payment incentives and penalties to observed service levels:
  - **Refurbishment:** to mitigate the risk that the private player damages septic tanks or uses sub-standard materials to repair them, the contract will clearly specify the type of refurbishment activity required. Private players will be required to submit household signatures for payment, and the ULB will monitor a random sample. Penalties will be imposed for poor quality work.
  - **Cleaning:** to ensure that the provider follows the cleaning schedule and safely disposes ~~al~~ of septage at the treatment site, a part of the payment will be tied to obtaining household signatures and a part will be tied to signatures from the treatment site operator to acknowledge that the waste is received. At the end of the year, penalties will be deducted for not cleaning the required number of tanks. To ensure safe transportation of waste, penalties will be imposed for observed spillage and illegal dumping.
  - **Construction of SDBs:** to ensure that SDBs meet the required quality standards, the design and materials will be vetted by ULB appointed civil consultants. Players will be paid on a milestone based monitored schedule.
  - **O&M of SDBs:** O&M payment will be contingent on treated sludge and effluent meeting requisite reuse/disposal standards
- **Other key risks that must be managed include:**
  - ***At will* termination:** can be mitigated by mandating a notice period for both parties, and compensating them for some part of their investment
  - ***At cause* termination:** can be mitigated by clearly defining roles and responsibilities in the contract, and compensating the injured parties for their investment
  - **Payment delays by the ULB:** can be mitigated by clearly identifying funds before procurement, ear-marking their use in an escrow account and including an interest clause for delayed payments.
  - **Cost escalation:** can be mitigated by accounting for inflation, and allowing for periodic renegotiations

Executive summary: Consumer financing for own toilets

Rationale for private sector engagement: The Wai and Sinnar ULBs have launched a scheme to provide partial subsidies to households in order to unlock latent demand for own toilets. In order to enhance take-up and address affordability issues among low income households, private /community-based microcredit providers can be facilitated to provide credit options for toilets.

Availability of private players:

- Five different sources of credit for toilets in these towns were assessed in terms of: (1) Reach towards target population (2) Local presence (3) Prior history and future interest in toilet loans (4) Financial and regulatory capacity to make toilet loans, and (5) Favorability of loan terms. The preliminary assessment suggests that:
  - **Self-help groups** can help reach the target population, but are relatively new and will need capacity building support to build financial capacity to make adequately sized loans
  - **Microfinance institutions** are also likely to cater to the target population, but high interest rates due to high costs of funds for them pose a challenge. In addition, they will need to start new operations in Wai.
  - **Credit cooperatives** can offer toilet loans at competitive rates, but access may be limited only to their members
  - **Commercial banks** offer the lowest interest rates after self-help groups but have significant income and collateral requirements that may be a barrier to access
  - **Housing financing companies** which are focused on low-income and unbanked populations may be potential credit providers. Though some of the new low income focused HFCs may not require collateral ,however, most HFCs require collateral even for toilet loans , posing a barrier for many households

Structure of the engagement: The nature of engagement will involve:

- Technical support to ULBs in implementing the partial subsidy scheme to unlock the latent demand
- Mobilization and capacity support to potential lenders to provide financial services and toilet loans in Wai and Sinnar
- Facilitate access to credit lines at lower costs to potential lenders for toilet loans to SHGs and individuals - using the proposed urban sanitation fund mechanism

Executive summary: Structuring a urban sanitation fund

- **There are many new sources of funds available that focus on results based approaches -** the new Companies Act mandates large companies to spend 2% of their after tax profits on CSR, creating new opportunities to attract private funding into sanitation in these cities, both of which have industrial areas. We have also received interest from local philanthropists interested in funding sanitation activities. Recent issuance of a debt fund for cancer by HDFC also shows emerging interest from social investors in India.
- **Different sources of funding can be effectively brought together in an urban sanitation fund** that (1) is flexible in accepting funds from various sources (2) follows a results-based approach, and (3) maintains a strategic demand-driven focus on urban sanitation issues
- **The fund would offer significant advantages to key donors and investors including:** Providing a clear strategic vision, enabling e donors to leverage their funding for greater impact (e.g. through the use of returnable capital using a combination of grant and loan funding), and Reduce implementation effort and costs, and make tangible local impact
- **To structure the urban sanitation fund, we will further explore three elements,**
  - the key players and their roles
  - the funding instrument or fund set up, including both grant funds that mobilize funds from CSR/donors and foundations and debt funds that can mobilize returnable capital from donors and social investors
  - the results-based funding mechanism, including development of performance metrics, and identification of verification agencies
- **We are exploring potential players to fulfil key roles including:**
  - a governance board to guide overall strategic vision and approach of each sub-fund
  - a fund manager to handle day-to-day administration and fund management
  - principal recipients responsible for funding of sanitation activities or for on-lending to households/ private providers
  - appropriate third-party verification agencies

Contents

We have been working in three small towns in Maharashtra to test private sector intervention in low-cost sanitation solutions

- **Overall objective:** To develop and implement a scalable, end-to-end methodology to enable ULBs in small and medium towns in Maharashtra to effectively engage the private sector in sanitation service provision

- **Approach:** We are implementing a five step methodology for private sector engagement in small and medium towns

  ① Conduct initial sanitation diagnostic and identify solutions

  ② Understand ULB institutional structure and assess capacity for private sector engagement

  ③ Analyze the potential for private sector engagement for selected solutions

  ④ Develop an implementation plan for private sector engagement

  ⑤ Test solutions through research-based pilots and scale up implementation

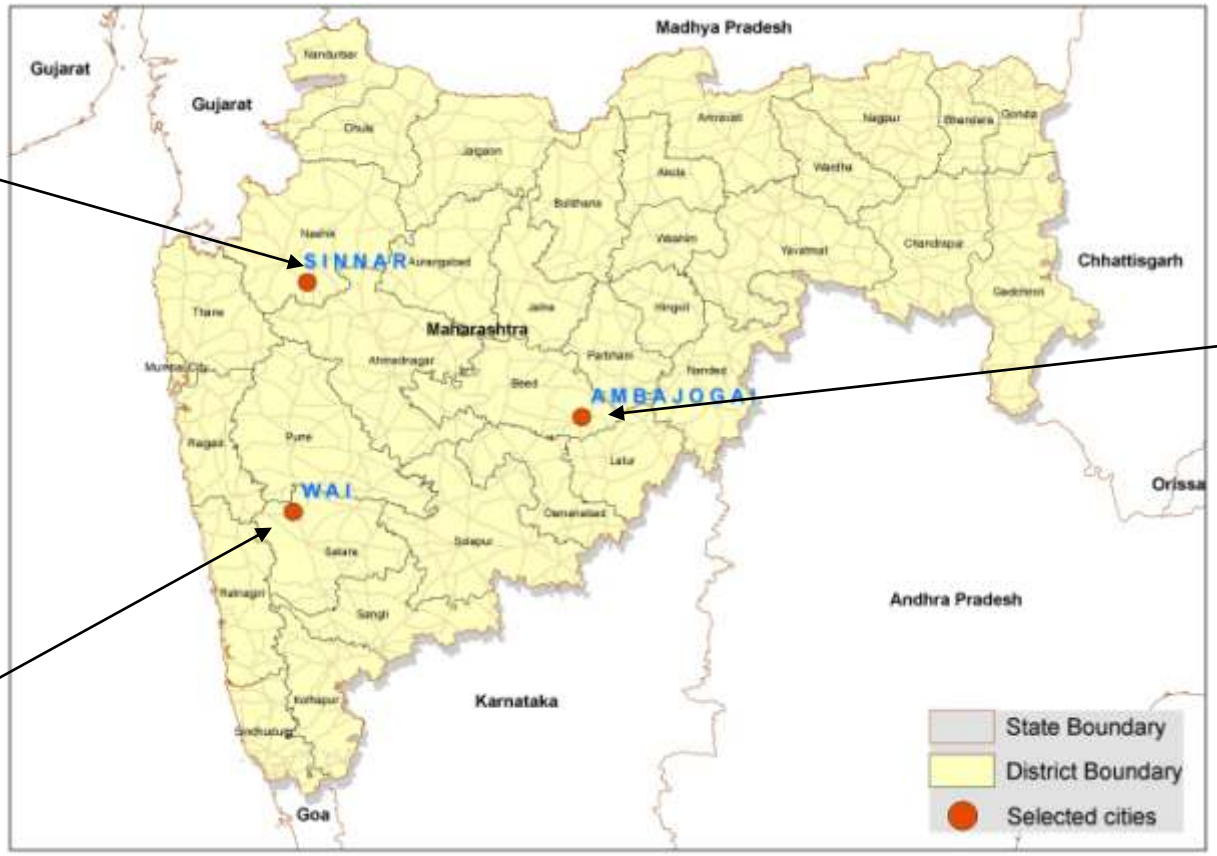
In this phase, we focus on steps 1 through 4, centered around designing these private sector engagements

Our research is centered around three cities in Maharashtra – Wai, Sinnar and Ambajogai

These cities were selected by the Maharashtra Jeevan Pradhikaran and the Water Supply and Sanitation Department of Maharashtra for the development of City Sanitation Plans (CSPs) with the support of CEPT University

Sinnar
Located in the Nashik district, with a population of ~65,000 that has more than doubled in size since 2001 mainly due to expansion of city boundaries and an industrial and manufacturing boom in nearby Nashik.

Wai
Located in the Satara district, 90 km away from Pune, with a population of ~36,000. Wai has grown slowly at 1% per year since 2001.



Ambajogai
Located in the Beed district, the town has a population of ~74,000 that has grown at 3% p.a. since 2001. Its growth has been lead by tourism and education.

Source: Census of India 2011, City Sanitation Plan, PAS Project – CEPT University

This phase of our work consists of four building blocks, this report focuses on the third step

Focus of previous *"Report on town diagnostics for sanitation services and nature of capacity building support needed"*

① Initial sanitation diagnostic

- What are the gaps in sanitation in each town?
- What are the solutions necessary to meet these gaps?
- Identify potential solutions

② ULB institutional and capacity analysis

- Who are the key stakeholders sanitation provision?
- What are the ULB's plans with regards to sanitation and what are existing resources?
- What is the capacity of these stakeholders to work with the private sector and implement PPPs?

③ Analysis of the potential for private sector engagement

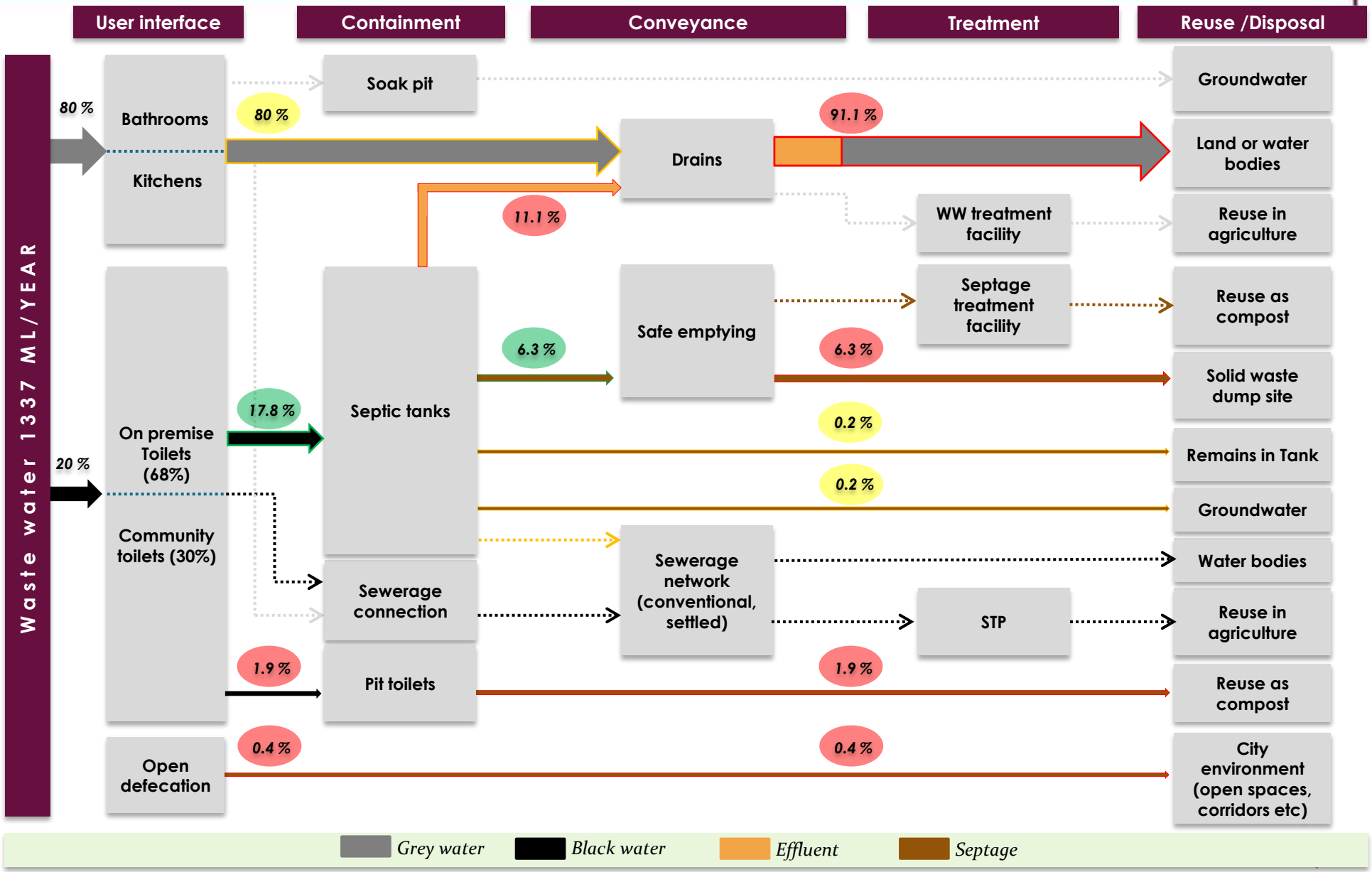
- Can the private sector provide these services at a lower cost or with higher efficiency?
- Are there private players who are willing and capable of providing these services?
- How can we structure the engagement to appeal to both the public and private players?

④ Implementation plan

- What are the key activities and timelines for implementation?
- What capacity building efforts are needed to enable ULBs to manage the contracts?
- What pilots can be planned?
- What kind of financial support is needed?

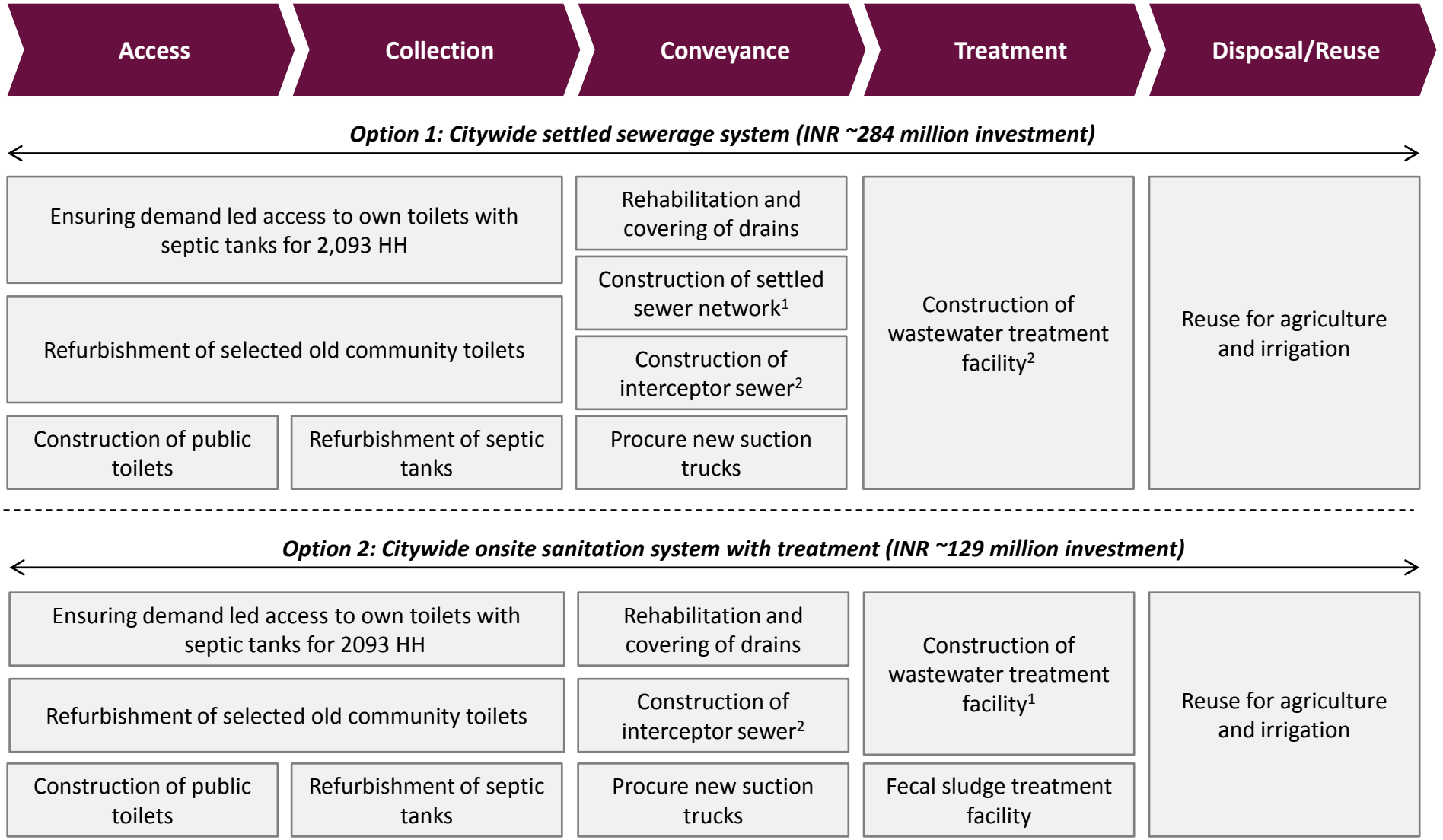
Focus of this report

A detailed diagnosis of gaps across the value chain in these towns has been conducted (Example of Wai)



Source: City Sanitation Plan of Wai , PAS Project – CEPT University

Cities have been supported to develop comprehensive City Sanitation Plans (CSP) for universal sanitation services (Example of Wai)



Note: (1) Settled sewers attached to a treatment facility is a longer term solution as compared to other solutions (2) Adopted under Wai's National River Action Project (NRAP) scheme

Source: City Sanitation Plan of Wai, PAS Project – CEPT University

Based on local priorities the following solutions have been short-listed in each of the three cities

Areas for intervention

1

Integrated fecal sludge management
(Wai and Sinnar)
Regular (in a 3-year cycle) collection and disposal of fecal waste from septic tanks, along with the necessary refurbishment of septic tanks, construction of a treatment facility for septage and reuse of treated septage

2

Own Toilets + Septic Tanks
(Wai and Sinnar)
Construction of own toilets, individual or shared by 2-4 households, along with attached septic tanks

3

Settled sewers attached to DEWATS
(Ambajogai only)
Conveyance of wastewater through non-conventional sewers to a decentralized wastewater treatment facility for the newly developing clusters and reuse of treated wastewater

These priority solutions were selected with city officials based on a combination of factors

	Urgency of sanitation gap	*Fit with local priorities*	*Ability to implement in the short-run*	*Ability to finance within its own funds*	***City rationale for choosing solution***
1 **Integrated fecal sludge management**	✓	✓	✓	✓	• Most households in all three cities depend on septic tanks, which are cleaned infrequently and release untreated effluent into drains • Fecal sludge management is relatively low cost, and can be implemented in the short run from the ULB's own funds
2 **Own toilets + septic tanks**	✓	✓	✓		• Wai and Sinnar pay ~INR 1-2 million for cleaning community and public toilets, and still face issues such as poor quality of maintenance, theft and vandalism • Individual toilets are not always feasible due to space and cost constraints; group toilets are more affordable and accessible, and shift maintenance burden on the households • Toilets can be constructed relatively quickly in the short-run
3 **Settled sewer attached to DEWATS**	✓	✓			• Ambajogai city was already focused on building a conventional sewer system in the center of the city • The city wanted a low cost option for the remaining three clusters

Source: Assessment based on interactions with the city stakeholders

In this document, we will review the potential for private sector engagement for the provision of these solutions, focusing on three sets of questions

Areas for intervention	Opportunities for private sector engagement	
Integrated fecal sludge management ***(Wai and Sinnar)***	A *Private sector engagement for refurbishment of septic tanks, regular septic tank emptying, construction and O&M of fecal sludge drying beds and sale of septage*	C *Attracting private sector investment through a city sanitation fund*
Own Toilets + Septic Tanks ***(Wai and Sinnar)***	B *Consumer financing to unlock latent demand for own toilets*	
Settled sewers attached to DEWATS ***(Ambajogai only)***	D *Private sector engagement for construction and O&M of settled sewers, construction and O&M of DEWATS, and sale of wastewater*	

Key questions for review

What is the rationale for private sector engagement for this solution?

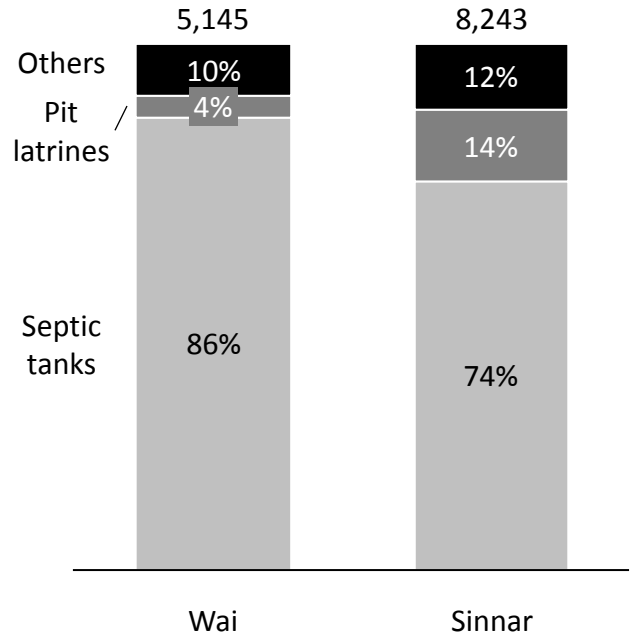
Are there private players who are willing and able to offer these services in these towns?

How can we structure these engagements to best incentivize the private players while ensuring a high level of performance?

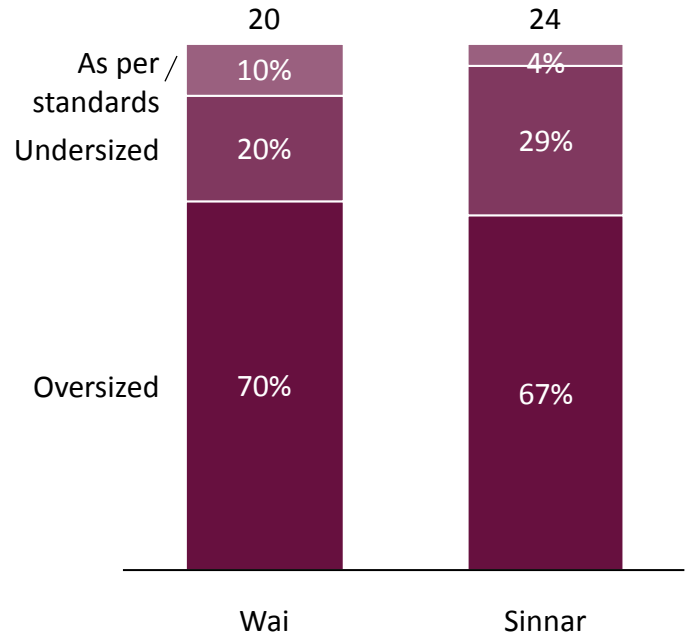
Contents

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
- Tanks generally have a conventional **2-3 chambered baffled design**

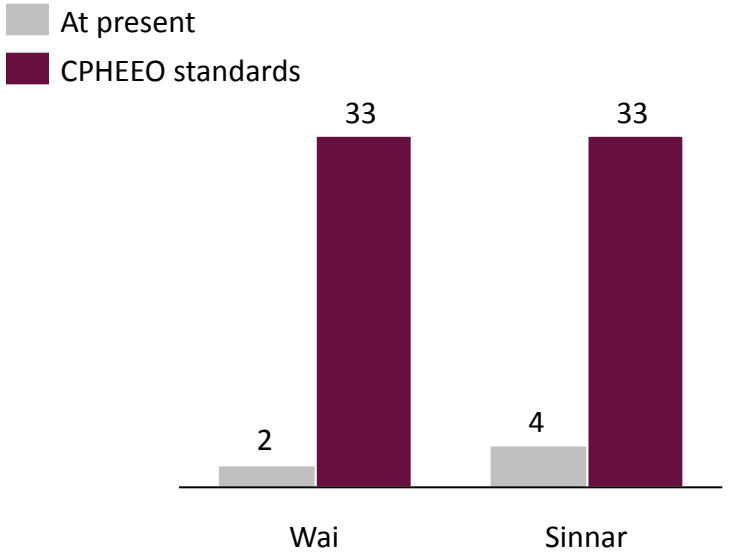
- A sample survey conducted in Wai and Sinnar found that septic tanks connected to individual toilets are **largely oversized** and do not meet the standards prescribed in IS codes and CPHEEO[1]
- Tanks are often connected directly to the drainage system

Note (1) The Central Public Health and Environmental Engineering Organization (CPHEEO) is the technical wing of the MoUD and deals with matters related to urban water supply and sanitation

Source: CEPT University studies in Wai and Sinnar

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**
- In addition to the fact that tanks are often over-sized, the driving factor behind **the infrequent cleaning is the lack of awareness among households** who do not bear the environmental impact of infrequent cleaning

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 the application of a lot of water to break the solids

Note (1) The Central Public Health and Environmental Engineering Organization (CPHEEO) is the technical wing of the MoUD and deals with the matters related to urban water supply and sanitation

Source: PAS database, City Sanitation Plan, PAS Project – CEPT University

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

Source: City Sanitation Plan, PAS Project – CEPT University

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

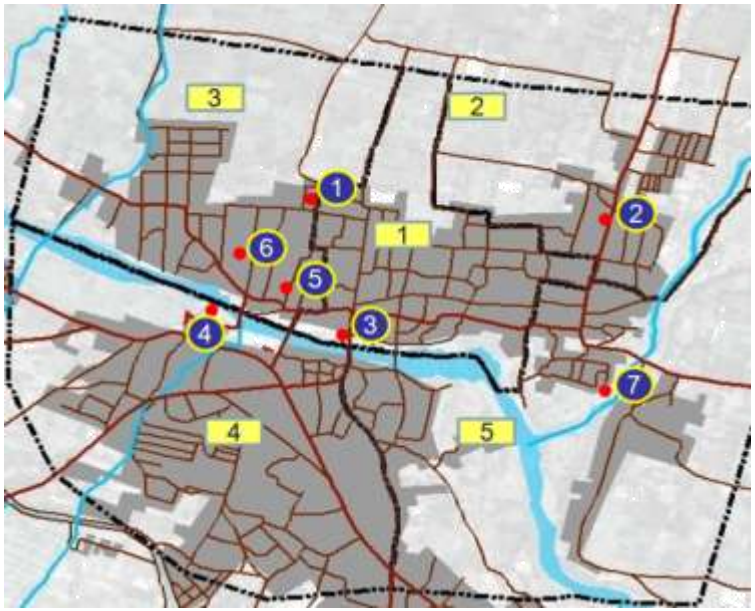
Location of the dumping ground in Wai

Location of dump site in Sinnar

Source: City Sanitation Plan, PAS Project – CEPT University

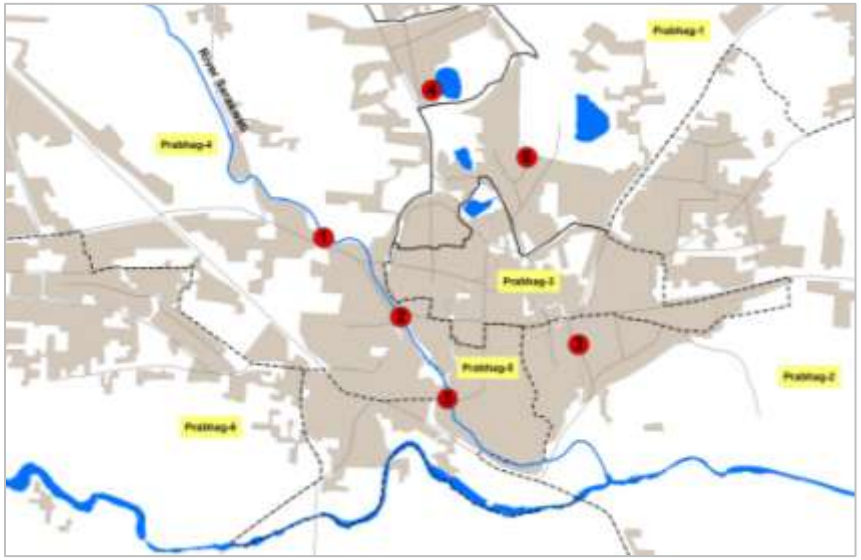
Sample tests of wastewater show that key indicators of pollution exceed the prescribed limits by the Central Pollution Control Board (CPCB)

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**
- **The level of BOD** was higher than the prescribed limits of the CPCB at **5/7 locations and the COD levels** were higher than the limit at **2/7 locations**

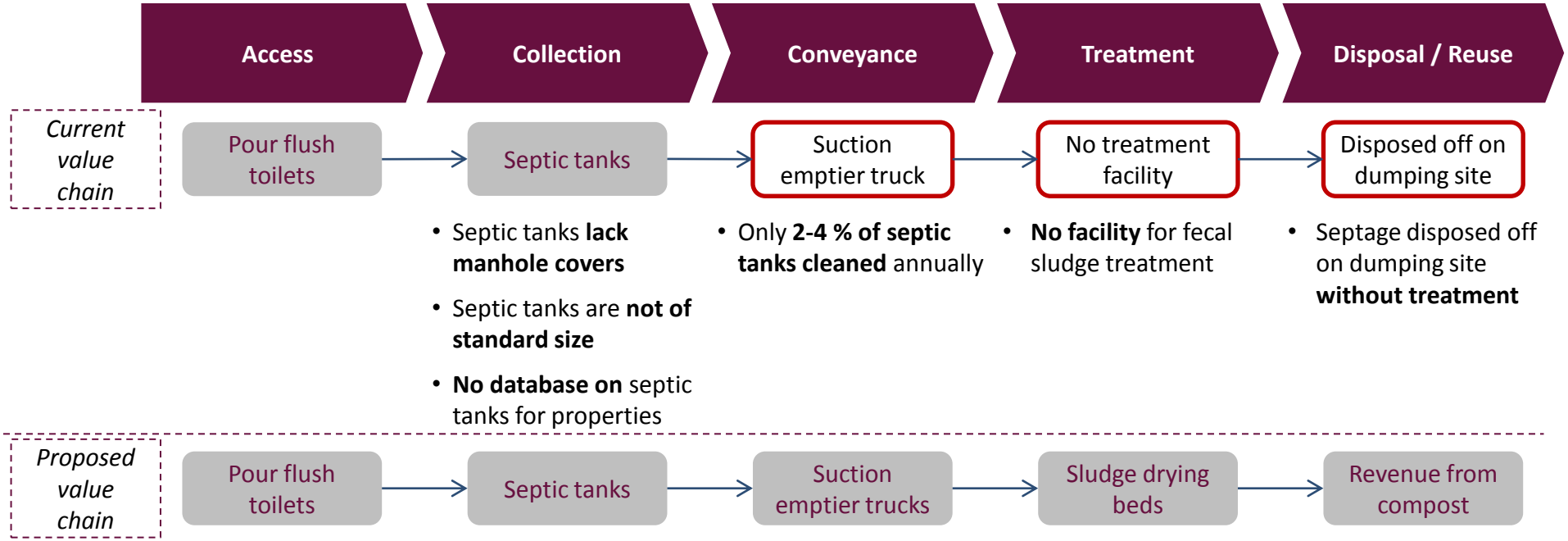
Test results of sample wastewater in Sinnar



- Wastewater samples were tested from 5 locations in Sinnar and checked the levels of **BOD, COD, TSS and the pH count**
- The **BOD and COD levels were much higher** than the prescribed limits of the CPCB **at all locations**

Source: City Sanitation Plan, PAS Project – CEPT University

To tackle these issues, these cities are exploring an end-to-end integrated fecal sludge management (IFSM) solution



Source: Presentation on septage management plan, CEPT University

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

Source: Presentation on septage management plan, CEPT University

Second, tanks will 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 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

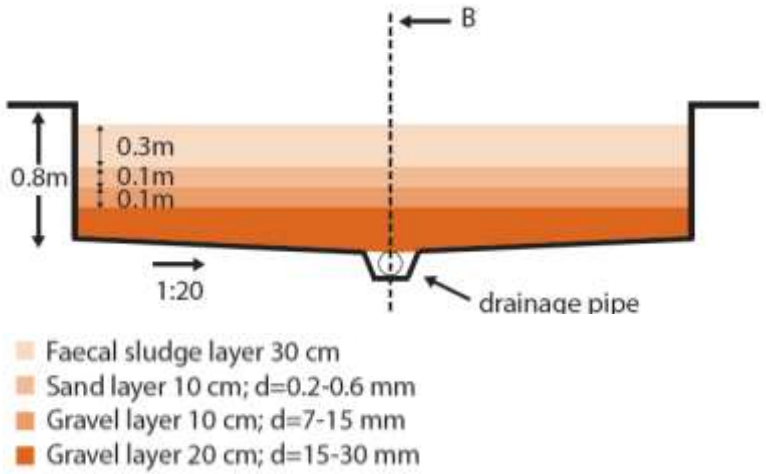
Source: Presentation on septage management plan, CEPT University

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

Third, unplanted sludge drying beds will 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**

Description of proposal

	Wai	Sinnar
Septage generated (cubic meters)	26.3	42
Number of sludge beds needed	11	18
Land area required (sq. m.)	1700	2800
Total cost[1] (INR million)	***2.2 – 2.8***	***3.6 – 4.5***
Cost per HH (INR)	***~330***	***~300***

- The cities have identified land near the current solid waste dumping site for the construction of **sludge drying beds**
- **Each sludge drying bed is ~12m X 10m and costs ~INR 200,000 – 250,000**

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

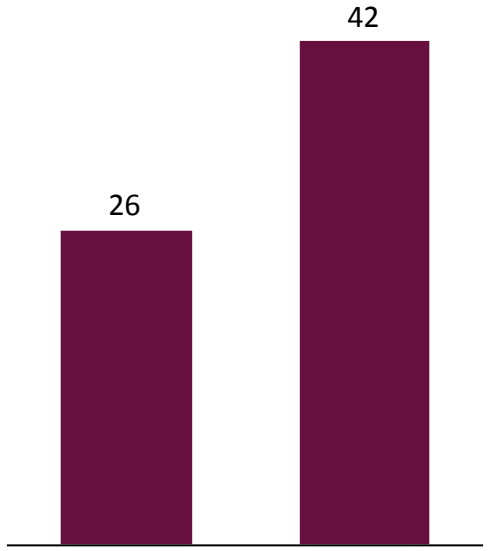
Source: Presentation on septage management plan, CEPT University

Finally, treated septage will 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 (Cubic meters/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"

City officials recognize the lack of internal capacity to meet these higher service standards and wish to engage the private sector

Lack of staff capacity

*"**Sinnar's population has doubled as the city area has grown from 5 sq. km.to 51 sq. km.,** but the ULB's manpower has remained the same. We are very short of staff, so we had to outsource these activities."*

- Sinnar Sanitary Inspector

*"**We outsourced the current contracts because we were facing a severe staff crunch.** For the proposed solutions, I don't think we can offer these service levels internally, we will need to consider private players."*

- Wai Engineer

Higher service standards with private engagement

*"**We are paying more than we did when we did these activities ourselves. Also, the service levels have improved and we have shifted a lot of our burden on to the private player.** For example, we constantly faced issues with theft and vandalism in community toilets. That is now the responsibility of the private player to keep these toilets operational."*

- Wai Sanitary Inspector

*"**Our experience with the private sector has been good…it is far easier to monitor and ensure the performance of private contractors**, especially if they are not local. With private players, you can incentivize them by withholding payments, which we cannot do with our internal staff."*

- Sinnar Council President

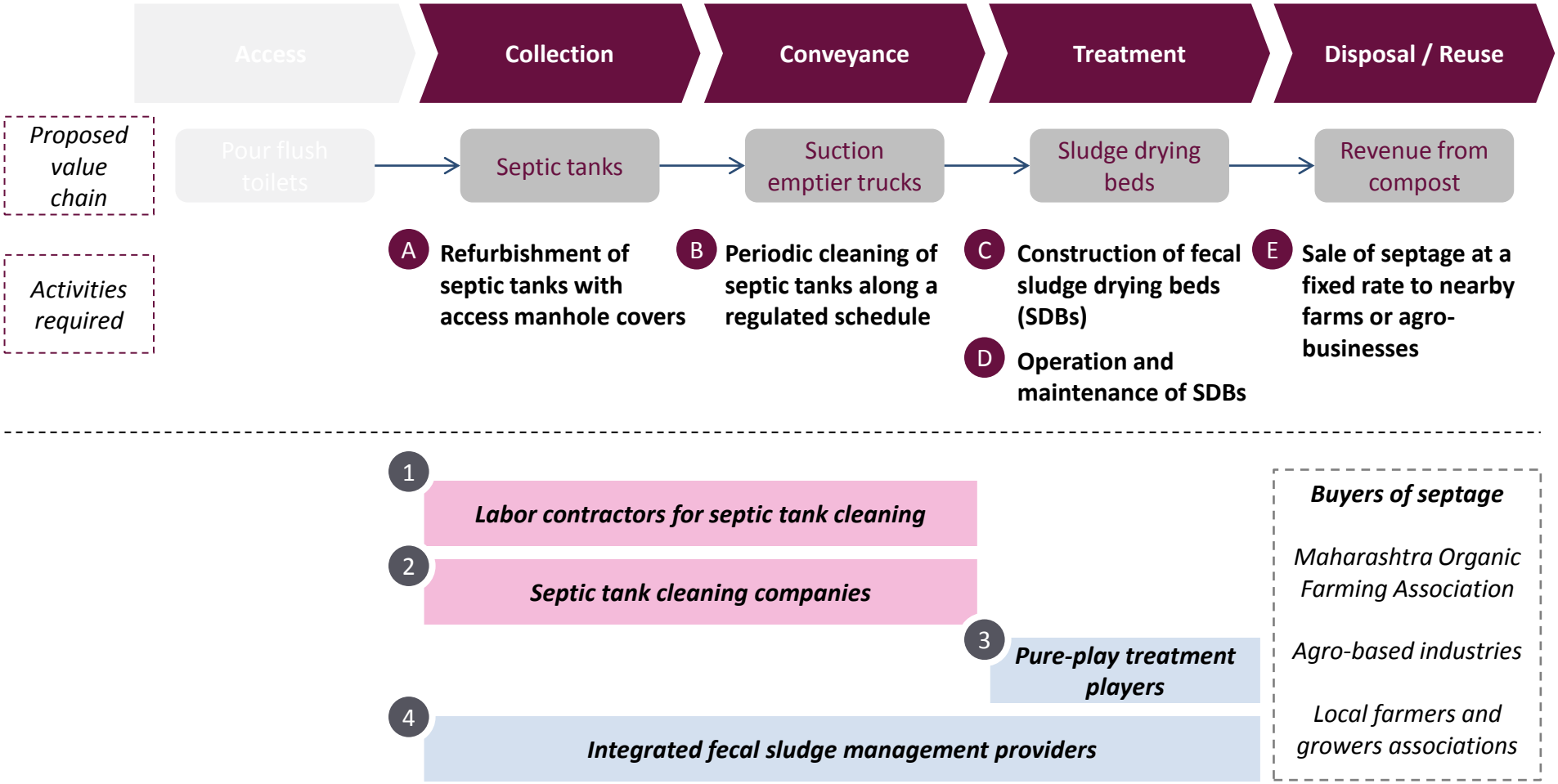
*"**Our experience with these contracts has been quite good. The ULB has not received any complaints so far**. It is a relief for our staff."*

- Wai Engineer

Source: Interviews with Wai and Sinnar city officials

Contents

We identified four kinds of players offering septage management services in nearby towns



Source: Field visits, online business listings

1

Labor contractors: These are small players that employ workers to operate rental trucks, and also offer other facility management services

Name: ZR Enterprises

Geographic focus: Pune

Services offered: General facility management

Business model:

- *Scale:* ~1-3 trips per month
- *Customers:* Households and small retail establishments
- *Payment structure:* ~ INR 1000 - 3000 per trip
- *Expected return:* ~ 10 - 15 lakh per year

Interest in business opportunity:

"Yes, I am actively looking for new business opportunities*… I can obtain a truck and labor for cleaning. I am familiar with sludge drying beds and know a contractor who can assist with their construction. I am not sure the sale of septage is a possibility, I would prefer to be paid a fee."*

Name: Manisha Enterprises

Geographic focus: Pune

Services offered: Septic tank & storm water cleaning

Business model:

- *Scale: ~2-3 trips per day*
- *Customers:* Households and small retail establishments
- *Payment structure:* ~ INR 1000 - 1200 per trip
- *Expected return:* Operating margin of 30%-40%

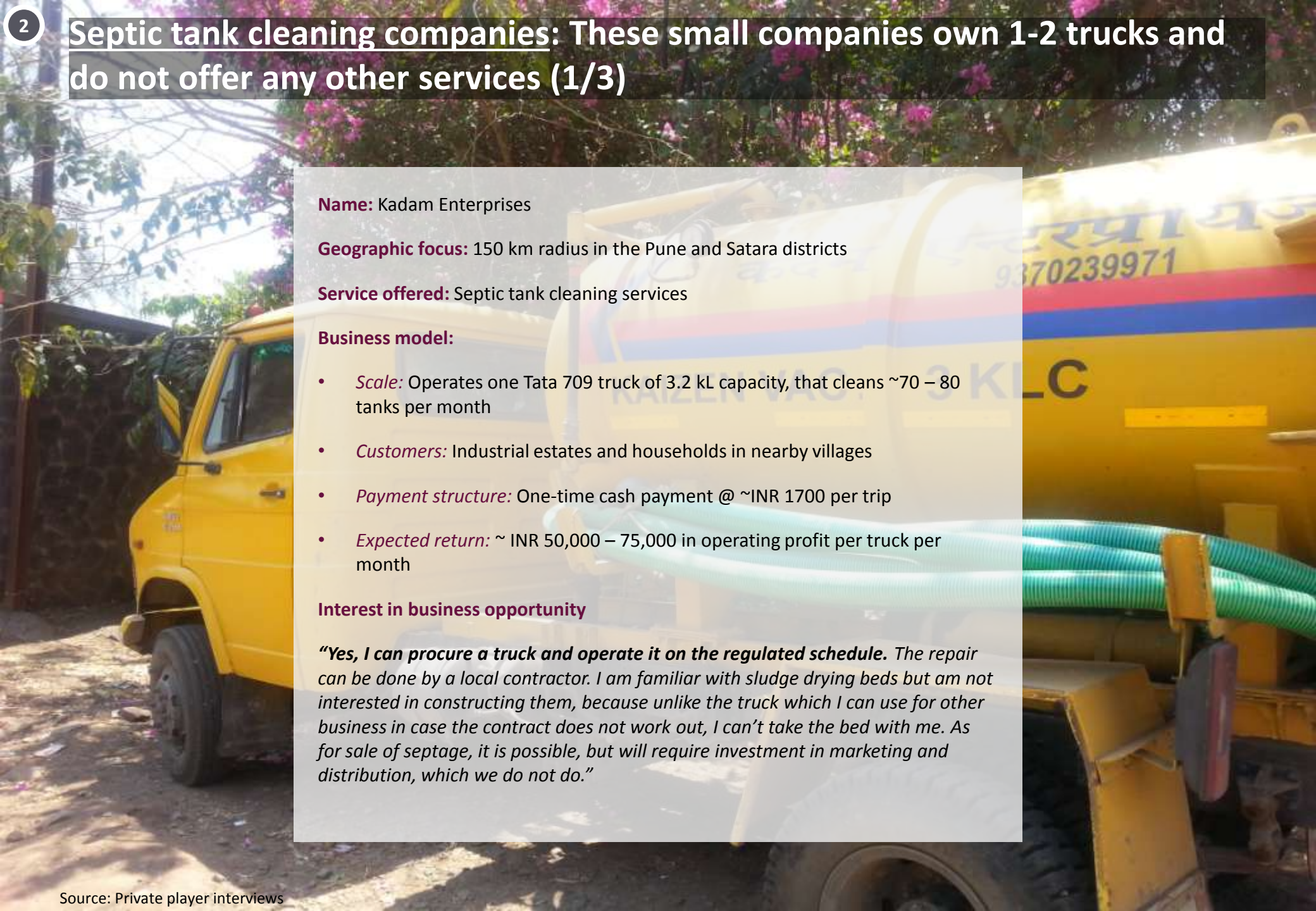
Interest in business opportunity:

"Yes, but only if the ULB provides the truck. *We find enough business in Pune and don't see a reason to expand. We do not do construction and are not familiar with sludge drying beds."*

Source: Private player interviews

2

Septic tank cleaning companies: These small companies own 1-2 trucks and do not offer any other services (1/3)



Name: Kadam Enterprises

Geographic focus: 150 km radius in the Pune and Satara districts

Service offered: Septic tank cleaning services

Business model:

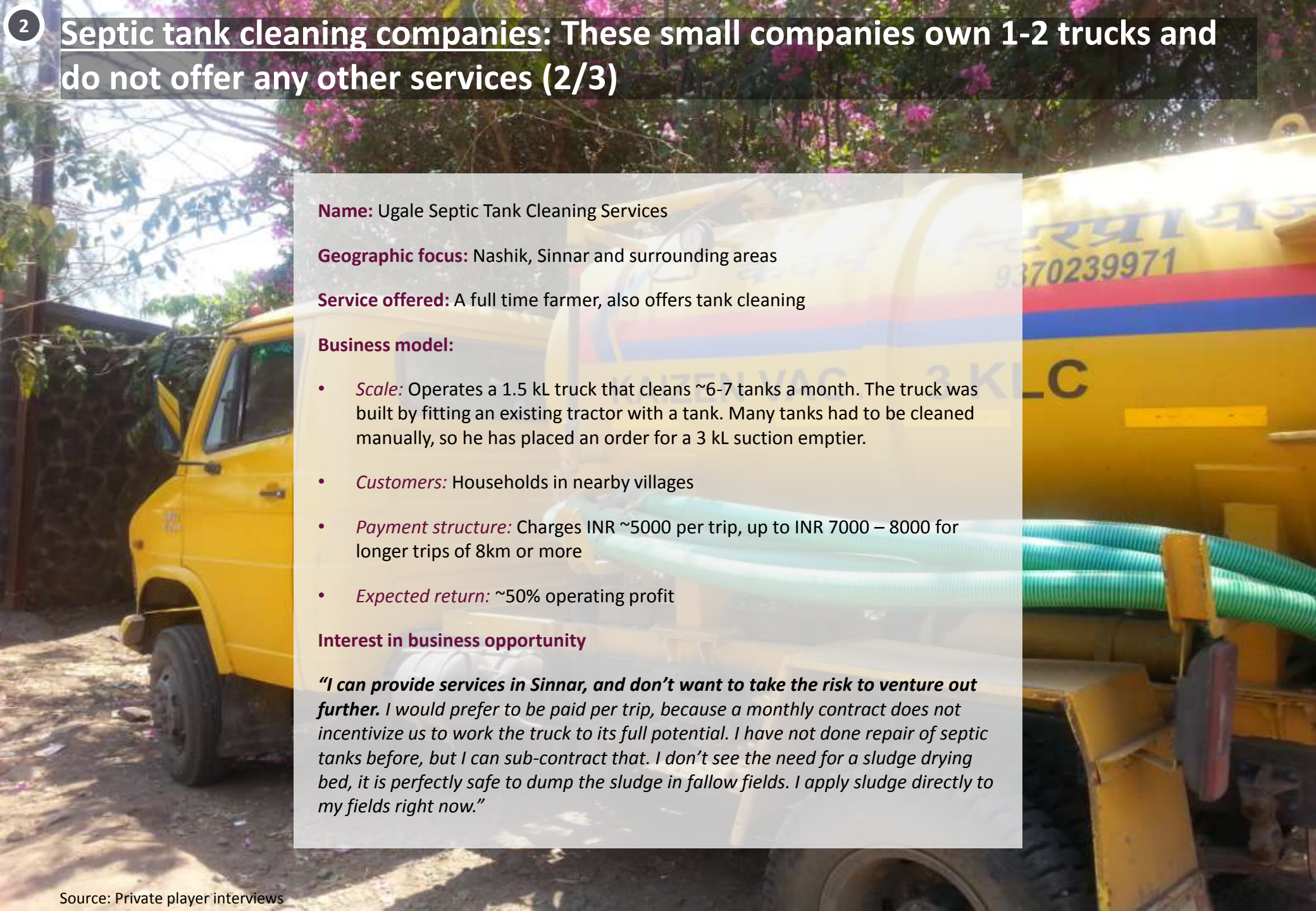
- *Scale:* Operates one Tata 709 truck of 3.2 kL capacity, that cleans ~70 – 80 tanks per month
- *Customers:* Industrial estates and households in nearby villages
- *Payment structure:* One-time cash payment @ ~INR 1700 per trip
- *Expected return:* ~ INR 50,000 – 75,000 in operating profit per truck per month

Interest in business opportunity

"Yes, I can procure a truck and operate it on the regulated schedule. *The repair can be done by a local contractor. I am familiar with sludge drying beds but am not interested in constructing them, because unlike the truck which I can use for other business in case the contract does not work out, I can't take the bed with me. As for sale of septage, it is possible, but will require investment in marketing and distribution, which we do not do."*

Source: Private player interviews

2 Septic tank cleaning companies: These small companies own 1-2 trucks and do not offer any other services (2/3)



Name: Ugale Septic Tank Cleaning Services

Geographic focus: Nashik, Sinnar and surrounding areas

Service offered: A full time farmer, also offers tank cleaning

Business model:

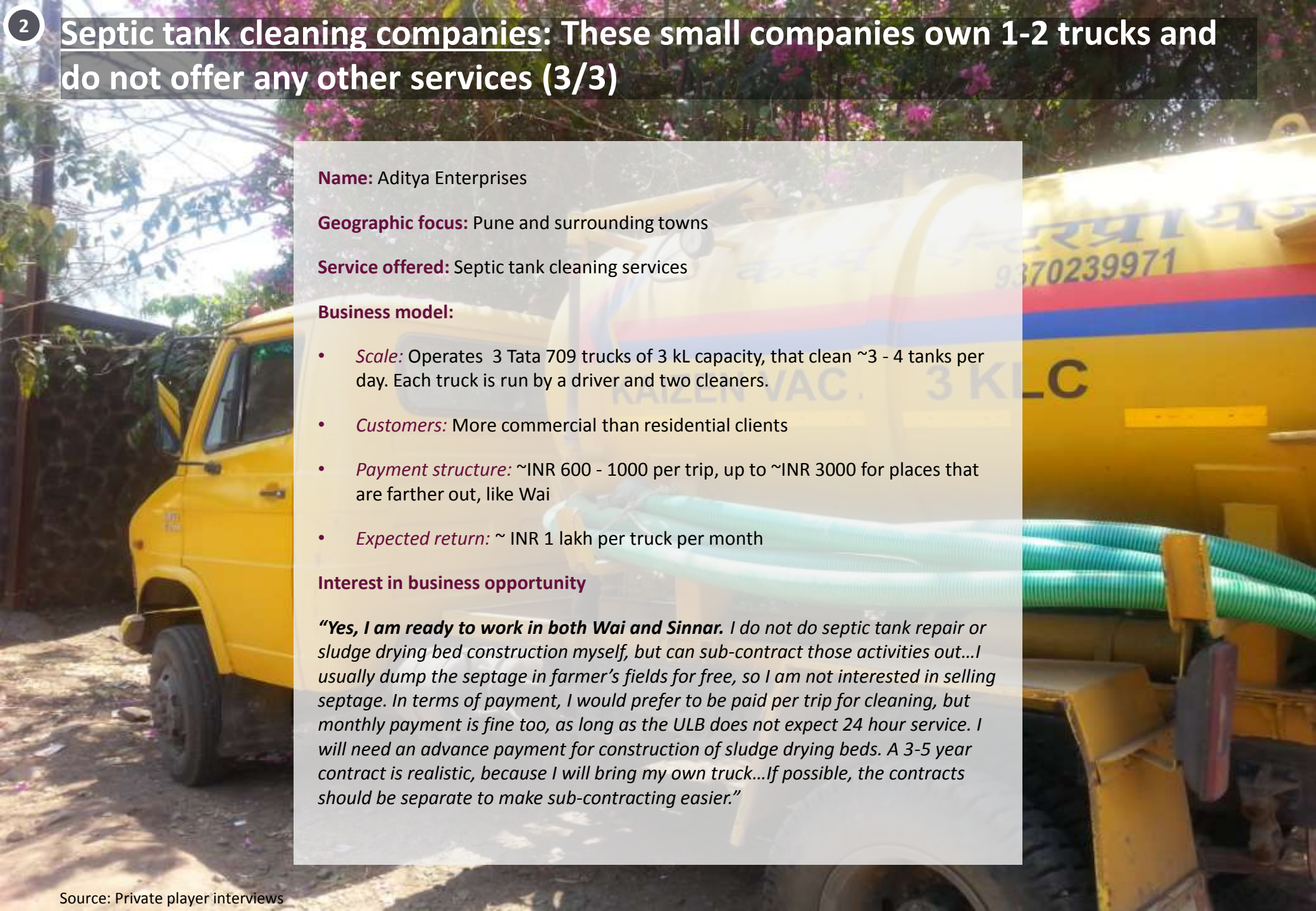
- *Scale:* Operates a 1.5 kL truck that cleans ~6-7 tanks a month. The truck was built by fitting an existing tractor with a tank. Many tanks had to be cleaned manually, so he has placed an order for a 3 kL suction emptier.
- *Customers:* Households in nearby villages
- *Payment structure:* Charges INR ~5000 per trip, up to INR 7000 – 8000 for longer trips of 8km or more
- *Expected return:* ~50% operating profit

Interest in business opportunity

"I can provide services in Sinnar, and don't want to take the risk to venture out further. *I would prefer to be paid per trip, because a monthly contract does not incentivize us to work the truck to its full potential. I have not done repair of septic tanks before, but I can sub-contract that. I don't see the need for a sludge drying bed, it is perfectly safe to dump the sludge in fallow fields. I apply sludge directly to my fields right now."*

Source: Private player interviews

2 Septic tank cleaning companies: These small companies own 1-2 trucks and do not offer any other services (3/3)



Name: Aditya Enterprises

Geographic focus: Pune and surrounding towns

Service offered: Septic tank cleaning services

Business model:

- *Scale:* Operates 3 Tata 709 trucks of 3 kL capacity, that clean ~3 - 4 tanks per day. Each truck is run by a driver and two cleaners.
- *Customers:* More commercial than residential clients
- *Payment structure:* ~INR 600 - 1000 per trip, up to ~INR 3000 for places that are farther out, like Wai
- *Expected return:* ~ INR 1 lakh per truck per month

Interest in business opportunity

"Yes, I am ready to work in both Wai and Sinnar. *I do not do septic tank repair or sludge drying bed construction myself, but can sub-contract those activities out…I usually dump the septage in farmer's fields for free, so I am not interested in selling septage. In terms of payment, I would prefer to be paid per trip for cleaning, but monthly payment is fine too, as long as the ULB does not expect 24 hour service. I will need an advance payment for construction of sludge drying beds. A 3-5 year contract is realistic, because I will bring my own truck…If possible, the contracts should be separate to make sub-contracting easier."*

Source: Private player interviews

3

Pure-play treatment players: Traditional sewage treatment plant providers are focused on more advanced technologies than sludge drying beds

Name: Era Hydro-Biotech Energy Private Limited

Geographic focus: Pune

Services offered: Manufacturing and construction of water, wastewater and sewage treatment plants

Interest in business opportunity

"We do not approve of stand-alone sludge drying beds. *Dried sludge will need to be handled manually, and what happens during the monsoon? In addition, each bed would need to be cleaned and repaired every few months. I would suggest a large anaerobic biogas plant, the gas from which can be used for electricity generation."*

"I am fine with a BOOT contract with a 1-2 year contract, but generally these contracts are mile-stone *based with 20% payment in advance, and the rest after project delivery."*

Name: Envicare Technologies Private Limited

Geographic focus: Pune

Service offered: Manufacturing and construction of water, wastewater and sewage treatment plants

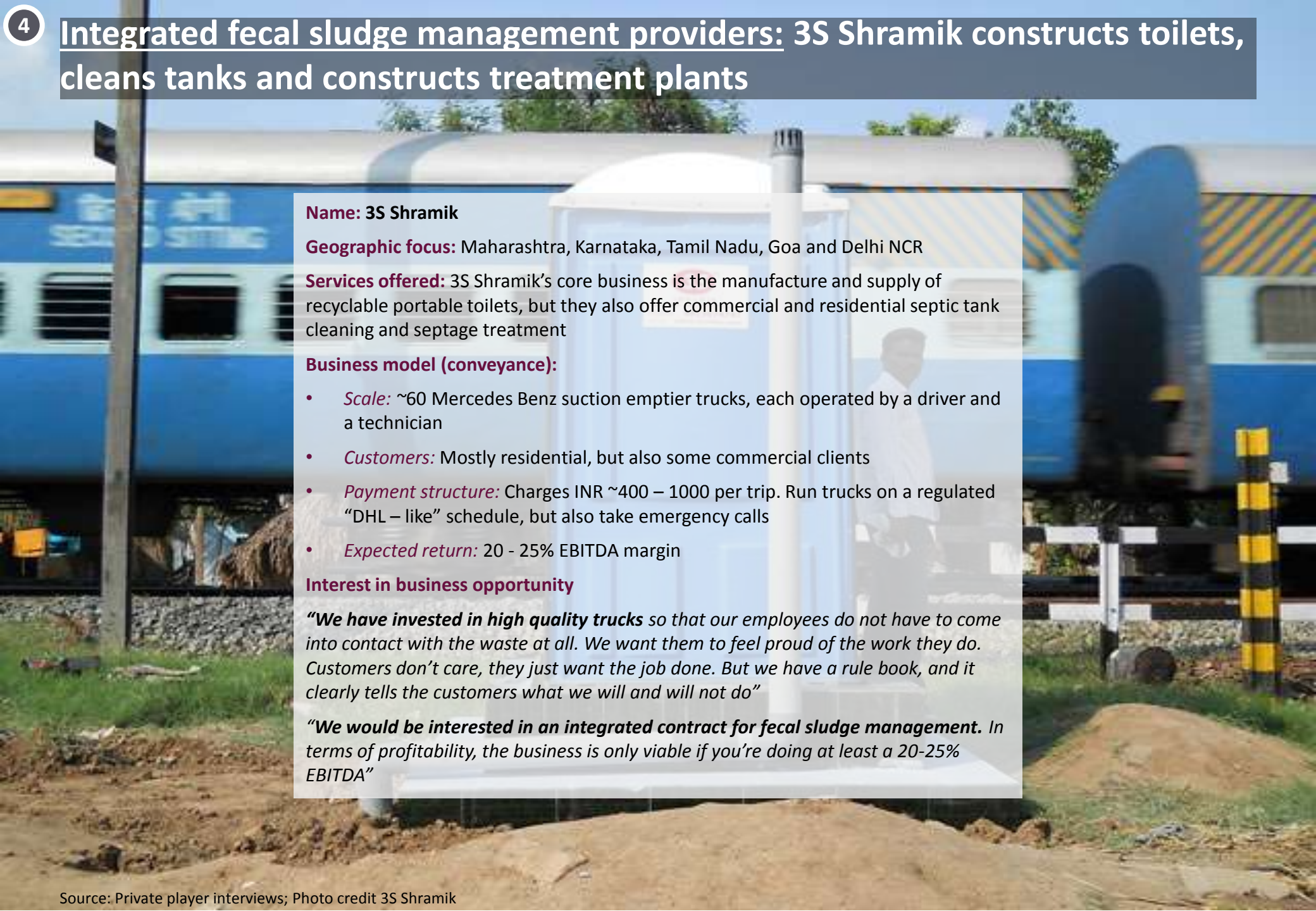
Interest in business opportunity

"We are not interested in constructing sludge drying beds by themselves. *The sludge will be half-digested, and attract fleas or fungal growth. We recommend an anaerobic digester attached to a bed. You can generate methane from the digester, and the dried sludge can be used as manure"*

"Payment needs to be mile-stone based, *~40% up-front, 50% when materials are delivered to the site and 10% post-completion. We would like a 25% return."*

Source: Private player interviews, Photo credit Era Hydro-biotech

4 Integrated fecal sludge management providers: 3S Shramik constructs toilets, cleans tanks and constructs treatment plants



Name: 3S Shramik

Geographic focus: Maharashtra, Karnataka, Tamil Nadu, Goa and Delhi NCR

Services offered: 3S Shramik's core business is the manufacture and supply of recyclable portable toilets, but they also offer commercial and residential septic tank cleaning and septage treatment

Business model (conveyance):

- *Scale:* ~60 Mercedes Benz suction emptier trucks, each operated by a driver and a technician
- *Customers:* Mostly residential, but also some commercial clients
- *Payment structure:* Charges INR ~400 – 1000 per trip. Run trucks on a regulated "DHL – like" schedule, but also take emergency calls
- *Expected return:* 20 - 25% EBITDA margin

Interest in business opportunity

*"**We have invested in high quality trucks** so that our employees do not have to come into contact with the waste at all. We want them to feel proud of the work they do. Customers don't care, they just want the job done. But we have a rule book, and it clearly tells the customers what we will and will not do"*

*"**We would be interested in an integrated contract for fecal sludge management.** In terms of profitability, the business is only viable if you're doing at least a 20-25% EBITDA"*

Source: Private player interviews; Photo credit 3S Shramik

4 Integrated fecal sludge management providers: The Sumeet Group manufactures and operates trucks, and also offers treatment options

Name: Sumeet Group

Geographic focus: Marathwada and Kalyan, Maharashtra

Services offered: Solid waste management, fecal sludge management, water and sewage treatment, facility management. Also manufactures suction emptier trucks

Business model (conveyance):

- *Scale:* Operates 5 Tata 709 3kL trucks
- *Customers:* Mostly residential, but also some commercial clients
- *Payment structure:* Charges INR ~800 per trip
- *Expected return:* ~20% operating profit

Interest in business opportunity

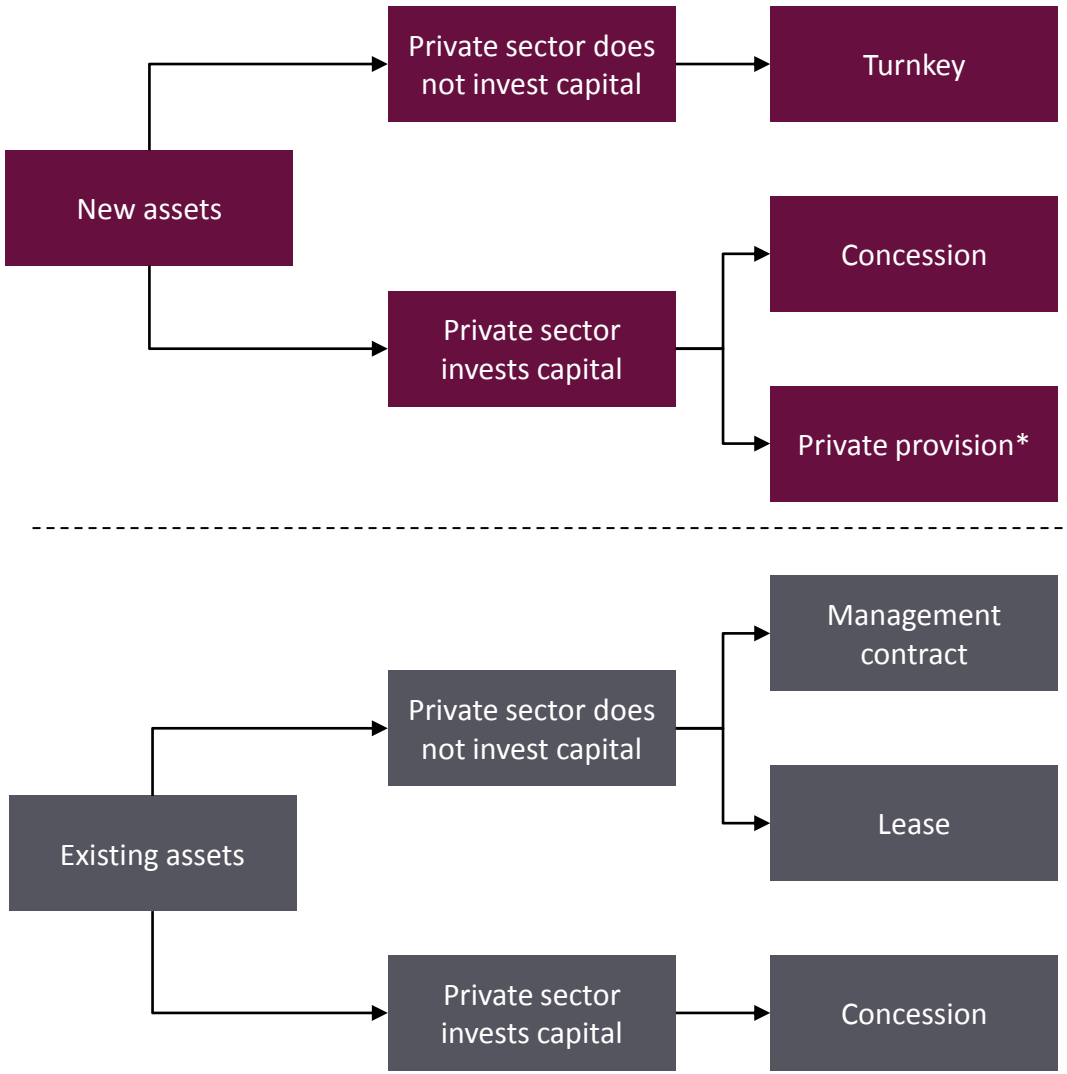
*"**We are happy to work in any city across Maharashtra.** We have not constructed sludge drying beds in the past, but can manage the construction. We can also repair septic tanks. Monthly payments for septic tanks are acceptable, but for construction we would like to be paid some portion in advance, followed by milestone based payments."*

*"**We have entered into a contract with the Barshi Municipal Council** for solid waste management. I enjoy working with them, they are a small organization and can resolve issues quickly. They also make payments on time."*

Source: Private player interviews; Photo credit Sumeet Group

Contents

PPP contracts can be divided into six types depending on whether they focus on creating assets and attracting private sector investment

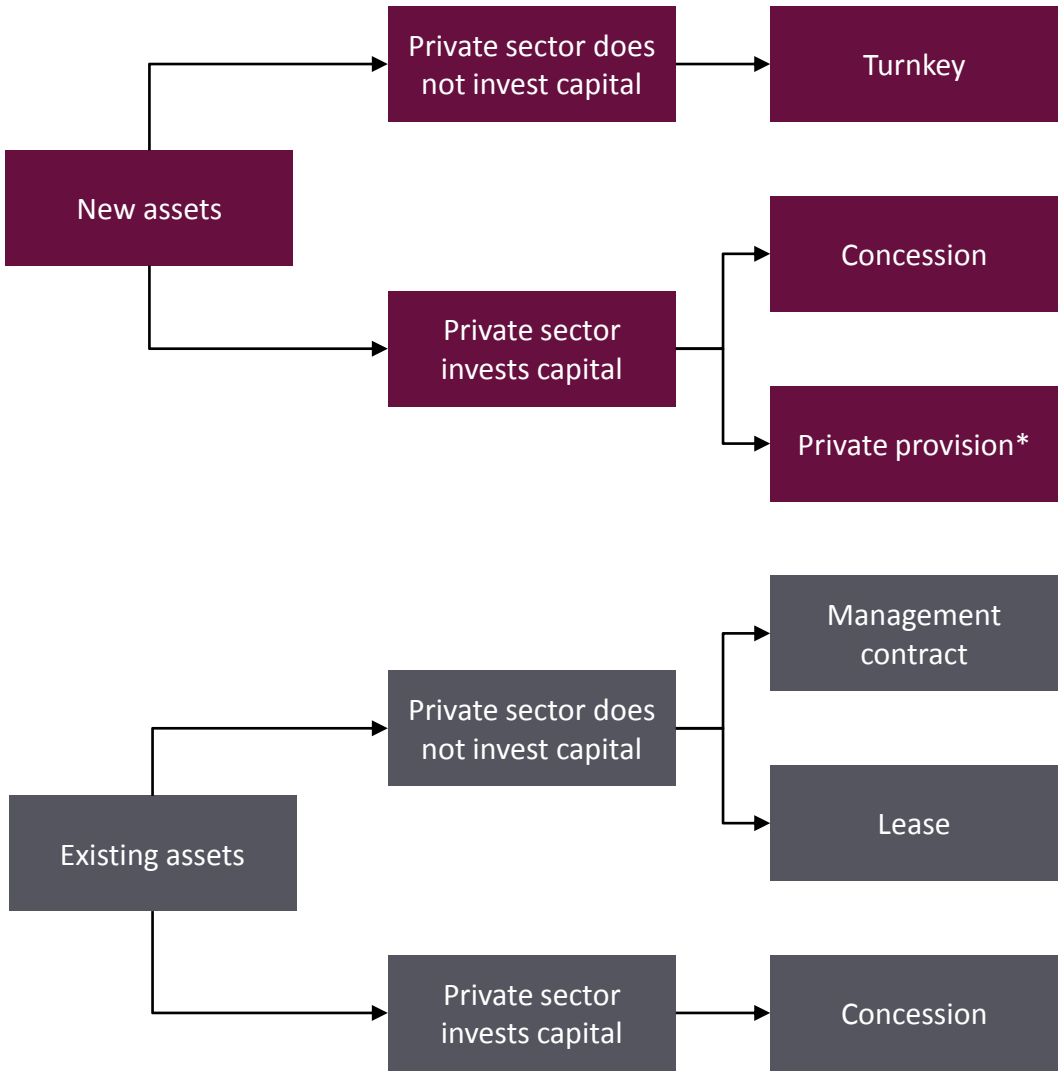


	Description
Turnkey	Private entity **designs and builds** an asset for a **fee** paid by the public sector
Concession	Public sector **grants rights** to private entity to **build and operate** a facility for a fixed period of time in exchange for a concession fee
Private provision*	Private entity **builds, owns and operates** the assets after **getting rights** from the government
Management contract	Private entity **operates and/or maintains** an asset or provides a service for a management fee
Lease	Private entity **operates and/or maintains** an asset for the public sector in exchange for a lease fee
Concession	Government **grants rights** to a private entity to **operate and maintain** a facility for a fixed period of time

*Note: Not generally defined as a PPP in India; Similarly short-term outsourcing contracts will not defined as PPPs as per the new 2011 Draft National Policy

Source: PPP toolkit – Ministry of finance – India, Toolkit for PPP in Urban Water Supply in Maharashtra – ADB, Department of economic affairs

Water and sanitation PPPs in India have spanned across these different categories



Examples in India

Replacement of existing sewage treatment plant in Perungudi, Tamil Nadu by WABAG, followed by a 10 year O&M contract

Maintenance of existing wastewater treatment plant and construction of a new wastewater treatment infrastructure for reuse by Triveni engineering in Surat, Gujarat

NA

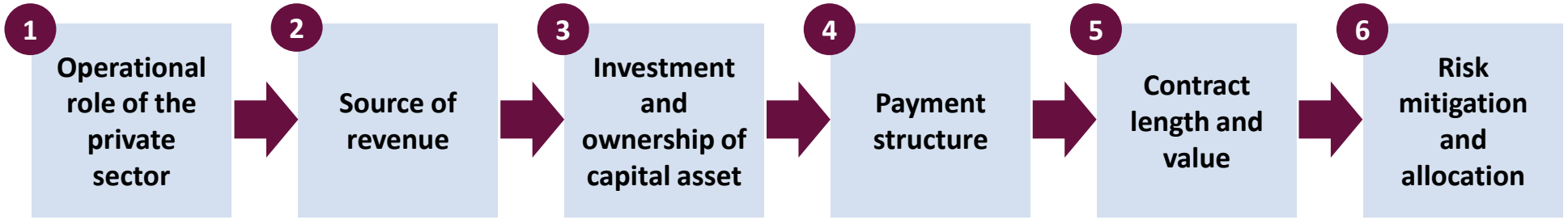
Bangalore Municipal Corporation awarded PPP to advertising agencies for O&M of public toilets in lieu of advertising space in 2013

SPML consortium was awarded a contract in 2010 to operate, meter and collect revenues for the water supply in Latur, Maharashtra

Veolia-Vishwaraj consortium was awarded a 25 year contract to manage the existing water distribution system and rehabilitate a part of existing network in Nagpur

*Private provision of water supply or sanitation are uncommon in India

We followed a six step process to structure a private sector engagement for integrated fecal sludge management



Should the ULB give out an integrated contract for refurbishment and cleaning of septic tanks and construction + O&M of SDBs or do these activities need to be unbundled?

Is the revenue from operations enough to meet private players' return expectations or does the ULB need to compensate private players?

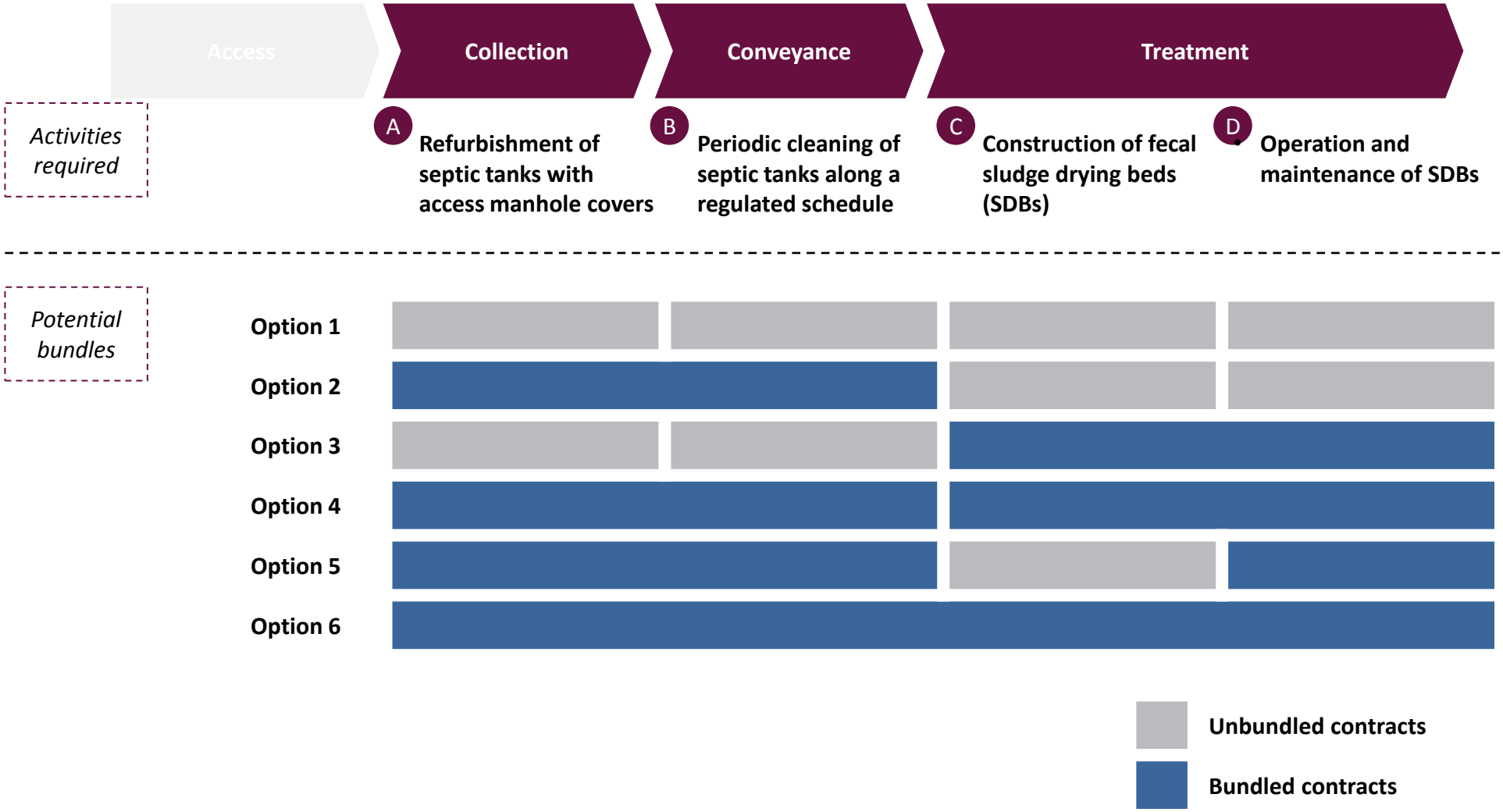
Should the capital investment in the truck and the SDB be borne by the private player or the ULB?

What is the appropriate payment structure (e.g. revenue from operations, fixed fee per unit or lump sum) for the private player?

What is the appropriate contract duration and value which compensates private players for the risk they undertake, while providing the ULB with the flexibility to switch providers?

What are the major identified risks for the private player and the ULB that need to be mitigated and allocated?

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



1 Operational role: Bundling contracts simplifies vendor management, and ensures greater accountability

Advantages of bundled contracts	Advantages of unbundled contracts
• **Ensures greater accountability:** Having a single point of contact avoids the issue of players blaming each other for lapses in service • **Aligns performance incentives:** Creates incentives for the private player to manage each element of the chain successfully • **Simplifies contract management:** Reduces the number of transactions needed to co-ordinate with different players	• **Diversifies non-performance risk:** With a bundled contract, non-performance puts all activities at risk • **Takes advantage of player expertise**: Contracts can be awarded to the most qualified player for each activity

The elements of integrated fecal sludge management are highly connected and success of one element is closely tied to the success of the others. Hence, bundled contracts have tangible benefits over unbundled contracts for IFSM.

Source: Castalia Strategic Advisors – 'Improving sanitation outcomes though service level agreements'

1 Operational role: The feasibility of bundling depends on the willingness and ability of players to provide various services

	Access	Collection	Conveyance	Treatment
Activities required		A Refurbishment of septic tanks with access manhole covers	B Periodic cleaning of septic tanks along a regulated schedule	C Construction of fecal sludge drying beds (SDBs)
				D Operation and maintenance of SDBs

Key

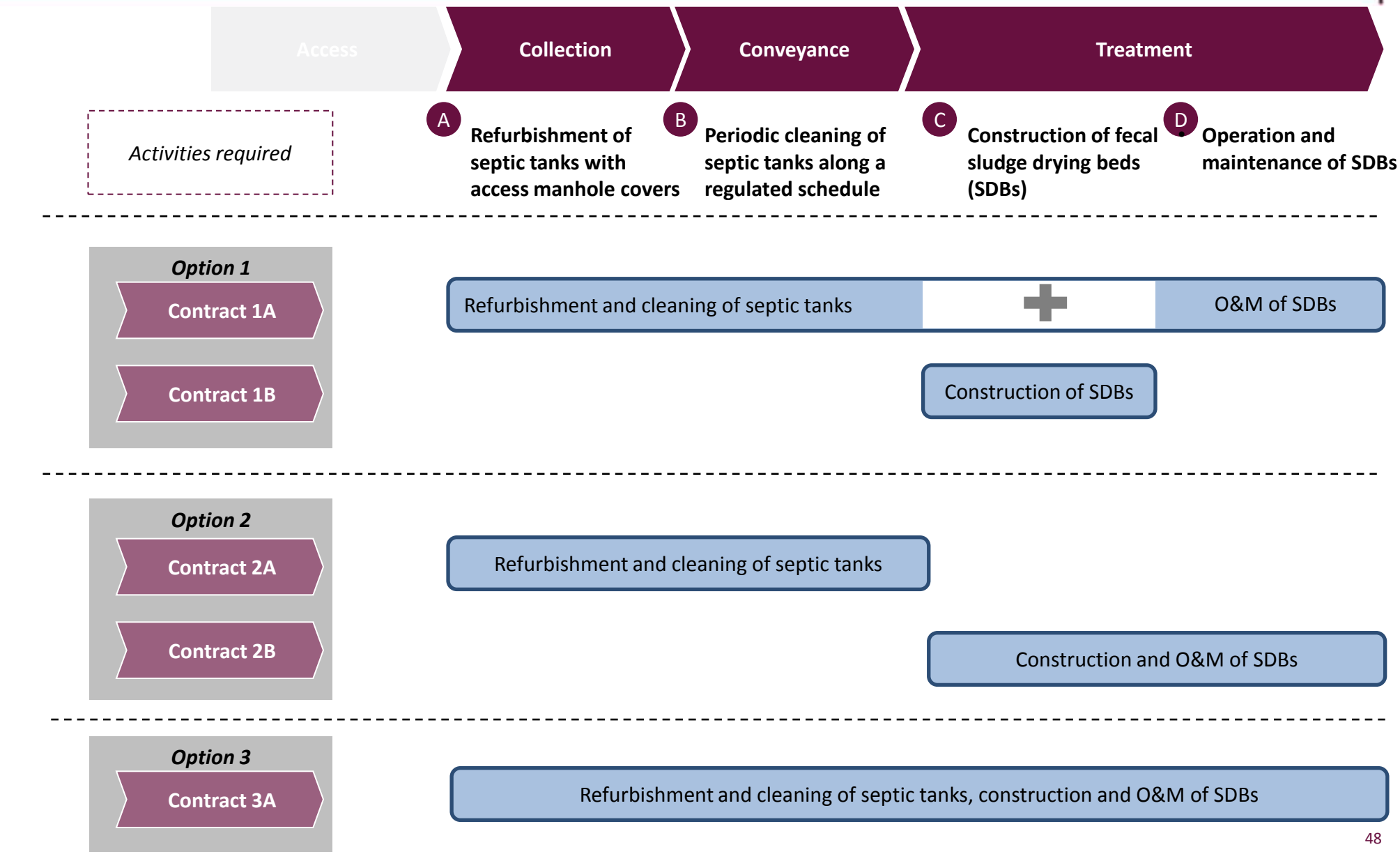
- Interested, with previous experience
- Interested, no previous experience
- Experienced, not interested
- Not interested, not experienced

		A	B	C	D
Labor contractors	ZR Services	Interested, with previous experience	Interested, with previous experience	Interested, no previous experience	Interested, no previous experience
	Manisha Enterprises	Interested, with previous experience	Interested, with previous experience	Not interested, not experienced	Not interested, not experienced
Small-scale septic tank cleaners	Kadam Enterprises	Not interested, not experienced	Interested, with previous experience	Not interested, not experienced	Not interested, not experienced
	Aditya Enterprises	Interested, no previous experience	Interested, with previous experience	Not interested, not experienced	Interested, no previous experience
	Ugale	Interested, no previous experience	Interested, with previous experience	Not interested, not experienced	Not interested, not experienced
STP companies	Era Hydro-Biotech	Not interested, not experienced	Not interested, not experienced	Experienced, not interested	Experienced, not interested
	Envicare	Not interested, not experienced	Not interested, not experienced	Interested, with previous experience	Interested, with previous experience
Integrated players	Sumeet	Interested, with previous experience	Interested, with previous experience	Interested, no previous experience	Interested, no previous experience
	3S Shramik	Interested, with previous experience	Interested, with previous experience	Interested, with previous experience	Interested, with previous experience

Majority of emptying players had no previous experience in construction while the players in treatment had none in septic tank emptying

Source: Private player interviews

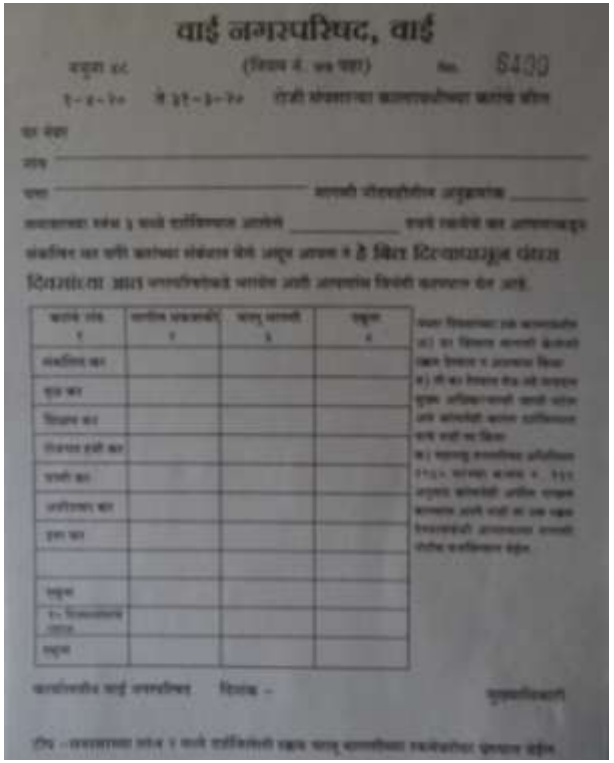
1 Given the interest and capabilities of identified players, there are three possible options for contract bundles



2

Source of revenue: With the proposed regulated system, instead of direct payment by HHs to private players, ULB will need to compensate private players using local "taxes"

Current taxes levied in Wai


वाई नगरपरिषद, वाई

Appropriate awareness can ensure willingness to increase local taxes

- Currently, households clean their septic tanks once in 8-10 years and spend INR ~1000 in Wai and INR ~400 - 800 in Sinnar
- Property owners currently have to pay local taxes of about Rs 2200/annum in Wai and Rs.1600/annum in 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 **10% in Wai and 20% in Sinnar.**
- As these are reasonable increases for a regular service and related environmental as well as personal benefits , it is expected that with appropriate awareness there will be willingness to pay additional taxes.

The ULB can consider using its local taxes to support the integrated fecal sludge management plan, and will need to compensate private players directly through a management fee

Source: Private player interviews

2 Source of revenue: There is demand for sludge among small and medium farmers, but willingness to pay is unclear

"Larger farmers who export their crops are bound by restrictions on the use of animal and human waste. ***Sludge can be sold mainly to small and marginal farmers****, who lack access to synthetic fertilizers."*

- Mr. Vishwanath, Biome

*"****Fecal sludge cannot be used in organic farming*** *due to concerns about e-coli and shigella infections. However, it is often used by small farmers as 'son-khad'."*

- Madhav Pandit, Maharashta Organic Farming Federation

"We make compost from solid waste. The market is extremely seasonal. Creating a continuous market for this waste is tough. People say that you are creating compost from waste so we don't want to use it. ***Source is very important."***

- Mr. Ravikrishna Pochiraju, Waste Ventures

*"****I often have to pay farmers*** *to dump sludge in their farms, I do not think the sale of septage is a viable revenue source."*

- Aditya Enterprises

"It (sale of septage) is possible, ***but will require investment in marketing and distribution****, which we do not do."*

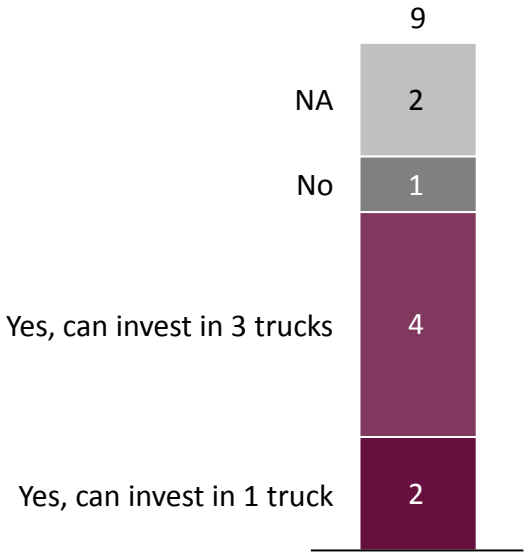
- Kadam Enterprises

Source: Private player interviews

3 Capital investment: While the private players are willing to invest in suction emptying trucks, they do not want to invest in the construction of SDBs

Willingness to invest in a suction emptier truck

(Number of players)



*"**Yes, I can procure a truck** and operate it on the regulated schedule… I can use (the truck) for other business in case the contract does not work out."*

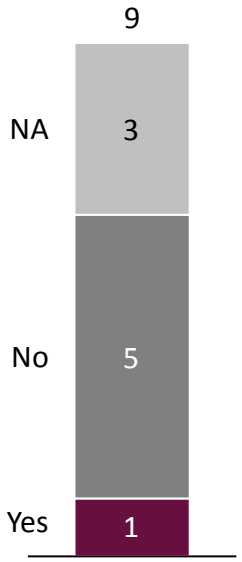
- Kadam Enterprises

*"**I cannot afford to buy more than one truck.** I have just ordered a truck, and faced financial troubles there too."*

- Ugale Septic Tank Cleaning Services

Willingness to invest in a sludge drying bed

(Number of players)



*"**Payment needs to be mile-stone based,** ~40% up-front, 50% when materials are delivered to the site and 10% post-completion."*

- Envicare

*"**It would be interesting** to explore an integrated contract structured as a build-operate-transfer concession agreement."*

- 3S Shramik

Source: Field interviews

3 Capital investment: Private sector investment in trucks has significant benefits for the ULB

Benefits to public sector

- ✓ **Ease of procurement:** ULB procurement of the truck would require floating a tender, inviting, evaluating and negotiating bids. This is likely to be time consuming, and involve transaction costs that can be avoided if the private player purchases the truck.
- ✓ **Aligns private sector incentives:** Private sector investment in trucks incentivizes the player to use and maintain the truck well.
- ✓ **Allows investment in quality:** ULBs are often bound to minimize cost, while the private sector can invest in quality trucks with longer lifecycles and additional features like water jets.

Benefits to private sector

- ✓ **Facilitates access to finance:** Having a contract from the ULB can make it easier for the private player to raise capital for the truck and negotiate better financing terms.
- ✓ **Provides a platform for business expansion:** A contract with the ULB serves as a low-risk platform for private sector players to scale by providing access to guaranteed demand to recoup investment in a truck.

Source: Private player interviews

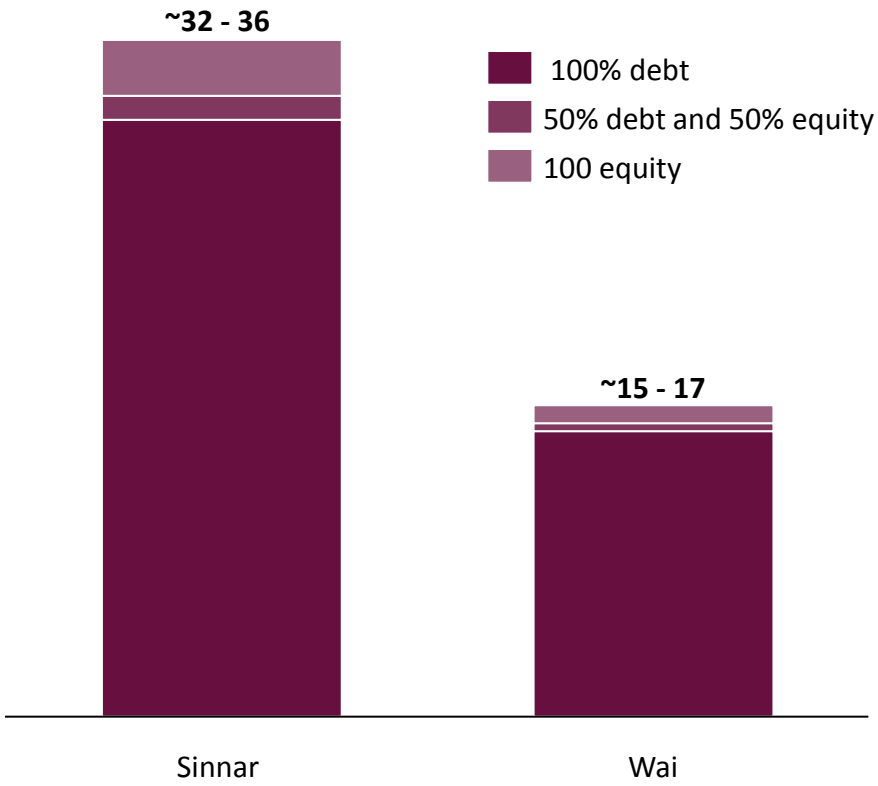
4 Payment structure: Different activities across the value chain will require different payment structures

Key activities	Payment structure	Rationale
Refurbishment of septic tanks	*Fixed fee per unit*	Refurbishment is a one time activity in which the cost per tank is known, but the number of tanks is not. Hence a fixed fee per refurbished tank is paid
Regular cleaning of septic tanks	*Recurring fixed fee*	Because of the ULB HH survey, the number of tanks to be cleaned and the schedule is well determined. Hence it is an ongoing activity for which a fixed monthly fee is paid given the schedule being followed and proper field reports are submitted by the private sector.
Emergency Cleaning of septic tanks	*Fixed fee per emptying service*	The emergency septic tank emptying service can be provided by the ULB using its own vehicle. The fee of this would be kept high as a deterrent for users to not opt out of regulated services
O&M of SDBs	*Recurring fixed fee*	O&M of SDBs is an ongoing activity for which the costs and procedures are well defined. Hence, a recurring fixed fee is paid
Construction of SDBs	*Overall fixed fee*	Construction of SDBs would be a one time activity. Since the design is specified by the ULB, the costs would be well known. Hence, an overall fixed fee can be given

5 Contract length and value: Contract 1A, involving refurbishment and regular cleaning of septic tanks with O&M of SDBs

Annual contract value for a 3 year contract at which NPV = 0

(INR, lakh)[2]



Key assumptions

- This represents the value at which the future net cash flows, discounted by the weighted average cost of capital (WACC) of the private player, is zero (i.e. NPV = 0)
- Does not include the cost of the refurbishment of septic tanks which will be paid out on a one-time basis
- Cash flows is the net income after tax, interest and principal payment for debt
- Various scenarios for funding of capital expenditure by the private player have been considered, i) 100% debt ii) 100% equity and iii) 50% debt and 50% equity
- Since suction emptying trucks are movable assets, the residual value of the truck has been included in the NPV calculation, resulting in little variation with contract length
- A 2-3 year contract will meet the requirements of both the private player and the ULB
- In Sinnar, the average annual local tax[1] required for this contract is estimated to be INR ~270 per Residential property and INR ~320 per non-residential property
- In Wai, the average annual local tax[1] required for this contract is estimated to be INR ~190 per Residential property and INR ~230 per non-residential property

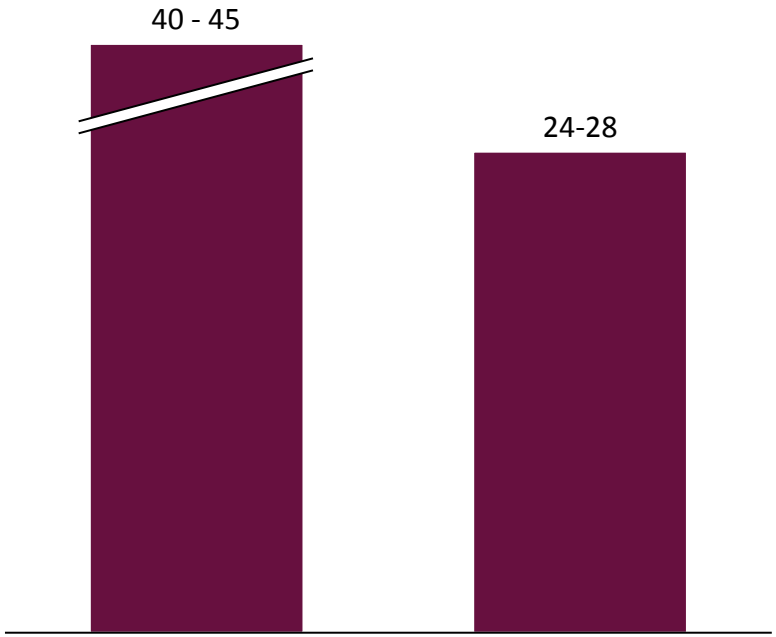
Note: (1) Collection efficiency of tax is assumed to be 80% (2) For assumptions see page 117-120

Source: Analysis based on estimated costs and responses from private player interviews

Contract length and value: Contract 1B, involving construction of SDBs

Contract value for SDB construction by gross profit margin

(INR, Lakhs)



Gross Profit margin	Sinnar	Wai
→	15% - 25%	15% - 25%

Key assumptions

- Since the SDB is not a movable asset and income from sale of septage is unreliable, private players are unwilling to invest in the asset
- Hence the private player will be paid a fixed overall fee based on milestones
- Each SDB costs INR ~2 lakhs including construction, labor and materials. An estimated gross margin of 15-25% was added on total construction costs to estimate the contract value
- The duration of the contract would span the time needed for construction, ~6 – 12 months

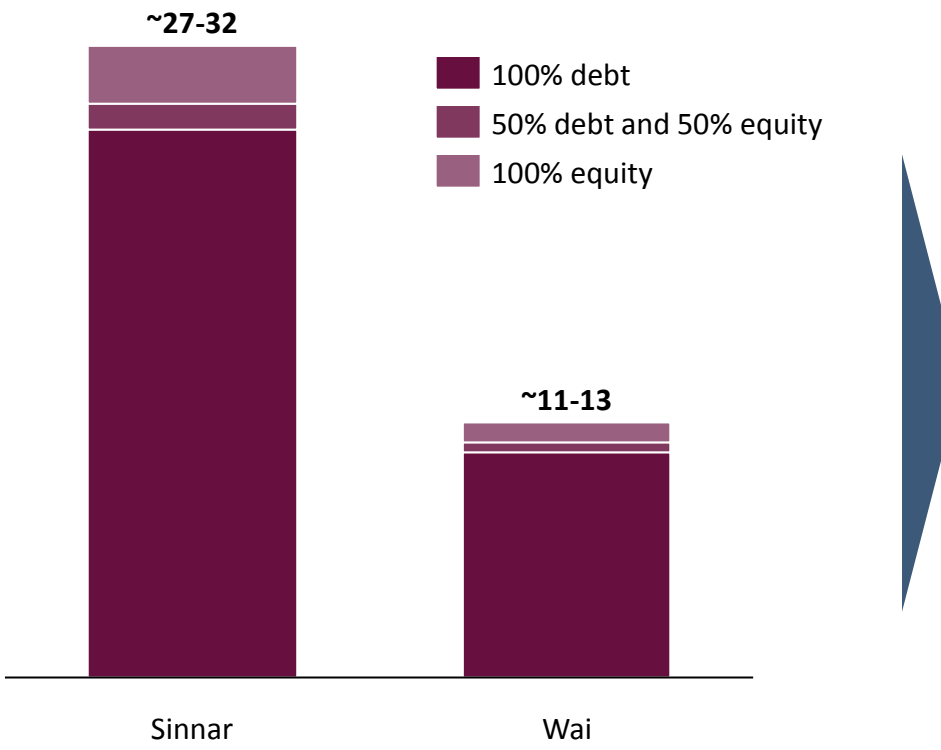
Note: For assumptions see page 117-120

Source: Analysis based on estimated costs and responses from private player interviews

5 Contract length and value: Contract 2A, involving refurbishment and regular cleaning of septic tanks

Annual contract value for a 3 year contract at which NPV = 0

(INR, lakh)[2]



Key assumptions

- This represents the value at which the future net cash flows, discounted by WACC of the private player, are zero (i.e. NPV = 0)
- Does not include the cost of the refurbishment of septic tanks
- Cash flows is the net income after tax and interest and principal payment for debt
- Various scenarios for funding of capital expenditure by the private player, i) 100% debt ii) 100% equity and iii) 50% debt and 50% equity
- Since suction emptying trucks are movable assets, the residual value of the truck (minus depreciation) has been included in the NPV calculation, resulting in little variation with contract length
- Based on the preferences of the public and the private sector and the ULB, a 2-3 year contract will meet the return criteria of private players and give the ULB the flexibility to switch players
- In Sinnar, the average annual local tax[1] required for this contract is estimated to be INR ~230 per Residential property and INR ~270 per non-residential property
- In Wai, the average annual local tax[1] required for this contract is estimated to be INR ~140 per Residential property and INR ~170 per non-residential property

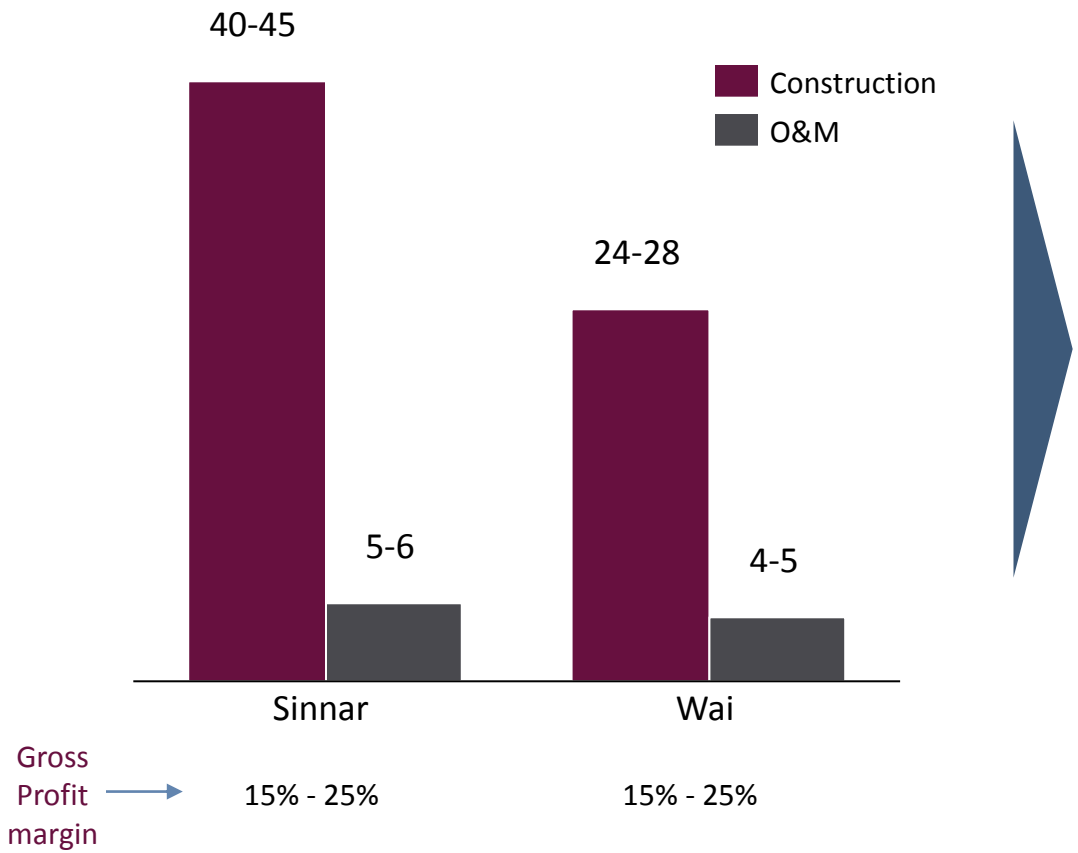
Note: (1) Collection efficiency of tax is assumed to be 80% (2) For assumptions see page 117-120

Source: Analysis based on estimated costs and responses from private player interviews

5 Contract length and value: Contract 2B, involving construction and O&M of SDBs

Contract value for SDB construction and O&M by gross profit margin

(INR, Lakhs)



Key assumptions

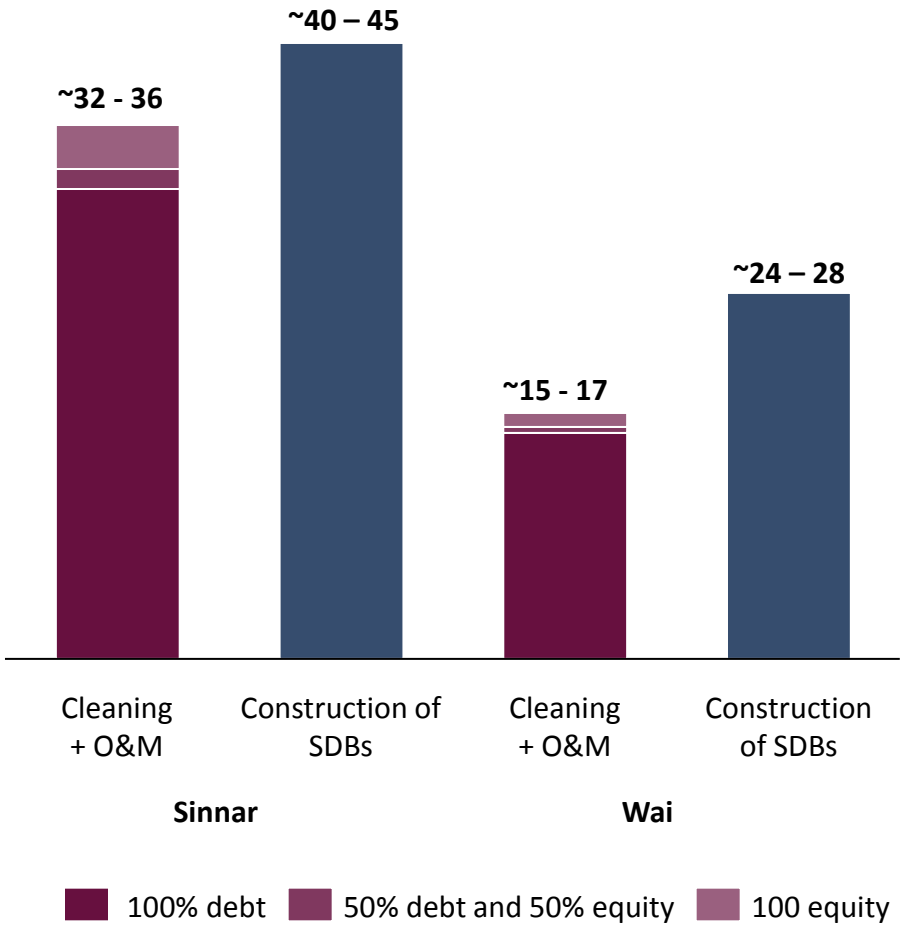
- Since the SDB is not a movable asset and is without a source of income from its operations, private players are skeptical to invest capital in it
- Hence, the private player in this scenario, would be paid a fixed overall fee based on milestones
- Each SDB costs INR ~2 lakhs including construction, labor and materials. A margin of 15-25% was added on total construction costs to estimate the contract value for construction. A margin of 15%-25% was added to O&M costs which includes salaries and 5% of capital costs
- Given that the same player is responsible for O&M, he could be held accountable for quality of the SDB by stretching out a part of the payment for construction over the period of O&M contract (e.g. 12-18 months)
- The duration of the contract would span the time needed for construction plus a year for O&M

Note: For assumptions see page 117-120

Source: Analysis based on estimated costs and responses from private player interviews

5 Contract length and value: Contract 3A, involving refurbishment and regular cleaning of septic tanks with construction and O&M of SDBs

Annual contract value for a 3 year contract at which NPV = 0 at WACC = 19.5% *(INR, lakh)*[2]



Key Assumptions

- This represents the value of the contract where monthly payment is made for cleaning of septic tanks and O&M of SDBs with upfront capital paid by the ULB for construction of SDBs
- The contract value for cleaning of septic tanks and O&M of SDBs estimates the future net cash flows, discounted by the weighted average cost of capital (WACC) of the private player, are zero (i.e. NPV = 0)
- The contract does not include the value for refurbishment of septic tanks which will vary depending on the number of tanks repaired
- A 2-3 year contract would meet the requirement of both the private player and the ULB
- In Sinnar, the average annual local tax[1] required for this contract is estimated to be INR ~270 per Residential property and INR ~320 per non-residential property
- In Wai, the average annual local tax[1] required for this contract is estimated to be INR ~190 per Residential property and INR ~230 per non-residential property

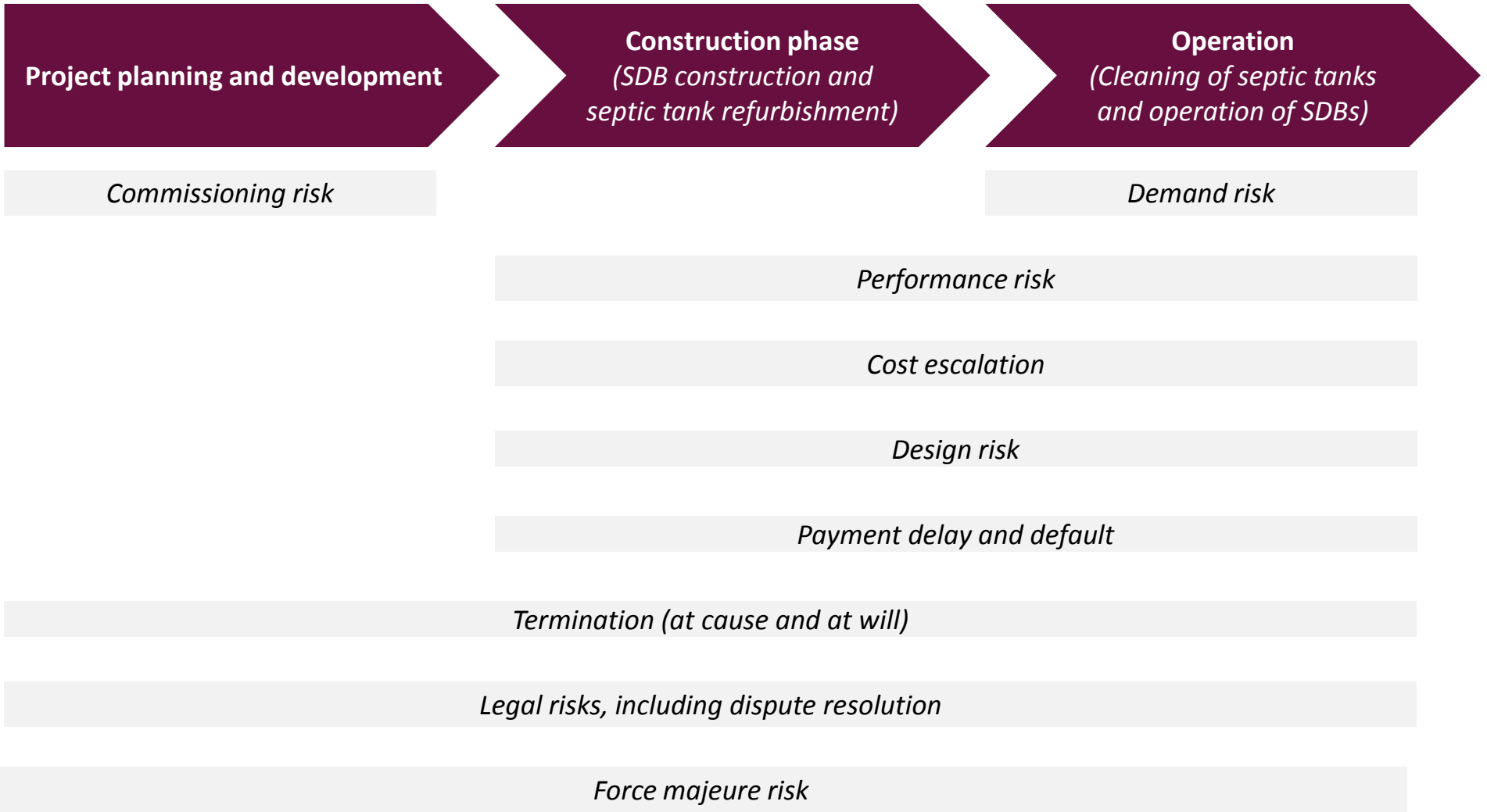
Note: (1) Collection efficiency of tax is assumed to be 80% (2) For assumptions see page 117-120

Source: Analysis based on estimated costs and responses from private player interviews

5 Summary of potential contract structures

	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, annually
1B Construction of SDBs	*ULB*	ULB	Overall fixed fee on a pre-decided schedule	~ INR 40-45 lakhs in Sinnar and ~24-28 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 and ~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

6 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"'

6 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

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

Cleaning of septic tanks

Risk	*Mitigation*	*Allocation of remaining risk*
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 damages tanks during cleaning	• As above	• Work on faulty septic tanks would have to be remedied within a specified period days of complaint and the cost shall be borne by the private player
Private player spills septage during transportation	• A complaint redress mechanism to be opened where grievances can be lodged by the HH and citizens with the ULB	• Complaints of spillage and illegal dumping must be addressed within a specified period, to avoid a fine
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	• In case the number of complaints exceeds a specified number in a given time period, the contract can be terminated

6 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 milestones • Regular reporting by the player • Regular monitoring by the ULB	• 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**	Sludge recovered from SDBs is not sufficiently treated	• Regular checks to be undertaken by the sanitation department to measure sludge properties • X% of O&M payment to be conditional on the sludge meeting specified qualities	• If the sludge does not meet specified standards, a warning would be given, followed by fines. • Persistent breaches may lead to termination

6 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]
Termination at will	• ULB decides discontinue the contract for reasons unrelated to player performance	• Up-front discussions with key stakeholders to create buy-in for private sector engagement • Frequent communication between ULB and private player	• X month notice period required • Private player compensated for investments, the cost of winding down and foregone profits • Performance bank guarantee returned to the private player
	• 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

Note: The private sector can be required to put down a performance bank guarantee at the beginning of the engagement to compensate the ULB in case of at-will termination by the private player. The guarantee is returned to the private player at the end of a successfully executed contract, or in case of at will termination by the ULB

Source: Adapted from 'Improving sanitation outcomes through service level agreements' – Castalia Partners

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

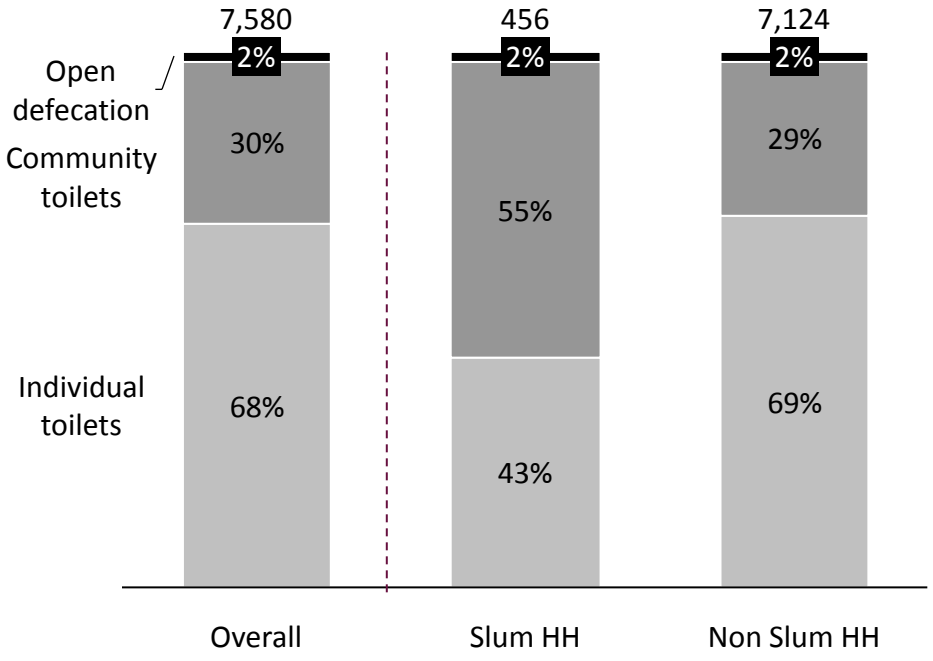
	Risk	*Mitigation*	*Allocation of remaining risk*
 **Payment delays**	• ULB is unable to make timely payments towards the project	• Ensuring budgetary allocation for contracts before procurement • Establishment of an escrow account for payment	• ULB to pay interest for the payment, delayed by X months 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 • Inclusion of a cost re-negotiation clause	• Private player would be responsible for bearing the cost escalations within the negotiated period

Source: Adapted from 'Improving sanitation outcomes through service level agreements' – Castalia Partners

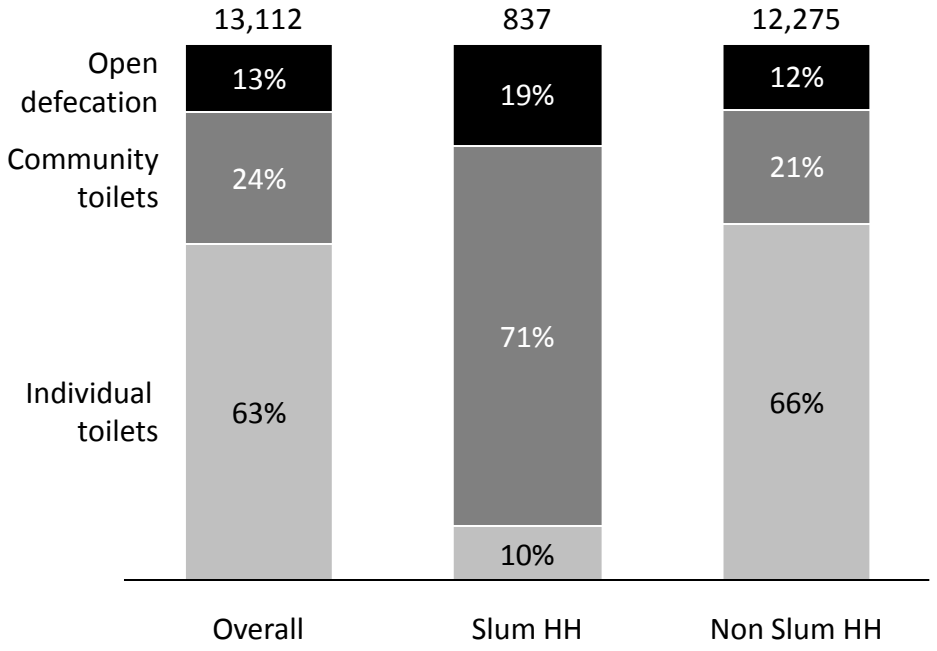
Contents

A large proportion of households in Wai and Sinnar rely on community toilets, even among non-slum households

Access to types of sanitation facility in Wai
(Number of HH)



Access to types of sanitation facility in Sinnar
(Number of HH)



- **135 households** practice **open defecation** in Wai
- **5,145 households** have access to **individual toilets**
- **2,300 households** are dependent on **community toilets, ~250 of them in slum areas**

- **1,658 households** practice **open defecation** in Sinnar
- **8,243 households** have access to **individual toilets**
- **3,211 households** are dependent on **community toilets, ~158 of them in slum areas**

Source: Census of India 2011

Community toilets are often poorly maintained, lacking regular access to water and electricity

Wai

New community toilet blocks in Wai are in good condition and well maintained. But, the older community toilet blocks are in dilapidated condition, lack electricity and water inside the toilet

Sinnar

Irregularly maintained, with inadequate supply of water and electricity

Source: City Sanitation Plan, PAS Project – CEPT University

Both ULBs have initiated the provision of own toilets, either individual and group toilets, to households who defecate in the open or rely on community toilets

Own toilets

	Individual toilets	Group toilets	Community toilets
			
Description	Personally owned toilets, usually constructed inside the household premises	Toilets owned and shared by few households who are related to each other or know each other well, constructed in common spaces between households	ULB owned toilets built in community spaces catering to households in the vicinity
# of HH per seat	1	2-4	10
JMP* category	Improved	Improved	Unimproved

Note: *According to the The WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation, an improved sanitation facility is defined as one that hygienically separates human excreta from human contact. In the Post 2015 targets, a group toilet shared by less than 5 families who know each other is also treated as 'improved sanitation'.

Individual and group toilets have several security and privacy benefits over community toilets

Criteria	Type of toilet facility			Advantages of individual and group toilets
	Individual toilets	Group toilets	Community toilets	
Space efficiency	◔	◕	●	• Group toilets require less space on a per HH basis
Cost effectiveness for household	◔	◕	◔	• Since 2-4 HH pool their resources, group toilets are more cost effective than individual toilets
Level of cleanliness	●	◕	○	• As households feel more ownership over individual and group toilets, they are likely to keep them cleaner than community toilets
Cost savings for the ULB	●	◕	○	• Group and individual toilets are privately owned and the burden of O&M costs shifts from the ULB to the households
Ease of Access	●	●	◔	• Group and individual toilets are likely to be located closer to households than community toilets
Safety and User friendly	●	●	◔	• Group and individual toilets are safer for the elderly, women and children as compared to community toilets, that are often located at a distance and lack electricity

While individual toilets are the most preferred solution, in situations where space and affordability pose serious constraints, group toilets may be a cost and space efficient way of providing improved sanitation facilities in Wai and Sinnar

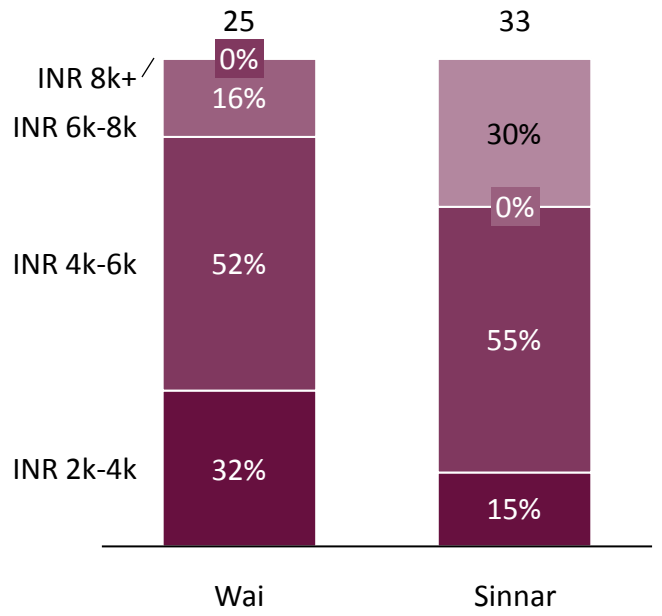
Sources for cleanliness: Report by the WHO-UNICEF committee to develop new targets for post-2015 beyond the Millennium Development Goals (MDGs), Research Paper- Public versus Individual Household Latrines- UNICEF-LSHTM

Preliminary demand assessment in Wai and Sinnar was done to assess the response towards group toilets

Methodology and key observations

- **Households in Wai and Sinnar** in areas with very low access to personal toilets were interviewed, and **designs were prepared for those** willing to implement group toilets. The details captured included location of toilet, detail drawings, HHs willing to share toilets, beneficiary contribution etc.
- In most cases, households **were receptive to the idea of** individual or sharing toilets, citing difficulties faced in accessing community toilets and their poor condition
- Households raised concerns about **affordability** even in case of group toilets and possible arrangements for **maintenance of group toilets** in future
- **In some slum areas,** households were hesitant to invest in a toilet given their lack of ownership over the land

Household willingness to spend *(in HH)*



- **More than half** of the households interviewed were willing to spend between **INR 4,000 and 6,000**
- The average household willingness to spend was **INR ~4,500 in Wai and INR ~6,300 in Sinnar**

Source: Presentation on Innovative scheme for moving towards own toilets, CEPT University, household surveys in Wai and Sinnar

A partial hardware subsidy, accompanied by access to finance and awareness generation can help unlock latent demand for toilets

Hardware subsidies + Awareness generation and IEC activities + Access to finance

- **Help households overcome affordability barriers and trigger increase in sanitation coverage**

  (E.g. The DISHARI project in Bangladesh, to scale up community led total sanitation approach provided ~40% hardware subsidy to poor households, increasing the sanitation coverage by 70% in ~5 years)

- **High level of subsidies can hamper financial sustainability, while very low subsidy dampen take-up**

  (E.g. In Senegal, when the program started with a 75% hardware subsidy for on-site sanitation services was provided to all households, the project proved unsustainable and was discontinued due to lack of funds)

- **Helps ensure adoption of improved sanitation and sustainability of the project**

  (E.g. The PLM program in Mozambique to provide low-cost on-site sanitation facilities, was most effective when the government financed community animators for demand promotion)

- **Lack of awareness can lead to low adoption of sanitation technologies and underuse of facilities**

  (E.g. In the Total Sanitation Campaign in India, which provided subsidy for toilet construction, a large number of toilets were unused after construction with households resorting to old practices)

- **Can unlock demand among households who are willing to invest in sanitation but face liquidity constraints**

  (E.g. In the Senegal PAPQUD[1] project, microfinance was needed to enable prospective beneficiaries gain access to credit for the construction of on-site sanitation facilities)

- **Can help leverage money to allow a wider coverage of the sanitation project**

  (E.g. In Vietnam, where a revolving fund was used to provide microcredit loan to households, the leverage ratio[1] was as high as 20)

Note: (1) Programme d'Assainissement Autonome des Quartiers Peri-urbains de Dakar (2) Leverage ratio is defined as HH investment divided by public investment

Source: Report on financing on-site sanitation facilities by WSP, Paper on public funding for sanitation by Water Supply and Sanitation Collaborative Council (WSSCC)

Case study: Hardware subsidies combined with IEC activities and access to credit facilities ensured the uptake of sanitation services in Senegal

Project description

- The **PAQPUD[1] was a large result-oriented program initiated in 2002 by the Government of Senegal and the World Bank,** to provide sanitation facilities to the poor
- The project's financial approach relies mainly on **providing hardware subsidies** while promoting **software support for community mobilization activities and sanitation promotion**. The project also included various channels to provide **access to credit** to households to overcome liquidity constraints
- Subsequently, **The Government of Senegal received a GPOBA[2] grant** in 2007 to build 15,100 on-site facilities in five municipalities

Project details

Hardware subsidy

- **Output-based hardware subsidies** to local sanitation providers for each sanitation solution built
- Hardware subsidy: **75% of total hardware costs**

Awareness generation and IEC activities

- Software support for sanitation promotion, including hygiene promotion and community organization
- Software support: **20% of total costs of sanitation solution**

Access to finance

- During the second phase of the program, households had the opportu-nity to **secure credit from the community associations and micro-credit institutions**

Project impact and key learnings

Impact

- The PAQPUD project provided **63,000 sanitation facilities and increased coverage by 22%**
- **Awareness generation activities ensure good O&M** and all facilities appeared to be working well, with high levels of satisfaction

Key learnings

- **A combination of hardware subsidies, IEC activities and provision of credit facilities** is essential to ensure sustainability of a project
- It is essential to promote adoption of improved facilities by **demand creation rather than providing high subsidies** as this approach is costly and non-scalable

Note: (1) Programme d'Assainissement Autonome des Quartiers Peri-urbains de Dakar (2) Global Partnership for Output Based Aid is a multi-donor initiative to support output based aid methods

Source: Report on financing on-site sanitation facilities by WSP, Report on payments by results in WASH by Jim Winpenny, Report on lessons learned from Senegal output based aid by GPOBA

The Wai and Sinnar ULBs are launching a partial subsidy scheme to spark demand, and incentivize households to pool resources for own toilets

Each household lacking access to own toilets will be provided with a subsidy of INR 5000 per household for individual toilets or toilets shared by up to four households

Scheme details	Number of households sharing a toilet			
	Households (Subsidy - INR 5,000/HH)			
	1	2	3	4
Cost per toilet (in INR)[1]	~30,000	~30,000	~30,000	~30,000
Subsidy per toilet provided by the ULB	5000 *(17% of cost)*	~10,000 *(33% of cost)*	~15,000 *(50% of cost)*	~20,000 *(67% of cost)*
Effective cost per HH	~25,000	~10,000	~5,000	~2,500

- ***Estimated willingness to pay upfront per household is ~INR 4000 – 6000[2] implying that 3-4 households can come together to afford a toilet directly***
- ***Households with lower willingness to pay, or lower preference for sharing will be connected with consumer financing through local credit providers***

Note: (1) Based on standard government schedule of rates and local contractor estimates, estimate includes cost of superstructure and septic tank (2) Based on 2013 focus group discussions with households in Wai and Sinnar

Source: Presentation on Innovative scheme for moving towards own toilets, CEPT University

Contents

We have explored five different types of credit providers in these towns

Self help groups (SHGs)	*Micro-finance institutions (MFIs)*	*Credit societies*	*Commercial banks*	*Housing finance companies (HFCs)*
• Groups of 5-10 women of similar socio-economic background, that make loans to members at low interest rates • Loans are financed through member contributions supplemented with borrowing from banks	• Provide loans to economically weaker sections who do not have access to traditional banking • Loans are usually given for income generating activities but could also be given for consumption. A periodic repayment needs to be made which is usually enforced through a peer liability model	• Autonomous association of people united voluntarily to meet their common economic needs through a jointly-owned and controlled enterprise • The members make deposits and in turn loans are given out to those in need at reasonable rates of return	• Commercial banks accept deposits and make loans to individuals and business enterprises • The lending is usually secured thorough a collateral but can also be unsecured • Repayment follows an EMI model with a defined rate of interest	• Housing finance companies (HFCs) are financial institutions one of whose primary businesses is housing loans • HFCs vary in the stringency of collateral requirements, but several players cater to low income populations

Chaitanya Credit Cooperative Society

Jalaram Co-Op Credit Society Limited

Annapurna Parivar

Source: Reserve Bank of India, National Housing Bank, Monitor Inclusive Markets, “Building houses, Financing Homes”, 2010

Credit providers are assessed along five key dimensions

Reach towards target population	• Do these institutions cater to our target population of households who lack access to own toilets? • Are there significant barriers to membership or loan application that could affect their ability to serve these populations?
Local presence	• Do these providers have existing business operations in Wai and Sinnar? • If not, are they interested in entering these towns?
Prior history and future interest in toilet loans	• Do these institutions have a previous history of providing loans? • If not, what is their level of interest in providing such loans?
Capacity to make toilet loans	• Do these credit institutions have the financial strength and capacity to make toilet loans of a sufficient size? • Are there any regulatory hurdles to making toilet loans?
Favorability of loan terms	• What are the interest rates offered by these institutions for toilet or personal loans?

Self help groups are interested in funding toilets, but most are new and lack the financial capacity

Factor	Assessment	Rationale
Reach towards target population		• Cater to the economically weaker populations, who are likely to lack access to own toilets. Only 9 or the 119 SHG members we surveyed in Wai had a toilet and only 37 of the 150 SHG members we surveyed in Sinnar had a toilet. • Membership is relatively simple, and no collateral is required for loans
Local presence		• There are over 100 SHGs active in Wai, reaching ~500 - 1000 households[1] • There are ~290 SHGs in Sinnar, reaching ~1500 – 3000 households[1]
Prior history or future interest in toilet loans		• One of 24 SHGs we interviewed in Wai had disbursed toilet loans, 2 had discussed toilet loans. However 15 were open to disbursing toilet loans. • In Sinnar, none of the SHGs interviewed had given a toilet loan, but 16 out of 28 were interested
Capacity to make toilet loans		• SHGs in Wai are relatively young, 33% less than 5 years old, and 76% less than 8 years old[2] . On average, SHG members in Wai save ~INR 800 per member per year[2,3] . In Sinnar, SHGs are relatively younger and on average save Rs 1000 per month • However, SHGs can borrow funds from commercial banks to which they are linked at about 10-12% per annum. However, in Sinnar the experience of commercial banks for repayments is so far not good unless they have been linked to MFIs or credit cooperative societies .
Favorability of loan terms		• In Wai, interest rate on loans was extremely low, ~1-2%, Banks receive interest subsidies for lending to SHGs under National Urban Livelihoods Mission

Given their limited financial capacity, SHGs are unlikely to be a large source of capital, however they can function as loan disbursement vehicles and for awareness generation

Note: (1) SHGs range in size from 5 to 15 members in Wai and 5 to 20 members in Sinnar. Because SHG members often belong to the same household, it is difficult to estimate the exact number of households they reach (2) Based on Wai ULB data on 74 SHGs registered between 2002 and 2011 (3) Data on loan size and loan corpus is unavailable

While a few microfinance institutions have expressed interest in toilet loans, high interest rates and regulatory barriers pose a challenge

Factor	Assessment	Rationale
Reach towards target population		• Likely to be able to serve lower income segments • Membership is relatively simple, and no collateral is required for loans
Local presence		• There are no MFIs current operating in Wai. However, due to its proximity to Nasik and high growth, about 6 MFIs have operations in Sinnar. Of the 7 MFIs interviewed in Nasik, most are willing to consider operations in Sinnar
Prior history or future interest in toilet loans		• Of the 4 MFIs identified who were willing to enter Wai, 3 had a previous history of providing toilet loans, and 1 was interested. The MFIs interviewed in Sinnar and Nasik also showed interest. • At recent meetings by CEPT with NHB and by water.org, most MFIs have shown keen interest in toilet loans
Capacity to make toilet loans		• Well-established organizations, average loan size of INR ~7000 - 10,000 • Though recent regulations imposed by the Reserve Bank of India mandate that MFIs lend ~70% of their loans towards income – generating activities, the 30% provides an adequate window.
Favorability of loan terms		• High rate of interest on most loans, ~20% - 25% due to high cost of funds and cost of operation. A credit line with lower cost of funds along with grants to cover mobilization costs can reduce costs

The microfinance institutions we identified are likely to be able to serve our target population. However, high interest rates and lack of local presence in Wai will need to be addressed through a credit line at lower cost of funds and grants to partially cover mobilization costs.

Source: Interviews and field work

Credit cooperatives offer toilet loans at competitive rates, but require collateral

Factor	Assessment	Rationale
Reach towards target population		• Generally require collateral (mainly in the form of property or insurance policies), though loans up to Rs 25,000 do not require collateral. • Require ID proof, income statements and guarantors, affecting ability to target BoP
Local presence		• There are 20 credit cooperatives operating in Wai, reaching approximately 50,000 members • There are 35 credit cooperatives operating in Sinnar, reaching approximately 100,000 members
Prior history or future interest in toilet loans		• Of the 26 credit cooperatives we spoke with in Wai/Sinnar, 2 offer toilet loans as a separate category, 7 offer toilet loans as a part of housing loans and 17 do not provide toilet loans. Of these 6 were willing to promote them • A few were ready to give out personal loans which could be used to construct toilets
Capacity to make toilet loans		• Most credit cooperatives in Wai currently offering toilet loans have a strong financial position (with assets ranging from INR 2 crore to 300 crore)
Favorability of loan terms		• Range of interest varies from 9%-20%, over a 1-5 year period in Wai and Sinnar (1 year for personal loans and 7 years for other loans)

Credit cooperatives are an option for the provision of toilet loans, but they will need to be made more interested in these type of loans. They will probably reach relatively middle income households

Source: Interviews and field work

While commercial banks offer home improvement loans, barriers to membership are high

Factor	Assessment	Rationale
Reach towards target population		• Due to stringent checks and documentation requirements, the ability of commercial banks to reach the target BoP population for sanitation loans is low
Local presence		• Many banks have branches in Wai and Sinnar, but only three (HDFC, State Bank of India and ICICI) provide loans
Prior history or future interest in toilet loans		• All three commercial banks lending in Wai gave out housing loans, but only HDFC Bank and State Bank of India were open to toilet loans • Of the many banks in Sinnar a few were not willing to extend toilet loans, however, others were willing to give toilet loans to suitable borrowers
Capacity to make toilet loans		• These are well-established national banks with strong financial positions • There are no major regulatory hurdles to lending for housing or toilets
Favorability of loan terms		• Range of interest varies from ~10-12% for housing loans in Wai and Sinnar

Commercial banks offer the lowest interest rates after self-help groups, but like cooperative banks, have significant income and collateral requirements, that may be a barrier to access

Source: Interviews and field work

Some housing financing companies explicitly target low income populations, and may be attractive sources of credit

Factor	Assessment	Rationale
Reach towards target population		• Several leading players such as GRUH, DHFL, Shubham and Micro Housing Finance Corporation have targeted lower income customers, including informal workers. NHB's special efforts also show good results to reach the low income groups. However most mainstream HFCs have collateral requirements
Local presence		• Housing finance companies are not located Wai and Sinnar, but have branches in nearby cities like Pune, Karad, Satara and Nashik
Prior history or future interest in toilet loans		• Initial conversations suggest interest among selected HFCs to explore toilet loans
Capacity to make toilet loans		• These are well-established institutions with strong financial positions • There are no major regulatory hurdles to lending for housing or toilets, though they will require property papers to make a mortgage backed loan
Favorability of loan terms		• Terms can be favorable with interest rate of about 10-12% and a 3 to 4 years tenor of loan, treated as a housing improvement loan

Housing financing companies which are focused on low-income and unbanked populations may be potential credit providers. Other housing finance companies may also see this as an opportunity for housing improvement loans – though mortgage requirements will be a barrier

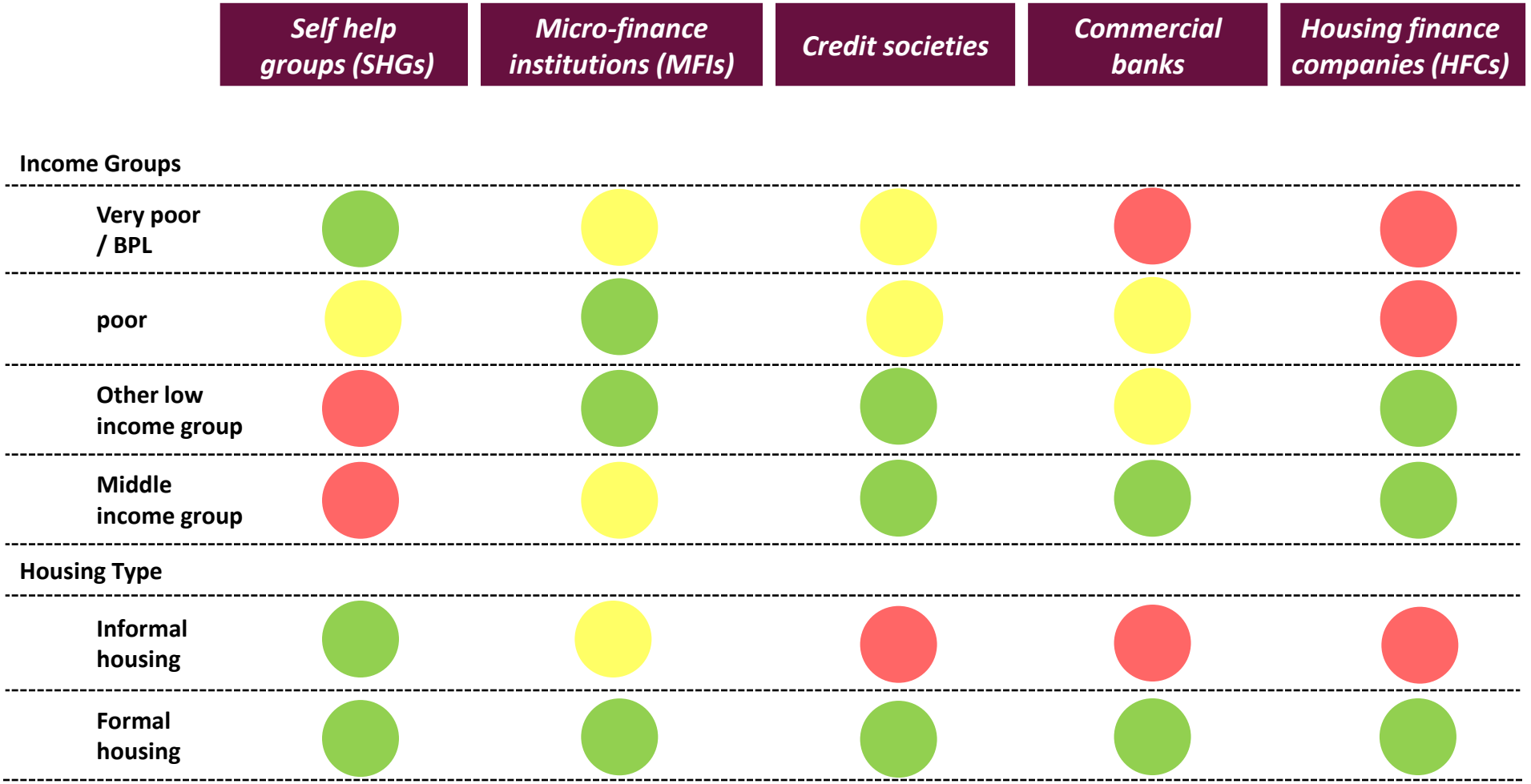
Source: Interviews and field work

Summary of Lenders for consumer finance for toilets

Factors	*Self help groups (SHGs)*	*Micro-finance institutions (MFIs)*	*Credit societies*	*Commercial banks*	*Housing finance companies (HFCs)*
Reach towards target population					
Local presence					
Prior history or future interest in toilet loans					
Capacity to make toilet loans					
Favorability of loan terms					

There are many opportunities for households to mobilize credit finance for building their own toilets. With capacity building support, SHGs can play an important role for the poor. The poor can also be reached through MFIs. MFIs will need a credit line of lower cost funds and grants to meet mobilization costs. Banks and HFCs can provide access to other (low and middle income households) that can offer mortgages. A key aspect will be to facilitate households to make their own possible choices from potential lenders.

Summary of Lenders for consumer finance for toilets

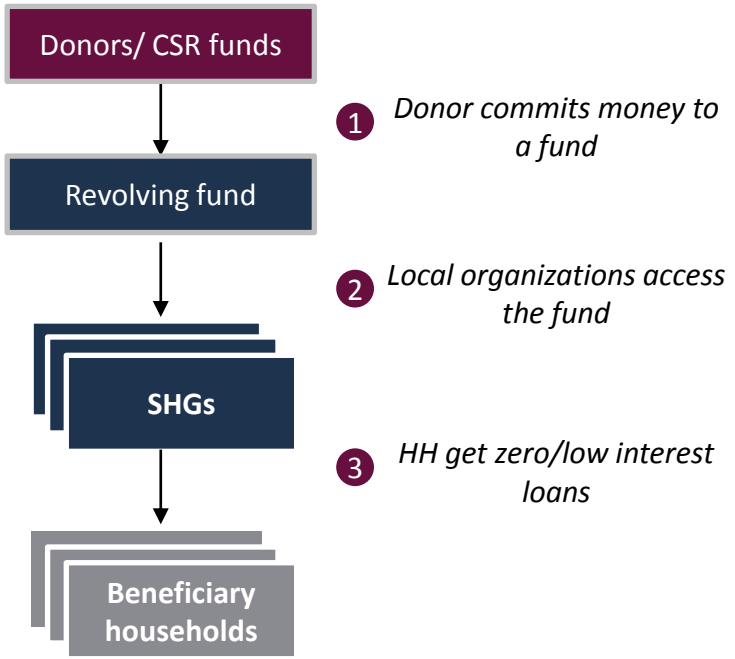


An enabling environment for these credit providers will be needed to enable or strengthen their presence in sanitation/toilet financing

Credit Source	Opportunities	Challenges	Enabling policies and actions
Self-help groups	• Strong local presence • Reach lower income populations • Low interest rates	• Lack financial strength to make loans of adequate size • Limited history of providing toilet loans	• Revolving fund for toilets • Awareness drive
Microfinance institutions	• Reach lower income populations • Established history of providing toilet loans	• Limited presence in Wai • High interest rates • Regulatory barriers on lending for non-income generating activities	• Credit lines or partial subsidies for lending for toilets to individuals and SHGs • Grants to support mobilization and set-up costs
Credit cooperatives	• Strong local presence • Strong financial capacity	• Stringent loan requirements for collateral, ID proof, etc. • Limited history of providing toilet only loans	• Credit lines or partial subsidies for lending for toilets to individuals and SHGs • Connect with SHGs to avail of interest subsidies
Commercial banks	• Strong local presence • Strong financial capacity • Moderate interest rates	• Stringent loan requirements for collateral, ID proof, etc. • Limited history of providing toilet only loans	
Housing finance companies	• Target lower income populations • Strong financial capacity	• Lack local presence • Previous history with toilet loans unknown	

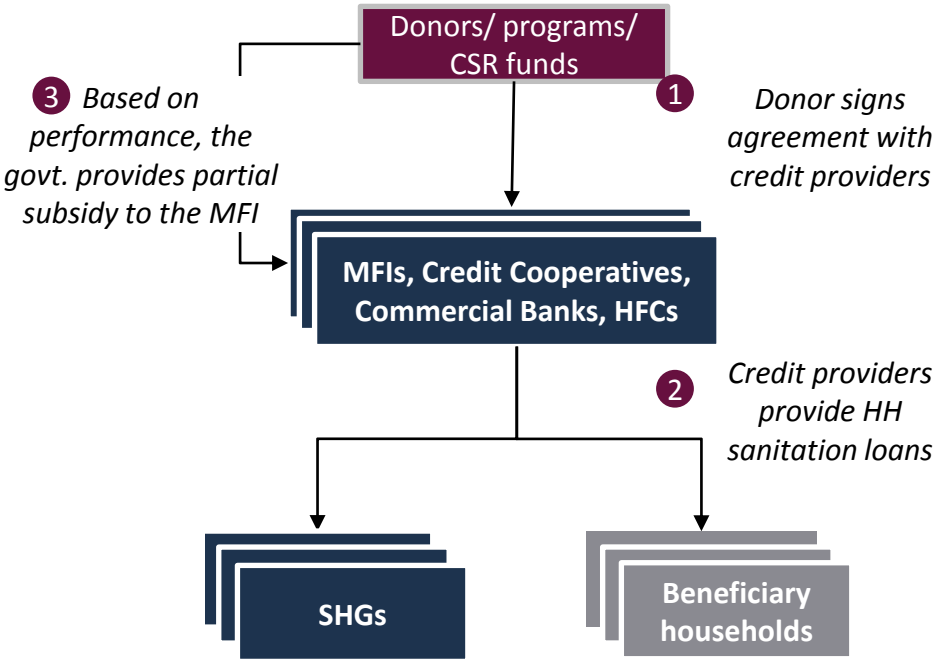
It is possible to leverage limited funds through revolving funds by SHGs and subsidies to other credit providers

Self help groups and Credit cooperatives



- **Local SHGs and credit cooperatives** can be given access to a **revolving fund** to provide **sanitation loans** to households at zero/low interest rate
- Previously used in the **Total Sanitation Campaign in India**, where a revolving fund with a maximum corpus of INR 5 million was set up at the village level

Micro credit institutions



- The local government can **provide performance based subsidy to MFIs** for providing sanitation loans to households at low interest rate
- **Previously used in the GPOBA 'Maji Ni Maisha'** project in Kenya, where a local MFI (K-rep bank) was given 40% subsidy once the water project was completed to repay a part of the loan to community water project

Source: Total Sanitation Campaign website, GPOBA website

Contents

The newly passed CSR law has created opportunities to attract private funding

SECTION 135 of the *Companies Act*

mandates that

8,000+
companies with

Net profit = or > than
INR 5 crore **(USD 800,000)**

Or

Turnover = or > than
INR 1,000 crore **(USD 170M)**

Or

Net worth = or > than
INR 500 crore **(USD 80M)**

spend
2% **of their**
Annual Profit
after tax

on
Corporate social responsibility
projects and programs

resulting in

= ₹ **12k-27k crore in additional CSR spend**

These other sources of funding will be needed to support the costs of proposals.

Approach corporations who have demonstrated a commitment to improving access to sanitation

	Company	Description	Geographical focus
FMCG	Hindustan Uniliver Ltd. (HUL)	Unilever Foundation and Domestos, HUL's toilet hygiene brand, supports UNICEF's Community Approaches to Toilet Sanitation (CATS) Program, that aims to promote demand for Sanitation through Community Awareness	India, South East Asia, Africa and Latin America
	Nestlé	Nestlé sponsored the construction of 37 sanitation facilities for 15,000 female students in village schools around their factories	Tamil Nadu, Karnataka, Haryana, Punjab, Uttarakhand, Himachal Pradesh
	Amul	Amul created a model low cost toilet block which costs INR 11,500 per unit. They also provide interest free loans to the milkmen to purchase the toilet block	Gujarat
Cement	ACC ltd.	ACC Limited spent INR 1.48 crores in 2012 on health and sanitation programs. They built 7 community toilets and 310 household toilets	Maharashtra, Jharkhand
	Ambuja Cement	In the past, has helped construct 40 low cost toilets in Navagram, Panjehra and Dugri villages. Also constructed 964 Toilet blocks, 2 Sulabh Sauchalayas and 793 soak pits in Maharashtra, in 2013	Maharashtra, West Bengal, Punjab, Rajasthan

Source: Company websites

Approach large companies with strong local interests in Wai and Sinnar

Wai

	Description	Nature of involvement near Wai
Shell – N - Tube	*Manufacturer of Cryogenic Tanks, Vaporisers, and Vacuum Insulated Pipeline*	*Manufacturing and Fabrication unit*
Mapro Foods	*Manufacturer of fruit jams, fuit beverage concentrates and fuit bars*	*Main unit administratve office*
Shraddha industries	*Manufacturer of pins, bushes, brackets, pinion and steel shafts*	*Manufacturing unit and administratve office*
Sakshi Constructions	*Constructors of commercial and residential properties*	*Construction projects in Wai and administratrive office*
Riya industries	*Exporter, supplier and manufacturer of cricket, soccer, gabion, basketball, badminton and other sport nets*	*Manufacturing unit and administratve office*

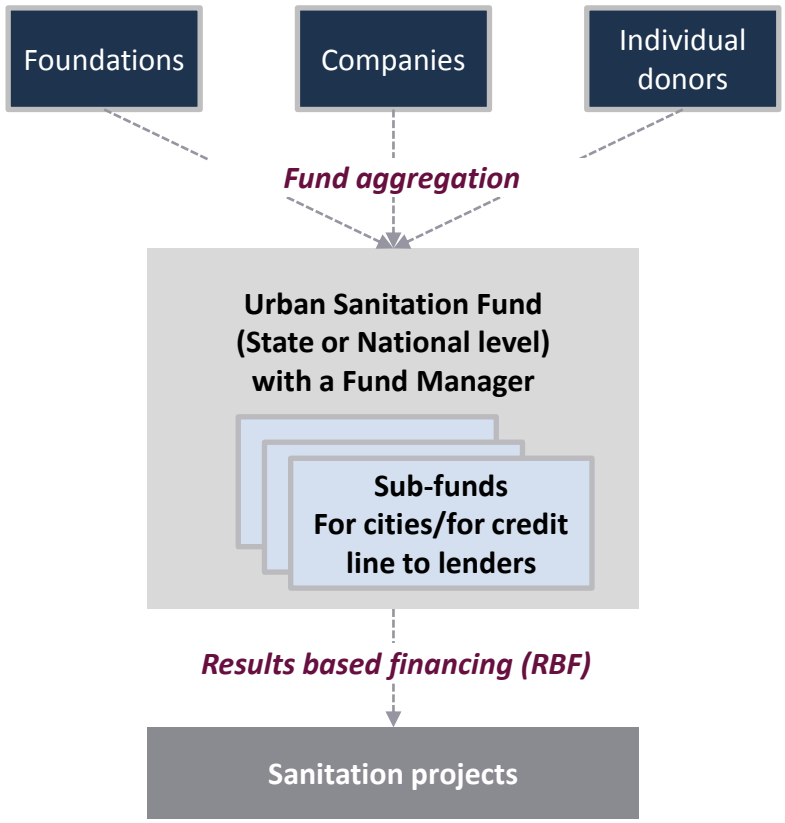
Sinnar

	Description	Nature of involvement near Sinnar
UB stainless limited	*Manufacturer of stainless stell welded tubes for application in automobiles, industires and architecture*	*Main manifacturing unit*
Indiabulls power limited	*Power generation through thermal power plants*	*Operate a thermal power plant*
Strong Machines	*Manufacturer, supplier and exporter of construction, mining and agricultural machinary*	*Manufacturing unit and administratve office*

Major foundations and multilateral agencies have also funded access initiatives in the past

	Donor agencies/ Foundations	Description	Geographical focus
Bi-lateral aid agencies	**Japanese International Cooperation Agency**	• Provided USD 163 million from 2006-13 to develop sewerage systems and treatment for residents in urban areas of Orissa • Activities included construction of public toilets, slum sanitation improvement and public awareness drives	Bhubaneshwar and Cuttack
	Deutsche Gesellschaft für Internationale Zusammenarbeit	• Supporting preparation of sanitation strategies and planning documents at the state and national levels • Working with CBSE to improve sanitation in a schools throughout India	Pan- India
	Deaprtment for International Development	• Working to increase the number of people with access to improved sanitation facility from 16.8 million to 40 million in Bihar and from 9 to 16 million in Orissa by 2015-16 • Working in Madhya Pradesh to provide sanitation to >300,000 people by 2015	Bihar, Orissa and Madhya Pradesh
International Foundations	***Bill and Melinda Gates Foundation***	• Invested in Samagra an organization that works to introduce clean sanitation in slums in India by leveraging the existing network of local entrepreneurs	Karnataka
	Michael and SusanDell Foundation	• Have funded organizations such as Mahila Housing SEWA Trust, Andhra Pradesh Mahila Abhivruddhi Society, Andhra Pradesh Mahila Abhivruddhi Society and Bharat Integrated Social Welfare Agency (BISWA) to increase access to sanitation through microcredit	Gujarat, Andhra Pradesh and Orissa

These sources can be effectively brought together in the form of a results based urban sanitation fund, at the national, state or city level



Flexibility to accept funds from different sources

To streamline funds in a strategic manner to reduce implementation effort and cost for donors

Strategic focus on sanitation

To obtain long-term commitment of capital to sanitation issues in specific cities or as a credit line

Results-based financing approach

To ensure funds are being utilized for highest impact

A urban sanitation fund could meet many of the philanthropic and strategic goals of identified donors

	Value proposition	*Risks factors*	*Mitigation measures*
Large corporates (CSR funds)	• Provides a clear strategy, streamlines efforts and ensures quality implementation • Reduces implementation costs and efforts • Gives an opportunity to leverage funds and magnify impact	• May not get the desired publicity • May require control over the way funds are spent • May be reluctant to work with the government	• Actively managing publicity and outreach and attracting other high profile donors (E.g. international foundations) • Membership on an independent governance board
Local philanthropists	• Provides an opportunity to invest in tangible local solutions • Reduces implementation costs and efforts	• May not get the desired publicity • May require control over the way funds are spent	• Actively managing local publicity and outreach • Membership on an independent governance board
Donor agencies, multilateral organizations and international foundations	• Opportunity to showcase local solutions which can be replicated in developing regions • Gives an opportunity to leverage funds and magnify impact	• New to monitor fund utilization and impact will require strong monitoring and verification	• Results based funding • Independent assessment can increase transparency

This urban sanitation fund can be deployed for multiple purposes

1 Capital expenditure	2 Monitoring and evaluation	3 Marketing support	4 Awareness generation
			
Potential initiatives			
• Construction of own toilets for households • Construction of toilet blocks for markets, offices, schools and hospitals • Construction of sludge drying beds	• Technical assessment of septic tanks • Impact assessment of IFSM activities • Impact assessment of partial subsidy scheme for own toilets • Periodic assessment of treatment facilities	• Assisting businesses create demand for low-cost sanitation products and services • Catalysing the sanitation market by supporting business development	• IEC activities to promote the adoption of households sanitation • Awareness generation campaigns for regular septic tank cleaning and enrolling for own toilet scheme • Awards to wards for achieving Open Defecation Free (ODF) status

Source: Artwork from Noun project

Contents

To develop a results-based fund, we need to define three core aspects

Key Players

What are the key roles, responsibilities and capabilities required for a results-based fund, and who can play these roles at a local level?

Funding instrument

Should the funds be disbursed in the form of grants/subsidies, loans or a mix of grants and loans to household or beneficiary?

Results based funding mechanism

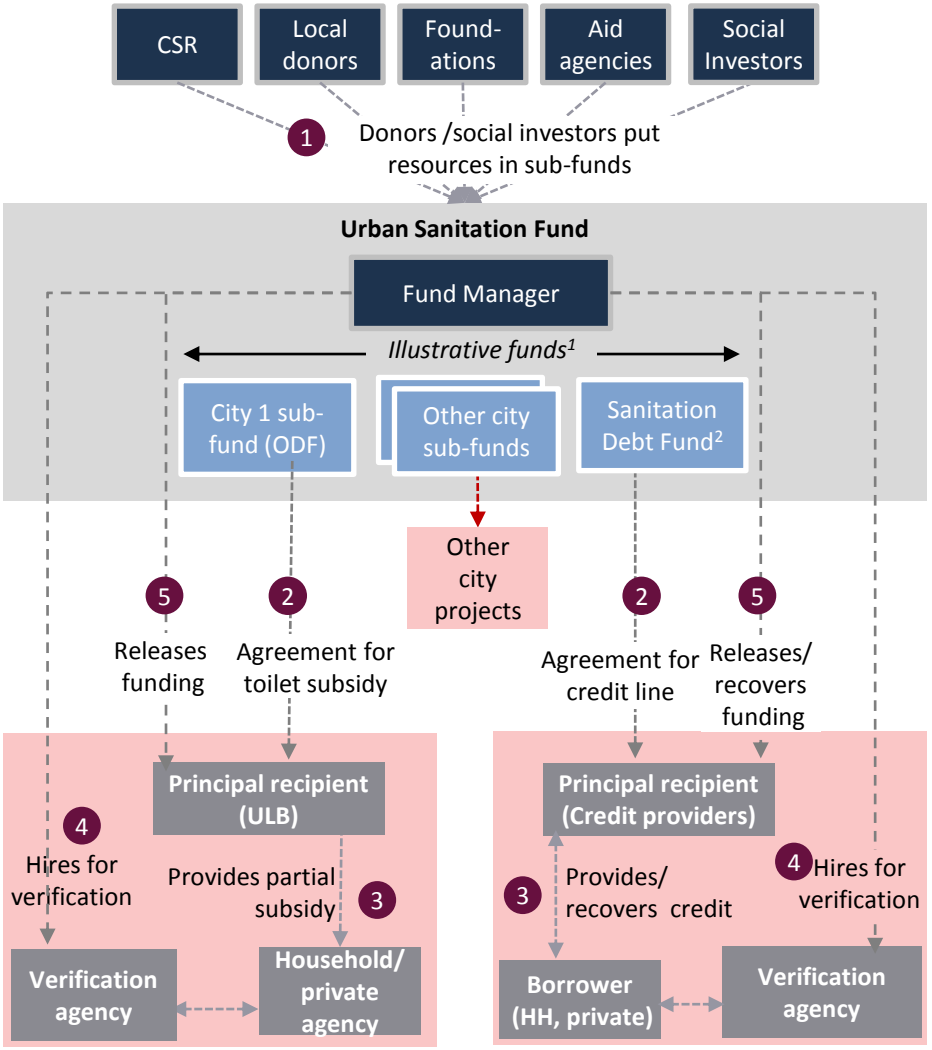
What are the performance metrics, how will they be measured, and how will payment be linked to these metrics?

Urban Sanitation Fund: Key roles in a results/performance-based fund structure

Key players involved

Role	Responsibilities	Capabilities required
Governance of sub-fund	• Policy decisions around fund purpose and structure (e.g. which cities to target, whether to focus on offering toilet subsidies or providing credit line to lenders etc.)	• Representation from key donors/investors in the sub-fund
Fund manager	• Review of assessment reports from verification agency • Fund disbursal to principal recipient • Selection of principal recipient for different sub-funds	• Administrative ability to manage day-to-day operations • Local presence • Credibility with key stakeholders
Principal recipient	• Funding of sanitation activities , TA grants, loans, PPPs, etc	• Technical capability to provide sanitation services • Local presence
Verification agency	• Monitoring and evaluation of service provision • Submission of assessment reports to the fund manager	• Local presence • Technical expertise and to conduct monitoring and assessments • Internal and external credibility

Structure of a performance based urban sanitation fund



Note: (1) The sub-funds can be set up at the city level and be flexible in their purpose. We also envisage a debt fund that can provide lower cost funds to potential lenders.(2) Here we have illustrated two potential sub-funds: A city fund that focuses on ODF city , and a second debt fund for toilet financing

Key players: The governance board (or trustees) of a fund are responsible for taking policy decisions and generally comprise members from donors

Examples[1]

- **The Global Partnership for Output Based Aid (GPOBA)**, is governed by the program council, which is made up of one representative from each of the partners. The Program Council meets at least once a year and is responsible for:
  1. Considering and defining GPOBA policies and strategies
  2. Overseeing the GPOBA Program Management Unit and reviewing GPOBA performance
  3. Approving the program's indicative annual work plan and financial plan
- **The TNUDF, India** is set up as a trust fund set up to fund urban infrastructure in the state of Tamil Nadu. It is managed by a fund manager (TNUIFSL) which is set up as a asset management company with private sector participation. It manages several urban infra funds and each sub-fund has a set of trustees as its own governance structure.

Advantages

- ✓ Provides a forum for stakeholders to set a shared vision for the fund
- ✓ Create an efficient and professional way to make joint decisions over time
- ✓ Creates a sense of ownership and participation

Potential players for sub-funds in the Urban Sanitation Fund

- An independent board with one member from each donor

Note: (1) For project details and key players involved please refer to the appendix

Key players: The role of the fund manager can be played by an independent company with a professional board including private financing institutions

Potential players

	Third party	Independent company
Example[1]	• In Senegal, The Global Partnership for Output Based Aid (GPOBA)'s fund for on-site sanitation facilities is administered by the Government of Senegal's Ministry of Finance and National Office for Sanitation	• The TNUIFSL[2] is managed by an independent board which includes members from Govt. of Tamil Nadu, and the private sector partners
Advantages and disadvantages	✓ Efficient decision-making ✓ Can help address lack of administrative capacity among donors × There may be regulatory and trust hurdles to placing a third-party in control of public funding × Adds complexity	✓ Consensual decision making ✓ Create a sense of ownership and control among donors × May increase administrative cost and slow-down approval process × Logistically complex to ensure that different players work together on a day-to-day basis
Potential players for urban sanitation fund	• A credible local NGO • Donors?	• An independent body consisting of representatives from domestic financial institutions that are key promoters along with prominent resource persons /institutions from the sector as independent members

An independent Company could be a preferred option for the urban sanitation fund

- ✓ **Professional and efficient decision-making**
- ✓ **Possibility of roping in key stakeholders from private, public and civil society**
- ✓ **Possibility of joint venture with public institutions**

Note: (1) For project details and key players involved please refer to the appendix (2) The Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL) PPP in urban sector promoted by Government of Tamil Nadu with equity participation from TN Government (49%) and financial institutions (51%)

Key players: The Principal Recipient (PR) is responsible for delivery of sanitation related activities and could be organizations such as:

Potential players

	Reputed NGO	Microcredit institution	Urban local government	Private contractors
Examples[1]	• In the GPOBA Vietnam rural water supply project, the East Meets West Foundation (EMFW) was the principal recipient	• In the GPOBA Kenya water supply project, K-Rep bank, a local MFI was the principal recipient	• In the Nirmal Bharat Abhiyan, the local village panchayat is the principal recipient and is responsible for ensuring that households construct toilets with subsidies provided	• In the GPOBA Morocco program, one of the Principal Recipients was a private operator and was responsible for implementation
Advantages and disadvantages	✓ Can generate demand × Might not be able to carry out lead to selective targeting of households × Will increase costs	✓ Can manage loan funding ✓ Has financial capacity to pre-finance construction × Might lead to selective targeting of households × Will increase costs	✓ Demand-driven ✓ Direct to end beneficiary ensures ease of targeting × May require an external financing source to pre-finance	✓ Can generate demand ✓ Has financial capability to pre-finance construction ✓ Has the technical know-how × Will increase costs
Potential interventions	• Construction of toilets and septic tanks	• Construction of toilets and septic tanks	• Construction of toilets and septic tanks • With the ULB other sanitation facilities/ services such as treatment or IFSM can be also funded	• Construction of SDBs • Construction of conveyance mechanisms

Note: (1) For project details and key players involved please refer to the appendix

Key players: The verification agency could be a technical auditor, a consulting company or an existing public institutions

Potential players

	Consulting company	Independent technical auditors	Public institutions
Example[1]	• The Global fund's HIV prevention and care for mothers program in India, hired PWC as the Local Fund Agent (verification agency) to assess performance and verify outputs	• The GPOBA project to extend water services in urban areas in Morocco, used independent technical auditors to inspect construction and verify outputs	• The Global fund uses public institutions which act as Local Fund Agents to assess performance and verify outputs
Advantages and disadvantages	✓ External credibility ✓ Technical and institutional capacity × May lack local presence × May be too expensive	✓ External credibility ✓ Technical and institutional capacity × May lack local presence × May be too expensive	✓ Local presence ✓ Reduce cost × May lack institutional capacity × May lack the technical expertise
Potential players for Urban Sanitation Fund	• Consulting firms from cities such as Mumbai, Pune, Nasik	• Local architects or civil contracting companies from cities such as Mumbai, Pune, Nasik	• Technical state level nodal agency such as the Maharashtra Jeevan Pradhikaran (MJP)

Note: (1) For project details and key players involved please refer to the appendix

Funding instrument: Funds can be loan based, grant based or a mix of both, based on type of activity

Funding instrument

	Grant	Loan	Hybrid (loan + grant)
Potential Applications	• Grants to ULBs for the construction of treatment facilities, to private as viability gap funding • Partial subsidies to households for the construction of toilets and septic tanks	• Low-interest, medium-long term loans to households for the construction of toilets and septic tanks	• Mixture of subsidy and loans provided to households for the construction of toilets and septic tanks
Example[1]	• In the GPOBA Vietnam rural water supply project, households were provided a grant subsidy amounting to 80% of total project cost • The households contributed the remaining 20% • GOI's Viability gap funding scheme	• Guardian MFI provides loans (up to INR 10,000) to households for constructing toilets. The households pay back the loan at an interest rate of 21% • Other MFIs have provided toilet loans at lower costs due to a credit line at lower cost of funds from the national Housing Bank (NHB)	• In the GPOBA Kenya water supply project, K-Rep bank provided medium term loans for 80% of the project cost • On successful completion of the project, the households were provided a subsidy of 40% of project cost to repay part of the loan

Note: (1) For project details and key players involved please refer to the appendix

Results based mechanism: Developing a performance based payment mechanism involves three key aspects

	1 Performance metric	2 Performance assessment	3 Payment mechanism
Activities	• *Develop observable metrics to assess the performance of the principal recipient* • *Ensure the metric is mutually agreed upon by the recipient and the fund manager*	• *Develop a process to measure performance along key metrics* • *Decide the frequency and sample size of the performance assessment*	• *Link the monitored metrics to the frequency and amount of payment made to the principal recipient* • *Select a combination of seed and performance based funding*

Results based mechanism: Developing a performance metric and assessment mechanism for construction of toilets

Performance metric

The performance metric could include standards of hardware construction as well as usage of the facility

Performance assessment

The performance of all or a random sample of households could be assessed at one or more stages

Examples

1. **Construction of toilets meeting predefined standards**
2. **Construction of septic tanks of adequate size as per the IS codes and CPHEEO[1] manual**
3. **Provision of access manhole cover for septic tanks to facilitate cleaning**
4. **Usage of toilets for a period of 1 month**

Assessment frequency

Option 1: Assessment of toilets only after construction is complete
(E.g. GPOBA Senegal on-site sanitation project)

Option 2: Periodic assessment at each stage
(E.g. GPOBA Morocco project)

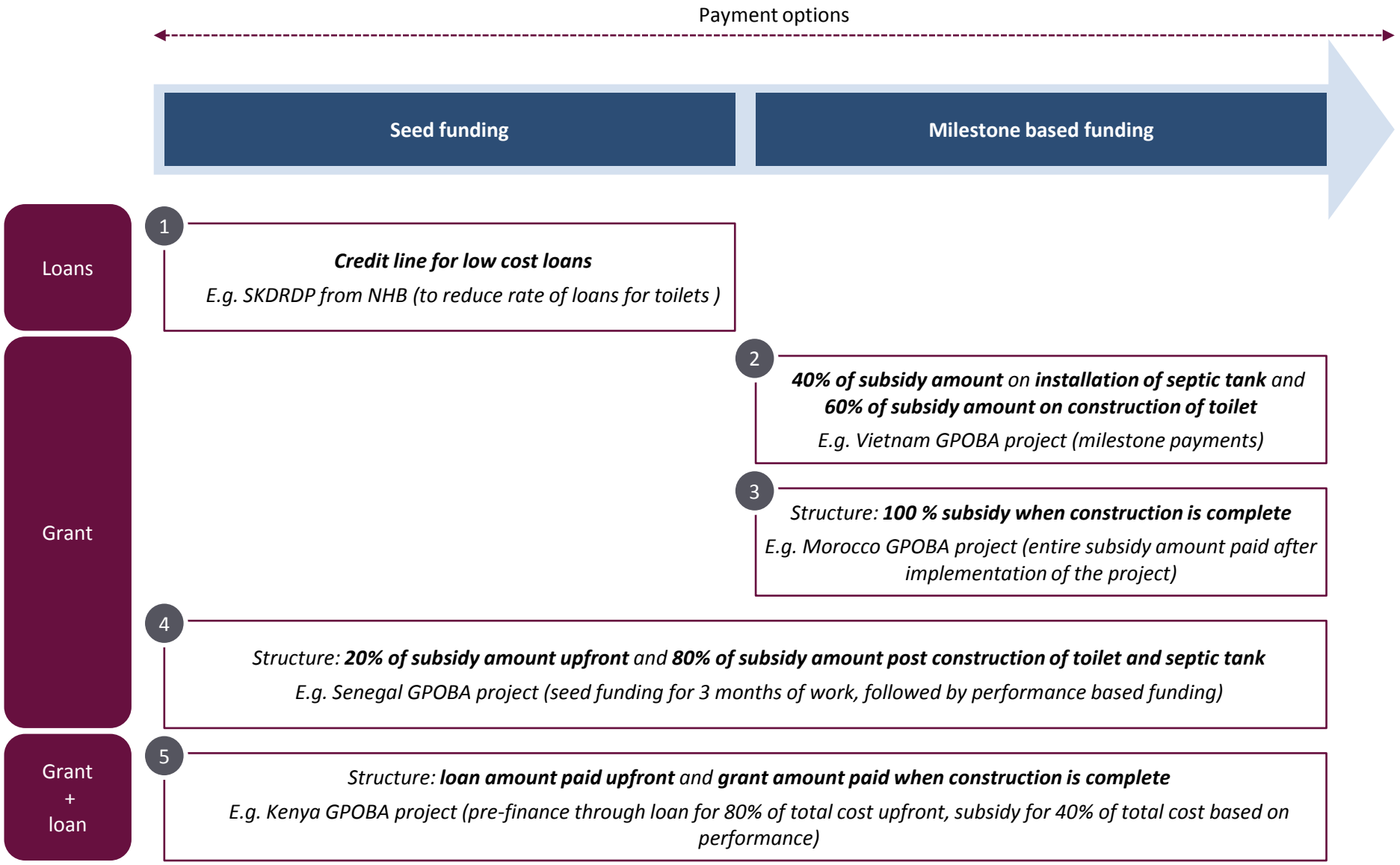
Assessment sample

Option 1: Assessment of all beneficiaries
(E.g. GPOBA Morocco project)

Option 2: Assessment of a random sample of beneficiaries
(E.g. Global Fund)

Note (1) The Central Public Health and Environmental Engineering Organization (CPHEEO) is the technical wing of the MoUD and deals with matters related to urban water supply and sanitation

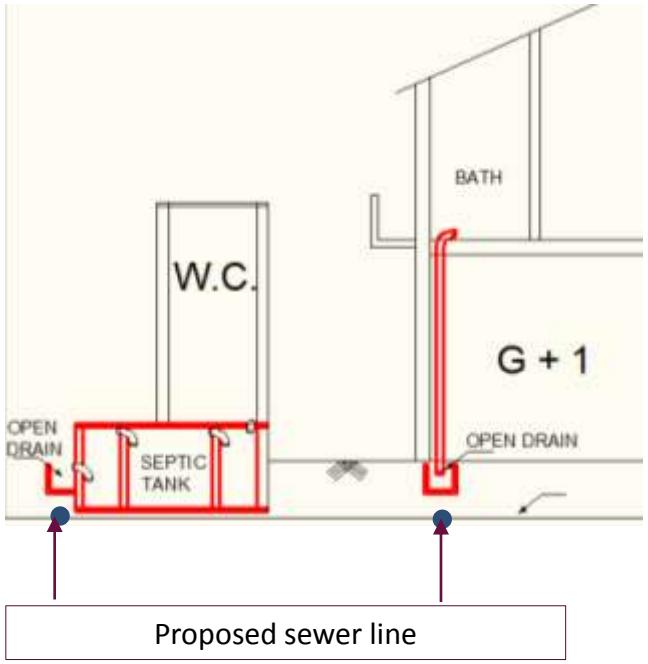
Results based mechanism: Example of payment mechanism for construction of toilets which could be seed funding as well as milestone based funding



Contents

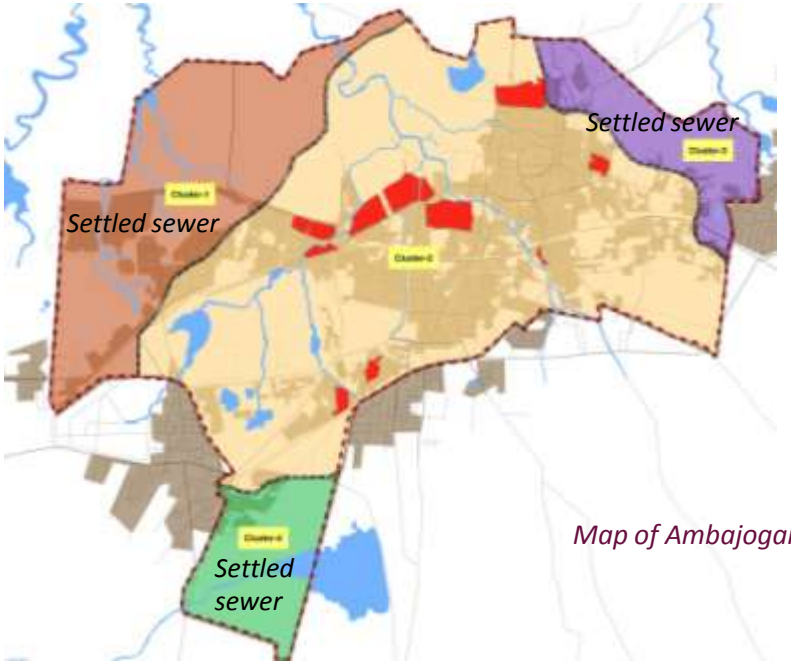
Ambajogai is exploring the construction of a settled sewer system to serve its three peripheral clusters

Settled sewer technology



- **Small bore sewers** with a minimum diameter of 100 mm are proposed to be constructed over a period of 5 years
- **Minimum excavation depth** is proposed to be **0.6 meters**

Proposed Location of settled sewers

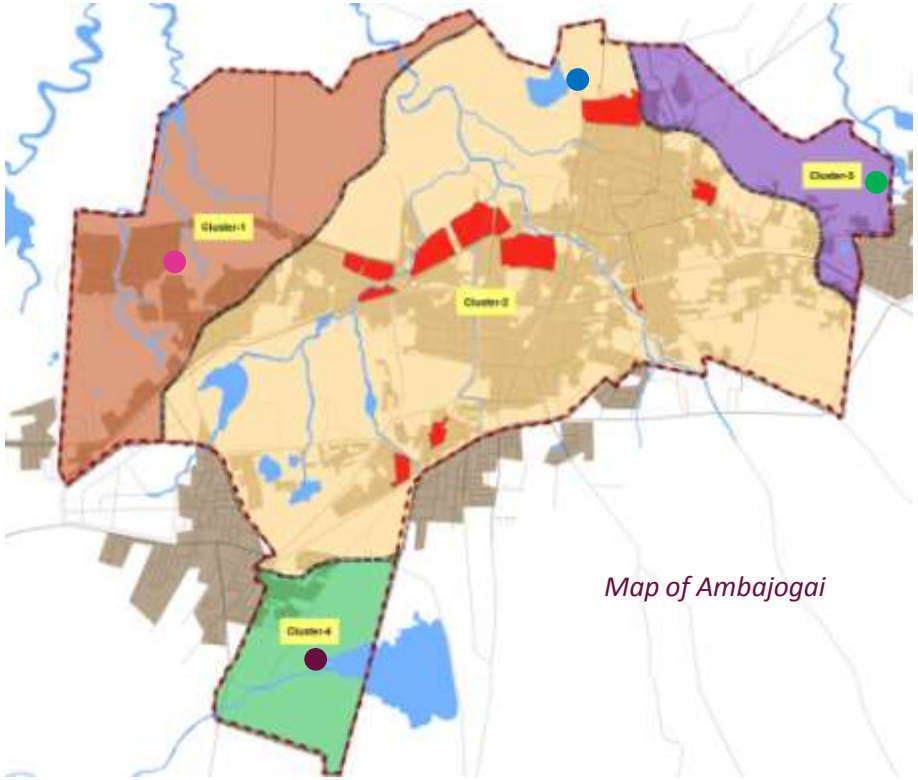


- The city is proposing a **conventional sewerage system for Cluster 2**
- The ULB is considering the **construction of settled sewers in Clusters 1, 3 and 4** which will not be covered under the conventional sewerage network proposed by the ULB
- These three clusters account for ~14% of the total households and **~14% of the total wastewater generated** (0.7 MLD / 4.97 MLD) in Ambajogai

Source: City Sanitation Plan of Ambejogai, PAS Project – CEPT University

The settled sewer system will be attached to a DEWATS facility at 4 locations for the treatment of wastewater

Proposed location of DEWATS



Map of Ambajogai

- DEWATS 1
- DEWATS 2
- DEWATS 3
- DEWATS 4

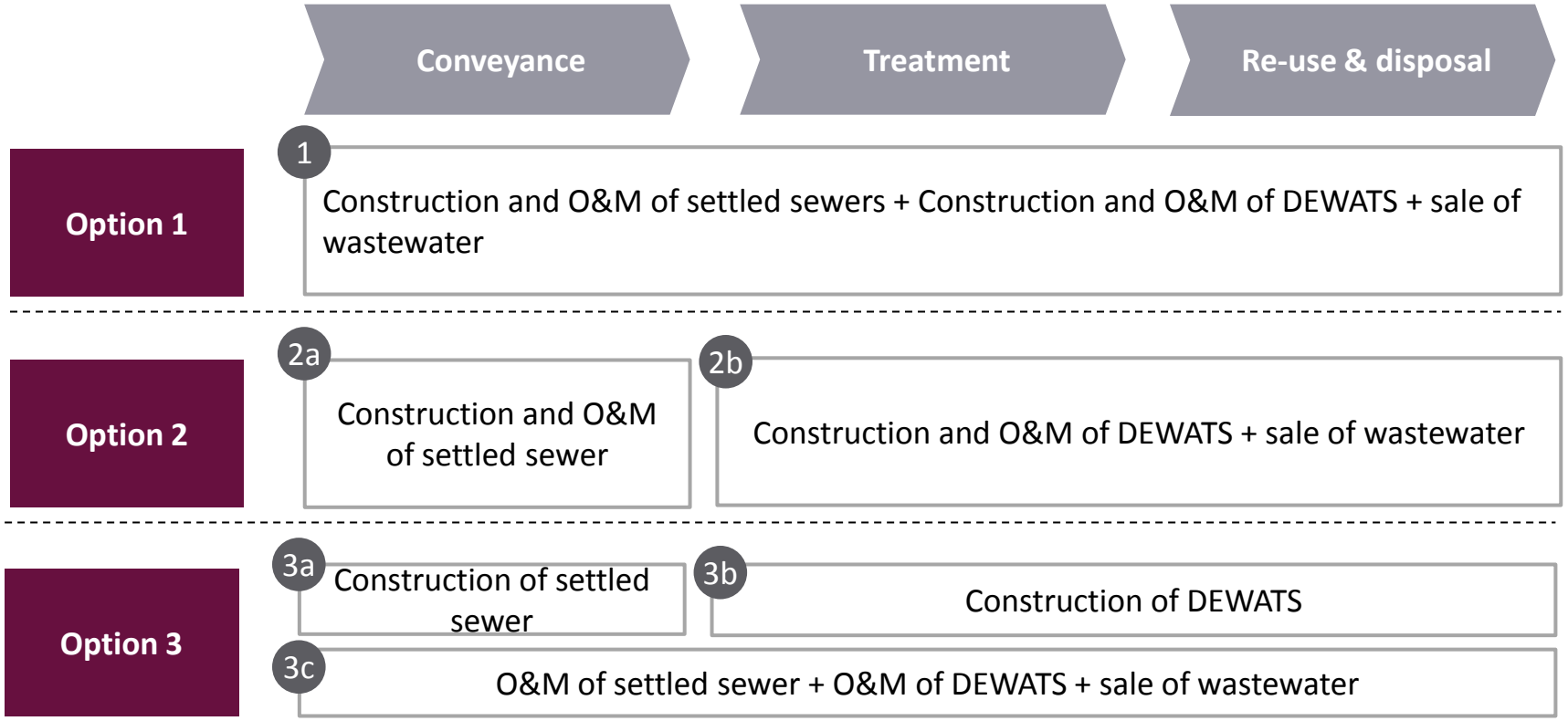
Details of DEWATS

DEWATS No.	Area	Population (2045)	Wastewater generated (Cu. M.)
1 A	Backside of Yogeshwari temple	2,350	255
1 B	Backside of Yogeshwari temple	2,150	183
2	Barula Talab	3,000	255
3 A	Kranti Nagar	4,700	400
3 B	Kranti Nagar	3,500	300
4 A	Mauli Nagar	6,000	510
4B	Mauli Nagar	6,000	510

- The city is exploring the construction of **7 DEWATS plants located at 4 locations**
- **DEWATS facilities will provide secondary treatment**, after which the wastewater will be **safe for disposal in the river or for reuse**

Source: City Sanitation Plan of Ambejogai, PAS Project – CEPT University , Centre for DEWATS dissemination (CDD) research

Ambajogai can explore different ways to engage the private sector, but the project has faced obstacles



Ambajogai city is also exploring conventional sewerage for the remaining clusters 1,3 and 4 that were not covered under the centralized sewerage plan for the city by comparing the conventional sewer option and settled sewer with DEWATs option in terms of capital and O & M cost. The final decision will be taken after this analysis is completed and assessed.

Contents

Going forward, we will be focused on developing a detailed implementation plan for these private sector engagements

① Initial sanitation diagnostic

- What are the gaps in sanitation in each town?
- What are the solutions necessary to meet these gaps?
- Identify potential solutions

② ULB institutional and capacity analysis

- Who are the key stakeholders sanitation provision?
- What are the ULB's plans with regards to sanitation and what are existing resources?
- What is the capacity of these stakeholders to work with the private sector and implement PPPs?

③ Analysis of the potential for private sector engagement

- Can the private sector provide these services at a lower cost or with higher efficiency?
- Are there private players who are willing and capable of providing these services?
- How can we structure the engagement to appeal to both the public and private players?

④ Implementation plan

- What are the key activities and timelines for implementation?
- What capacity building efforts are needed to enable ULBs to manage the contracts?
- What pilots can be planned?
- What kind of financial support is needed?

Focus of the next phase of our work

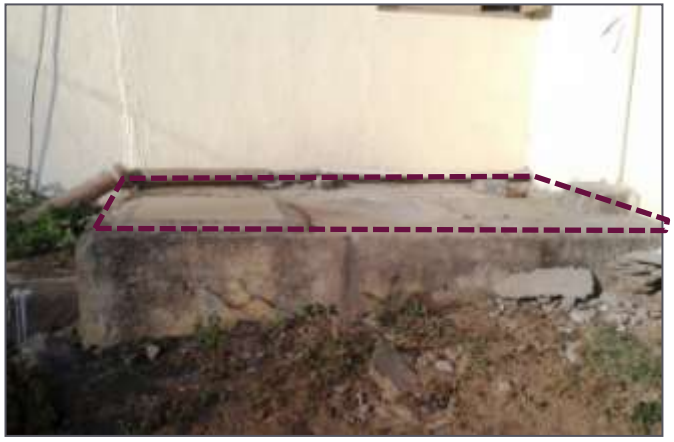
Appendix

Household septic tanks are difficult to access and often connected directly to drains

DIFFICULTY OF ACCESS

Septic tanks are often constructed below the toilets

Many tanks are sealed, and lack an access manhole



DIRECT CONNECTION TO DRAINS

Septic tanks are often connected into drains

In some areas, tanks drain into open drains

Source: CEPT University

We utilized several approaches to identify relevant players for IFSM in these towns

Target interviewees

- ✓ Septic tank cleaning companies
- ✓ Large-scale water supply and sanitation infrastructure companies
- ✓ Small and medium wastewater and sewage treatment companies
- ✓ Local contractors
- ✓ Agri-businesses and farmers association[1]

Target cities

Methodology

- ✓ Desk research
- ✓ Online business listings (e.g. Just dial, Sulekha, Yellow pages)
- ✓ Local non-profits (e.g. Kshitij Foundation)
- ✓ Word-of-mouth references

Online business listings

Note: (1) We also interviewed local farmers and agri-businesses to asses the market for sale of treated septage

Private IFSM has been successfully implemented in Malaysia and Philippines to ensure regular fecal sludge management

- In Malaysia, privatization of sewerage services in 1994 accompanied by stringent government regulations and guidelines have resulted in 94% of the total population having access to improved sanitation since 2006
- In Philippines, The Clean Water Act, 2004 (CWA) requires local government units (LGUs) to create septage management programs in areas that lack sewerage systems. In order to implement the CWA, three LGUs in Alabel, Dumaguete, and Marikina, in assistance with USAID have adopted comprehensive septic management ordinances

Key strategies

Septic tanks design

- Septic tank can only be used once the design is approved by the City Engineer
- Building owners or contractors are expected to inform the concerned agency while installing new septic tanks

Periodic cleaning of septic tanks

- Septic tanks are desludged every 2-5 years depending on a predetermined schedule
- Households pay semi-annual wastewater bills and can pay a one time fee for unscheduled cleanings

Septage disposal

- Septage is transported by a hauler or vacuum truck to designated septage disposal sites and cannot be disposed off in water bodies or open fields

Penalties

- Any person violating these regulations has to pay a significant fine

Source: Artwork from the Noun project, Report on “Assessment of septage management in Asia” by USAID

Sludge drying beds are a non-mechanical and low-cost method for treatment of fecal sludge

Rationale for selecting sludge drying beds

Technology Option	Input	Output	Energy requirement	Land required	Capital cost	O & M cost
Unplanted Sludge drying bed (SDB)	• Fecal sludge	• Treated sludge	Non-mechanical	◑	◔	◔
Planted Sludge drying bed	• Fecal sludge	• Treated sludge • Forage	Non-mechanical	●	◑	◔
High Rate Sludge digester	• Fecal sludge	• Treated sludge • Biogas	Mechanical	◔	●	●
Mechanical Dewatering of sludge	• Fecal sludge	• Treated sludge	Mechanical	◑	●	●
Co-Composting	• Fecal Sludge • Organic waste	• Compost	Non-mechanical	●	◔	◔
Anaerobic bio-gas reactor	• Fecal sludge • Black water • Organic waste	• Treated sludge • Biogas	Mechanical	◔	◑	◑

Unplanted sludge drying beds are an efficient method for the treatment of fecal sludge and require low investment on capital and O&M

Source: Presentation on septage management plan, CEPT University

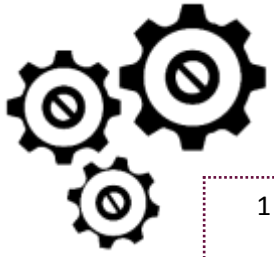
Capital cost in cleaning contracts

Capital cost due to investments		Sinnar	Wai
1	Number of tanks to be cleaned per year in Sinnar	~2,800	~1760
	Number trips required per day for ~300 days in Sinnar	4	6
	Number of trucks required in Sinnar	3	1
	Cost per truck (INR)	9,00,000	9,00,000
	Cost of trucks (INR)	**27,00,0000**	**9,00,000**
2	Number of safety gear and uniforms required in Sinnar	9 x 2	3 x 2
	Unit cost of safety gear and uniforms (INR)	5,000	5,000
	Cost (INR)	**90,000**	**30,000**
Total cost (INR)		**27,90,000**	**9,30,000**

Business establishment expenses	
Legal costs (INR)	50,000
Registration costs (INR)	10,000
Miscellaneous (INR)	10,000
Total Cost = INR 70,000	

Note: All costs in INR; Source: Artwork from Noun project, CEPT University analysis for Septage Management plan

Operational cost in cleaning contracts



		Sinnar	Wai
1	Cost of diesel (INR/L)	60	
	Fuel efficiency (KM/L)	10	
	Total distance travelled in a year (Km)	28, 500	16,000
	Cost (INR)	**1,75,000**	**96,000**
2	Number of people required per truck	3 (1 driver and 2 cleaners)	
	Monthly salary (INR) – including Provident Fund[1]	12,540	
	Total salary (INR)	**13,50, 000**	**4,50,000**
4	**Annual Medical expenses/insurance (INR 10,000 per employee)**	**90,000**	**30,000**
5	**Annul Telephone bill (INR 3,000 per month)**	**36,000**	
6	**Electricity and water bill (INR)**	**1,80,000**	
7	**Travel (INR)**	**10,000**	
8.	**Training (INR)**	**25,000**	
9	Vehicle maintenance cost (INR)	97,200	32,400
	Vehicle insurance cost (INR)	36,000	12,000
	Misc. cost (INR)	24,000	24,000
	Cost (INR)	**1,57,200**	**68,000**
Annual Cost (INR)		**20,27,000**	**8,97,000**

Note: All costs in INR; (1) PF taken as 4.5% of monthly salary i.e. 4.5% of INR 12,000

Source: Artwork from Noun project, CEPT University analysis for Septage Management plan

Capital and O&M cost of SDBs

Capital costs		Sinnar	Wai
1	Amount of septage treated per day (cu. m.)	42	26.3
	Total septage (15 days) (cu. m.)	**630**	**394.5**
	Area of one SDB (sq. m.)	120	120
	Depth of septage (m)	0.3	0.3
	Capacity per bed (cu. m.)	**36**	**36**
	Number of beds req.	**18**	**11**
	Cost per bed	**2,00,000**	
	Cost	**3,600,000**	**2,200,000**

O&M costs		Sinnar	Wai
1	Number of staff	3	
	Monthly salary (INR) - including PF [1]	7,315	
	Annual salary	**263,300**	
2	**Health insurance**	**30,000**	
3	**Maintenance cost (5% of capital cost)**	**2,03,000**	**1,09,500**
	Total annual cost (INR)	**~4,73,000**	**~4,03,000**

Note: All costs in INR; (1) PF taken as 4.5% of monthly salary i.e. 4.5% of INR 7,000

Source: Artwork from Noun project, CEPT University analysis for Septage Management plan

Financial assumptions for contract valuation of contracts involving purchase of truck

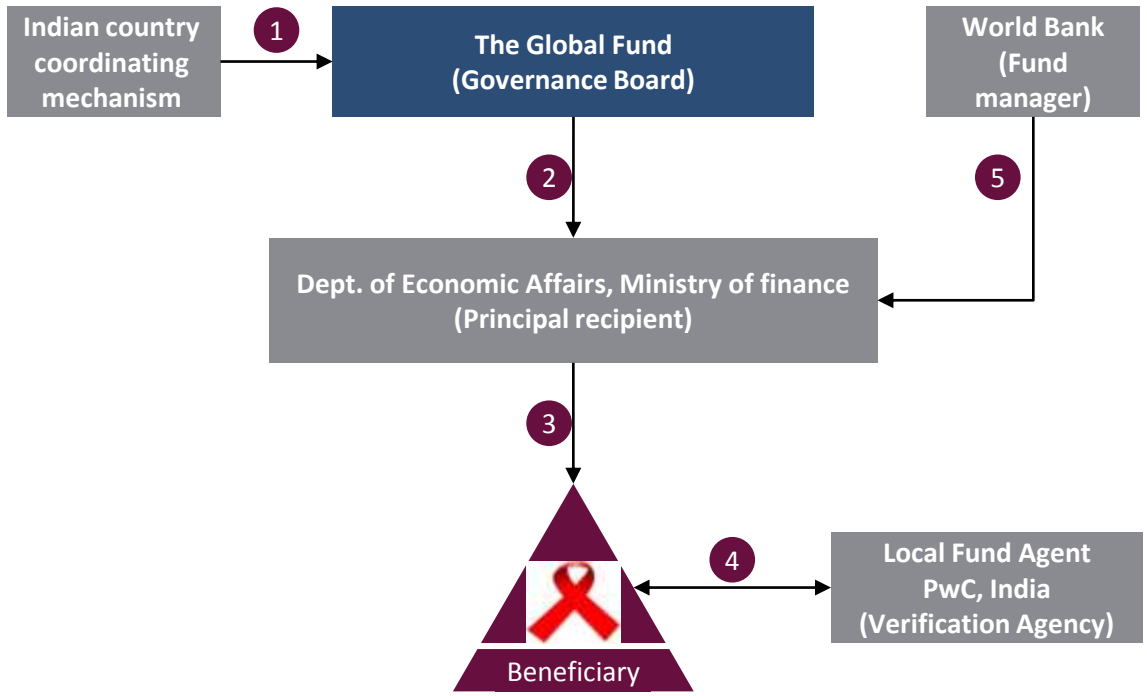
Assumptions

- **Debt for truck** is assumed to have been taken for **5 years at an interest rate of 14%** p.a.
- **Straight line annual depreciation of 16.21%** is taken for the suction emptying trucks
- **Cost of equity is taken at ~25%**
- **Tax rate is taken as 20%**.
- Rate of inflation is taken at 7%

The Global Fund is an independent financial institution providing output based aid to fight AIDS, Tuberculosis and Malaria

Project name: HIV prevention and care for mothers and their families in India

Project mechanism



Key Processes

1. **The Indian Country Coordinating Mechanism (CCM),** after consulting various stakeholders, prepares a detailed project plan and applies for grant to the **Global Fund**
2. Based on approval of the **Technical Review Panel** and the **Grants Approval Committee**, initial fund is granted to the **Ministry of Finance**, nominated as the **Principal Recipient** (PR) by the CCM
3. The **PR** provides services (either itself, or through subcontractors) to the **beneficiaries**
4. **PricewaterhouseCoopers, India** (The **Local Fund Agent**, contracted by the Global Fund) carries out independent impact assessment and monitors implementation
5. Based on the approval of the Local Fund Agent, funding is released by the **World Bank** (**Fund manager** of the Global Fund)

Additional details

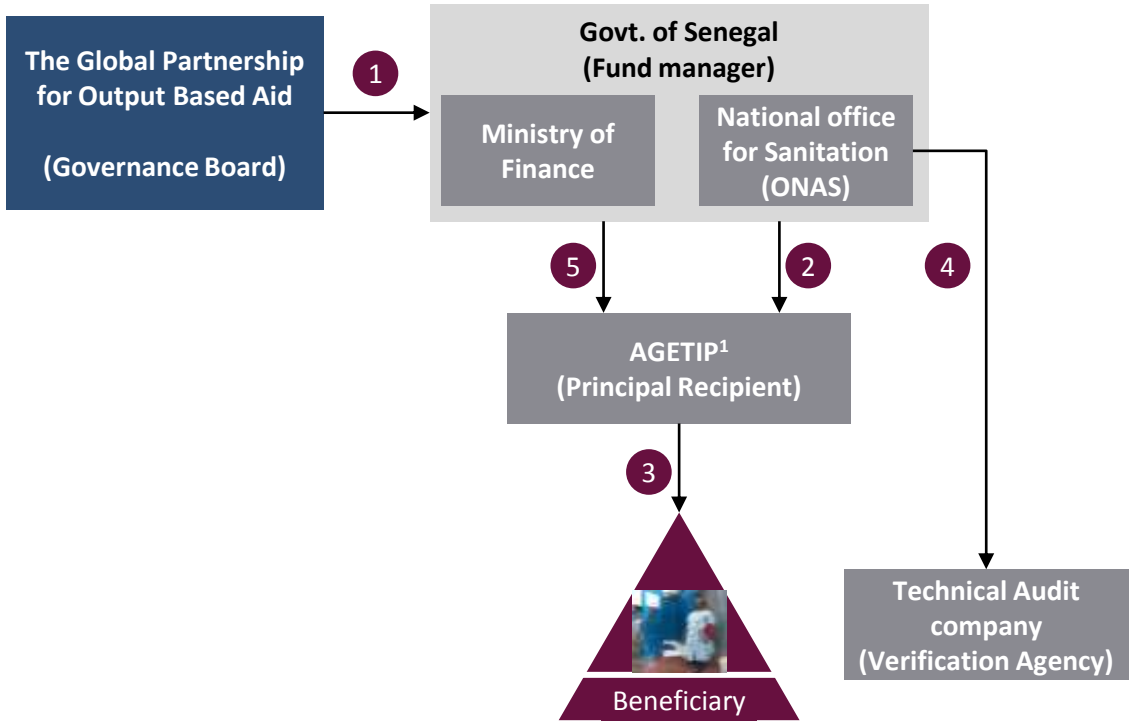
Funding Instrument: Grant based

Performance metric: The **performance is assessed against a variety of pre-set targets** (such as number HIV+ pregnant women receiving antiretroviral prophylaxis, reduction in the number of infants with maternally acquired HIV infection etc.)

The Global Partnership for Output Based Aid (GPOBA) provides output based grants to improve basic services in developing countries… (1/4)

Project name: Senegal on-site sanitation services

Project mechanism



Key Processes

1. **GPOBA** signs agreement with the **Ministry of finance, Govt. of Senegal** and transfers the fund
2. **ONAS** is responsible for implementation of the project, and **outsources implementation to AGETIP** and provides 3 month seed funding
3. **AGETIP[1] constructs on-site sanitation facilities** for the beneficiaries
4. ONAS appoints an **independent technical auditor** to validate outputs
5. Based on verification of outputs, ONAS requests the **Ministry of Finance to disburse funds to AGETIP** (on a quarterly basis)

Additional details

Funding Instrument: Grant based (80% cost is borne by GPOBA and 20% by beneficiary households)

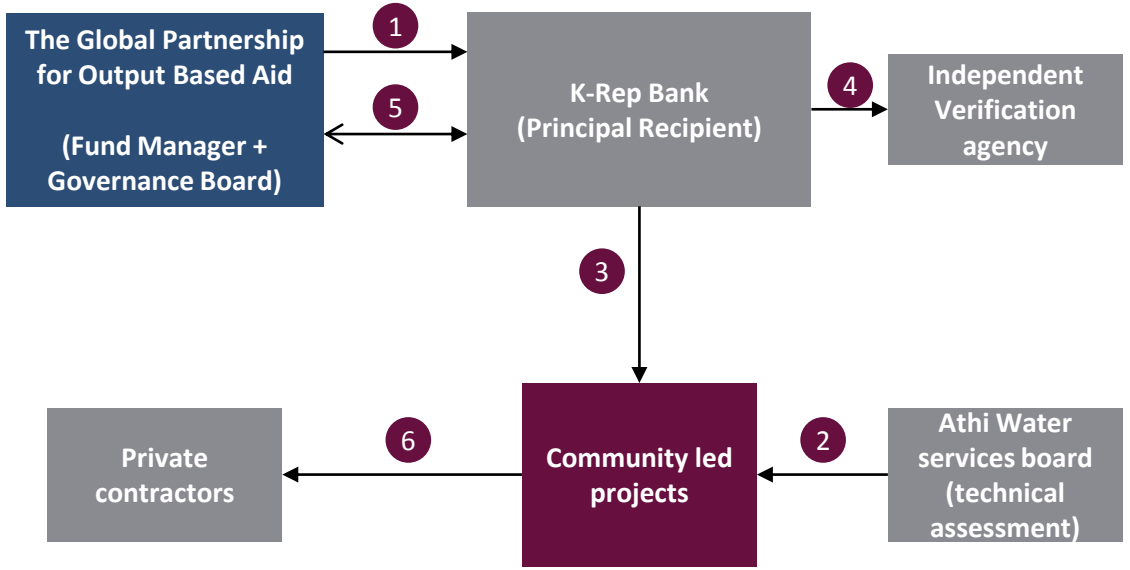
Performance metric: The **performance is assessed against a variety of pre-set targets** (such as number of toilets constructed, number of septic tanks constructed, number of shower and washbasins provided etc.)

Note: (1) The Agence d'Execution des Travaux d'Interet Public contre le sous-employ (AGETIP) is a Non-Profit Organization which implements infrastructure development project

The Global Partnership for Output Based Aid (GPOBA) provides output based grants to improve basic services in developing countries… (2/4)

Project name: Kenya output based aid for piped water supply

Project mechanism



Key Processes

1. **GPOBA signs agreement with K-Rep Bank** to provide output based aid for community led water supply projects in Kenya
2. **The Athi Water Services Board provides technical clearance** to the community led project
3. **K-Rep Bank provides loans** for 80% of project cost
4. K-Rep bank hires an **independent Verification Agency (VA)** to carry out a technical audit and assessment of the project
5. K-Rep bank submits the VAs report to the **GPOBA, who releases funding to the bank**
6. **The Bank expects the community to outsource O&M to private operators to ensure the projects are running well and hence payments are maid on time**

Additional details

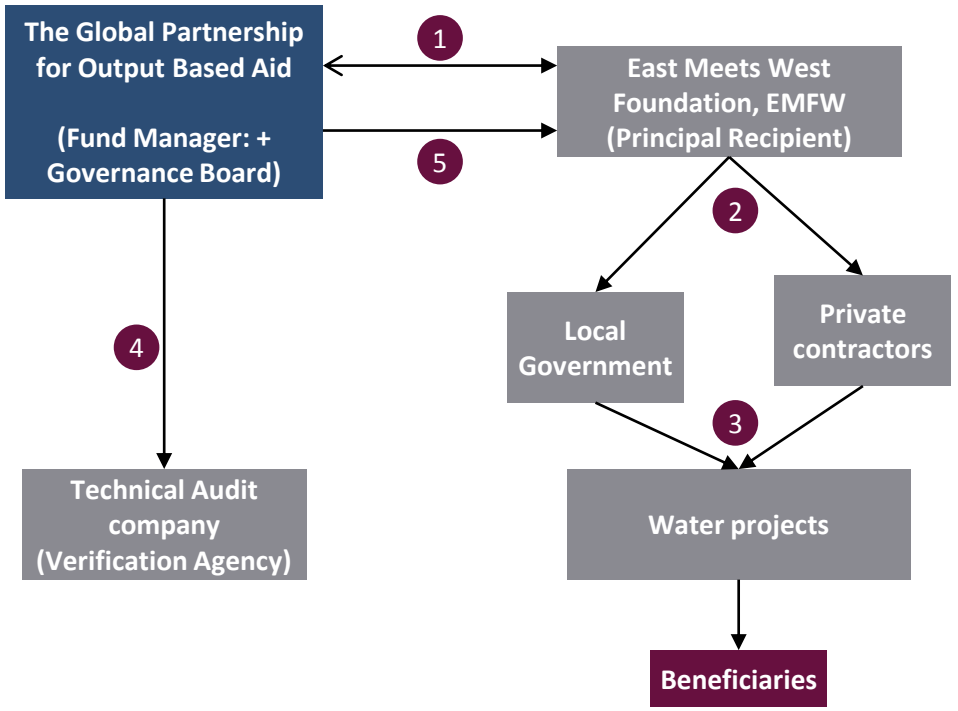
Funding Instrument: Grant + Loan based (20% of project cost is borne by the households, 40% is provided as loan by K-Rep bank, and 40% as subsidy upon completion of the project)

Performance metric: The performance is assessed against two primary targets which are number of new connections and average total monthly revenues collected

The Global Partnership for Output Based Aid (GPOBA) provides output based grants to improve basic services in developing countries… (3/4)

Project name: Vietnam rural water supply project

Project mechanism



Key Processes

1. **GPOBA** enters into an agreement with **East Meets West Foundation (EMFW)** to provide financing for **rural water supply projects**
2. **EMFW outsources construction** to **private contractors** and signs an **MoU with the local government** for the O&M
3. The private contractors construct the water projects and the local government takes responsibility of O&M
4. The GPOBA hires an **independent Verification Agency (VA)** to carry out a technical audit and assessment of the project
5. Based on the report of the VA the **GPOBA releases funding to EMFW**

Additional details

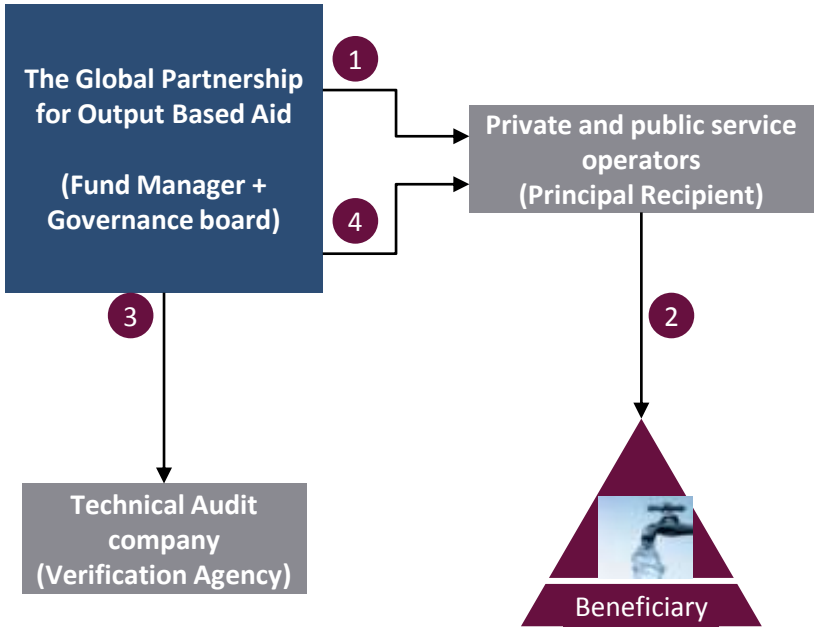
Funding Instrument: Grant based- 80% cost is borne by GPOBA (80% of subsidy amount is paid once households get working connections, and 20% of subsidy amount is paid after six months of service delivery) and 20% by beneficiary households

Performance metric: The performance is assessed against two primary targets which are number of households provided with piped connections and six months of billed consumption

The Global Partnership for Output Based Aid (GPOBA) provides output based grants to improve basic services in developing countries… (4/4)

Project name: Morocco- Extending water services in urban areas

Project mechanism



Key Processes

1. **GPOBA enters into an agreement with the Ministry of Finance, Govt. of Morocco** and 1 **public/private service provider** in each town to provide water supply and sanitation connections
2. Based on household demand, **the private sector operator provides water supply and/or sanitation connections** to each household
3. **GPOBA hires an independent technical auditing company** to verify outputs and recommend subsidy payment
4. Based on the report of the VA, the **GPOBA releases funding to the independent service operator**

Additional details

Funding Instrument: Grant based- Based on the region ~30% - 70% cost is borne by GPOBA (60% of subsidy amount is paid once households get working connections, and 40% of subsidy amount is paid after six months of service delivery) and remaining project cost is borne by the beneficiary households

Performance metric: The performance is assessed against two primary targets which are number of households provided with piped connections and six months of service delivery