Toilets And Beyond –
How to implement ODF+ in small towns in India

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Dhruv Bhavsar & Omkar Kane
CEPT University
Overview of sanitation situation in Maharashtra

- 25% urban households have reported no toilets
- 33 cities out of 360+ cities have partial sewer system
- 52% properties depend on onsite system
- 194 cities provide septic tank emptying services
- 10 cities treat septage at existing STPs

Source: PAS 2014-15
GoM launched **Swachh Maharashtra Mission**

Launch of SMMU

15<sup>th</sup> May 2015

CEPT MoU with GoM
Developed concept of ODF, ODF+, ODF++
# Incentives for ODF Cities

<table>
<thead>
<tr>
<th></th>
<th>ODF Cities (Rs.)</th>
<th>Swachh Cities (Rs.)</th>
<th>Linked to Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Class</td>
<td>2 Cr.</td>
<td>2 Cr.</td>
<td>30% released on first validation, if positive</td>
</tr>
<tr>
<td>B Class</td>
<td>1.5 Cr.</td>
<td>1.5 Cr.</td>
<td>70% released on 2nd validation after a six months, if positive</td>
</tr>
<tr>
<td>C Class</td>
<td>1 Cr.</td>
<td>1 Cr.</td>
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*Utilisation of funds for Sustainability and moving towards ODF+ and ODF++*
**CSP – Support to small and mid-sized cities**

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.

**Hingoli**
Located in the Hingoli district, the town has a population of ~85,000. It’s primarily a pilgrimage destination.

Source: Census of India 2011
**Key activities undertaken in preparation of CSP**

- **Assessment of Sanitation situation in cities across various sectors**
- **Development of sanitation options**
- **Analysis of city budgets**
- **Continuous stakeholder engagement**
- **Institutional Capacity assessment**

**Key outcome:**
A City Sanitation plan through which Universal access to Sanitation is achieved and the option is financially viable for ULB
## City Background Information

<table>
<thead>
<tr>
<th></th>
<th>Wai</th>
<th>Sinnar</th>
</tr>
</thead>
<tbody>
<tr>
<td>District</td>
<td>Satara</td>
<td>Nashik</td>
</tr>
<tr>
<td>Civic status</td>
<td>Nagar Parishad ‘C’ class</td>
<td>Nagar Parishad ‘B’ class</td>
</tr>
<tr>
<td>Total Area</td>
<td>3.64 sq km</td>
<td>51.4 sq km</td>
</tr>
<tr>
<td>Population</td>
<td>36025</td>
<td>65299</td>
</tr>
<tr>
<td>Households</td>
<td>7580</td>
<td>13112</td>
</tr>
<tr>
<td>Slum HHs</td>
<td>456 (6%)</td>
<td>837 (7%)</td>
</tr>
<tr>
<td>No of Wards</td>
<td>19 wards managed through 5</td>
<td>19 wards managed through</td>
</tr>
<tr>
<td></td>
<td>Prabhs</td>
<td>5 Prabhs</td>
</tr>
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Wai is a tourist town, whereas Sinnar is more of an industrial hub.
Access: ~ 65% coverage of individual toilets and high dependency on community toilets

Access to types of sanitation facility (Number of HH)

<table>
<thead>
<tr>
<th></th>
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<th>Sinnar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual toilets</td>
<td>7,580  68%</td>
<td>13,112  63%</td>
</tr>
<tr>
<td>Community toilets</td>
<td>13,000  30%</td>
<td>18,000  24%</td>
</tr>
<tr>
<td>Open defecation</td>
<td>780  2%</td>
<td>900  13%</td>
</tr>
</tbody>
</table>

Access to community toilets

~ 30 blocks

Source: Census of India 2011, City Sanitation Plan, PAS Project – CEPT University
Septage collection: **Households in these towns depend on septic tanks that are generally oversized**

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

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<thead>
<tr>
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<th>Sinnar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Others</td>
<td>5,145</td>
<td>8,243</td>
</tr>
<tr>
<td>Pit / latrines</td>
<td>10% (4%)</td>
<td>12% (12%)</td>
</tr>
<tr>
<td>Septic tanks</td>
<td>86%</td>
<td>74%</td>
</tr>
</tbody>
</table>

### Sample assessment of size of septic tanks connected to personal toilets (Number of toilets)

<table>
<thead>
<tr>
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<th>Sinnar</th>
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</thead>
<tbody>
<tr>
<td>As per standards</td>
<td>20 (5%)</td>
<td>14 (7%)</td>
</tr>
<tr>
<td>Oversized</td>
<td>70%</td>
<td>64%</td>
</tr>
<tr>
<td>Undersized</td>
<td>25%</td>
<td>29%</td>
</tr>
</tbody>
</table>

- Septic tanks are made with conventional **2-3 chambered baffled design**
- A sample survey 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 manual
- As a result, they are **cleaned infrequently**, often only once in more than ~8-10 years

Source: City Sanitation Plan, PAS Project – CEPT University
Septage conveyance: Septic tanks are only cleaned once in more than ~8 to 10 years resulting in fecal matter being released into drains

Existing septage conveyance mechanism in Wai

- The truck is owned and operated by the ULB, that charges households ~INR 500 / trip in Sinnar, INR 1000 / trip in Wai
- There is no regulated schedule for cleaning, and households call the ULB when required, ~once in >8-10 years
- Only 1-4% of tanks are cleaned annually, far below the service standards of 33% recommended by the MoUD’s CPHEEO manual
- Due to infrequent cleaning, septage begins to solidify in tanks

Existing septage conveyance mechanism in Sinnar

- ULB operated
- 3000 litre truck
- ULB operated
- 5000 litre truck
Septage Disposal: Collected septage is disposed off at solid waste dump site...
Need to tackle these issues through End-to-end IFSM solution – Moving from RED to GREEN

Current Situation
- Lack of universal access to improved toilets
- Lack of adequate data base on toilets for properties

Proposed Approach
- Converting unimproved toilets to improved toilets
- Ensuring 100% access to improved toilets
- Data base on toilets for all properties

• Pour flush toilets
  - Septic tanks
    - Septic tanks lack manhole covers
    - Septic tanks are not of standard size
    - No database on septic tanks for properties
  - Suction emptier truck
    - Only 4% of septic tanks cleaned annually
  - No treatment facility
    - Septage disposed off on dumping site without treatment
  - Disposed off on dumping site

• Pour flush toilets
  - Septic tanks
    - Providing access manhole covers to allow regular cleaning
    - Enforcing regulations on septic tanks design
    - Data base of properties with septic tanks
  - Suction emptier trucks
    - Preparing a schedule for period cleaning of septic tanks, to ensure that all septic tank are cleaned at least once in 3 years
    - Enforcing regulations and penalties for periodicity of septic tank cleaning and safe handling of sludge
    - Payment using local taxes using escrow mechanisms
  - Treatment facility
    - Installing treatment facility for the treatment of septage
  - Revenue from compost
    - Safe dumping of treated fecal matter and/or the sale of septage at a fixed rate to nearby farms or agro-businesses
Cities has **passed resolutions to implement the “own toilet scheme”**

Cities developed and implemented ‘Own toilet scheme’ much before Swachh Bharat Mission was announced
Aligned the Own toilet scheme with National and State Schemes

**Swachh Bharat Mission**
Subsidy: INR 4,000

**Swachh Maharashtra Abhiyan**
Subsidy: INR 8,000

**Urban Local Body**
Subsidy: INR 5000 - 10,000

**Total Subsidy**
INR 17,000 - 22,000
Activities undertaken by the cities to become ODF . . .

1. Toilet Subsidy scheme Awareness and inviting applications
   - Posters/banners/handouts/form distribution
   - Jingles/movies: rickshaw, TV, radio, festivals

2. OD spot monitoring
   - Good morning Squad

3. Capacity building and enabling
   - Toilet vendor-lender fair
   - Training staff/masons

4. Application Monitoring
   - Finance options
     - Self help groups
     - Micro-finance institutions
     - Credit societies
     - Commercial banks
     - Housing finance companies
   - Bulk SMS
     - Application process, site inspection
Wai has been declared as an ODF City by GoM & GoI and Sinnar will be declared in March, 2017

~2600+ applications have been received

~1900 applications have been approved for construction

~1100 toilets constructed
Both councils has signed resolution to implement FSM plans

The resolution covers aspects like:

- Citywide IFSM
- Involving Private sector
- Scheduled cleaning
- Land for treatment facility
- Taxes to be levied
- Escrow account
Moving from a **consumer complaint system** to **regular service oriented system**

### Current septage management practice

- **~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

2. Wai and Sinnar has only **1 truck of 5kL and 3kL capacity**, owned and operated by the ULB

3. Houses pay **~INR 400 – 1000** to the ULB to get tanks cleaned

### Proposed solutions

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 to educate HHs about the need for regular cleaning

2. Wai and Sinnar will get addition **2 and 3 nos of 5 kL trucks** respectively to clean ~3-4 septic tanks a day, which can be operated by a private.

3. All property owners (residential and non-residential) will pay a ‘**special sanitary tax**’ to be levied by the ULB as per the **municipal legislation**

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(1) Maharashtra Municipal Councils, Nagar Panchayats and Industrial Townships Act, 1965, Chapter IX : Municipal taxation, Section 108
Scheduled desludging services in towns financed through taxation . . .

3 trucks to desludge ~ 4000 septic tanks annually

2 trucks to desludge ~ 2000 septic tanks annually
City is exploring septage treatment options . . .

- Cities have allocated land for treatment facility
- Undertook septage quality tests
- Exploring PACKAGE treatment plants for treating of septage
- Both councils have floated an Expression of Interest for interested bidders
- Received +ve response from bidders
To ensure adoption of the integrated fecal sludge management plan, the ULB has made regulatory changes

- ULB has/will formulate **bye-laws** and rules to **ensure implementation** of FSM plan

- The rules will address:

  1. **Septic tank design**: to ensure septic tanks of standard size are installed
  2. **Periodicity of de-sludging**: to ensure septic tanks are cleaned every 3 years
  3. **De-sludging procedures**: to ensure safe handling of fecal sludge
  4. **Sanitation tax**: to persuade households to clean septic tanks regularly
  5. **Penalties**: to deter irregular cleaning and use of substandard septic tanks

- **Regular monitoring and inspection** of septic tanks and de-sludging procedures to facilitate the implementation of bye-laws will be undertaken
These **activities** will be supported by **IEC campaigns** to generate awareness . . .

**Developed Awareness materials for FSM**

**Awareness generation pamphlets**

**Proper Design and Cleaning of your Septic Tank!**

- **Wrong**
  - Septic tank base should always be water tight and it should have proper vent pipes
  - Proper access manhole should be provided for easy emptying

- **Right**
  - Clean your septic tanks regularly once in 3 years
  - Do not wait for it to overflow. This will adversely affect your health and your environment

**Empty Septic tank regularly**

- Septic tank should be emptied every 2-3 years
  - Avail Nagarpatika services!
  - Not emptying it regularly will result in-

**Training of local contractors for proper construction of septic tanks**
City level Database of toilets & septic tanks using SaniTAB

Map depicts HHs with toilets connected to septic tanks
Identified private players offering septage management services within and nearby town

Proposed value chain

Activities required

Access → Collection → Conveyance → Treatment → Disposal / Reuse

Pour flush toilets → Septic tanks → Suction emptier trucks → Sludge drying beds → Revenue from compost

A. Refurbishment of septic tanks with access manhole covers
B. Periodic cleaning of septic tanks along a regulated schedule
C. Construction of fecal sludge treatment plant (FSTP)
D. Operation and maintenance of FSTP
E. Sale of septage at a fixed rate to nearby farms or agro-businesses

1. Labor contractors for septic tank cleaning
2. Septic tank cleaning companies
3. Pure-play treatment players
4. Integrated fecal sludge management providers

 Buyers of septage
Maharashtra Organic Farming Association
Agro-based industries
Local farmers and growers associations

Small scale players (<10 employees)
Medium scale enterprises (>10-50 employees)

Source: Field visits, online business listings
Assessed work profile, interests and capacity of private sector

Name: Company X

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

Services offered: Company X 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”

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

- **Option 1**
  - **Contract 1A**: Refurbishment and cleaning of septic tanks
  - **Contract 1B**: Construction of FSTP

- **Option 2**
  - **Contract 2A**: Refurbishment and cleaning of septic tanks
  - **Contract 2B**: Construction and O&M of FSTP

- **Option 3**
  - **Contract 3A**: Refurbishment and cleaning of septic tanks, construction and O&M of FSTP
Followed six processes in structuring a PSP option for FSM:

1. Operational role of the private contractor
2. Source of revenue
3. Investment/ownership of capital asset
4. Payment structure
5. Contract length and value
6. Risk mitigation and allocation

Bundled or Unbundled contract?
Revenue stream enough to meet private players’ return expectations?
Who should invest in capital assets?
How to address the major risks for the private player and the ULB?
What is the appropriate contract duration for private and ULB?
What is the appropriate payment structure for the private player?
Each contract option along with draft tender clauses was discussed with the private sector and ULB to understand their concern and requirement.

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

Additional Aspects covered with ULB
- Pros & Cons of each option
- Contract costs
- Taxes to be levied
- Bid document process and requirements
Following this process, bid documents have been rolled out in few cities of Maharashtra.

CONTENTS
I. Short Tender Notice ..........................................................
II. Detailed Tender Schedule ..................................................
    Notes ........................................................................
III. List of documents to be submitted along with tender .........
IV. Detailed Tender Notice – General Conditions ..............
V. Detailed Tender Notice – Special Conditions .................
V. Form Formats ................................................................
   Details of suction emptier trucks available with the tenderer for the use of this work ....
   Details of work of similar type and magnitude carried out by the tenderer ............
   Details of technical personnel with the tenderer ..........................
   Year wise statement showing cost of completed works ..................
VI. Opening of Tender ..........................................................
VII. Acceptance of Tender ..................................................
VIII. Declaration of the Contractor ........................................
IX. Financial Bid Form .........................................................

Sinnar Municipal Council, Sinnar

TENDER DOCUMENT

Name of Work
“Scheduled cleaning of septic tanks, Sinnar”

Estimated Cost: To be given by the bidder

E.M.D. ₹40,000/-

Office of the
Chief Officer, Sinnar Municipal Council, Sinnar

Sunil S. Patil  Vyankesh R. Durves  Sanjay Ravve  Ashwini Deshmukh
Municipal Engineer  Chief Officer  Vice President  President

Septic tank cleaning
Tender document
Key Results . . .

- Scheduled based septic tank emptying services to be rolled out
- Sanitation tax levied for financing FSM services
- Regulations enforced backed by awareness campaign and monitoring
- Private Sector involved for providing FSM services
- Balanced performance based contracts developed for these services
- Exploring reuse possibility of septage
Thank you . . .

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