FSM for Rural India
- Approach and first steps

National Workshop on Non-Sewered Sanitation
- Mussorie, Uttarakhand
Why FSM for Rural India

More than 55% of all rural toilets maybe “non-twin pits”
## Components of strategy

<table>
<thead>
<tr>
<th>Components</th>
<th>Scope</th>
<th>Desired output</th>
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</table>
| Biodegradable waste | • 700 GOBARDHAN projects  
• All districts to have organic waste management | • Organic waste is managed within the village and is converted to useful products |
| Non-biodegradable waste | • 700 districts to have plastic projects | • Plastic waste, metals, glass etc. are disposed safely  
• Medical and sanitary waste is incinerated (as per rule)  
• Inerts are disposed safely |
| Fecal Sludge | • All census towns and LDVs to be covered as priority | • Fecal sludge from pits and tanks is treated before disposal |
| Grey Water | • All districts to have grey water management | • Greywater and septic tank overflows disposed in-situ or treated before disposal |
# Timeline of strategy

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<tbody>
<tr>
<td>District SLWM Action Plan</td>
<td>SLWM action plan for each district – 700 (in number)</td>
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<tr>
<td>A. Biodegradable waste</td>
<td>GOBARDHAN Projects</td>
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<td>700 (up to Sep 2019)</td>
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<td>Other bio-waste</td>
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<td>B. Non-biodegradable waste</td>
<td>Plastic management projects</td>
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<td></td>
<td>50 district projects</td>
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<td>Other non-biowaste</td>
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<tr>
<td>C. Fecal Sludge</td>
<td>FSM plants/projects</td>
<td>5-6 pilots*</td>
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<tr>
<td>D. Grey Water</td>
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<td>2 pilots**</td>
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### Notes:

1. Anupshahr, UP (Ganga GP)
2. Sikkim (Hilly terrain)
3. Odisha (Rural-Urban Convergence)
4. Udipi, Karnataka (In-situ FSM)
5. Remote area (Very low cost)
6. Flood prone area

**

1. Andhra Pradesh (DEWATS for greywater recycling for non-potable purposes like agriculture, etc)
2. Gujarat (In-Situ greywater treatment soak it/leach pit)

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*Note: The State Integrated SLWM plan will have all 4 streams mentioned above by end of Sep 2019.*
Priority Areas for FSM

- Census towns
  - Population 4000+, density > 400 per sqkm
  - Urban characteristics, rural admin
  - 83% CTs “near” a town or each other
- LDVs: Ganga Basin Villages
  - Large, dense villages
  - Population > 1000
  - Density > 400
Step 1: Know your Pits – Single Pit

Desludging required when pit fills
But better do it every 5-6 years
Step 1: Know your Pits – Septic Tank

Desludging required every 2.5 – 3 years
Step 1: Know your Pits – Septic Tank?

Septic tank or single pit?

Holding tank
Step 3: Pick your Tools

which causes the actual desludging operation to be much more difficult than it can be.
### Step 3: Pick your Tools

**Emptying and Transport of sludge**

<table>
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<tr>
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<th>Gulper</th>
<th>Pump and tanks</th>
<th>Vacuum Truck</th>
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<tbody>
<tr>
<td>Ease of use</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
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<tr>
<td>Thick sludge</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Accessibility</td>
<td>High</td>
<td>High (50m)</td>
<td>Medium</td>
</tr>
<tr>
<td>Capital cost</td>
<td>~ Rs. 20,000</td>
<td>~ Rs. 1 lakh</td>
<td>Rs. 7 – 15 lakhs</td>
</tr>
<tr>
<td>Opex</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
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</tbody>
</table>
Step 3: Treatment Methods – Cost and complexity

- **Type 1**
  - Trenching System
  - Capex: INR 65 - 75k
  - Cost per capita: INR 5
  - Opex: INR 10

- **Type 2**
  - Geo-bag with liquid treatment
  - Capex: INR 22 - 25Lacs
  - Cost per capita: INR 170
  - Opex: INR 10

- **Type 3**
  - Planted drying beds with liquid treatment
  - Capex: INR 125 - 150k
  - Cost per capita: INR 10

- **Type 4**
  - Anaerobic digestion based
  - Capex: INR 25 - 28 Lacs
  - Cost per capita: INR 200
  - Opex: INR 25

Cost for 3kl/day = 15000 population
Cost per capita per method

Slide courtesy CDD Society
Step 3: Pick your Tools

Leh, Ladakh, J&K
12000 lit; 720 sqm; Rs. 52 lakhs
Step 4: Choose your FSM Model
Step 2: Fix your pits!!
Step 5: Get to work!

Phases of FSM Implementation

**Build Capacity**
- CB, IEC, HR strat
- Plan and funds

**Generate Demand**
- Financial incentives
- Develop local entrepreneurs

**Implement**
- Pilot Demonstrations
- License desludging operators
- Monitoring; MIS
- Run IEC
- Execute FSM

**State**
- State – Advisory Committee and PMU

**District**
- Water Sanitation Committee (DWSC), District Sanitation Cell
- District Water Sanitation Committee (DWSC), District Sanitation Cell

**Block**
- Project Management Unit

**GP**
- GP - Village Sanitation Committee (VWSC)
- GP - Village Sanitation Committee (VWSC)

- Know your pits
- Pick your tools
- Set pricing, tariffs
- Consolidate implementation plans
- Handhold GP
- Cluster projects
- Financial incentives
- Pilot Demonstrations

- Roll out of FSM Implementation
FSM Pilot Cluster - Bulandshahr, UP

- All villages within 10km or 1 hour driving distance of disposal point
- 3 Existing STPs and 6 proposed FSTPs
Shit Flow Diagram: India

- **Containment**
  - 13.9% WC
  - 36.18% On-Site Facility
  - 50% OD / Open Discharge

- **Emptying**
  - Leakage includes DEWATS (3.6% + 0.2%)
  - Legally dumped (9.3%)
  - Illegally dumped (21.7%)

- **Transport**
  - Safely Emptied (5.18%)
  - Effectively Treated (5.2%)
  - Not Effectively Treated (3.08%)

- **Treatment**
  - Effectively Treated (1.4%)
  - Not Effectively Treated (0.45%)
  - Effectively Treated (9.21%)
  - Safely Abandoned (0.09%)

- **Reuse/Disposal**
  - 5.2%
  - 1.4%
  - 6.7%
  - 0.1%
  - 93.3%

- **Domestic Environment**
  - 49.9%

- **Agriculture field**
  - 21.7%

- **Receiving Waters**
  - 12.7%
  - 3.8%

Data Source: Census 2011
ANY QUESTIONS??

THANK YOU