ASSESSMENT OF FECAL SLUDGE AND SEPTAGE MANAGEMENT - PHASE 1

Target towns / cities under various programmes

- AMRUT
- Namami Gange
Type of Containment Systems in select 30 cities

Break up of containment systems

- 45% Septic Tank connected to open drain
- 36% Fully Lined Tank connected to open drain
- 8% Lined Pit with semi-permeable walls and open bottom
- 5% Lined Tank with impermeable walls and open bottom
- 3% Septic Tank connected to soak pit
- 3% Pit Latrine
- 2% Septic Tank connected to open ground
- 1% Fully Lined Tank connected to open ground/water body
Type of Emptying in select 30 cities

Break up of emptiers:
- 50% Manual
- 50% Mechanical

Break up of vehicles:
- 91% Tractor Mounted
- 9% Truck Mounted
Extent of faecal sludge treatment

- FS not treated: 87%
- FS treated: 13%
CLUSTER 1: Cities with population more than 10 lakh

Lucknow, Kanpur, Agra, Allahabad, Meerut, Banaras, Aligarh
Large Cities (More than 10 lakh)

### Uttar Pradesh, India

**Cluster 1, SFD Level: 2 - Intermediate SFD**

**Date prepared: 16 October 2018**

**Prepared by: CSE**

#### City | Population | FS collected based on current demand (in KLD) | FS generated in KLD (based on once in 3 years emptying)
---|---|---|---
Allahabad | 11,12,544 | 72 | 223
Varanasi | 1198491 | 22 | 246
Aligarh | 8,89,408 | 84 | 346
Meerut | 1305429 | 230 | 370
Kanpur | 2765348 | 320 | 388
Lucknow | 2817105 | 350 | 673
Agra | 1874542 | 260 | 479
**Total** | 1,19,62,867 | 1338 | 2725
Characteristics of cluster 1: Large Cities

- Around 44% population is dependent on centralized sewerage system, but wastewater of only 28% is safely treated.
- 32% population dependent on tanks connected to open drains.
- In absence of scheduled desludging, only 40-50% of FS generated gets emptied, rest remains in the tank and reduces the treatment efficiency of the septic tank.
- 72% emptier are private operators - 90% of the vacuum tankers are tractor mounted rest are truck mounted.
- Due to inaccessible tanks (lack of small scale mechanized systems), manual emptying is still observed.
- There are 38 STPs with cumulative capacity of 1560 MLD which receive 1265MLD of sewage as on date.
- More than 30 private operators are registered with local bodies.
- As a preliminary measure Allahabad, Meerut and Lucknow have allowed the discharge of collected faecal sludge to its pumping stations and Kanpur allows it to be directly discharged into its STP.
- The faecal sludge collected by unregistered operators is disposed in drains/fields/ponds.
CLUSTER 2: Cities with population between 5 and 10 lakh
Jhansi, Firozabad, Moradabad, Gorakhpur, Loni
Medium Cities (5-10 lakh)

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
<th>FS collected based on current demand (in KLD)</th>
<th>FS generated in KLD (based on once in 3 years emptying)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jhansi</td>
<td>507293</td>
<td>10</td>
<td>222</td>
</tr>
<tr>
<td>Firozabad</td>
<td>603797</td>
<td>55</td>
<td>242</td>
</tr>
<tr>
<td>Moradabad</td>
<td>887871</td>
<td>243</td>
<td>478</td>
</tr>
<tr>
<td>Gorakhpur</td>
<td>673446</td>
<td>120</td>
<td>314</td>
</tr>
<tr>
<td>Loni</td>
<td>516082</td>
<td>50</td>
<td>235</td>
</tr>
<tr>
<td>Total</td>
<td>3188489</td>
<td>474</td>
<td>1491</td>
</tr>
</tbody>
</table>
Characteristics of cluster 2

- More than **70% population is dependent on tanks** connected to open drain and roughly half of them qualify to be called as septic tanks.

- In absence of scheduled desludging, **only 30% of FS generated gets emptied**, rest remains in the tank and reduces the treatment efficiency of the septic tank.

- 78% emptying is done by private operators. 40% of the vacuum tankers are truck mounted, rest all are tractor mounted.

- **Due to inaccessible tanks, manual emptying is rampant**.

- There are 4 STPs of cumulative capacity of 133 MLD which receives only 81 MLD sewage.

- **Only Jhansi has a designated disposal site**, in rest of the cities the collected faecal sludge is disposed in drains/fields/ponds - 1 FSTP of 6 KLD, which receives around 3KLD as on date.
CLAUSTH 3: Cities with population between 1.2 and 5 lakh
Bahraich, Raebareli, Fatehpur, Amroha, Ayodhya, Hapur
## Small and medium cities (1.2-5 lakh)

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
<th>FS collected based on current demand (in KLD)</th>
<th>FS generated in KLD (based on once in 3 years emptying)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahraich</td>
<td>186223</td>
<td>30</td>
<td>74</td>
</tr>
<tr>
<td>Raebareli</td>
<td>1,91,316</td>
<td>40</td>
<td>65</td>
</tr>
<tr>
<td>Fatehpur</td>
<td>193193</td>
<td>40</td>
<td>101</td>
</tr>
<tr>
<td>Amroha</td>
<td>1,98,471</td>
<td>78</td>
<td>109</td>
</tr>
<tr>
<td>Ayodhya - Faizabad</td>
<td>221118</td>
<td>40</td>
<td>95</td>
</tr>
<tr>
<td>Hapur</td>
<td>262983</td>
<td>58</td>
<td>107</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1253304</strong></td>
<td><strong>286</strong></td>
<td><strong>551</strong></td>
</tr>
</tbody>
</table>

### Cluster 3, Uttar Pradesh, India

**Version: Draft**

**SFD Level: 2 - Intermediate SFD**

**Date prepared: 16 October 2018**

**Prepared by: CSE**

**Key:** WW: Wastewater, FS: Faecal sludge, SN: Supernatant

- **Safety managed**
- **Unsafe managed**

**Diagram showing containment, emptying, transport, and treatment stages**
Characteristics of cluster 3

- More than 60% population is dependent on tanks connected to open drain and 28% of them qualify to be called as septic tanks.
- In absence of scheduled desludging, only 40-50% of FS generated gets emptied, rest remains in the tank and reduces the treatment efficiency of the septic tank.
- 94% of the vacuum tankers are tractor mounted rest are truck mounted.
- Due to inaccessible tanks, manual emptying is rampant.
- There is only 1 STP of 12 MLD in Ayodhya which receives only 6 MLD sewage as on date.
- There is no designated disposal site for the collected faecal sludge hence it is disposed in drains/fields/ponds.
CLUSTER 4: Cities with population less than 1.2 lakh
Saidpur, Hastinapur, Chunar, Ramnagar, Gangaghat, Bijnor, Baraut, Balia, Shikohabad,
Pt Deen Dayal Upadhyaya Nagar, Chandousi, Basti
Small cities (less than 1.2 lakh)

City (Nagar Palika/Parishaed) | Population | FS collected based on current demand (in KLD) | FS generated in KLD
--- | --- | --- | ---
Saidpur | 24338 | 3 | 11
Hastinapur | 26452 | 3 | 11
Chunar | 37185 | 4.5 | 15
Ramnagar | 49132 | 4.5 | 4
Gangaghat | 84072 | 6 | 39
Bijnor | 93297 | 12 | 49
Baraut | 103764 | 32 | 51
Balia | 104424 | 34 | 35
Shikohabad | 107300 | 10 | 43
Pt Deen Dayal Upadhyay | 109650 | 34 | 48
Chandousi | 1,14,383 | 50 | 53
Basti | 114657 | 38 | 50
Total | 968654 | 231 | 409
Characteristics of cluster 4

- More than 60% population is dependent on tanks connected to open drain and roughly half of them qualify to be called as septic tanks

- Ramnagar, Chandousi and Baraut have some kind of sewerage network, but there is negligible treatment of waste water

- Quite a few households don’t even have an open drains in their neighbourhood

- In absence of scheduled desludging, only 50% of FS generated gets emptied, rest remains in the tank and reduces the treatment efficiency of the septic tank

- 81% emptying is done by private operators- 95% of the vacuum tankers are tractor mounted

- Due to inaccessible tanks, manual emptying is rampant

- Except Bijnor no other city has any sewage treatment plant, 24 MLD STP at Bijnor is yet to be commissioned

- There is no dedicated faecal sludge treatment plant in any of the cities in the cluster, the collected faecal sludge is disposed in drains/fields/ponds
Proposed FSSM Approach Urban Areas in U.P.

- **Full FSM with dedicated treatment facility**: Town/Cities - Saidpur, Hastinapur, Chunar, Ramnagar, Gangaghat, Bijnor, Baraut, Balia, Shikohabad, Pt. Deen Dayal Upadhyaya Nagar, Chandousi, Basti.

- **Partial FSSM**: Jhansi, Loni, Moradabad, Gorakhpur, Bahraich, Fatehpur, Amroha, Ayodhya-Faizabad, Hapur, Shahjahanpur.

- **Gap filling**: Raebareli, Firozabad, Bareilly - Allahabad, Varanasi, Agra, Kanpur, Lucknow, Ghaziabad.

- **% Households with On-site Sanitation Systems**:
  - **100**: Full FSSM
  - **75**: Partial FSSM
  - **50**: Partial FSSM

- **Cluster 4** (less than 1.2 lakh)
  - **Full FSSM**
  - **Partial FSSM**
  - **Gap filling**

- **Cluster 2 & 3** (1.2 – 10 lakh)
  - **Partial FSSM**
  - **Partial FSSM**
  - **Gap filling**

- **Cluster 1** (more than 10 lakh)
  - **Partial FSSM**
  - **Gap filling**
  - **Gap filling**

**Notes**:
- **Gap filling**: Complete Sewerage; FSSM only for non-sewered pockets with treatment at FSSTP or Co-treatment at STP.

**Legend**:
- **Full FSM with dedicated treatment facility**: Blue
- **Partial FSSM – Combined FSSM & Sewerage system; co-treatment; DEWATs; On-site treatment system, FSSTP wherever necessary.**: Orange
- **Gap Filling – Complete Sewerage; FSSM only for non-sewered pockets with treatment at FSSTP or Co-treatment at STP**: Gray