Sanitation worker safety and livelihoods in India: A blueprint for action

Phase 1: Understanding the problem

21\textsuperscript{st} November 2017
Agenda

Project context

Sanitation worker ecosystem

Worker profiles, challenges and personas

Underlying insights

Focus areas

Next steps
Unsafe sanitation work continues to persist in multiple forms in India in spite of it being banned in 1993 and several initiatives by CSOs

State of sanitation workers remains a blind spot

• There’s been incredible progress in sanitation coverage in India, esp. in recent years; dialogue shifting to waste mgt.
• However, the state of sanitation workers remains a blind spot

Workers face significant challenges on multiple fronts – financial, health and social

• Hazardous work environment leading to acute mental and physical health issues; rampant drug abuse and alcoholism
• Poor pay and exploitation by sanitation contractors
• Social stigma and lack of access to public resources

There are some systemic drivers of this problem

• Social barriers such as caste and gender based discrimination
• Lack of technological substitutes
• Challenges in implementation of the law
• Entrenched behavior which perpetuates the practice
• Lack of awareness of workers about their rights and alternative job options

Existing initiatives fail to address the entire system

• Legal and policy measures by government (e.g., the MS Act) and initiatives by CSOs (such as alternative sanitation tech, advocacy, awareness building, and skilling) don’t address entire system
The objective of the project is to help improve sanitation workers’ safety and livelihoods through a fact base, national strategy, and city-level blueprint.

<table>
<thead>
<tr>
<th>Fact base on unsafe sanitation</th>
<th>National strategy</th>
<th>City-level blueprint</th>
</tr>
</thead>
</table>
| Deeply understand the state of unsafe sanitation work, incl.:  
- Typologies of work and personas of workers; scale of problem  
- Challenges faced on the worker and supply-side and underlying issues  
- Policy framework  
- Ecosystem map  
- Interventions tried and success/failure factors | Develop national strategy, including:  
- Vision and goals  
- Program mix and roadmap  
- Institutional structure  
- Partnerships | Develop city-level blueprint for 1-2 cities of BMGF interest, incl.:  
- Specific interventions  
- Directory of potential implementation partners  
- Roadmap and implementation timelines |
We have structured this project in four phases and are at the end of Phase 1 (understanding the problem)

**Phase 1**
Understanding the problem

- **Objectives**
  - 5 weeks
  - Comprehensively understand the issue from a worker perspective as well as supply-side or institutional perspective

- **Key activities**
  - Stakeholder and institutional mapping
  - Desk and expert research
  - HCD research, incl. interviews, immersive journey mapping, user storytelling

- **Outputs**
  - Research report outlining the problem in 2 parts:
    - Worker lens
    - Supply-side / institutional lens

**Phase 2**
Identifying best practices

- **Objectives**
  - 3 weeks
  - Learn from existing initiatives from both a worker and supply-side perspective
  - Develop design principles for success as well as key constraints

- **Key activities**
  - Desk research to identify innovations in institutions, hardware, software, financing and regulation
  - Expert interviews
  - Field research for case studies, if needed

- **Outputs**
  - Best practices report covering:
    - Global and Indian examples
    - 2 high potential case studies
    - Design principles for success

**Phase 3**
Developing solutions list

- **Objectives**
  - 2 weeks
  - Developing 6-7 high potential solutions

- **Key activities**
  - Brainstorming to develop a long-list of solutions
  - Collaborative working session to rate solutions and identify shortlist

- **Outputs**
  - Solutions report covering longlist and shortlist of solutions

**Phase 4**
Developing strategy blueprint

- **Objectives**
  - 2 weeks
  - Developing an overall strategy blueprint to address the problem

- **Key activities**
  - Develop a national strategy at different levels of government
  - Discussions/ feedback sessions with BMGF, govt., NGO stakeholders
  - Develop final blueprint, with high-level recos for 1-2 cities
  - Develop partnership directory

- **Outputs**
  - Final national strategy and city blueprint
  - Partnership directory covering key partners

We are here
## Where we are on the project

<table>
<thead>
<tr>
<th>Activity</th>
<th>Week of</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1: Understanding the problem</strong></td>
<td></td>
</tr>
<tr>
<td>Desk research on “status quo”</td>
<td></td>
</tr>
<tr>
<td>Expert interviews to understand worker and supply-side issues</td>
<td></td>
</tr>
<tr>
<td>Prepare for and conduct field research</td>
<td></td>
</tr>
<tr>
<td>Synthesize and draft deliverable</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 2: Identifying best practices</strong></td>
<td></td>
</tr>
<tr>
<td>Draw up long-list of best practices</td>
<td></td>
</tr>
<tr>
<td>Develop 2 case studies; design principles</td>
<td></td>
</tr>
<tr>
<td>Draft deliverable</td>
<td></td>
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<tr>
<td><strong>Phase 3: Developing solution list</strong></td>
<td></td>
</tr>
<tr>
<td>Develop long-list of solutions and prioritization framework</td>
<td></td>
</tr>
<tr>
<td>Prepare for and conduct workshop to shortlist solutions</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 4: Developing strategy blueprint</strong></td>
<td></td>
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<tr>
<td>Develop macro-level blueprint</td>
<td></td>
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<tr>
<td>Develop strategy for 2 cities</td>
<td></td>
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<tr>
<td>Draft and submit final deliverable</td>
<td></td>
</tr>
</tbody>
</table>

**Check-ins**

- Kick-off
- Update meeting
- Multi-stakeholder workshop
- Client presentation

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Field work

We are here

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In the diagnosis phase, our research has focused on four key sets of questions:

1. **What is the sanitation worker ecosystem?**
   - What are the typologies of sanitation work? What is the scale of the problem?
   - Who are the key stakeholders in the worker ecosystem? What are their roles and connections?
   - What is the regulatory and policy framework? What is the governance structure?

2. **What are the challenges they face?**
   - What are the challenges in executing the work?
   - What are the implications of the work on the financial, social and health status of workers?
   - What are the aspirations of workers and challenges faced in exiting?

3. **What are the underlying demand- and supply-side drivers?**
   - What are the underlying insights, from both a worker and supply-side/institutional perspective?
     - Behavioural
     - Social
     - Infra/tech
     - Governance
   - Which areas should be prioritized for addressing, basis:
     - Criticality
     - Solvability
     - Additionality

4. **What should be the focus areas?**
We have employed multiple research methods to uncover insights

**Overview**

- Desk research
  - Review of government policies & initiatives, worker conditions (media and academic reports)

**Points of inquiry**

- Expert interviews
  - Interactions with government officials at the national and ULB level, IIHS, ASCI, NGOs
  - Understanding the sanitation system (offsite vs onsite) and plans for expansion
  - Current and proposed initiatives w.r.t. sanitation work
  - Existing understanding of sanitation workers
  - Identification of key stakeholders
  - Scale of problem / extent of unsafe sanitation work
  - Key underlying drivers of the issue
  - Interventions done by govt/ others to alleviate the situation – and their impact/ efficacy
  - Potential solutions

- Field research
  - Interactions with 53 sanitation workers. Multiple methods were used with workers – shadowing, observation at work-sites, in-depth interviews, group discussions
  - Profile/ background; how they entered the job
  - Challenges faced on-the-job and in exiting the profession
  - Key financial, health, and social challenges
  - Aspirations and goals
We interviewed 41 stakeholders including CSOs, government officials, and experts (1/3)

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Position</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Government</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Krishna Kumar Bhagat</td>
<td>Manager (Projects)</td>
<td>NSKFDC</td>
</tr>
<tr>
<td>2</td>
<td>R.K. Gupta</td>
<td>DY. Manager (Projects)</td>
<td>NSKFDC</td>
</tr>
<tr>
<td>3</td>
<td>Yasmin Sultana</td>
<td>Assistant Director</td>
<td>NCSK</td>
</tr>
<tr>
<td>4,5</td>
<td>Spoke on condition of anonymity</td>
<td>Zonal Engineer (2)</td>
<td>DJB</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Junior Engineer</td>
<td>DJB</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Contractor</td>
<td>For DJB</td>
</tr>
<tr>
<td>8</td>
<td>Amit Garg</td>
<td>Executive Director</td>
<td>Indian Railways</td>
</tr>
<tr>
<td></td>
<td><strong>CSOs/Academics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Bezwada Wilson</td>
<td>Founder</td>
<td>SKA</td>
</tr>
<tr>
<td>10</td>
<td>Ashif Shaikh</td>
<td>Founder</td>
<td>Jan Sahas</td>
</tr>
<tr>
<td>11</td>
<td>Anurag Anthony</td>
<td>CTO</td>
<td>UMC</td>
</tr>
<tr>
<td>12</td>
<td>S. Anand</td>
<td>Journalist</td>
<td>Ex Tehelka</td>
</tr>
<tr>
<td>13</td>
<td>Sukhdeo Thorat</td>
<td>Professor</td>
<td>Indian Institute for Dalit Studies; JNU</td>
</tr>
<tr>
<td>14</td>
<td>Arkaja Singh</td>
<td>Fellow</td>
<td>CPR</td>
</tr>
<tr>
<td></td>
<td><strong>Manufacturers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Arati Krishna</td>
<td>Head, Sales and Marketing</td>
<td>Kam-Avida</td>
</tr>
</tbody>
</table>
We interviewed 41 stakeholders including CSOs, government officials, and experts (2/3)

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<tbody>
<tr>
<td>16</td>
<td>Shruti Ojha</td>
<td>Municipal Commissioner</td>
<td>GWMC</td>
</tr>
<tr>
<td>17</td>
<td>Amrapali Kata</td>
<td>District Collector</td>
<td>GWMC</td>
</tr>
<tr>
<td>18</td>
<td>Bommana Rajareddy</td>
<td>Medical Health Officer</td>
<td>GWMC</td>
</tr>
<tr>
<td>19</td>
<td>Shankar</td>
<td>Deputy Director</td>
<td>Telangana Scheduled Castes Co-Operative Development Corporation</td>
</tr>
<tr>
<td>20</td>
<td>Krishnamacharya</td>
<td>Program officer</td>
<td>Schedule Caste Development Department (Urban)</td>
</tr>
<tr>
<td>21</td>
<td>D. Suresh</td>
<td>Deputy Director</td>
<td>Schedule Caste Development Department (Rural)</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Program Manager</td>
<td>MEPMA</td>
</tr>
</tbody>
</table>

*Warangal- Govt.*

*Warangal- CSO*

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<th>Organization</th>
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<tbody>
<tr>
<td>23</td>
<td>V. Srinivas Chary</td>
<td>Director</td>
<td>ASCI</td>
</tr>
<tr>
<td>24</td>
<td>Y. Malini Reddy</td>
<td>Associate Professor</td>
<td>ASCI</td>
</tr>
<tr>
<td>25</td>
<td>Rajmohan Reddy</td>
<td>Team Leader</td>
<td>ASCI</td>
</tr>
</tbody>
</table>
We interviewed 41 stakeholders including CSOs, government officials, and experts (3/3)

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</thead>
<tbody>
<tr>
<td></td>
<td><strong>Trichy- Govt.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Ravichandran</td>
<td>Municipal Commissioner</td>
<td>TCC</td>
</tr>
<tr>
<td>27</td>
<td>Dr. Chithra</td>
<td>Chief Health Officer</td>
<td>TCC</td>
</tr>
<tr>
<td>28</td>
<td>Amuda</td>
<td>Chief Engineer</td>
<td>TCC</td>
</tr>
<tr>
<td>29</td>
<td>Thalaiviruchan</td>
<td>Sanitary Officer</td>
<td>TCC</td>
</tr>
<tr>
<td>30</td>
<td>Ravindran</td>
<td>Assistant Executive Engineer</td>
<td>TCC</td>
</tr>
<tr>
<td>31</td>
<td>Guru</td>
<td>Health section clerk</td>
<td>TCC</td>
</tr>
<tr>
<td>32</td>
<td>Ravi</td>
<td>Vehicle In-charge, Engineering section</td>
<td>TCC</td>
</tr>
<tr>
<td>33</td>
<td>Loganathan</td>
<td>AEE Mechanical</td>
<td>TCC</td>
</tr>
<tr>
<td>34</td>
<td>Loganathan</td>
<td>Junior Engineer</td>
<td>TCC</td>
</tr>
<tr>
<td>35</td>
<td>Raj Laxmi</td>
<td>District Manager</td>
<td>Trichy branch, TADHCO</td>
</tr>
<tr>
<td>36</td>
<td>Vijay Kumar</td>
<td>Assistant Manager</td>
<td>Trichy branch, TADHCO</td>
</tr>
<tr>
<td></td>
<td><strong>Trichy- CSO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>V. Ganapathy</td>
<td>Journalist/Activist</td>
<td>Ex Hindu</td>
</tr>
<tr>
<td>38</td>
<td>S.Damodaran</td>
<td>Founder</td>
<td>Gramalaya</td>
</tr>
<tr>
<td>39</td>
<td>Kavita Wankhade</td>
<td>Senior Lead – Practice</td>
<td>IIHS</td>
</tr>
<tr>
<td>40</td>
<td>Rajesh Ramamoorthy</td>
<td>Specialist – TNUSSP</td>
<td>IIHS</td>
</tr>
<tr>
<td>41</td>
<td>Srinithi Sudhakar Moopanar</td>
<td>Specialist – TNUSSP</td>
<td>IIHS</td>
</tr>
</tbody>
</table>
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Sanitation worker ecosystem

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Next steps
Sanitation workers are broadly understood to be a single amorphous category, but there exist nine types of work across the value chain.

Note: Icons indicate unsafe manual intervention; Interface use: insanitary latrines include without slab, night soil serviced by human/animal; open defecation figures include night soil disposed into open drain; latrines with slabs/improved pits and flush latrines connected to other systems excluded from percentage break-up.

Source: Data on interfaces is from Census 2011 estimates, Dalberg analysis.
Most hazardous sanitation work, sewer cleaning and faecal sludge handling, is concentrated in urban areas

<table>
<thead>
<tr>
<th>Type of work</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sewer cleaning</td>
<td>• Unblocking and cleaning sewer and wastewater drains</td>
<td>• Urban areas</td>
</tr>
<tr>
<td></td>
<td>• Complaint-based, seasonal (rainy season) and occasionally for preventive maintenance</td>
<td></td>
</tr>
<tr>
<td>2 Faecal sludge handling</td>
<td>• Emptying, collection and transport of human waste from septic tanks</td>
<td>• Primarily urban, mostly unplanned localities</td>
</tr>
<tr>
<td></td>
<td>• On-demand; de-sludging frequency varies greatly ranging from 6 months – 10-15 years</td>
<td></td>
</tr>
<tr>
<td>3 Railway cleaning</td>
<td>• Cleaning faecal matter from railway tracks and platforms; several times a day</td>
<td>• Rail network and railway stations</td>
</tr>
<tr>
<td></td>
<td>• Cleaning faecal matter from railway toilets and platform toilets</td>
<td></td>
</tr>
<tr>
<td>4 Latrine cleaning</td>
<td>• Emptying of dry/single-pit latrines primarily in rural areas; daily collection and transport/emptying of fecal matter</td>
<td>• Primarily rural</td>
</tr>
</tbody>
</table>

Note: Riskiness is defined by looking at the immediate risk on the job (e.g. risk of fatalities) and risk of prolonged illnesses
Treatment plant and drain cleaning, prevalent in urban areas, is comparatively more hazardous than various types of toilet cleaning

<table>
<thead>
<tr>
<th>Type of work</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Plant work</td>
<td>• Maintaining and operating sewage and faecal sludge treatment plants on a daily basis</td>
<td>• Urban, across the ~527 STPs/FSTPs in India</td>
</tr>
<tr>
<td>Community/Public toilet keeping</td>
<td>• Maintaining public/community toilets (often insanitary) on a daily basis</td>
<td>• Rural and urban CTC^{2}s, mostly in slums; public convenience shelters</td>
</tr>
<tr>
<td>School toilet cleaning</td>
<td>• Operating and maintaining school toilets on a daily basis</td>
<td>• Schools—rural and urban</td>
</tr>
<tr>
<td>Sweeping/Drain cleaning</td>
<td>• Cleaning open drains and road sweeping, often encountering fecal matter due to open defecation and insanitary latrines connected to drains</td>
<td>• Urban—drains alongside roads</td>
</tr>
<tr>
<td>Domestic Work</td>
<td>• Cleaning toilets in middle-high income households/institutions, encountering insanitary conditions at times</td>
<td>• Urban areas</td>
</tr>
</tbody>
</table>

Note: Riskiness is defined by looking at the immediate risk on the job (e.g. risk of fatalities) and risk of prolonged illnesses.
We estimate that there are ~5 mn full-time equivalents of sanitation workers nationally; they vary by degrees to risk exposure and policy recognition.

<table>
<thead>
<tr>
<th>Category</th>
<th>Exposure to human faecal matter</th>
<th>Recognition in existing legal/policy frameworks</th>
<th>Media awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Category 2</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Category 3</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

- **Government only recognises Category 1 workers as “manual scavengers” but official figures remain limited to ~182k\(^1\) households; other orgs suggest there are 2 million\(^2\) workers (~11x govt. figures)**

There is a need to identify and estimate the number of workers involved in unsafe sanitation work via an independent and verifiable third-party assessment.

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(1): SECC survey, 2011; (2): Ashif Shaikh, Jan Sahaas; Source: Dalberg analysis
~1.1 mn (~45% of total) sanitation workers are in urban areas, with drain and community and public toilet cleaners accounting for ~600K

Number of sanitation workers (2017)

<table>
<thead>
<tr>
<th>% of workers</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>All workers</td>
<td>~1.4 mn</td>
<td>~1.1 mn</td>
</tr>
<tr>
<td>% of workers</td>
<td>60%</td>
<td>40%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latrine cleaners</td>
<td>~90%</td>
<td>~10%</td>
</tr>
<tr>
<td>Sewer cleaners</td>
<td>NA</td>
<td>100%</td>
</tr>
<tr>
<td>Septic tank cleaners</td>
<td>~20%</td>
<td>~80%</td>
</tr>
<tr>
<td>Railway workers</td>
<td>NA</td>
<td>100%</td>
</tr>
<tr>
<td>CTC/PT cleaners</td>
<td>~10%</td>
<td>~90%</td>
</tr>
<tr>
<td>School toilet cleaners</td>
<td>~80%</td>
<td>~20%</td>
</tr>
<tr>
<td>Treatment plant workers</td>
<td>NA</td>
<td>100%</td>
</tr>
<tr>
<td>Drain cleaners</td>
<td>NA</td>
<td>100%</td>
</tr>
</tbody>
</table>

Number of urban sanitation workers is lesser than rural workers, but urban workers carry out the more risky jobs such as sewer cleaning and septic tank cleaning.

We have focused on urban sanitation workers.

Source: Icons from the noun project; Dalberg analysis
Gender lens: ~50% of urban sanitation workers are women, working primarily as school toilet and drain cleaners

### Number of sanitation workers (2017)

<table>
<thead>
<tr>
<th>Category</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All workers</strong></td>
<td>~50%</td>
<td>~50%</td>
</tr>
<tr>
<td><strong>% of workers</strong></td>
<td>~50%</td>
<td>~50%</td>
</tr>
<tr>
<td>Latrine cleaners</td>
<td>~77k</td>
<td>~5%</td>
</tr>
<tr>
<td>Sewer cleaners</td>
<td>NA</td>
<td>100%</td>
</tr>
<tr>
<td>Septic tank cleaners</td>
<td>NA</td>
<td>100%</td>
</tr>
<tr>
<td>Railway workers</td>
<td>~77k</td>
<td>10-20%</td>
</tr>
<tr>
<td>CTC/PT cleaners</td>
<td>~45k</td>
<td>25-30%</td>
</tr>
<tr>
<td>School toilet cleaners</td>
<td>~150k</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Treatment plant workers</td>
<td>NA</td>
<td>100%</td>
</tr>
<tr>
<td>Drain cleaners</td>
<td>~209k</td>
<td>50-60%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40-50%</td>
</tr>
</tbody>
</table>

- Women sanitation workers are found in jobs that bear low fatality risk or are less hazardous, but often their husbands are involved in more risky jobs such as sewer cleaning.
- Women prefer working as school toilet cleaners due to an “emotional attachment” with children and assured monthly income.

Source: Icons from the noun project; Dalberg analysis
Almost all sanitation workers belong to the lowest Dalit sub-caste communities

Regional Dalit sub-castes tied to manual scavenging/sanitation work

28.6 mn people\(^1\) currently in these lowest sub-castes within Dalits (i.e., 5.5-6 mn households)

40-60% of these households are engaged in sanitation work\(^2\), with the remainder predominantly in daily wage or agricultural labor

96% of the workers we spoke to are from these sub-castes\(^3\)

Members of these lowest sub-caste groups occupy jobs across the sanitation value chain; there are no patterns of social mobility across job types

Source: (1): Extrapolated from 2001 Census using a 2.35% annual population growth rate which is documented for SCs (2): Conservative estimates from our sizing model of sanitation workers, analyses by Bhasha Singh (“Unseen”, 2013) and Sukhdeo Thorat; (3): Based on 53 interviews in Delhi, Trichy and Warangal
Going forward, the number of urban sanitation workers with significant exposure to faecal matter is expected to reduce to 1 mn

**Number of urban sanitation workers**

<table>
<thead>
<tr>
<th>Category</th>
<th>Workers (2022)</th>
<th>Increase/decrease over 2017 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sewer cleaners</strong></td>
<td>~214k</td>
<td>45%</td>
</tr>
<tr>
<td><strong>Railway workers</strong></td>
<td>~53k</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Latrine cleaners</strong></td>
<td>~60k</td>
<td></td>
</tr>
<tr>
<td><strong>Drain cleaners</strong></td>
<td>~310k</td>
<td>26%</td>
</tr>
<tr>
<td><strong>School toilet cleaners</strong></td>
<td>~170k</td>
<td></td>
</tr>
<tr>
<td><strong>Septic tank cleaners</strong></td>
<td>~17k</td>
<td></td>
</tr>
<tr>
<td><strong>CTC/PT cleaners</strong></td>
<td>~177k</td>
<td></td>
</tr>
<tr>
<td><strong>Treatment plant workers</strong></td>
<td>~7k</td>
<td></td>
</tr>
<tr>
<td><strong>Total Number of Workers</strong></td>
<td>~1 Mn</td>
<td></td>
</tr>
</tbody>
</table>

- **Adoption of bio-digester toilets will reduce exposure to faecal matter**
- **Push on Swachh Bharat will reduce number of insanitary latrines**
- **National schemes like AMRUT will significantly increase sewer coverage**
- **Drain cleaners coming in contact with faecal matter will decrease as presence of open defecation and insanitary latrines reduces**

(1): Number of workers coming in contact with faecal matter; Note: Projections based on business as usual scenario without taking account mechanisation (except railways which has announced installation of bio-toilets)

Source: Census 2011, WSP Financial Requirements of Urban Sanitation in India, Expert interviews, Dalberg analysis
Sanitation workers engage with various stakeholders in the sanitation ecosystem; we have evaluated the role of each stakeholder

- **Sanitation Workers**
  - Hire SWs directly or via contractors for emptying/containment or unblocking household pipes
  - Supply of gear and equipment

- **Civil Society Org.**
  - Organization and empowerment of SWs
  - Awareness campaigns
  - Capacity-building and systems support

- **Unions**
  - Caste-based networks and self-association

- **Family and Community**
  - Social capital

- **Media**
  - Public sensitization, behavior change
  - Advocacy and awareness

- **Households and Institutions**
  - Improvement of systems and capacity building

- **Manufacturers**
  - Supply of gear and equipment

- **Urban Local Bodies**
  - Work contracts/licensing
  - Supply of gear and equipment

- **Private Operators/Contractors**
  - Single job contracts
  - Multi-year service contracts
  - Labor supply contracts

- **State Govt.**
  - Implementation of rehabilitation schemes
  - Ratification of policies

- **Central Govt.**
  - Policy design (MoUHA)
  - Rehabilitation of manual scavengers (MoSJE)

- **Customers/employers**
  - Permanent employment
  - Capacity-building and systems support

- **Supporting entities**
  - Innovation/suppliers

- **Innovators/suppliers**
  - Capacity-building and systems support

Source: Dalberg analysis
Policy, governance, funding – stakeholders involved

- **Central Govt.**
  - Policy design (MoUHA)
  - Rehabilitation of manual scavengers (MoSJE)

- **State Govt.**
  - Ratification of policies
  - Implementation of rehabilitation schemes

- **Urban Local Bodies**
  - Work contracts/licensing
  - Supply of gear and equipment

- **Private Operators/Contractors**
  - Supply of gear and equipment
  - Work contracts/licensing
  - Multi-year service contracts
  - Labor supply contracts

- **Households and Institutions**
  - Supply of gear and equipment
  - Rehabilitation of manual scavengers
  - Centrally funded

- **Manufacturers**
  - Supply of gear and equipment

- **Civil Society Org.**
  - Capacity building
  - Organization and empowerment of SWs
  - Awareness campaigns
  - Capacity-building and systems support

- **Unions**
  - Organization and empowerment of SWs
  - Awareness campaigns
  - Caste-based networks and self-association

- **Family and Community**
  - Social capital
  - Caste-based networks and self-association
  - Public sensitization, behavior change
  - Advocacy and awareness

- **Media**
  - Attention
  - Public sensitization, behavior change
  - Advocacy and awareness

- **Hire SWs directly or via contractors for emptying/containment or unblocking household pipes**

Source: Dalberg analysis

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>Employment of manual scavengers and construction of dry latrines prohibited</td>
</tr>
<tr>
<td>2007</td>
<td>Rehabilitation scheme for manual scavengers introduced</td>
</tr>
<tr>
<td>2011</td>
<td>Writ filed by Safai Karamchari Andolan (SKA)</td>
</tr>
<tr>
<td>2013</td>
<td>National Advisory Council resolution</td>
</tr>
<tr>
<td>2014</td>
<td>Supreme Court order</td>
</tr>
</tbody>
</table>

**Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act**

- Prohibition of employment of manual scavengers in cleaning dry latrines
- Prohibition of new construction of dry latrines; replacement of existing insanitary latrines
- Punishment of Rs. 2,000 or imprisonment of up to a year

**Scheme for Rehabilitation of Manual Scavengers (SRMS)**

- Rehabilitation of manual scavengers and dependents by 2009 with skills training, loans, etc.
- Rs. 231 Cr expended from 2007-10
- Stagnated after 2010, revised in 2013 with the new Act
- Now focuses on self-employment and one-time cash assistance

**Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act**

- Wider definition of manual scavengers to include other categories like open drain cleaners, railway cleaners, single pit cleaners and others coming in contact with fecal matter
- Attempts to fix accountability
- Punishment increased to Rs. 50,000

**Writ Filed by Safai Karamchari Andolan (SKA)**

- Filed as a PIL to require government bodies to strictly implement the 1993 Act
- Prompted the SC to monitor legislative progress; forced states to ratify 1993 Act
- Discussed for over 10 years and admitted arguments that laid the framework for the 2013 act

**National Advisory Council Resolution**

- National Advisory Council urged the Central Government to enact new law to identify and rehabilitate manual scavengers, and punish offenders

**Supreme Court Order**

- March 2014 order declared that manual sewer cleaning should be made illegal even in emergency situations, and that ULBs should draft plans for mechanization
- The order also directs states to conduct identification surveys, and award rehabilitation to all manual scavengers

[Policy] Unsafe sanitation work continues; there has been a lack of convictions and successful cases of rehabilitation

**Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act**

- Not effective in identification or rehabilitation, dry latrines continued to be constructed, states’ liabilities were not fixed

**Scheme for Rehabilitation of Manual Scavengers (SRMS)**

- Poor identification, limited reach and mixed success of skills and training programs

**Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act**

- Poor targeting and massive undercounting by states has led to a saturation of rehabilitation benefits to existing scavengers; CSO estimates suggest less than 500 have been rehabilitated due to the provisions, since 2013

---


- **Writ Filed by Safai Karamchari Andolan (SKA)**
  - Forced regulatory and legal institutions to admit that eradication was far from over

- **National Advisory Council Resolution**
  - Recommended several steps that included quarterly monitoring by central/state governments; no evidence if followed

- **Supreme Court Order**
  - Criminalization of manual entry into sewers has pushed ULBs and contractors to officially deny its existence, and block documentation/solutioning; 250+ workers have died in sewers since the order in just 21 states/UTs

---

(1): Data from Safai Karamchari Andolan, likely undercounted
There are some other policies relevant to sanitation workers

### Sanitation

<table>
<thead>
<tr>
<th>Policy / scheme</th>
<th>Relevance for sanitation work</th>
<th>(Likely) impact on SWs</th>
</tr>
</thead>
</table>
| **Swachh Bharat Mission** (2014)     | • SBM promotes solid and liquid waste management, community toilets in urban areas, household latrines in rural areas to end OD by 2019 and improve sanitation standards  
  • Swachh Vidyalaya schemes sets benchmarks for toilet construction and cleaning in schools | • Focus on meeting toilet construction targets has led to an uptick in the number of insanitary dry latrines  
  • Reports suggest that several sanitation departments have increased the employment of manual scavengers |
| **New Municipal Solid Waste Rules** (2016) | • Directs states towards organization and integration of waste collectors/municipal corporation employees and improve their safety standards | • Organization of workers within contractual systems to increase  
  • Provision of basic gear to SWM workers will increase |
| **Bio-toilets in trains** (2017)      | • 2017 Rail Budget includes funds for all coaches to have bio-toilets by 2019, thus eliminating the need for manual cleaning of tracks | • Have already fitted bio-toilets in 30,000 coaches  
  • Targeting to finish the remaining 40,000 by 2019<sup>1</sup>  
  • Workers’ exposure to fecal matter will reduce |

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<sup>1</sup> Expert interview with Executive Director, Ministry of Railways; Dalberg analysis
There are some other policies relevant to sanitation workers.

### Rehabilitation

<table>
<thead>
<tr>
<th>Policy / scheme</th>
<th>Features and relevance for SWs</th>
</tr>
</thead>
</table>
| **NSKFDC Schemes for Sanitation Workers**                     | • 8 kinds of loan-based schemes for sanitation workers, up to Rs. 10-25 lakh  
  o Annually give loans worth Rs. 150-170 Cr to 10k - 20k sanitation workers, average loan value Rs. 1.5 lakh  
  o Rely on ULBs and local govt. bodies for the certification of workers  
  o Loans are routed through RRBs, nationalized banks and state channelizing agencies (SCAs)  
• Training programs via Sector Skills Councils and govt.-affiliated institutions  
  o 5k - 7k trainees annually                                                                                   |
| **SC schemes for rehabilitation**                             | • Several central and state government schemes for the benefit of SCs, like:  
  o Scholarships and hostels for students (high school and higher education)  
  o Low-interest loans for self-employment from National SC Corporation  
  o Skills-based training in various occupations (construction, apparel manufacturing, electronics, etc.)                                                                                                                           |
| **The SC and ST (Prevention of Atrocities) Act (1989)**        | • Provides legal provisions protecting against caste-based discrimination and employment in activities that engender the practice of untouchability  
• SWs who are members of scheduled castes can register cases of discrimination and atrocities with National Commission for Scheduled Castes |
| **National Urban Livelihood Mission (2013)**                  | • Focus on urban skilling and employment programs that pertain towards people with unreliable sources of income  
• Provides financial assistance to individuals/groups for self employment ventures  
• Relevant for SWs and their children to seek alternate employment                                         |

Source: Expert interviews with NSKFDC, NCSK and SCAs
[Policy] Safety norms have been prescribed at the national level for the riskiest types of work

- The Manual Scavenging Act 2013 specifies:
  - Conditions under which manual intervention is allowed: damaged manholes, emergency, machine’s inability to carry out task etc.
  - Safety gear to be provided to workers in these cases: 44 types, incl. air purifier gas masks and nylon safety belts
  - Cleaning equipment to be provided by ULBs: 14 including suction, jetting, etc.

- Following the Act, states ratified it and released operative guidelines for private desludging operators, on:
  - Specifications of tanks
  - Licensing of operators if they meet mechanization requirements
  - Provision of Personal Protective Equipment (PPE)

- For contractual operations (e.g. STPs), the terms include provision of safety gear and tools, in line with the MS Act

- Annual General Conditions of Contract drawn up by the Ministry of Railways mandate the use of mechanized cleaning equipment

- Contractors also mandated to provide gear and ensure that they are used

- Workers entitled to periodical medical check-ups and treatment when required

- Solid Waste Management Guidelines 2016 by the Ministry of Environment and Forestry require ULBs to ensure that SWM workers are provided with safety gear (jacket, gloves, boots, etc.) by contractors, and that workers are using them

- No national guidelines for community and public toilet cleaning (devised at ULB level)
- No mention of cleaning processes for school toilets in the Swachh Vidyalaya scheme
Various ministries are responsible for sanitation within their respective systems, and they operate in silos.

- **State Sanitation Departments**: Coordinate policies and standardize operations between municipal corporations.
- **Urban Local Body**: Receive financial support from the Central and State governments.
- **Ministry of Housing and Urban Affairs (MoHUA)**: Monitors the functioning of ULBs, drafts national standards.
- **State Government (Council of Municipal Commissioners)**: Urban policies are drafted by the state government.
- **MoR**: Draws out General Conditions of Contracts for O&M that are tailored by divisional boards.
- **MHRD**: Issued directives to state education depts. for construction and O&M of school toilets.
- **State Education Department**: Control budgets for school cleanliness.
- **District Education Office**: In charge of school cleanliness.
- **Station Health Office**: In charge of track/platform sanitation.
- **Urban sanitation system**: Various ministries are responsible for sanitation within their respective systems, and they operate in silos.
- **Schools**: Responsibilities are distributed among different levels of government.
- **Railways**: Responsibilities are distributed among different levels of government.
[Governance] The Ministry of Social Justice and Empowerment is tasked with the welfare and rehabilitation of sanitation workers

---

**Welfare and rehabilitation support to sanitation workers**

**Ministry of Social Justice and Empowerment**

- **National Commission for Safai Karamcharis (NCSK)**
  - Founded in 1993, non-statutory and non-constitutional body
  - Address grievances of workers, related to safety, pay and service
  - Ensure implementation of the Act and the SC judgment
  - Monitor state governments in demolition of dry latrines, identifying manual scavengers and implementing rehabilitation schemes

- **State Commission for Safai Karamchari (SCSK)**
  - Each state mandated to constitute SCSKs
  - Only 13 states complied and have functional bodies

- **National Safai Karamchari Finance and Development Corporation (NSKFDC)**
  - Founded in 1997
  - Develop and implement schemes for the welfare and rehabilitation of sanitation workers
  - Spread awareness on their schemes among local government bodies and sanitation workers
  - NSKFDC routes its financial interventions through state channelizing agencies (e.g. TAHDCO in TN) that do lending along with RRBs and disburse one-time-cash (OTC) assistance

- **State Channelizing Agencies (SCAs)**

- **District office**
  - District offices for SCAs are tasked to register SWs and drive awareness campaigns for schemes

---

Source: Expert interviews
[Governance] Within ULBs, the Public Health and Engineering departments are responsible for sanitation work and infra respectively.

**Illustrative City Corporation**

- **Municipal Commissioner**
  - **City Engineer**
    - Executive Engineer
    - Asst. Executive Engineer
    - Junior Engineer
  - **Assistant Commissioner (1 per zone)**
    - Asst. Executive Engineer (zonal)
    - Junior Engineer (zonal)
  - **City Health Officer**
    - Sanitary Officer
    - Sanitary Inspector
    - Sanitary Supervisor
    - Sanitation worker

**Private Operators**

- **Private Desludging Operators**
- **Community Toilet Operators**
- **STP Operator**

**Other Govt. Entities**

- **MHRD & State Education Dept.** (for school toilets)
- **MoR & Divisional Railway Dept.** (for railway tracks)

---

**Role**

- Maintenance, cleaning of sewer system
- Procurement of sewer cleaning equipment
- Implementation of ULB plans at the zonal level
- Mgt. of public and community toilets, road and drain cleaning, solid waste mgt., public health awareness

**Private operators obtain licenses/contracts/agreements from ULB**

- Ministries of HRD and Railways draft policies on school and railway track cleaning
- State departments release budgets, tenders etc.
## Funding
Funding sources for sanitation – while the Centre and State support spend major sanitation infra, ULBs incur bulk of the operating expenses

### Legend:

- **Central and State Governments**
- **Private Operators/Contractors**
- **Households and Institutions**
- **Multiple Entities**

### Expenses

<table>
<thead>
<tr>
<th>Capex</th>
<th>Opex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanitation Infra</td>
<td>Cleaning equipment</td>
</tr>
<tr>
<td>Worker salaries</td>
<td>Safety Gear</td>
</tr>
<tr>
<td>Training</td>
<td>Medical</td>
</tr>
</tbody>
</table>

### Income of Private Operators

- ULB channels salaries through labour supplier and pays contractor on a per-job basis
- Households/institutions pay 1,000 – 2,000 per job
- ULB pays the contractor as per terms
- Users pay Rs. 1-5 per use
- Railways pays contractor as per terms

### Sources
Source: Field research, Dalberg analysis
ULB budgets relevant to Sanitation Workers (2016-17), INR Cr

<table>
<thead>
<tr>
<th>Trichy City Corporation</th>
<th>Greater Warangal Municipal Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TCC budget</strong></td>
<td><strong>GWMC budget</strong></td>
</tr>
<tr>
<td>~1500 permanent govt.-employed SWs; average salary ~INR 21K p.m.</td>
<td>~300 permanent govt.-employed SWs, average salary ~INR 22K p.m.</td>
</tr>
<tr>
<td>~700 contractual SWs; average salary ~INR 7.5K p.m.</td>
<td>~2,300 contractual SWs, average salary ~INR 8K p.m.</td>
</tr>
<tr>
<td>Spend on equipment mostly on solid waste collection vehicles; jetting/suction machines replaced every ~10 years</td>
<td>Spend on gear and liveries ~2% of payroll</td>
</tr>
<tr>
<td>TCC budget</td>
<td>GWMC budget</td>
</tr>
<tr>
<td>48.47</td>
<td>31.75</td>
</tr>
<tr>
<td>38.25</td>
<td>8.10</td>
</tr>
<tr>
<td>6.41</td>
<td>22.90</td>
</tr>
<tr>
<td>0.50</td>
<td>0.75*</td>
</tr>
<tr>
<td>3.09</td>
<td></td>
</tr>
<tr>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>0.09</td>
<td></td>
</tr>
</tbody>
</table>

**Sanitation infra:** TCC has been allotted INR 344 Cr under AMRUT for Phase-II of its UGD extension, to be completed by 2019

**Sanitation infra:** As per Warangal’s smart city plan (SCP), INR 126 Cr is required to reach 100% UGD coverage by mid-2019

*: GWMC equipment/gear budget doesn’t give further demarcation on spending categories. Source: TCC Budget 2016-17, GWMC Budget 2016-17, Field Research Interviews with government officials, Dalberg analysis
[Funding] Budgets for rehabilitation of manual scavengers slashed in 2016-17 as they claim to have rehabilitated bulk of scavengers identified by states.

Budgets for Scheme for Rehabilitation of Manual Scavengers (2013-18), INR Cr

- 2013-14: Budget Estimate 570, Revised Estimate 70
- 2014-15: Budget Estimate 448, Revised Estimate 50
- 2015-16: Budget Estimate 470
- 2016-17: Revised Estimate 10
- 2017-18: Revised Estimate 5

- Funding cut significantly as NSKFDC has surplus funds.
- Claim to have reached most manual scavengers, as only ~13K were identified by states.
- ~12.5K received cash assistance, ~1K were sanctioned loans, and ~3K completed training in this period.
Employment – stakeholders involved

Sanitation Workers

- Hire SWs directly or via contractors for emptying/containment or unblocking household pipes
- Supply of gear and equipment
- Organizational support
- Social capital
- Attention
- Direct employment

Private Operators/Contractors

- Operate septic tank vehicles
- Manage community toilets
- Multi-year service contracts
- Labor supply contracts
- Supply of gear and equipment
- Work contracts/licensing
- Employment
- Single job contracts

Urban Local Bodies

- Policy design (MoUHA)
- Rehabilitation of manual scavengers (MoSJE)
- Permanent employment
- Capacity building

State Govt.

- Ratification of policies
- Implementation of rehabilitation schemes

Central Govt.

Manufacturers

- Supply of gear and equipment

Private Operators/Contractors

- Multi-year service contracts
- Labor supply contracts

Households and Institutions

- Single job contracts

Unions

- Caste-based networks and self-association
- Organization and empowerment of SWs
- Awareness campaigns
- Capacity-building and systems support

Civil Society Org.

- Advocacy and awareness
- Public sensitization, behavior change

Family and Community

Media

- Advocacy and awareness
- Public sensitization, behavior change

Source: Dalberg analysis
There are six models of employment, with the government playing roles of varying importance in different types of sanitation work.

<table>
<thead>
<tr>
<th>Employer</th>
<th>Labor Suppliers</th>
<th>PPP/Service Contracts</th>
<th>Private Operators</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed completely by the government, with no outsourcing</td>
<td>Contractors only for labor supply; employ SWs via informal contracts</td>
<td>Multi-year service contracts</td>
<td>Operations run directly by private operators for profit; informal agreements with SWs</td>
<td>Households employ workers directly for short-term needs</td>
</tr>
</tbody>
</table>

**Type of work**

- **Septic Tank Desludging**
- **Sewer Work**
- **Drain Cleaning**
- **Govt. School Toilet Cleaning**
- **Govt. managed CT/PT Cleaning**
- **Railway Cleaning***
- **Treatment Plant Work***
- **Community/Public Toilet Cleaning**
- **Latrine Cleaning**
- **Sewer Work**
- **Sewer Work**
- **Sewer Work**
- **Sewer Work**

**Stakeholder roles**

- **Government**
  - Construct, manage and maintain the facilities
  - Supervise labor
  - Provide equipment, gear, benefits
  - Monitor cleanliness and operations
  - Provide land
  - Contract out management/maintenance
  - Monitor performance, adherence to terms
  - Develop guidelines for operation
  - License desludging operators
  - Monitor operations
  - Generate own business
  - Hire workers
  - Buy gear and equipment for workers
  - Develop specification and monitor adherence (for septic tanks)
  - Fulfil household demand

- **Non-Govt.**
  - N/A
  - Payment channel to workers
  - Source replacement workers when required
  - Execute contracts
  - Provide gear/cleaning agents
  - Construct and maintain the facilities according to SLAs (in PPP model)
  - Generate own business
  - Hire workers
  - Buy gear and equipment for workers

*: Contractor changes every 2-3 years, while workers remain the same (as per findings from Trichy and Warangal), **: some limited government-owned trucks for PTs (in Trichy)
[Employment] There are three kinds of contractors in the sanitation system; labor suppliers are individuals, service contractors are much larger.

<table>
<thead>
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<td>Drain Cleaning</td>
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<td>Septic Tank Desludging</td>
<td></td>
</tr>
<tr>
<td>Govt. School Toilet Cleaning</td>
<td>Sewer Work</td>
<td>Treatment Plant Work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Govt. managed CT/PT cleaning</td>
<td>Community/Public Toilet Cleaning</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Profile

- **Government**
  - Construct, manage and maintain the facilities
  - Individuals with little or no links to the work
  - Receive fixed salary or % of worker salaries (e.g. Warangal: 8K pm)
  - N/A

- **Labor Suppliers**
  - Orgs with considerable experience in sanitation
  - Min. turnover (Railways – 1 Cr; CTs – Rs. 5 lakh)
  - Railways – Eureka Forbes; SR; Munarewa
  - CTs – Sulabh, Gramalaya, local NGOs
  - STP – Thermal Physical, Trichy

- **PPP/Service Contracts**
  - Own 1-3 desludging trucks
  - Charge Rs. 1,000 – 2,000 per operation
  - Earn 20-30K p.m. (net income)
  - Individuals who see business opportunity in de-sludging

- **Private Operators**
  - Monitor adherence to specifications
  - Fulfil household demand

### Examples

- **Government**
  - N/A

- **Labor Suppliers**
  - N/A

- **PPP/Service Contracts**
  - Warangal: 8K pm

- **Private Operators**
  - Railways – Eureka Forbes; SR; Munarewa
  - CTs – Sulabh, Gramalaya, local NGOs
  - STP – Thermal Physical, Trichy

Source: Field research, Dalberg analysis
**[Employment] Worker remuneration and benefits are primarily a function of who their employer is**

<table>
<thead>
<tr>
<th>Type of work</th>
<th>Risk to Health (Low – High)</th>
<th>Monthly Income (Rs.)</th>
<th>Benefits</th>
<th>Working days/month(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Contractual</td>
<td>Government</td>
<td>PF, ESI(^1), etc.</td>
</tr>
<tr>
<td>Sewer Cleaners</td>
<td>![Risk Level]</td>
<td>5 – 7.5k</td>
<td>10 – 30k</td>
<td>![Benefits Icon]</td>
</tr>
<tr>
<td>Septic Tank Cleaners</td>
<td>![Risk Level]</td>
<td>4 – 8k</td>
<td>N/A</td>
<td>![Benefits Icon]</td>
</tr>
<tr>
<td>Railway Track Cleaners</td>
<td>![Risk Level]</td>
<td>4 – 10k*</td>
<td>N/A</td>
<td>![Benefits Icon]</td>
</tr>
<tr>
<td>CT/PT Cleaners</td>
<td>![Risk Level]</td>
<td>5 – 7k</td>
<td>10 – 30k</td>
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</tr>
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<td>Treatment Plant Workers</td>
<td>![Risk Level]</td>
<td>8 – 10k*</td>
<td>N/A</td>
<td>![Benefits Icon]</td>
</tr>
<tr>
<td>School Toilet Cleaners</td>
<td>![Risk Level]</td>
<td>2.5 – 5k*</td>
<td>2.5 – 5k*</td>
<td>![Benefits Icon]</td>
</tr>
<tr>
<td>Drain Cleaners</td>
<td>![Risk Level]</td>
<td>7 – 8k*</td>
<td>10 – 30k</td>
<td>![Benefits Icon]</td>
</tr>
</tbody>
</table>

*Low correlation between riskiness and salaries, or other factors like age and experience; income systematically higher for permanent government employees*

*: Set by state labor departments, they are often lower than state minimum wages (average ~Rs. 12k); (1): Employee State Insurance; (2): Adjusting for sick days/leaves available; Source: Estimates of incomes based on interviews in Delhi, Trichy and Warangal, Dalberg analysis*
Manufacturing – stakeholders involved

- **Sanitation Workers**
  - Hire SWs directly or via contractors for emptying/containment or unblocking household pipes
  - Supply of gear and equipment
  - Employment
  - Direct employment
  - Supply of gear and equipment

- **Civil Society Org.**
  - Organization and empowerment of SWs
  - Awareness campaigns
  - Capacity-building and systems support
  - Employment
  - Supply of gear and equipment

- **Private Operators/Contractors**
  - Work contracts/licensing
  - Single job contracts
  - Supply of gear and equipment
  - Labor supply contracts

- **Urban Local Bodies**
  - Permanent employment
  - Multi-year service contracts

- **State Govt.**
  - Ratification of policies
  - Implementation of rehabilitation schemes

- **Central Govt.**
  - Policy design (MoUHA)
  - Rehabilitation of manual scavengers (MoSJE)
  - Management of community toilets
  - Supply of gear and equipment

- **Manufacturers**
  - Operate septic tank vehicles
  - Maintain community toilets

- **Family and Community**
  - Caste-based networks and self-association
  - Social capital
  - Attention

- **Households and Institutions**
  - Employ SWs
  - Supply of gear and equipment

- **Media**
  - Public sensitization, behavior change
  - Advocacy and awareness

- **Unions**
  - Organization and empowerment of SWs
  - Caste-based networks and self-association
  - Self-association
  - Awareness campaigns
  - Capacity-building and systems support

Source: Dalberg analysis
Various equipment and machines are used for different types of work

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
<th>Lifetime</th>
<th>Cost</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suction</strong></td>
<td>Used to empty septic tanks, occasionally used to clear sewer network blockages by removing the accumulated sludge from the septic tank/sewer</td>
<td>10 years</td>
<td>INR 20-23 lakhs</td>
<td>Machines are sold in big cities/industrial towns making repair and maintenance difficult</td>
</tr>
<tr>
<td><strong>Jetting</strong></td>
<td>Used to desilt/unclog drains and pipes in the sewer/storm water network</td>
<td>10 years</td>
<td>INR 20-23 lakhs</td>
<td>Hose pipes are typically difficult to maneuver and still involve significant manual component; operated without any training and gear; difficult for machine to enter narrow lanes; incremental innovations such as pumps mounted on three-wheelers (autos) have been tried but not successful due to limited water capacity of the tank and requires constant refilling</td>
</tr>
<tr>
<td><strong>Suction-cum-jetting</strong></td>
<td>Single combined machine for both, jetting (clearing blockages) from sewer lines and storm water drains and suction (sucking up the cleared debris), from sewer manholes</td>
<td>10 years</td>
<td>INR 36-40 lakhs</td>
<td>Similar issues faced by jetting and suction machines</td>
</tr>
</tbody>
</table>

No recent improvements in technology; most firms are selling customized tankers with pumps and hoses

(1): Representative images from Kam-Avida; Source: Expert interviews, Dalberg analysis
**Manufacturers** There has been limited innovation over the last decade; incremental improvements being done

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Description</th>
<th>Life Time</th>
<th>Cost</th>
<th>Issues</th>
<th>Verdict</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desilting</td>
<td>Compact tractor towed / trailer mounted open drain de-silting equipment which uses a hydraulically operated bucket and boom arrangement</td>
<td>10 years</td>
<td>~INR 15 lakhs (~6 lakhs for the machine)</td>
<td>Limited manoeuvrability, can only be used in wide lanes which have bigger drains</td>
<td></td>
</tr>
<tr>
<td>Mini-jetting</td>
<td>Smaller trailer to access the sewer lines / drains on narrow lanes where cleaning with large sized vehicle is not possible</td>
<td>10 years</td>
<td>INR 26 lakhs (9 lakhs-vehicle, 17 lakhs-machine)</td>
<td>Allows for preventive maintenance which reduces blockages - In Hyderabad, complaints have reduced ~60%, from 1,000 per day to 400, due to preventive maintenance - earlier impossible due to less approachability of narrow lanes/streets</td>
<td></td>
</tr>
<tr>
<td>Recycler</td>
<td>Combination of high vacuum - high flow suction - cum jetting combination recycler machines which recyclres water from sludge collected so it can be used for jetting</td>
<td>10 years</td>
<td>INR 6 crores</td>
<td>Solves the problem of limited water in suction-cum-jetting machines by recycling water, can only be used roads with big lanes and is extremely expensive</td>
<td></td>
</tr>
</tbody>
</table>

(1): Hyderabad Metropolitan Water Supply and Sewerage Board; (2) Representative images from Kam-Avida; (3): BMC to use new machines to clean drains, manholes; Source: Expert interviews, Dalberg analysis
Manufacturers] Few manufacturers account for bulk of market and provide equipment for all kinds of sanitation work

<table>
<thead>
<tr>
<th># OF MANUFACTURERS</th>
<th>50-60*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of work</td>
<td></td>
</tr>
<tr>
<td>Drain cleaning</td>
<td></td>
</tr>
<tr>
<td>Sewer cleaning</td>
<td></td>
</tr>
<tr>
<td>Septic tank cleaning</td>
<td></td>
</tr>
<tr>
<td>Major customers</td>
<td></td>
</tr>
<tr>
<td>Mainly Corporations, Municipalities, Water Supply and Sewage Boards, some big contractors</td>
<td></td>
</tr>
<tr>
<td>Major players</td>
<td></td>
</tr>
<tr>
<td>Kam-Avida</td>
<td></td>
</tr>
<tr>
<td>• 5526 machines sold</td>
<td></td>
</tr>
<tr>
<td>• Head-office and factory in Pune</td>
<td></td>
</tr>
<tr>
<td>• 80,000 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>Maniar</td>
<td></td>
</tr>
<tr>
<td>• Head-office and factory in Ahmedabad</td>
<td></td>
</tr>
<tr>
<td>• ~30,000 sq. ft.</td>
<td></td>
</tr>
<tr>
<td>TPS</td>
<td></td>
</tr>
<tr>
<td>• Head-office in Delhi, with presence in 6 other locations</td>
<td></td>
</tr>
<tr>
<td>IPWT</td>
<td></td>
</tr>
<tr>
<td>• Head-office and factory in Mumbai</td>
<td></td>
</tr>
<tr>
<td>• ~1,38,000 sq. ft.</td>
<td></td>
</tr>
</tbody>
</table>

(*) Based on India Mart listings; (1): As of 31st Oct, 2017, includes machines despatched for work beyond unsafe sanitation work considered-Kam-avida website; Source: Expert interviews, websites of manufacturers, Dalberg analysis

Major Players

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</table>
Manufacturers

Safety gear is typically procured by ULBs “off the shelf” given lower spends (1%) and limited product differentiation among suppliers.

Types of gear provided (basic)

- Reusable rubber gloves: INR 50/unit
- Surgical masks: INR 1/unit
- Reflector vests: INR 80/unit

Cost per kit: ~INR 135
Annual cost: ~INR 270-510

- Concentrated market: very few (3-5) large scale manufacturers and various local suppliers; little scope for product differentiation and development

- Trichy: Budget for gear (2016-17) was INR 50 lakhs (~1% of payroll)
- Warangal: Budget for gear (2016-17) was INR 30 lakhs (<1% of payroll) with no increase in allocated amount for next year

There is little indication of user-centric development in this space

(1): Frequency varies from semi-annual to quarterly replacement; Source: Field research, TCC records, GWMC records; Dalberg analysis
HAL is working with PMO and Hyderabad Municipal Water Supply and Sewerage Board (HMWSSB) to reduce manual cleaning. Teams from IITs are also involved. Innovations include:-

<table>
<thead>
<tr>
<th>Innovations</th>
<th>Description</th>
</tr>
</thead>
</table>
| Processes and infra | • Signal system to identify open manholes, geotag them and check for breakage  
• Small sewage cleaning machines that can enter narrow lanes and by-lanes and allow for preventive maintenance |
| Safety gear | • New sewerage safety suit since the existing suits were not suitable for narrow manholes while undertaking repairs |

Railways piloted a customised track cleaning machine – rail wagon with a vacuum cleaning machine mounted on it; locally made with both the wagon, the vacuum and the exhaust machine being manufactured in-house

• Not very useful for cleaning human excreta on the tracks as it can mainly suck up dry objects
• Has not received uptake due to issues with operation and maintenance

Other innovations in the pipeline include: robotic CCTV/ video inspection system for small sewer/pipelines

Source: [How Indian Railways is ensuring cleanliness on tracks, 2014](https://timesofindia.indiatimes.com/); [Create tech to replace manual sewer cleaning, PMO tells HAL; Dalberg analysis](https://www.dalberg.com/blog/2017/04/create-tech-to-replace-manual-sewer-cleaning-pmo-tells-hal/);
Sanitation worker support – stakeholders involved

- **Civil Society Org.**
  - Capacity building
  - Policy design (MoUHA)
  - Rehabilitation of manual scavengers (MoSJE)

- **State Govt.**
  - Implementation of rehabilitation schemes

- **Urban Local Bodies**
  - Work contracts / licensing
  - Supply of gear and equipment

- **Manufacturers**
  - Supply of gear and equipment

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  - Labor supply contracts
  - Multi-year service contracts
  - Operate septic tank vehicles

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  - Single job contracts

- **Family and Community**
  - Organization and empowerment of SWs
  - Awareness campaigns
  - Capacity-building and systems support

- **Unions**
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- **Sanitation Workers**
  - Attention
  - Employment
  - Permanent employment
  - Direct employment

- **Central Govt.**
  - Ratification of policies

- **Family and Community**
  - Social capital

- **Organizational support**

- **Sanitation Workers**

Source: Dalberg analysis
Workers have some degree of unionization, with govt. ones having the strongest ties; demands mostly focus on compensation.

### Type of union support

<table>
<thead>
<tr>
<th>Description</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
</table>
| **Safai Karamchari Unions** | • Consisting of municipality workers on govt. payroll  
• Includes permanent sewer workers, drain cleaners  
• Railway workers may have similar unions in respective junctions | **Political/Caste based unions** | • Consisting of all workers- linked by political support/caste  
• Not specific to sanitation workers  
• Includes contractual workers |
| **Example** | • Delhi Safai Karamchari Union  
• Delhi Jal Board Karamchari Union (~3,500)  
• Government School Scavenger Union, Warangal (>3,000) | • Madiga Reservation Porata Samithi (Warangal-Madiga Community)  
• Centre of Indian Trade Unions (CITU)- affiliated to Communist Party of India (~3 M) |
| **Demands/support** | • Increase in income, disbursement of salaries on time, jobs for dependents, benefits (health) | • Increase in income, regularization of job  
• Broader asks such as categorization of SCs, etc. |

Workers demands remain restricted to increase in income, regularization of jobs and regular payment, with safety gear/conditions being a low priority.

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Source: Field Research, Dalberg analysis
There are few CSOs focused on the issue of unsafe sanitation work
• CSOs have a broader mission-focused on lower-caste communities, bonded labour, etc. and lack an explicit focus on sanitation workers

Most are working at the local level at small scale
• Barring SKA and Jan Sahas, CSOs are working at a small scale focusing on cities/wards/blocks, etc
• CSOs not engaging with city governments, private donors, etc. to enable systemic, large-scale change (exception being Mission Garima launched by Tata Trusts)

CSOs are not addressing the problem comprehensively
• Primarily focused on advocacy to encourage workers to leave the profession, or rehabilitation through vocational training, efforts don’t address root causes, which may lead to new workers entering the profession or workers relapsing into the profession

Efforts have had limited impact
• Most interventions have been active for >5 years but number of sanitation workers impacted limited to 100-400 per CSO
• There is little information on sustainability and success of these initiatives

Source: All icons sourced from the Noun Project
[CSOs] Most CSOs are working at the state or local-level, focusing on advocacy and rehabilitation of sanitation workers

Impact refers to number of workers rehabilitated

- **Pan-India, HQ: Delhi**
  - Legal advocacy, awareness, identification
  - 3 lakh sanitation workers

- **M.P Rajasthan, Bihar, Maharashtra and U.P. H.Q: M.P.**
  - Advocacy and rehabilitation
  - ~30,000 sanitation workers

- **Rajasthan**
  - Construction of sanitary latrines with simultaneous rehabilitation
  - 403 sanitation workers impacted

- **Gujarat**
  - Legal advocacy, awareness, assisted rehabilitation, worker safety and construction of sanitary latrines
  - 100+ sanitation workers impacted

- **Maharashtra**
  - Technological innovation
  - TBD

- **Karnataka**
  - Advocacy, awareness, and rehabilitation and education for children for workers
  - 160 sanitation workers

- **M.P Rajasthan, Bihar, Maharashtra and U.P. H.Q: M.P.**
  - Advocacy and rehabilitation
  - ~30,000 sanitation workers

Impact refers to number of workers rehabilitated.

Indicates state of headquarters for CSOs present in multiple states.
[CSOs] CSOs are working across various interventions, with rehabilitation and advocacy being most common (1/3)

---


**Footprint:** Pan-India

**Impact:** ~3 lakh sanitation workers

- **Legal advocacy:** Instrumental in getting the 2013 Act passed, with SKA heading the Committee for drafting the report; convincing district administrations to abolish dry latrines and helping rehabilitate workers under eligible government schemes
- **Awareness:** Conducting awareness drives to make workers aware of their rights and convincing workers to leave the practice (Bhima Yatra)
- **Monitoring:** Conducting surveys in states to collect data on workers and dry latrine owners and also tracking number of deaths of sewer workers

---


**Footprint:** Two cities in Rajasthan

**Impact:** 403 women (288 in Tonk, 115 in Alwar)

- **Focuses on five steps for eradication:** liberation, vocational training and rehabilitation, education of children and social elevation
- **Conversion of dry latrines:** Replacing dry latrines with two-pit latrines
- **Training:** Providing vocational skills like food processing, tailoring, designing and embroidery, beauty care along with teaching functional literacy.
  - Women provided training at Sulabh’s centres: Nai Disha
  - Training period lasts for two years, with one year of rehabilitation (transition to new job) to ensure women are able to sustain themselves
- **Rehabilitation:** Women are organized into SHGs/cooperatives, and entrusted with leadership, procurement and marketing responsibilities.
**CSOs** are working across various interventions, with rehabilitation and advocacy being most common (2/3)

<table>
<thead>
<tr>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3</strong> Misson Garima</td>
</tr>
<tr>
<td><strong>Footprint</strong>: Two wards in Mumbai</td>
</tr>
<tr>
<td><strong>Impact</strong>: To be determined</td>
</tr>
<tr>
<td><strong>TATA TRUSTS</strong></td>
</tr>
<tr>
<td><strong>Mission Garima</strong></td>
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<td><strong>Identification</strong>: Identified 36,000 workers in two wards in Bombay – workers who go inside manholes, septic tanks etc.</td>
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<tr>
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</tr>
<tr>
<td><strong>Footprint</strong>: 13 Indian states</td>
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<td><strong>Impact</strong>: ~30,000</td>
</tr>
<tr>
<td><strong>Jan Sahas</strong></td>
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<tr>
<td><strong>5</strong> Navsarjan Trust</td>
</tr>
<tr>
<td><strong>Footprint</strong>: Gujarat</td>
</tr>
<tr>
<td><strong>Impact</strong>: 100+</td>
</tr>
<tr>
<td><strong>Navsarjan Trust</strong></td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>1996</strong></td>
</tr>
<tr>
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</tr>
<tr>
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**Footprint** refers to geographic scale and **impact** refers to number of workers rehabilitated; Source: Navsarjan website; interview with Ashif Sheikh, Jan Sahas; Dalberg analysis
CSOs are working across various interventions, with rehabilitation and advocacy being most common (3/3)

<table>
<thead>
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<tbody>
<tr>
<td><strong>Advocacy:</strong> Advocating with local governments and legal advocacy through filing of PILs</td>
</tr>
<tr>
<td><strong>Awareness</strong> campaigns with the community</td>
</tr>
<tr>
<td><strong>Alternate employment for scavenging community:</strong> Creating linkages with other organizations and institutions for vocational training of youth</td>
</tr>
<tr>
<td><strong>Education for children of scavenging community:</strong> Setting up education support centres (5) for children and monitoring of RTE Act and checking discriminatory practices at schools</td>
</tr>
<tr>
<td><strong>Health entitlement:</strong> Supporting families to access Rashtriya Swasthya Bima Yojana and ensuring sweepers receive safety equipment</td>
</tr>
<tr>
<td><strong>Accessing government schemes and programs:</strong> Supporting to access government schemes for pensions, ration cards, maternity benefit, self employment, provident fund, NREGA, etc.</td>
</tr>
</tbody>
</table>

Footprint refers to geographic scale and impact refers to number of workers rehabilitated; Source: Navsarjan website; interview with Ashif Sheikh, Jan Sahas; Dalberg analysis; Source: Thamate website; Dalberg analysis
Increasing media attention, mostly on the riskiest jobs, has helped create public awareness and spur government action.

<table>
<thead>
<tr>
<th>Major players</th>
<th>Coverage</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV</td>
<td>Focus primarily on sewer and railway workers, potentially due to the riskiness and institutionalized nature of the problem</td>
<td>• NTDV has significant reach: reach of 1.56M viewers¹</td>
</tr>
<tr>
<td>Print (incl. online)</td>
<td>Broader coverage than TV, incl. septic tank cleaners, STP workers, SWM workers</td>
<td>• Significant reach → public awareness</td>
</tr>
<tr>
<td></td>
<td>Coverage seems to be primarily reactive/ incident-driven (e.g., deaths of sewer workers in Delhi) / specific sanitation-themed days</td>
<td>• After the reportage of &gt;10 deaths in a month in Delhi, the L.G. announced full mechanisation of sewer cleaning with violators being deemed “guilty of culpable homicide”</td>
</tr>
<tr>
<td>Film</td>
<td>Comprehensive understanding of sanitation workers, ranging from sewer workers to toilets cleaners</td>
<td>• The National Commission of Safai Karamcharis (NCSK) relies extensively on news reports to track workers in absence of a systematic identification system</td>
</tr>
<tr>
<td></td>
<td>Individual-driven; low budget films</td>
<td>• Lack of national focus: Of the three documentaries, 2 focus on Tamil Nadu and 1 on Delhi</td>
</tr>
<tr>
<td></td>
<td>Few documentaries on the topic: Kakkoos (2017), Mugamoodi (2017), Fecal Attraction (2011), Manhole (2016)</td>
<td>• Kakkoos has ~0.5 mn¹ YouTube views</td>
</tr>
<tr>
<td></td>
<td>Several publications: Indian Express, Outlook, The Hindu, Wire, Scroll, etc.</td>
<td>• Manhole has ~13,000 YouTube views</td>
</tr>
</tbody>
</table>

• Media portrays sanitation workers with a broad brush; not nuanced
• Social media coverage on the topic is infrequent and driven by news

¹: TV viewership on 16 May: Who won the battle?; Source: Dalberg analysis
Given Trichy’s sanitation system, there are seven types of sanitation work that are relevant for our study

<table>
<thead>
<tr>
<th>Interface</th>
<th>Containment / Emptying</th>
<th>Transport</th>
<th>Treatment</th>
<th>Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual toilets connected to sewers</td>
<td>Piped sewer networks</td>
<td>Decanting Stations</td>
<td>Sewage Treatment Plant</td>
<td>Reuse in agriculture as manure</td>
</tr>
<tr>
<td>Individual toilets with septic tanks</td>
<td>Septic tanks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insanitary latrines</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community toilets</td>
<td>Pit latrines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open defecation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 30% Individual toilets connected to sewers
- 38% Individual toilets with septic tanks
- 8% Insanitary latrines
- 17% Community toilets
- 7% Open defecation

Sources:
- Data on interfaces is from Census 2011 estimates and the TNUSSP Baseline Survey 2016, Dalberg analysis

Indicates approx. % of households using the interface as the primary mode of defecation.
There are ~2,200 sanitation workers, more than half of whom are women.

Number of sanitation workers in Trichy (Dalberg estimate)

<table>
<thead>
<tr>
<th>Category</th>
<th>Total Number of Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>School toilet cleaners</td>
<td>950-1000</td>
</tr>
<tr>
<td>Drain Cleaners*</td>
<td>~2,200</td>
</tr>
<tr>
<td>CTC/PT cleaners</td>
<td>650-700</td>
</tr>
<tr>
<td>Treatment plant workers</td>
<td>3</td>
</tr>
<tr>
<td>Septic tank cleaners</td>
<td>80-100</td>
</tr>
<tr>
<td>Railways cleaners</td>
<td>25-30</td>
</tr>
<tr>
<td>Sewer workers</td>
<td>180-200</td>
</tr>
</tbody>
</table>

* Women workers work in CTCs, school toilets, and drain cleaning and face limited exposure to human faecal matter.

**Percentage of women (est.):**
- Sewer workers: No women
- Septic tank cleaners: No women
- Railways cleaners: Negligible
- CTC/PT cleaners: ~40%
- Treatment plant workers: No women
- School toilet cleaners: ~100%
- Drain Cleaners: ~40%
- Total: 50-60%

* Drain Cleaning involves sweeping roads and then unblocking roadside drains.

Source: Data from Trichy field visits and Dalberg analysis.
There are five models of employment, with the local government playing roles of varying importance in different types of sanitation work.

<table>
<thead>
<tr>
<th>Employer</th>
<th>Type of work</th>
<th>Stakeholder roles</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully government</td>
<td>TCC + Workers’ Collective</td>
<td></td>
<td>• Construct, manage and maintain the facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Construct, manage and maintain the facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Monitor cleanliness and operations</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Fund major renovations</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Contractual employees get no health/leave benefits, PF, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Manage day-to-day ops, fund minor repairs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Provide equipment/gear for SWs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Execute contract</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Develop guidelines for operation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• License desludging operators</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Collect fee for decanting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Execute as per terms of license</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Provide for worker safety</td>
</tr>
<tr>
<td>Fully private</td>
<td>TCC + Workers’ Collective</td>
<td></td>
<td>• Construct, manage and maintain the facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>• Provide for worker safety</td>
</tr>
</tbody>
</table>

- **Trichy City Corporation (TCC)**
  - Employers are a mix of permanent TCC SWs and daily wagers from local collectives
- **Self-Help Groups (SHGs)**
  - Employers are a mix of permanent TCC SWs and daily wagers from local collectives
- **Private Contractors**
  - Employers are a mix of permanent TCC SWs and daily wagers from local collectives
- **Private Operators**
  - Employers are a mix of permanent TCC SWs and daily wagers from local collectives
~30% of workers are outsourced or private, with their salaries being significantly lower than that of government employees

<table>
<thead>
<tr>
<th>Type of worker</th>
<th>TCC</th>
<th>Workers Collective</th>
<th>SHGs</th>
<th>Contractors</th>
<th>Private operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewer cleaners</td>
<td>80-100</td>
<td>100-120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Septic tank cleaners</td>
<td>4</td>
<td></td>
<td>80-100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Railway track cleaners</td>
<td>25-30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTC/PT cleaners</td>
<td>100-150</td>
<td>40-60</td>
<td>80-100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment plant workers</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School toilet cleaners</td>
<td>650-700</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain cleaners</td>
<td>600-650</td>
<td>375-400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total:</strong> (~2,200)</td>
<td>~1500</td>
<td>~500</td>
<td>~100</td>
<td>~30</td>
<td>~100</td>
</tr>
</tbody>
</table>

**Riskiness of work and income levels**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Monthly income (INR)</th>
<th>Daily wage (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Govt. is increasingly outsourcing work/ engaging contract employees given budget constraints</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Icons from the noun project; Data from Trichy field visits and Dalberg analysis
Within the TCC, the engineering and health departments are responsible for various aspects of sanitation work.

**Tiruchirappalli City Corporation**

- **Municipal Commissioner**
  - **City Engineer**
    - **Executive Engineer**
    - **Asst. Executive Engineer**
    - **Junior Engineer**
  - **Assistant Commissioner (1 per zone)**
    - **Asst. Executive Engineer (zonal)**
    - **Junior Engineer (zonal)**
  - **City Health Officer**
    - **Sanitary Officer**
    - **Sanitary Inspector**
    - **Sanitary Supervisor**
    - **Sanitation worker**

There are significant vacancies at all levels.

- **Maintenance, cleaning of sewer system**
- **Procurement of sewer cleaning equipment**
- **Licensing of private desludging vehicles**
- **Monitoring sewage treatment plant operations**
- **Implementation of TCC plans at the zonal level**
- **Mgt. of public and community toilets, road and drain cleaning, solid waste mgt., public health awareness**
- **Employ ~1,500 full-time sanitation workers and ~700 on contract**

**Private Operators**

- **Private Desludging Operators**
- **Community Toilet Operators**
- **STP Operator**

- **Private operators obtain licenses/contracts/agreements from TCC**
- **TCC monitors their operations**

**Other Govt. Entities**

- **MHRD & State Education Dept.**
  (for school toilets)
- **MoR & Divisional Railway Dept.**
  (for railway tracks)

- **Ministries of HRD and Railways draft policies on school and railway track cleaning**
- **State departments release budgets, tenders etc.**

* TAHDCO – Tamil Nadu Adi Dravidar Housing and Development Corporation
In Trichy, O&M guidelines have been specified for the most risky types of sanitation work; however, adherence to norms is suspect

<table>
<thead>
<tr>
<th>Sewer cleaning</th>
<th>Septic tank cleaning</th>
<th>Sewage treatment plant work</th>
</tr>
</thead>
</table>
| • Follow the Manual Scavenging Act 2013, which specifies:  
  o Conditions under which manual intervention is allowed: damaged manholes, emergency, machine inability etc.  
  o Safety gear to be provided to workers in these cases: 44 types, incl. air purifier gas masks and nylon safety belts  
  o Cleaning equipment to be provided by ULBs: 14 including suction, jetting, etc.  | • In line with the Manual Scavenging Act, Tamil Nadu rolled out operative guidelines for septage management in 2014. This includes:  
  o Specifications for building septic tanks; frequency of desludging  
  o Licensing of desludging vehicles if they meet a minimum requirement of mechanization  
  o Cleaning equipment and safety gear for workers if they are required to enter tanks | • Terms of contract with the private contractor specify the provision of:  
  o Safety gear: masks, gum boots, gloves, safety belts, etc.  
  o Tools to aid unblocking  
  • The contract also specifies penalties for contravention  
    o e.g., Rs. 500 p.m. for no safety belt; Rs. 500 p.m. for no gas mask |

• No guidelines for other types of work (e.g. drain and toilet cleaning)  
• Even where specified, there is only partial compliance
2. Trichy and Warangal: understanding the sanitation system
Warangal has a decentralized sanitation system; there are five types of sanitation work that are relevant for our study:

- **Public Toilets** include 44 toilets in fuel stations.
- **FSTP** coming up shortly.
- 8 under construction.

Source: Data on interfaces is from Census 2011 estimates, ASCI reports and local interviews; Dalberg analysis.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Containment / Emptying</th>
<th>Transport</th>
<th>Treatment**</th>
<th>Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual toilets with septic tanks</td>
<td>Septic Tanks</td>
<td></td>
<td></td>
<td>Dumping Yards</td>
</tr>
<tr>
<td>Individual toilets with pit latrines</td>
<td>Twin Pits</td>
<td></td>
<td></td>
<td>Decomposition and Reuse (Leeching)</td>
</tr>
<tr>
<td>Insanitary latrines</td>
<td></td>
<td></td>
<td></td>
<td>Land/Water Bodies</td>
</tr>
<tr>
<td>Open defecation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

55-60%  
25-30%  
2-5%  
0-5%

Indicates approx. % of households using the interface as a primary interface of defecation.

*: Public Toilets include 44 toilets in fuel stations, **: FSTP coming up shortly, ***: 8 under construction.

Source: Data on interfaces is from Census 2011 estimates, ASCI reports and local interviews; Dalberg analysis.
There are ~2,900 sanitation workers, 60-70% of whom are women.

Number of sanitation workers in Warangal (Dalberg estimate)

* Drain Cleaning involves sweeping roads and unblocking roadside drains

Source: Data from Warangal field visits, DISE district level data for schools and Dalberg analysis
There are five models of employment, with the local government playing roles of varying importance in different types of sanitation work.

<table>
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<tr>
<th>Employer</th>
<th>Type of work</th>
<th>Stakeholder roles</th>
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<tbody>
<tr>
<td>Fully government</td>
<td>Government</td>
<td>Government</td>
</tr>
<tr>
<td>Govt. + Private Contractors (Labor)</td>
<td>Drain cleaning</td>
<td>Govt. school toilet cleaning</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Toilet Cleaning</td>
<td>N/A</td>
</tr>
<tr>
<td>Private Contractors (Service)</td>
<td>Railway Cleaning</td>
<td>Private operators</td>
</tr>
<tr>
<td>Fully private</td>
<td>Septic tank desludging</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Private school toilet cleaning</td>
<td></td>
</tr>
</tbody>
</table>

**Managed completely by the government, with no outsourcing**
- Construct, manage and maintain the facilities
- Supervise labor
- Provide equipment, gear, benefits
- Monitor cleanliness and operations
- N/A

**Contractors only for labor supply; employ SWs via informal contracts**
- Provide land
- Monitor cleanliness and operations
- Payment channel to workers

**Managed by CSOs as revenue sharing models; employ SWs via informal contracts**
- Contract out management/maintenance
- Monitor performance, adherence to terms
- Execute contract
- Develop guidelines for operation
- License desludging operators
- Monitor operations

**Multi-year service contracts**
- Construct and maintain the facilities according to SLAs
- Provide gear/cleaning agents
- License desludging operators
- Ensure worker safety

**Operations run directly by private operators for profit; informal agreements with SWs**
- Execute as per terms of license
- Provide gear/equipment
- Ensure worker safety
~75% of workers are outsourced or private, and only railways and drain cleaners receive some form of employment benefits

<table>
<thead>
<tr>
<th>Type of worker</th>
<th>Type of employer</th>
<th>Riskiness of work and income levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Govt.</td>
<td>Govt + Contractors (labor)</td>
</tr>
<tr>
<td>Septic tank cleaners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Railway track cleaners</td>
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<td></td>
</tr>
<tr>
<td>School toilet cleaners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain cleaners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total: (~2,900)</td>
<td>650-720</td>
<td>1,500</td>
</tr>
</tbody>
</table>

Salaries seem to be somewhat risk-adjusted, even if not intentional; benefits determined by association with government (railway track cleaners, drain cleaners)

~75% workers are on contract basis, given budget constraints

Source: Icons from the noun project; Data from Warangal field visits and Dalberg analysis
The Medical and Health Officer is responsible for sanitation outcomes and processes in Warangal

Greater Warangal Municipal Corporation

**Municipal Commissioner**

- Medical and Health Officer
- Sanitary Inspector
- Sanitary Supervisor ("Jawaan") (~130)

**Sanitation worker** (~2600)

- Responsible for public health and **overall sanitation** in the city
- **Employment and welfare** of staff for road and drain cleaning;
- **Monitoring** septage management, and maintenance of PTs

- Conversion of **insanitary to sanitary latrines**
- Specification and monitoring of **household septic tanks**

Private Operators

- Private Desludging Operators
- **Public Toilet Operators**

Other Govt. Entities

- MHRD & State Education Deptt.
- MoR & Divisional Railway Deptt.

- **80-90% of these workers are on contract**

- Private operators obtain licenses/agreements from GWMC
- GWMC **monitors** their operations

- Ministries of HRD and Railways **draft policies** on school and railway track cleaning
- State departments **release budgets, tenders etc.**
There are guidelines for septic tank desludging and public toilet cleaning, but monitoring and compliance is unclear.

### Septic Tank Desludging
- **Licensing Criteria**
  - Meeting a **minimum level of mechanization**, vehicles in working condition

- **Safety Guidelines**
  - Adoption of “CPHEEO approved standards and procedures for desludging”
  - Employ trained workers and provide PPE (e.g., gas detectors, oxygen masks, etc.)
  - Accident insurance, annual health checkups for workers

- **Penalties**
  - Fines for contravention, higher for repeat offenders
  - License could be **canceled for non-compliance**

### Public Toilet Cleaning
- **Licensing Criteria**
  - Companies with **turnover greater than Rs. 5 lakh**
  - Experience of building 5 PTs in the last 3 years, 3 years of operational experience

- **Safety Guidelines**
  - Provision of brooms, brushes, baskets, cleaning material, etc., but no PPE specified
  - Identity cards and aprons for cleaners

- **Penalties**
  - Penalties of Rs. 50-200/day if cleaning standards are not met
  - No explicit penalties if worker safety standards not met

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No stated guidelines for drain cleaning.

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Source: GWMC Septage Management Guidelines 2016, License to Desludgers, GWMC Service Level Agreements