Khandela is a town, located in Sikar district of Rajasthan, around 52 kms from Sikar city, which is the divisional headquarters of the district. The town relies on onsite sanitation systems (OSS) and there is no underground drainage (UGD)*. The OSS are desludged using mechanical equipment, such as vacuum pumps; and the faecal sludge was being indiscriminately disposed onto vacant farmlands on the outskirts of the town, posing health and environmental risks.

Rajasthan Urban Infrastructure Development programme (RUIDP), with financial support from The Asian Development Bank and The Bill and Melinda Gates Foundation, chose to demonstrate town-wide Faecal Sludge Management (FSM) in three towns in Rajasthan - each based on a different technology. Khandela was selected as one of those pilot towns. We supported IPE Global, the implementing agency, with the design engineering, construction monitoring and commissioning of a 10 KLD Faecal Sludge Treatment Plant (FSTP) for the town.

*2% of households discharge their blackwater into open, stormwater drains

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</thead>
<tbody>
<tr>
<td>22,756</td>
<td>27,800</td>
<td>4,635</td>
<td>100%</td>
<td>94%</td>
<td>0%</td>
</tr>
</tbody>
</table>
### Timeline

- **Dec 2017 - Apr 2018**: Baseline assessment and FSTP design
- **Jun 2018 - Aug 2018**: Tender process
- **Oct 2018 - Dec 2019**: Construction
- **Jul 2020**: FSTP commissioned

### Operational Model

The project was tendered out as a Build-Operate-Transfer (BOT) model. Construction and operations (for one year i.e. July 2020 to 2021) were undertaken by a private organization (Divija Construction), before being handed over to the ULB. The ULB, currently, operates the FSTP and bears all operational expenditure too. The ULB is also responsible for collecting faecal sludge from households - regulating private operators, as needed. Sale of by-products (i.e. bio-solids) from the FSTP serve as an additional source of revenue for the ULB.

### Outcomes

The project serves as a successful pilot for demonstrating town-wide FSM in the State, with a different technology as well as operating model. It also highlights (along with the successful pilot demonstration at Phulera-Sambhar) how FSM is an effective and economical solution for safe sanitation; motivating ADB to include FSM as one of their sectors for investment within sanitation. By showcasing FSM interventions across the sanitation value chain, it serves as a model for effective Faecal Sludge and Septage Management (FSSM), improved urban sanitation as well as public health - for small and medium ULBs across Rajasthan to learn from. Moreover, it has also resulted in the roll out of a state-level FSM Policy and Guidelines - making Rajasthan one of the first states in India to do so.
Collection and Transportation of Faecal Sludge

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of trips per month</td>
<td>12–15</td>
<td>by the private vehicle</td>
</tr>
<tr>
<td>Desludging Vehicles</td>
<td>3</td>
<td>(2 private and 1 Government-owned)</td>
</tr>
<tr>
<td>No. of trips per month</td>
<td>10</td>
<td>by the Government-owned vehicle</td>
</tr>
<tr>
<td>Quantity of faecal sludge</td>
<td>3–6 m³/day</td>
<td>generated - based on collection</td>
</tr>
</tbody>
</table>

Learnings

1. Capacity-building is essential to ensure sustainability of sanitation infrastructure. At Khandela, capacity building was carried out for desludging operators and city officials, to ensure they are well-versed with the new system and resulting processes.

2. Integrated FSM services handled by a single party can contribute to efficient FSM operations (as demonstrated by Divija Construction).
Treatment Process at the FSTP

- Screen Chamber
- Planted Drying Bed
- Settler
- Anaerobic Filter
- Planted Gravel Filter
- Polishing Pond