



# SFD Lite Report

## Nawabganj India

This SFD Lite Report was prepared by  
Centre for Science and Environment.

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# 1 The SFD Graphic

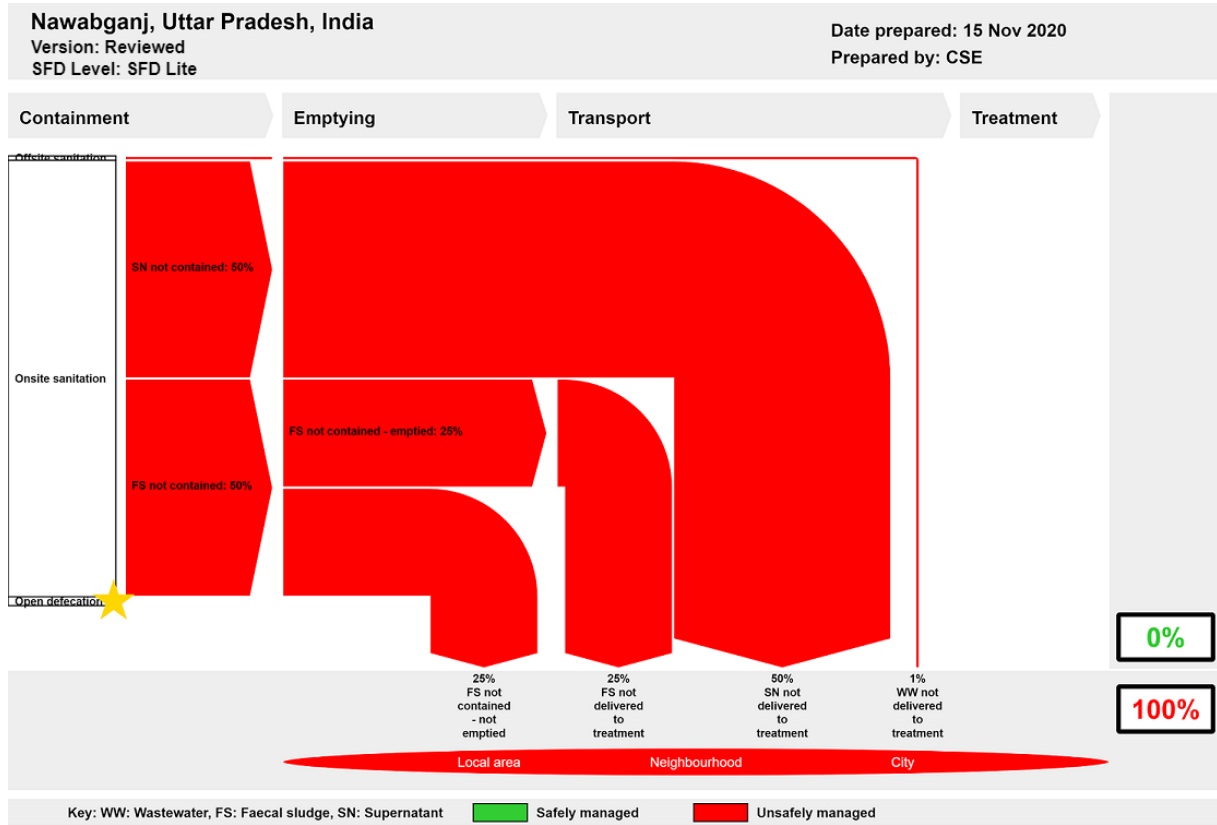


Figure 1. SFD Graphic for Nawabganj.

## 2 SFD Lite information

### Produced by:

- Centre for Science and Environment, New Delhi.
- This report was compiled as part of the SFD Promotion Initiative project funded by Bill and Melinda Gates Foundation (BMGF). We would like to thank Mr Anil Kumar, Executive officer, Mr Swapnil Dwivedi, Computer Operator, Nagar Panchayat Nawabganj for providing all the required secondary data and cooperating for Key Informant Interviews (KIIs) & Focussed Group Discussions (FGDs).
- This report would not have been possible without constant support of Mr Abhishek Rai, DPM, Unnao District who helped in providing relevant sanitation data.

### Collaborating partners:

- Nagar Panchayat, Nawabganj, Uttar Pradesh.

Date of production: 15/12/2020

### 3 General city information

Nawabganj is a town and a *nagar panchayat* in Unnao district which is situated between Lucknow and Kanpur in the Indian state of Uttar Pradesh. It belongs to Lucknow Division. It is located 24 Km towards East from District head quarters Unnao. It is a Block head quarter. Nawabganj was established by Nawab Ramzan Ali (Nawab of Sheesh Mahal Estate Lucknow) in 1858. He established Nawabganj between two villages Pachhiyavn & Durgaganj. Nawabganj Bird Sanctuary, a bird sanctuary (chandra shekhar azad) and nature reserve, is located near the town. Shri Durga Mata temple is located in the town. Shri Kushahari Mata temple is 3 km. away from the town near Kusumbhi railway station.

As per Census 2011, Nawabganj has a population of 11,545 residing in 1,946 households. The population of the city as per *Swachh Survekshan* (country wide annual ranking mechanism for cities with respect to sanitation) conducted in 2019 is 13,161 corresponding to 2,217 households.<sup>1</sup> This population is used for preparation of the SFD graphic. The urban local body governing the town is Nawabganj Nagar Panchayat (NNP). NNP has an administrative area of 3 sq.km which is divided into 10 wards. The density of the city is 4,387 people per sq.km which is high in comparison to state density of 828 people per sq.km.<sup>2</sup>

The geographical coordinates of Nawabganj are 26.6210° North and 80.6683° East. The topography of Nawabganj is majorly plain. The average rainfall is 850 mm. Temperature rises to 46°C and drops to 6°C. The soil type is clayey and sandy with occasional gravel and boulder. Table 1 shows the population growth in Nawabganj in the past two decades.

Table 1: Population Growth rate Nawabganj (Source: NNP, 2020; Census, 2011).

Census Year	Population	Growth Rate (%)	Source
2001	9,840	-	Census 2001
2011	11,545	17	Census 2011
2019	13,161	14	BNP

### 4 Service outcomes

Nawabganj, Uttar Pradesh, India, 15 Nov 2020. SFD Level: SFD Lite

Population: 13161

Proportion of tanks: septic tanks: 50%, fully lined tanks: 50%, lined, open bottom tanks: 50%

Containment								
System type	Population	Transport	Treatment	Emptying	Transport	Treatment	Transport	Treatment
	Pop	W4c	W5c	F3	F4	F5	S4e	S5e
System label and description	Proportion of population using this type of system	Proportion of wastewater in open sewer or storm drain system, which is delivered to treatment plants	Proportion of wastewater delivered to treatment plants, which is treated	Proportion of this type of system from which faecal sludge is emptied	Proportion of faecal sludge emptied, which is delivered to treatment plants	Proportion of faecal sludge delivered to treatment plants, which is treated	Proportion of supernatant in open drain or storm sewer system, which is delivered to treatment plants	Proportion of supernatant in open drain or storm sewer system that is delivered to treatment plants, which is treated
<b>T1A1C6</b> Toilet discharges directly to open drain or storm sewer	1.0	0.0	0.0					
<b>T1A2C6</b> Septic tank connected to open drain or storm sewer	10.0			50.0	0.0	0.0	0.0	0.0
<b>T1A3C6</b> Fully lined tank (sealed) connected to an open drain or storm sewer	60.0			50.0	0.0	0.0	0.0	0.0
<b>T1A4C6</b> Lined tank with impermeable walls and open bottom, connected to an open drain or storm sewer	29.0			50.0	0.0	0.0	0.0	0.0

Table 2: SFD Matrix for Nawabganj.

<sup>1</sup> KII with Executive Officer, Nawabganj.

<sup>2</sup> District Census Handbook 2011 for Nawabganj (Houses and household amenities and assets table HH-08: percentage of households by availability of the type of Latrine Facility; <http://censusindia.gov.in/DigitalLibrary/MFTableSeries.aspx>

The outcome of the SFD graphic shows that all of the excreta flow (100%) is classified as unsafely managed (Figure 1). The unsafely managed excreta originate from wastewater not delivered to treatment (1%), Supernatant (SN) not contained - not delivered to treatment (50%), FS not contained - emptied but not delivered to treatment (25%) and 25% of FS not contained - not emptied.

Overview on technologies and methods used for different sanitation systems through the sanitation service chain is as follows:

#### 4.1 Offsite Systems

There is no sewerage network in the city within the administrative boundary of Nawabganj. However, there are households which are directly discharging into water body. In the sample household survey, it was found that few of the households have connected their toilets discharging directly to an open drain (T1A1C6)<sup>3</sup>. It was concluded that such households correspond to 1% of the population of Nawabganj (Figure 2).

#### 4.2 On-site Sanitation Systems

*Containment:* Based on the sample household survey, KIIs and FGDs with relevant stakeholders, it is estimated that 99% of the population is dependent on the On-site Sanitation Systems (OSS)<sup>4,5,6</sup>. The most prevalent OSS in Nawabganj are Fully Lined Tanks (FLT) (sealed) connected to an open drain or storm sewer (T1A3C6, 60%). Lined tanks with impermeable walls and open bottom, connected to an open drain or storm sewer (T1A4C6, 29%) and septic tanks connected to open drain or storm sewer (T1A2C6, 10%) are the other two prevalent systems after the afore-mentioned system. Lastly, lined pits with impermeable walls and open bottom with no outlet and no overflow (T2A4C10) is used by 2% of the population.



Figure 2: Toilet discharging directly to open drain.



Figure 3: Lined tank with open bottom.

According to the Executive Officer and Computer Operator, 1,049 Individual Household Latrines (IHHL) have been provided to households having no toilets or access to community toilets in the vicinity or to households with insanitary toilets as of August 2020, under Swachh Bharat Mission (SBM). FLTs in Nawabganj are either square or rectangular in shape whereas septic tanks are mostly 2-chambered tanks. Most of the containment systems constructed under SBM are fully lined tanks (sealed) or lined tanks with open bottom (Figure 3).

<sup>3</sup> Sample household survey, 2020.

<sup>4</sup> Field Observations.

<sup>5</sup> KIIs with Executive Officer and household surveys.

<sup>6</sup> FGDs with sanitation workers.

**Community Toilets (CTs)/Public Toilets (PTs):** There are 4 community toilets and 5 public toilets in Nawabganj which have Septic Tanks Connected to Open Drain (STOD)<sup>7</sup> as their containment system. The average size of septic tanks in community toilets is 8 x 4 x 8 m .The average size of septic tanks in public toilet is 6 x 3 x 8 m. As majority of the CTs/PTs have been recently constructed under SBM and hence have not yet reached at stage where emptying is required which would be further stretched due to low number of people actually using these facilities and every household in the city having its own functional toilet.



Figure 4: Pink toilet constructed under SBM.



Figure 5: ULB owned vacuum tanker.

**Emptying:** The city is dependent on desludging service provided by the Urban Local Body (ULB) vacuum tanker for emptying faecal sludge from containment systems of the households as there are no private operators from Nawabganj. The ones operating from Unnao are not interested in providing emptying services in Nawabganj due to long distance. City has narrow and congested roads, however, manual scavenging was not observed during field observation and KII with households. Hence, its effect is not considered while generating the SFD graphic due to

insufficient data. The tanker owned by ULB is of 5,000 litres capacity, equipped with a motorised pump and a 250 ft (76,2 m) long hose pipe to access containment systems in narrow roads and congested areas (Figure 5). Desludging is usually carried out by 2 people (1 Driver + 1 Helpers) and a fee of 13 – 20 \$<sup>9</sup> per trip is charged. The variation in fees depends upon the size of the containment system and the extent of solidification of sludge at the bottom. Emptying of containments in Nawabganj is done on demand basis and, on an average, 1 trip every month is completed<sup>10</sup>.

The frequency of emptying varies from 6 to 8 years and can go up to 20 years for larger containment systems. Hence, it was observed that households are taking too long to get their containments emptied. Hence, it was assumed that the population using their systems with emptying (variable F3) is taken as 50% for all sanitation systems.

**Transportation:** The emptied Faecal Sludge (FS) is transported using a tractor-mounted vacuum tanker. These vehicles cover a distance of 1-2 km per trip on an average<sup>11</sup> after desludging from the households and they decant the emptied FS in the nearby agricultural/open fields. In the KII with the vacuum tanker operator, it was revealed that the time taken for emptying and discharge of FS is 1-2 hours on an average. None of the FS getting emptied is delivered to the nearby Faecal Sludge Treatment Plant (FSTP) at Unnao. Moreover, the supernatant from the septic tanks and fully lined tanks flows in the open drains which ultimately reaches a pond nearby. Therefore, variables F4 and S4e set to 0% for all sanitation systems.

<sup>7</sup> Field observations from visits to different Community & Public Toilet, 2020.

<sup>9</sup> Based on KII with ULB vacuum tanker driver.

<sup>10</sup> Based on KII with ULB vacuum tanker driver and ULB records.

<sup>11</sup> KII with private emptying operators.



Figure 6: Pond for FS disposal.

*Treatment/Disposal:* Nawabganj has no designated site for the disposal of FS<sup>12</sup>. Therefore, in the absence of such provision, the vacuum tanker operator discharges the faecal sludge in nearby agricultural fields/pond<sup>13</sup> (Figure 6). Usually, local farmers allow them to discharge the FS on their farm lands, which is later used by farmers as a soil conditioner. Sometimes, farmers tip them on discharging FS regularly in times of need. Since there is no proper treatment of emptied FS as well as for wastewater, variables F5 and S5e are set to 0% for all sanitation systems.

## 5 Data and assumptions

Census 2011 was considered as the baseline and the data for all the stages of sanitation chain were updated based on the data collected from field through KIIs, FGDs, observations and secondary data collected from relevant stakeholders. Following assumptions were made for developing the SFD graphic for Nawabganj.

- 80% of water supplied is wastewater generated.
- The proportion of FS in septic tanks, fully lined tanks and lined tanks with open bottom/all types of pits (step two of the Graphic Generator) was set to 50%, 50% and 50%, respectively, as per the guidance given in the Frequently Asked Questions (FAQs) in the Sustainable Sanitation Alliance (SuSanA) website.

## 6 Context-adapted SFD Graphic

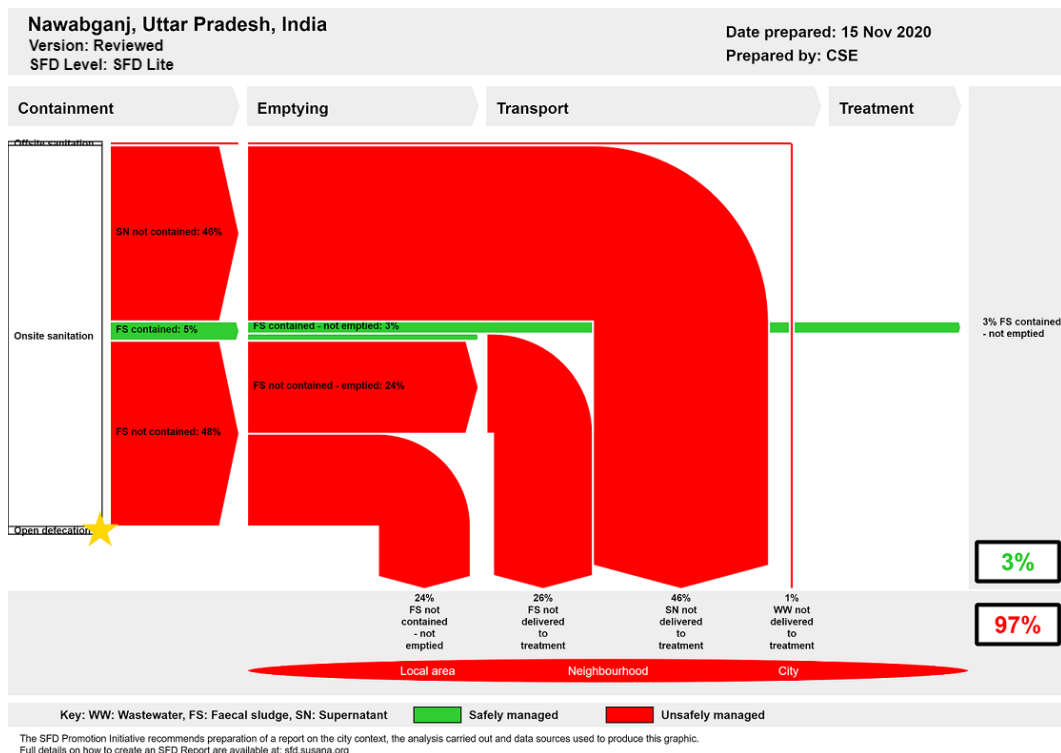


Figure 7: Context-adapted SFD Graphic for Nawabganj.

<sup>12</sup> KII with Executive Officer, BNP.

<sup>13</sup> Field observation, 2020.

The only difference suggested in the context-adapted SFD is at containment stage (Figure 7). The FS portion of correctly designed septic tanks is considered as safely managed, even though connected to open drains. The supernatant is considered as unsafely managed. So, the final percentage for safely managed excreta becomes 3% and the unsafely managed excreta goes to 97%.

## 7 List of data sources

### Reports and literature

- District Census Handbook 2011 for Nawabganj (Houses and household amenities and assets table HH-08: percentage of households by availability of the type of Latrine Facility <http://censusindia.gov.in/DigitalLibrary/MFTableSeries.aspx>
- District Census Handbook 2011 (Population Census Abstract Data Table (India & State/UTs-Town/Village/WardLevel) [http://censusindia.gov.in/2011census/population\\_enumeration.html](http://censusindia.gov.in/2011census/population_enumeration.html)
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### Key Informant Interviews (KII)

- Executive Officer, NNP.
- Computer Operator, NNP.

### Focus Group Discussions (FGD)

- Masons.
- Ward members.

### Field Visits

- Public and Community toilets.
- Nullah tapping locations.
- Sewage Treatment Plants.
- Random household survey.

SFD Promotion Initiative

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