SFD Lite Report

Noorpur
India

This SFD Lite Report was prepared by
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1 The SFD Graphic

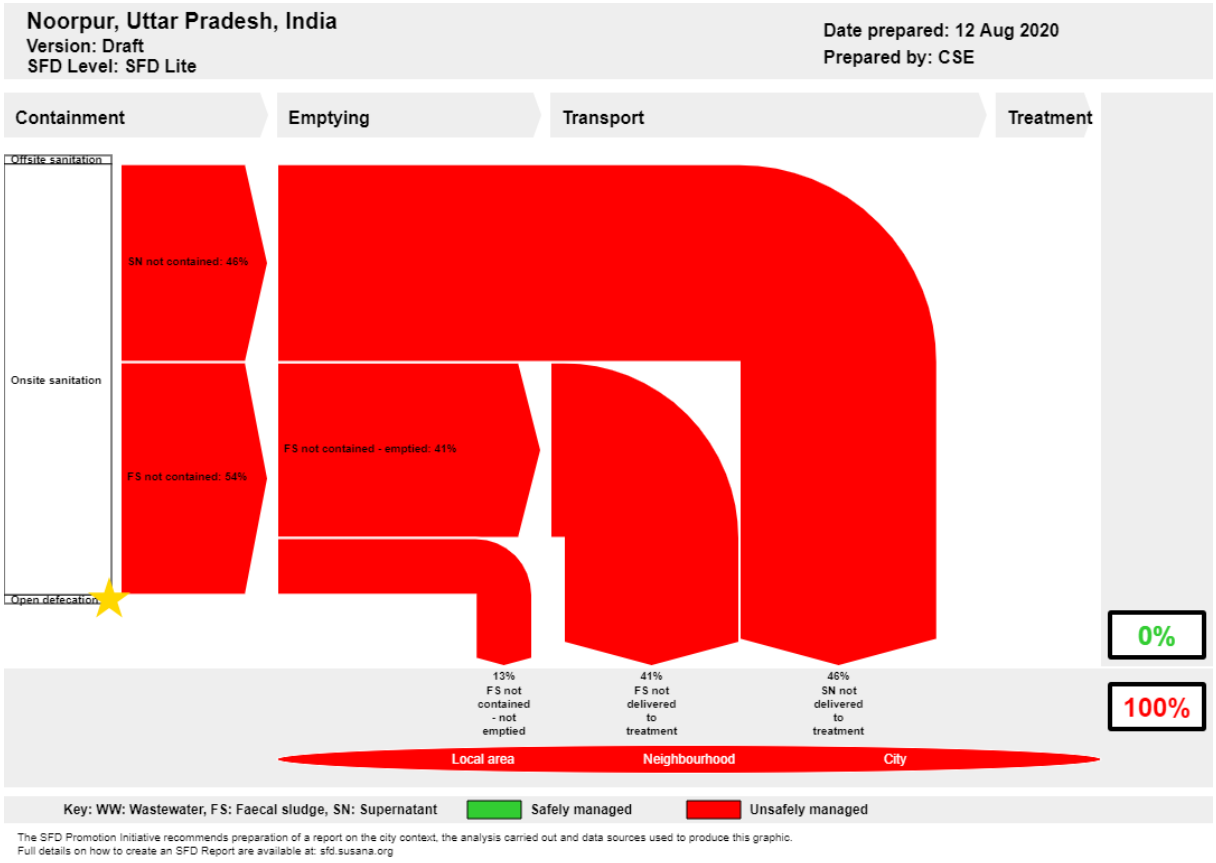

Figure 1: SFD Graphic for Noorpur

2 SFD Lite information

Produced by:

- Centre for Science and Environment, New Delhi.
- This report is compiled as part of SFD Promotion Initiative project funded by Bill and Melinda Gates Foundation (BMGF). We would like to thank Mr Durgeshwar Tripathi, Executive Officer, Mr Veer Singh, Head Clerk, Mr Jarar Ahmed, Engineer and Mr Ashfaq Hussain for supporting and providing the data required and cooperating for Key Informant Interviews (KIIs) & Focussed Group Discussions (FGDs).
- This report would not have been possible without constant support of Nassir Hussain, Coumputer Operator, Rajender Singh, field staff and Pawan, Safai Incharge who helped in conducting sample surveys and FGDs in field.

Collaborating partners:

- Noorpur Nagar Palika Parishad, Noorpur, Uttar Pradesh.

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3 General city information

Noorpur is a small town in Bijnor District, Uttar Pradesh and is located 38 km South-East of Bijnor city, District Headquarters. According to Census 2011 Noorpur has a population of 38,801 residing in 6,324 households (HHs). The population of the city as per *Swachh Survekshan* (Country wide annual ranking mechanism for cities with respect to sanitation) conducted in 2019 is 43, 500 corresponding to 7096 HHs.[1] This population is used for the preparation of SFD. The urban local body governing the town is Noorpur Nagar Palika Parishad (NNPP) or Noorpur Municipal Council. NNPP has an administrative area of 1.55 sq.km which is divided into 25 wards. The density of the city is 36,500 people per sq.km which is very high in comparison to the state density of 828 people per sq.km.[2]

The geographical coordinates of Noorpur are 29°09'05.8" North and 78°24'13.0" East. The topography of Bijnor district is majorly plain. It is elevated 225 metres above sea level. The average rainfall is 999.4 mm. The temperature rises to 46°C and drops to 6°C. The soil type is clayey and sandy with occasional gravel and boulder.[3] Table 1 shows the population growth in Noorpur in past three decades.

Table 1: Population growth rate Noorpur City

Census Year	Population	Growth Rate (%)	Source
1991	22235	7.83	Census 1991
2001	33590	5.1	Census 2001
2011	38806	1.55	Census 2011
2020	43500	1.2	Swachh Survekshan, 2019

4 Service outcomes

Table 2: SFD Matrix for Noorpur

Noorpur, Uttar Pradesh, India, 12 Aug 2020. SFD Level: SFD Lite
Population: 43500
Proportion of tanks: septic tanks: 50%, fully lined tanks: 50%, lined, open bottom tanks: 50%

System label	Pop	F3	F4	F5	S4e	S5e
System description	Proportion of population using this type of system	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
T1A2C6 Septic tank connected to open drain or storm sewer	30.0	80.0	0.0	0.0	0.0	0.0
T1A3C6 Fully lined tank (sealed) connected to an open drain or storm sewer	62.0	80.0	0.0	0.0	0.0	0.0
T2A5C10 Lined pit with semi-permeable walls and open bottom, no outlet or overflow, where there is a 'significant risk' of groundwater pollution	8.0	50.0	0.0	0.0		

[1] KII with project manager Swachha Bharat Mission (SBM)
[2] District Census Handbook 2011 for Bijnor (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

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

4.1 Offsite systems

As per city officials of Noorpur Nagar Palika Parishad the city never had any sewer network. The city is completely dependent on on-site sanitation systems which may or may not be connected to open drains. The open drains in the city ends up either in low lying areas near Moradabad road or into the Bann River which flows 2 kilometer away from the city.[4] 51% of the HHs of the city are connected to piped water supply and remaining HHs are either dependent on government handpumps or self owned submersible systems[5,6].

Figure 2: Open Drains overflowing in to low lying areas/open fields. (Harsh/CSE/2020)

4.2 On-site Sanitation systems

Figure 3: A septic tank under construction. (Harsh/CSE/2020)

Figure 4: A fully lined tank connected to open drain. (Harsh/CSE/2020)

Containment: Based on KIIs & FGDs with relevant stakeholders and sample HH survey, it was concluded that 100% population of the city is dependent on Onsite Sanitation Systems (OSS). The two most prevalent OSS in Noorpur are Fully lined tank (FLT) connected to open drain (T1A3C6, 62%) and Septic tank (ST) connected to open drains (T1A2C6, 30%).[7,8,9] These type of containment systems are present universally all over the city as also observed during field survey. FLTs are either square or rectangular in shape whereas septic tanks are 2-3 chambered tanks. According to the District Project Manager (DPM), Swachh Bharat Mission (SBM), 860 Individual Household Latrines (IHHL) have been provided to HHs having no toilets or to HHs with insanitary toilets or to HHs which had no containments as on February 2020, under SBM. Most of the septic tanks, observed in sample HH survey, do not adhere to the standards prescribed by the Bureau of India Standards (BIS). The size of the tanks is generally decided by the factors like space availability and economic status of the HH. The average size of the containment system as observed on ground and discussed in FGDs varies from 2 cubic meter to 10 cubic meters.[10,11,] The minimum and maximum depth of the tanks is ranging from 1.5 to 3.5 meters. [12] The third containment type in the city which was commonly seen in

[4] KII with senior Clerk NNPP and FGD with drain cleaners and sanitation workers
[5] KII with Executive Officer NNPP
[6] KII with Engineer Jal Kal NNPP
[7] FGD with Manual emptiers
[8] FGDs with sanitation workers
[9] HH sample survey and liscensed government masons
[10] Field observations during sample HHs survey
[11] FGDs with manual and mechanical emtiers.
[12] FGDs with mason.

low income settlements like *Ravidas Colony, Banjaraan and Islam Nagar* are the lined pit with semi-permeable walls and open bottom (LSO), no outlet or overflow (T2A5C10, 8%)[13]. These containments were the upgraded versions of the containments which were earlier unlined pits[14].

As per the data received from NNPP there are four Community toilets (CTs) and two Public Toilets (PTs) in the city which are maintained by NNPP.[15] As the city is celebrating open defecation free status, CTs are not being used much as there is hardly any HH with no toilet now. PTs are generally used for urination. The containments of PT and CTs had a capacity of around 11 cubic meter and were 3 meter deep.[16]

Emptying: The city is dependent on private emptying operators and manual emptiers for emptying faecal sludge (FS) from OSS. There are five private desludging operators in the city who provide emptying services through mechanical means.[17] Wards like 1, 7, 10 and 13 have congested roads that makes it difficult for emptying using desludging vehicles, hence, manual emptying is prevalent in these parts of the city.There are around 50-70 HHs of manual emptiers in the city. A few manual emptiers also work on contract with NNPP during some months of the year[18].

Figure 5 : Emptying in process by mechanical means (Harsh/CSE/2020)

Figure 6: Advertisements by private emptiers (Harsh/CSE/2020)

The mechanical desludging is usually carried out by 3 people (1 Driver + 2 Helpers) and a fee of INR 1500 – 3000 (20-40 USD) 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. Most of private emptiers operate from Sarodha Village (Chandpur), which is nearly 10 kilometres away from the city. Emptying in Noorpur is done on demand and on an average 3 trips are done per day in the city.[19] Advertisements of emptiers could be seen on electric poles, wall paintings, etc (figure 6). The manual emptiers don't do any formal advertisement but run their services strictly on word of mouth basis to

[13] Field obsevations in sample HH survey
[14] FGDs with local masons and manual emptiers.
[15] KII with senior clerk NNPP
[16] FGD with sanitation workers
[17] FGD with private operators
[18] FGD with manual emptiers
[19] FGD with private emptiers and HH sample survey

avoid any legal issues. For emptying a tank of 6 cubic meter capacity a group of 3 to 5 manual emptiers is required. An emptying fees of around 2500 to 3500 INR is charged by the manual emptying group in this case[20].

Most of the people get their tanks emptied, but not in a scheduled manner, the frequency of emptying varies from 5 to 7 years. Hence it was assumed that HHs that are taking too long to get their tanks emptied are rather using their systems without emptying hence the population using their systems with emptying (F3) is estimated to be 80% for FLTs and STs and 50% for lined pits with semi permeable walls and open bottom.

Figure 5: FGD with manual emptiers (Harsh/CSE/2020)

Figure 6: NNPP vacuum tanker parked in garrage (Harsh/CSE/2020)

Transport: NNPP owns one vacuum emptying tanker which has never been used as the tractor required for pulling the tanker is not available[21].

There are five private desludging operators in the city who have seven tractor mounted vacuum tankers. The vacuum tankers are equipped with a motorised pump, storage tank of 2500 to 5000 L capacity and a 200 ft long hose pipe to access containment systems in narrow roads and congested areas. If the containment system is not approachable even with 200 ft hose pipe, they reject those sites.[22] In such a case HHs have to depend on manual emptiers, who generally use jerry cans stacked on hand cart to transport emptied faecal sludge.[23] Since, there is no functional treatment system in the city, both FS and SN does not get delivered to any treatment facility. Therefore variable S4e and F4 shows 0% delivered in SFD matrix.

Treatment/ Disposal. NNPP has no designated site for discharge of FS. The mechanical emptiers usually discharge FS in open fields or low lying areas near highways. Manual emptiers generally work at night and dispose the FS in nearby open drains or at an empty plot. The supernatant from T1A2C6 and T1A3C6 flows in open drains which finally ends in open fields or Bann River outsite city boundaries. As there is no treatment facility in the town the variable S5e and F5 both are considered 0% in SFD matrix.

[20] FGD with manual emptiers
[21] KII with senior Clerk NNPP
[22] FGD with Private Emptiers
[23] FGD manual emptiers

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, secondary data collected from relevant stakeholders. Following assumptions were made for developing the SFD for Noorpur.

- 80% of water supplied is wastewater generated
- 50% of the contents of tanks and pits is Faecal sludge
- HHs getting their systems emptied in less than 7 years are considered to be using their system with emptying and those who are taking more than 7 years are considered as good as not emptying their systems.

6 Context Adapted SFD Graphic

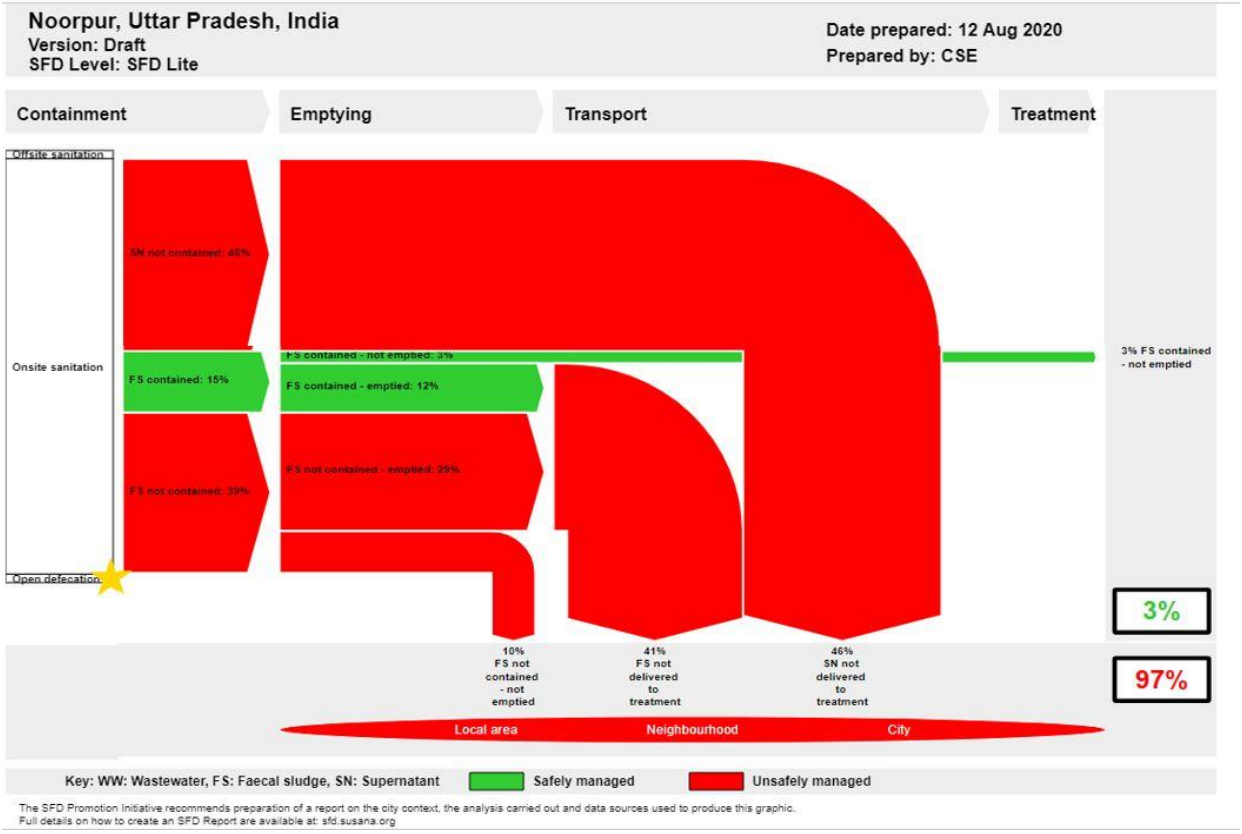

Figure 7: Context adapted SFD Graphic for Noorpur

The only difference suggested in the context adapted SFD Graphic is at containment stage for correctly designed septic tanks, though connected to open drains. With an earlier assumption of 50% of the proportion of the content of the septic tank which is solid FS, generated and collected inside the septic tanks. 50% of the content is supernatant which attributes to be 15% of the population flows through open drains hence, not contained. The solid FS collected in the septic tank is considered to be contained and hence 15% of FS is contained (represented green in colour at containment stage). Followed by this, 12% FS contained is emptied, remaining 3% is FS remains in the tank which is contained and never emptied. The supernatant generated from the septic tank connected to open drain is not contained and hence considered to be unsafely managed (represented red in colour). Overall, excreta of 97% population is not managed according to the context adapted SFD.

7 List of data sources

Reports and literature

- District Census Handbook 2011 (Population Census Abstract Data Table (India & State/UTs-Town/Village/WardLevel) http://censusindia.gov.in/2011census/population_enumeration.html
- Ground Water Brochure Bijnor District, U.P. (2014).
- Swachhta Sarvekshan 2020, Ministry of Housing and Urban Developmen MoUD. 2014.
- Guidelines for Swachh Bharat Mission.: Ministry of Urban Development. Government of India.
- MoUD. 2013. Septage Management in Urban India. Ministry of Urban Development, Government of India.

Key Informant Interviews (KII)

- DPM Swachh Bharat Mission, Bijnor District
- Senior Clerk, NNPP
- Junior Engineer Civil, Jal-Kal, NNPP
- Executive Officer, NNPP

Focus Group Discussions (FGD)

- Masons
- Private desludging operators
- Manual emptiers
- Sanitation workers, NNPP

Field Visits

- Public and community toilets
- Open drains outfall
- Residential areas
- Faecal sludge discharge sites

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