



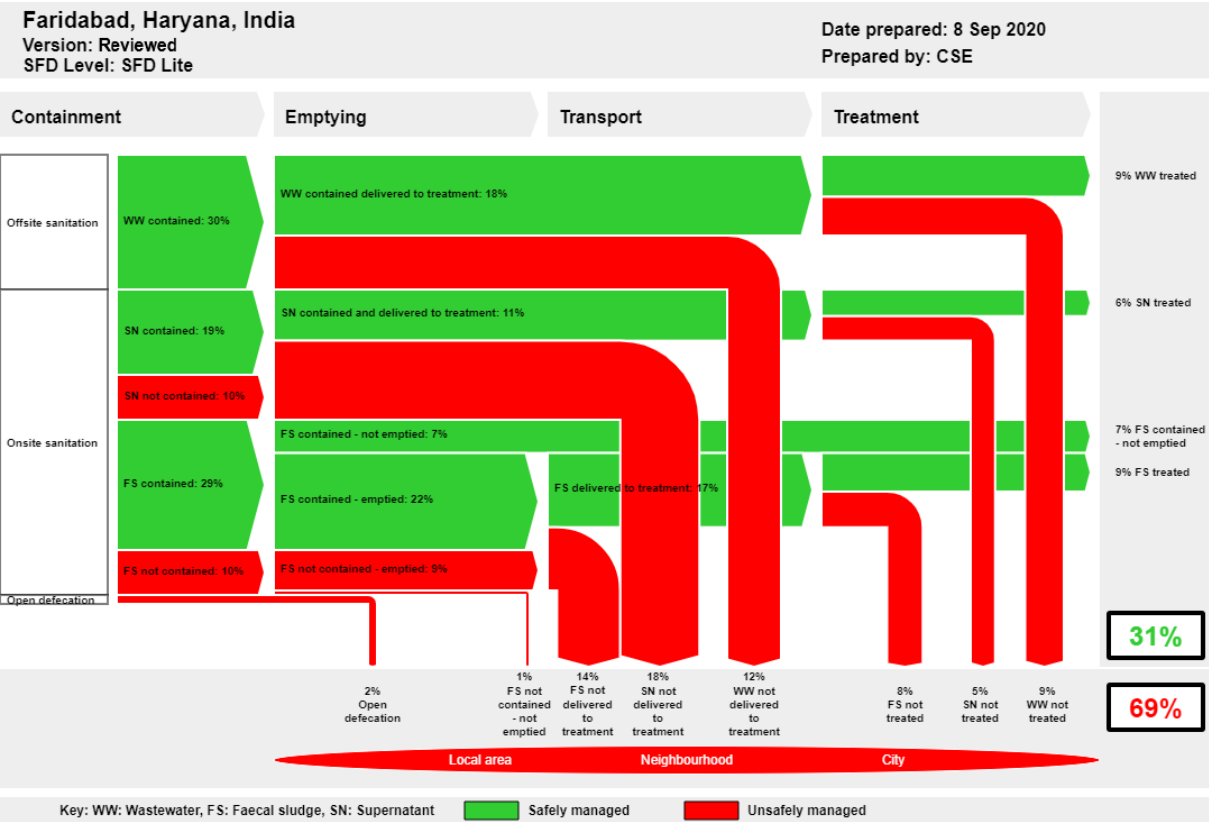
SFD Lite Report

Faridabad India

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

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1 The SFD Graphic



The SFD Promotion Initiative recommends preparation of a report on the city context, the analysis carried out and data sources used to produce this graphic. Full details on how to create an SFD Report are available at: sfd.susana.org

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 Yash Garg (IAS), Municipal Commissioner, Municipal Corporation Faridabad; Dr. Garima Mittal (IAS), CEO, Smart City, Faridabad; Dr Uday Bhan, Medical Health Officer, Municipal Corporation Faridabad; Sh. Shyam Singh, Nodal Officer for Swacch Bharat Mission; Sh. R.S Dahiya, Sanitary Inspector, Faridabad Municipal Corporation; Mr Mukesh Sharma, Clerk, Faridabad Municipal Corporation for providing all the required secondary data and cooperating for Key Informant Interviews (KIs) & Focus Group Discussions (FGDs).
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Collaborating partners:

- Municipal Corporation Faridabad, Faridabad, Haryana, India

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3 General city information

Faridabad, the south-eastern district in the state of Haryana, was founded in 1607 AD by Sheikh Farid, the treasurer of the Mughal Emperor Jahangir, with the object of protecting the Grand Trunk Road, now called Delhi-Mathura National Highway-2 (Shershah Suri Marg). Faridabad is located at mean elevation of about 205 msl at 28.43°N 77.32°E on the plains of the river Yamuna bordered by the river to the east and Aravali hills towards the west and southwest. Yamuna is the only main river that flows through the eastern boundary of the district. Agra canal which originated in Okhla, Delhi flows through Faridabad before finally joining Banganga River¹

Faridabad District is divided into three sub-divisions viz. Faridabad, Ballabgarh, and Badkhal each headed by a Sub Divisional Magistrate (SDM). The Municipal Corporation of Faridabad (MCF) provides the urban civic services to the citizens of Faridabad City. According to the 2011

| Census Year | Population | Growth Rate (%) | Source |
|-------------|-------------|-----------------|-------------------------------------|
| 1991 | 6,25,085 | - | DPR for Sewerage Pattern, Faridabad |
| 2001 | 10,55,938 | 6.89 | Census 2011 |
| 2011 | 14, 14,050 | 3.39 | Census 2011 |
| 2020 | 18, 33, 000 | 2.96 | Faridabad Municipal Corporation |

Table 1: Population Growth rate Faridabad city Source: (MCF, 2020), (Census, 2011)

census, the population of the city was 14,14,050² and the total no. of households (HH) was 287848¹ and spread across an area of 207.88 sq Km. The current population of the city is 18.33 lakhs³ and the total no. of households (HH) is 3,57,315 which is divided into 40 election wards. The water supplied in the city is predominantly through Raney well and tubewells. The total water supply in the city is 247 MLD with per capita water supply of 135 LPCD (KII-1, 2020)

Faridabad has a tropical steppe climate⁴ the maximum temperature in summers of 39°C and min temperature in winter less than 8°C and annual rainfall of about 542 mm (mostly June-September). Surajkund and Badkhal are two major lakes which is a major tourist attraction in the city. The risk of groundwater level⁵ in the city is low as the level ranges from 25 meters to 106 meters below ground level. In the last 27 years, it has consistently declined at an annual average rate of 0.50 mts.

¹ Municipal Corporation Faridabad, 2020

² Census 2011

³ ULB sanitation data, MCF 2020

⁴ District Disaster Management Plan, 2017

⁵ Central Ground Water Report, Faridabad, 2013

4 Service outcomes

Faridabad, Haryana, India, 8 Sep 2020. SFD Level: SFD Lite

Population: 1833000

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

| System label | Pop | W4a | W5a | F3 | F4 | F5 | S4d | S5d | S4e | S5e |
|--|--|--|--|---|---|---|---|---|---|---|
| System description | Proportion of population using this type of system | Proportion of wastewater in sewer system, which is delivered to centralised treatment plants | Proportion of wastewater delivered to centralised 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 sewer system, which is delivered to treatment plants | Proportion of supernatant in sewer system that is 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 |
| T1A1C2 Toilet discharges directly to a centralised foul/separate sewer | 30.0 | 60.0 | 52.0 | | | | | | | |
| T1A2C2 Septic tank connected to a centralised foul/separate sewer | 18.0 | | | 90.0 | 54.0 | 52.0 | 60.0 | 52.0 | | |
| T1A3C2 Fully lined tank (sealed) connected to a centralised foul/separate sewer | 20.0 | | | 90.0 | 54.0 | 52.0 | 60.0 | 52.0 | | |
| T1A3C6 Fully lined tank (sealed) connected to an open drain or storm sewer | 20.0 | | | 90.0 | 54.0 | 52.0 | | | 0.0 | 0.0 |
| T1A4C10 Lined tank with impermeable walls and open bottom, no outlet or overflow | 5.0 | | | 90.0 | 54.0 | 52.0 | | | | |
| T1A5C10 Lined pit with semi-permeable walls and open bottom, no outlet or overflow | 5.0 | | | 90.0 | 54.0 | 52.0 | | | | |
| T1B11 C7 TO C9 Open defecation | 2.0 | | | | | | | | | |

Table 2: SFD Matrix for Faridabad

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

4.1 Offsite Systems

The sewerage network has been laid in the city within the administrative boundary of Faridabad with total 638 km of sewerage network which accounts for 30% city's population⁶ (Field Observation; KII-2, 2020; KII-3, 2020) but wards pipelines are under repair. Rest 70% of city's population is dependent on hybrid system of on-site containment systems (OSS) a Septic tank and fully lined tank, whose outlet is connected to sewer lines & open drains respectively (Field Observation; FGD-1, 2020; FGD-2, 2020)



Figure 1: Pratappgarh STP (Source: Niharika/CSE, 2020)

⁶ Faridabad ULB Data, 2020

There are 11 intermediate sewage pumping stations and 3 main pumping stations⁷ with 3 STPs in the city having an installed treatment capacity of 140 MLD (KII-8, 2020; KII-9,2020). The STPs are based on UASB and SBR technology. As per the current scenario, ~60% of the wastewater is reaching to the STPs⁸ (W4a, S4d) considering the leakages from old defunct sewer lines which finds its way to either open drains, canal or River Yamuna (KII-5, 2020). There are 2 main nallahs in the city namely Budhiya nallah & Gaunchi nallah⁹ that ends up directly flowing into river Yamuna. While, all open drains in the city are tapped and diverted into sewer line (KII-4,2020) but that also ends up in open canals to River Yamuna (Field observation; KII-5, 2020; FGD-2, 2020). Presently, around 117 MLD is reaching to the inlet of STP out of 197 MLD of total water supply (247 MLD) which is in compliance to total treatment capacity of 140 MLD. Therefore, varaibale W4a & S4d is considered 60% in SFD matrix.



Figure 2: Untreated wastewater in Canal is flowing through the city (Source: Niharika/CSE, 2020)

4.2 On-site Sanitation Systems

Containment: Based on sample household survey, KIIs and FGDs with relevant stakeholders, it was concluded that 70% population is dependent on the On-site Sanitation Systems (OSS) (Field Observation; KII- 4, FGD-1, 2020; FGD-2, 2020). The containment systems prevalent in the city are septic tank (ST) connected to centralised foul/separate sewer (T1A2C2, 20%), fully lined tank (FLT) connected to centralised foul/separate sewer (T1A3C2, 20%), fully lined tank (FLT) connected to open drain or storm sewer (T1A3C6, 20%), Lined tank with impermeable walls and open bottom, no outlet or overflow (T1A4C10, 5%) and Lined pit with semi-permeable walls and open bottom, no outlet or overflow (T1A5C10, 5%) (Field Observation; FGD-1, 2020; FGD-2, 2020).



Figure 3: Septic Tank connected to sewer line in Ward no. 4 (Niharika/CSE, 2020)



Figure 4: Lined Pits in a HH (Ward no. 6) (Niharika/CSE, 2020)

The general size of STs and FLTs varies from 5 – 12 ft * 4 – 8 ft * 6 – 15 ft, depending upon the household size, income level, community, etc (Field Observation; FGD-1, 2020; FGD-2, 2020). Based on the size, the construction cost varies from INR 10 K to INR 50 K (FGD-1, 2020). The septic tanks are two to three chambered with proper partition walls including plastered bottom whereas the FLTs are single chambered with impermeable walls & sealed vaults.

Community Toilets/Public Toilets: There are 29 PTs and 27 CTs¹⁰ in Faridabad which have ST/FLT connected to sewer line. There are around 216 precast toilets and 09 Mobile toilets in the city (KII-8,

⁷ Revamping of Sewerage System & Sewage Treatment Works in Faridabad under JNNURM Detailed Project Report, 2011

⁸ Faridabad Smart City Data, 2020

⁹ Status report of State of Haryana to OA06, 2020

¹⁰ List of PT/CT Municipal Corporation Faridabad, 2020

2020). The average size of septic tanks in community toilet is 25 x 15 x 25 ft which is emptied once in a month or once in a year. The commercial buildings, Public Toilets (PTs)/ Community Toilets (CTs) and residential apartments have either direct sewer connections or ST/FLT connected to sewer lines (Field Observation; FGD-1, 2020; FGD-2, 2020).



Figure 5. Swacch Public Toilet opposite MCF Office in Ward no. 15 (Source: Niharika/CSE, 2020)



Figure 6: PT near Sabzi Mandi in Ballabgarh (Source: Niharika/CSE, 2020)

As per 2011 census, 9% of the population was defecating in open but Municipal Corporation Faridabad has constructed PT/CTs & individual household laterines(IHHL) 15687¹¹ in numbers across the city especially for Below Poverty Line (BPL) near low income settlements and as a result, the city has achieved ODF status¹² on 02/08/2019 (KII-6, 2020; KII-7, 2020). Under SBM, there is a proposal for the new construction of 47 (CT) and (80) PT¹³ in the city (KII-7, 2020). However, people living in slums and low income settlements are resorted to defecate in open due to poor accessibility & infrastructure or lack of maintainence in toilets (Field Observation; FGD-3, 2020)

Emptying: The city is dependent on Govt./Private operated mechanised desludging services for emptying of faecal sludge from STs/FLTs/ Lined tanks/ Lined pits (Field Observation; FGD-2, 2020). The emptying frequency varies from 6 months to 2 years (demand based) across the city depending upon the nature and the size of containment system (FGD-2, 2020). During field visits, it has been observed that a significant proportion of population empties their STs /FLTs/Lined tanks/ Lined Pits within 6 months or even 4 times in a year. There are total 18 government operated vacuum tractors and 26 registered private operated vaccum tractors plying in the city. Each of these vacuum tractors are equipped with motorised pumps and have a storage capacity of 5000-6000 L. This even include non-registered private vaccum tankers plying in the city. In order to carry out the work in narrow and congested areas, these vehicles are equipped with ~120 ft long hose. Due to frequent emptying services, the variable F3 is considered 90% in SFD matrix



Figure 7: Emptying of ST by Private vacuum tractor (Source: Niharika/CSE, 2020)

¹¹ Swacch Bharat Mission- Gramin, Annual Implementation Plan, 2018-2019

¹² ODF status, MCF, 2020

¹³ List of Proposed PT/CT in Faridabad, MCF, 2020

There are no charges by Govt operated vacuum tractors whereas private operators charge the varying fees from INR 500-1000/ trip based on property type & containment size (FGD-2, 2020). The desludging services for the public and community toilets is carried out periodically by the service providers of Faridabad Municipal Corporation and hence are free of cost (FGD-3, 2020). All the emptying vehicles are maintained properly by Faridabad Municipal Corporation at the designated depot (Field Observation). The emptiers are not provided with Personal Protective Equipments (PPEs) for carrying out safe emptying services (FGD-3, 2020)



Figure 8: Manual scavenging in ward no. 17 (Source: Niharika/CSE, 2020)



Figure 9: Sewer cleaning in ward no. 12 (Niharika/CSE, 2020)

Manual scavenging is prevalent in the city in case of containment/sewer clogging (FGD-3, 2020). In general 2 to 3 labourers are required and charged around INR 500- INR 1000 and the cost increases based on size of containment and number of labourers required. Mainly a person without any safety gears goes in and removes the sludge & solid material using sapde/buckets which is loaded into a tractor (FGD-3,2020).

Transportation: The emptied septage is transported through the tractor mounted vacuum tankers. The average time taken to dispose emptied septage is around ~30 minutes (FGD-2, 2020). Around 5 to 6 trips per day are made by each vehicle (FGD-2, 2020). The faecal sludge (FS) emptied by Govt/ private operated vacuum tractors is discharged into designated disposal sites/nallahs instructed by Faridabad Municipal Corporation while private operators discharged Faecal sludge either in open fields or ground (FiledObservation; FGD-2, 2020). Therefore , the variable F4 is considered 54% in SFD matrix.



Figure 10: Private Vacuum Tankers (Source: Niharika/CSE, 2020)

Treatment/Disposal: The treated wastewater is either used by private agencies or discharged into Budhiya nallah (KII-7, 2020; KII-8, 2020; KII-9, 2020). Both treated and untreated wastewater is discharged in River Yamuna based on STP performance (Filed observation; FGD-1, 2020). The sludge generated in STP is provided for horticulture use but without adhering to standards compliance. In some cases the dried sludge is also given to private agency contracted by Municipal Corporation Faridabad which is then further sold as manure (KII-8, 2020; KII-9, 2020). The lab report from the STP revealed that the discharge standards prescribed by Central Pollution Control Board (CPCB) are met by one of three STPs, as other 2 STPs are under construction. Therefore, varaibale W5a & S5d is considered 52% in SFD matrix.

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 KII, FGDs, field observations, secondary data collected from relevant stakeholders. Following assumptions were made for developing the SFD for Faridabad.

- 50% of the contents of Septic tanks and Fully lined tank is Faecal sludge.
- 80% of water supplied is wastewater generated.
- Proportion of OSS emptied is considered as 90% due to average emptying frequency of 3-4 times in a year.

6 List of datasources

Reports and literature

- District Census Handbook 2011 for Faridabad (Houses and household amenities and assets table HH-08: percentage of households by availability of the type of Latrine Facility <https://www.censusindia.gov.in/2011census/Hlo-series/HH08.html>)
- Central Ground Water Report, Faridabad, Haryana 2013
- District Disaster Management Plan, 2017
- IHHL, SBM data, Faridabad, Haryana (2019-2019)
- Faridabad Smart City Plan, 2031
- City Master Plan, Faridabad Municipal Corporation, 2031
- Revamping of Sewerage System & Sewage Treatment Works in Faridabad under JNNURM Detailed Project Report, 2011
- Housing for all plan of action under Pradhan Mantra Awaas Yojna, Faridabad Municipal Corporation, 2016
- List of Public Toilets/ Community Toilets/ Parks/ Recreational areas of Faridabad (SBM Data, Municipal Corporation)
- City Development Plan Faridabad, 2031
- Status report by State of Haryana to OA06, 2020
- MoSJE. 2014. The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 [18th September, 2013]. Ministry of Social Justice and Empowerment.
- MoUD. 2017. National Policy on Faecal Sludge and Septage Management. Ministry of Urban Development
- 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)

- KII-1, 2020; Interview with Dr Uday Bhan, Medical Health Officer & Air Pollution, Faridabad Municipal Corporation

- KII-2, 2020; Interview with Mr R.S. Dahiya, Sanitary Inspector, Department of Sanitation, Faridabad Municipal Corporation
- KII-3, 2020; Interview with Mr Dilbag Singh, P.A, to Smart City C.E.O, Smart City Office Faridabad
- KII-4, 2020; Interview with Mr Birender, Superintendent Engineer, Municipal Corporation Faridabad
- KII-5, 2020; Interview with Mr Subhash, Sewermen Union President, Faridabad Municipal Corporation
- KII-6, 2020; Interview with Mr Shyam Singh, Nodal Officer, SBM, Municipal Corporation Faridabad
- KII-7, 2020; Interview with Mr Mukesh Sharma, Computer operator cum Clerk, Sanitation Department, Faridabad Municipal Corporation
- KII-8, 2020; Interview with Mr Moti Ram, Plant operator, Pratapgarh STP
- KII-9, 2020; Interview with Mr Manoj, JE, Badshahpur STP
- **Focus Group Discussions (FGD)**
- FGD-1, 2020; Focus Group Discussion with masons
- FGD-2, 2020; Focus Group Discussion with Emptying Service Providers
- FGD-3, 2020; Focus Group Discussion with Sewermen Union

Field Observations

- Survey of Public toilet (4 nos) and community toilets (4 nos)
- Visit to 2 Sewage Treatment Plant and Pumping Stations
- Visit to approximate 75 households covering Lower Income Groups (LIG), Middle Income Groups (MIG) and Higher Income Groups (HIG) spread throughout the city.

Faridabad, India, 2020

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