SFD Lite Report

Jamalpur Municipality Bangladesh

This SFD Lite Report was prepared by
CWIS-FSM Support Cell, DPHE

Date of production/ last update: 19/04/2021
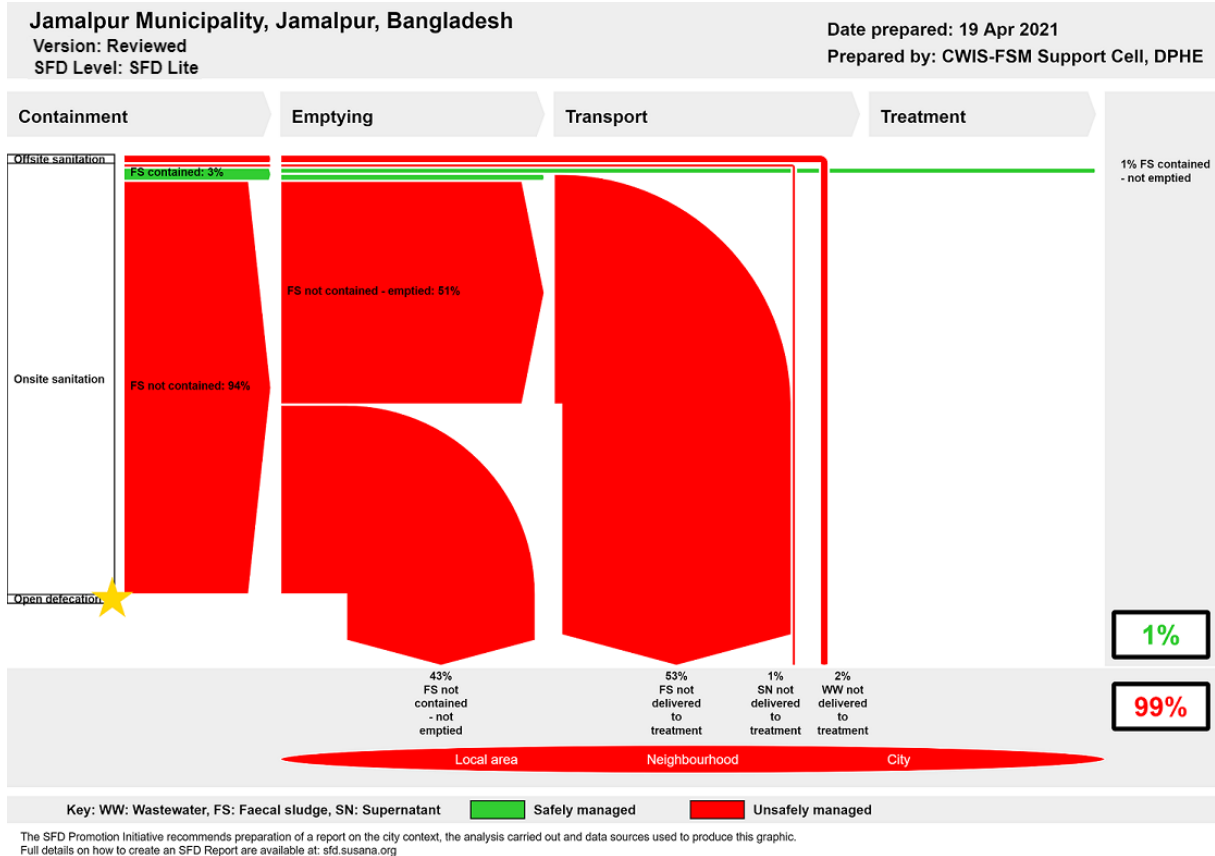
1 The SFD Graphic

Jamalpur Municipality, Jamalpur, Bangladesh
Version: Reviewed
SFD Level: SFD Lite

Date prepared: 19 Apr 2021
Prepared by: CWIS-FSM Support Cell, DPHE

Containment | Emptying | Transport | Treatment

Offsite sanitation
FS contained: 3%
1% FS contained - not emptied

FS not contained - emptied: 51%

Onsite sanitation
FS not contained: 94%

Open defecation

1%

99%

43% FS not contained - not emptied | 53% FS not delivered to treatment | 1% SN not delivered to treatment | 2% WW not delivered to treatment

Local area | Neighbourhood | City

Key: WW: Wastewater, FS: Faecal sludge, SN: Supernatant | Safely managed | Unsafely managed

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

Figure 1: SFD Graphic for Jamalpur municipality.

2 SFD Lite information

Produced by:

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- This report was compiled as part of the Baslene Survey of 61 Town project of DPHE. We would like to thank Mr. Mirza Shakawatul Alam Moni, Mayor, Jamalpur Municipality, Mr. Hafizur Rahman, Secretary, Jamalpur Municipality; Mr.Shurboto Tarafdar, Executive Engineer, and Jamalpur Municipality for providing all the required primary and secondary data and cooperating for Key Informant Interviews (KIIs) & Focussed Group Discussions (FGDs). This report would not have been possible to produce without constant support of Mr. Mirza Shakawatul Alam Moni, Mayor, Municipality, who helped in conducting sample surveys and FGDs in the field.

Collaborating partners:

- DevCon, Tiller and Jamalpur municipality played vital roles in collecting and sharing data, and producing this SFD graphic and SFD lite report.

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3 General city information

Jamalpur is a fast-growing city, which is 174 km away from the Dhaka city. It is beside the Brahmaputra River and well connected with road, rail and water. It is one of the oldest towns in the sub-continent and was declared municipality in 1869. Jamalpur is one of the 53 district level municipalities in the country.

Table 1: City profile.

Population parameters	
Estimated population, 2020	196,122
Households, 2020	44132
Area, sq.km	53.28
Total roads, km	205.66
Total drains, km	55.245

According to the population census in 2011 by the Bangladesh Bureau of Statistics (BBS), the Pourosova Population was 142,764. The urban population growth in Jamalpur is considered 2.5% per year. Considering 10% floating population, such as farmers and traders, comes to the city every day, the present (2020) population is estimated to be around 196,122.

The municipality covers an area of 53.28 square kilometres. At present, Jamalpur municipality has 205.66 km of road out of which 161.68 km is bituminous road, 24.93 km is Reinforced Cement Concrete (RCC) road, 3.05 km is HB soling road, and 16 km is earthen road. The city has about 55.245 km of drain which includes 43.50 km of pucca drain and 11.745 km of earthen drain (Table 1).

The geographical coordinates of Jamalpur are: 24° 20' 0" North, 88° 55' 0" East (Figure 2). In the context of Bangladesh, the municipality area is relatively highland. The Brahmaputra River passed east side of the municipality. The municipality falls in Physiographic Unit Brahmaputra floodplain. The general soil type is grey floodplain and non-calcareous dark grey floodplain soil.
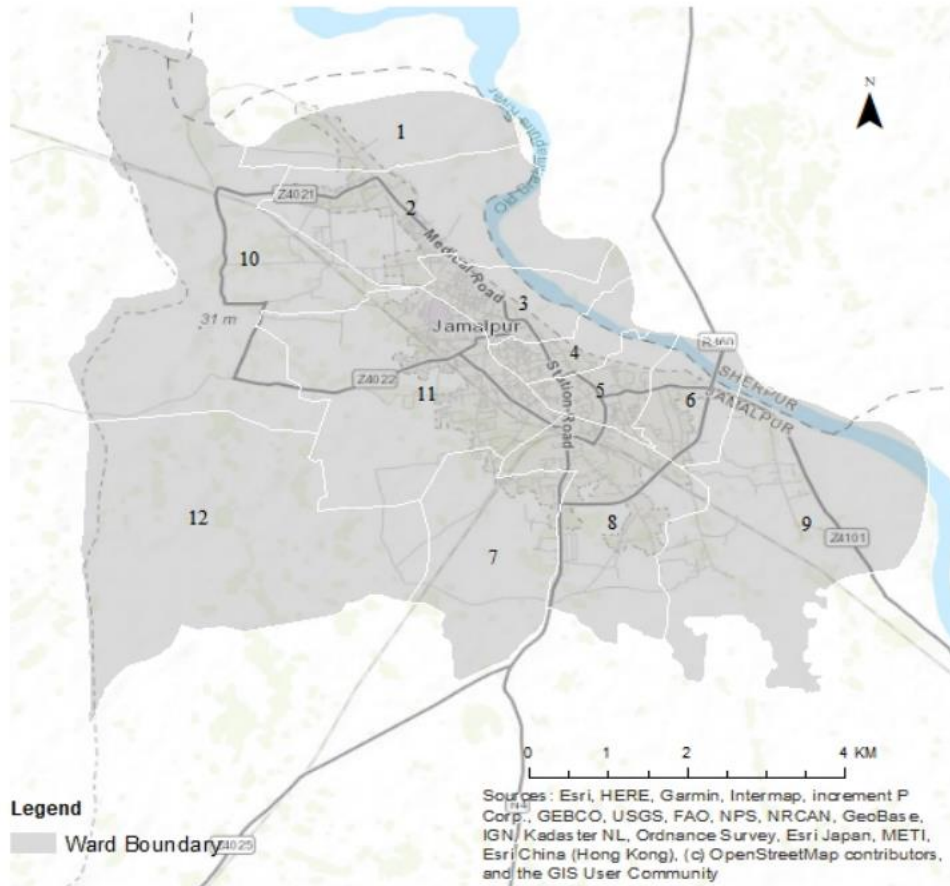

Figure 2: Jamalpur Ward Boundary Map.

According to the Bangladesh Meteorological Department, the city area and surrounding area experience a tropical monsoon climate. It is characterized by warm, humid summers and cool, and dry winters. About 90% of the total annual rainfall occurs in the period from May through October and the driest months of the year are November to March. The maximum mean temperature observed is 26.3-32.3°C between April-August, with the minimum mean temperatures of between 11.8-13.3°C in January. The annual average rainfall is about 2,253 mm, according to BMD (1981-2017).

The Brahmaputra River passed east side of the municipality. Bongshai canals, Goba canal and Bania bazar Khal flow through the city. According to the flood zoning map of Bangladesh (BMD, 2012), the city is in a flood-free zone (in the last 12 years no flooding event happened). However, the drainage network of the city is not adequate. Every year, many city areas face water logging during monsoon for drainage congestion. There are some secondary drains carrying stormwater and domestic wastewater to the outfalls of the rivers and canals.

The population density in the 9 wards of the city is shown in Figure 3. The density is high in the east, ranging from 10,001 to 12,559 per sq km. The population density in the east and west is lower, ranging from 1,150 to 2,500 per sq km.
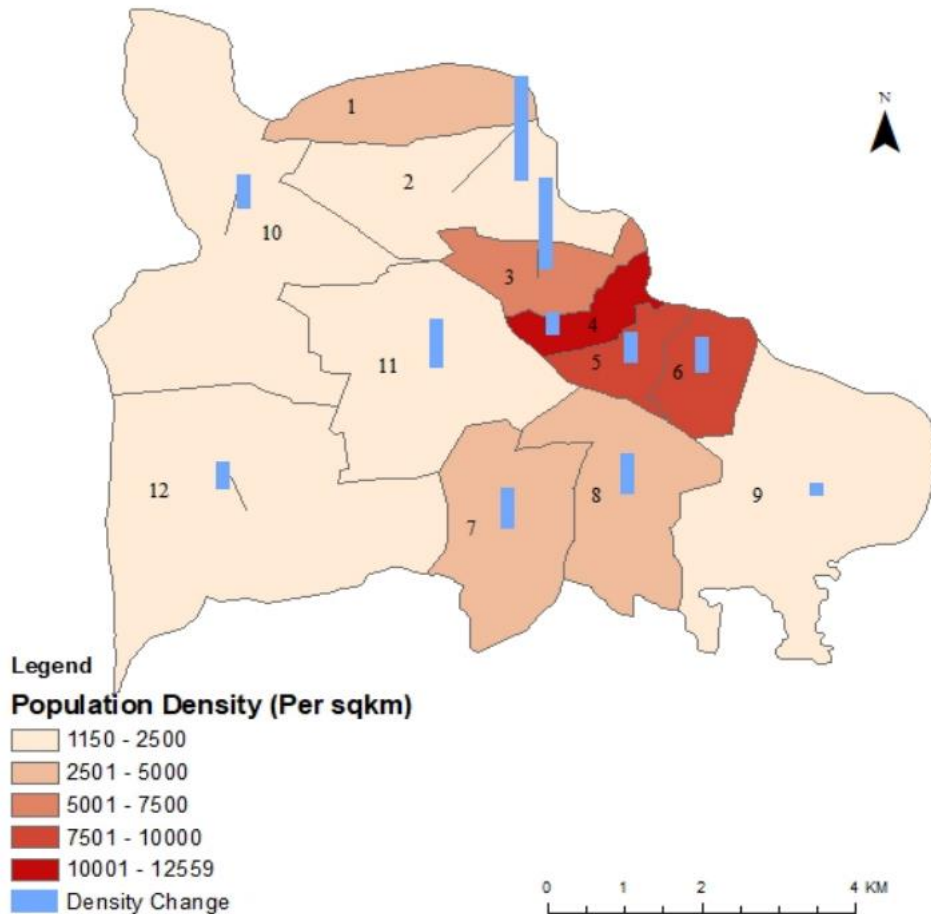

Figure 3: Population density in different Wards of Jamalpur municipality.

4 Service outcomes

Jamalpur Municipality, Jamalpur, Bangladesh, 19 Apr 2021. SFD Level: SFD Lite
Population: 196000
Proportion of tanks: septic tanks: 89%, fully lined tanks: 0%, lined, open bottom tanks: 100%

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
T1A1C6 Toilet discharges directly to open drain or storm sewer	2.0	0.0	0.0					
T1A2C5 Septic tank connected to soak pit	3.0			60.0	0.0	0.0		
T1A2C6 Septic tank connected to open drain or storm sewer	6.0			10.0	0.0	0.0	0.0	0.0
T1A2C7 Septic tank connected to open water body	10.0			10.0	0.0	0.0		
T1A2C9 Septic tank connected to 'don't know where'	9.0			10.0	0.0	0.0		
T1A4C8 Lined tank with impermeable walls and open bottom, connected to open ground	9.0			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	61.0			80.0	0.0	0.0		

Table 2: SFD Matrix for Jamalpur municipality.

The outcome of the SFD graphic shows that only one percent (1%) of the excreta flow is classified as safely managed, and the remaining ninety nine (99%) percent is classified as unsafely managed (Figure 1). The unsafely managed excreta originate from wastewater not delivered to treatment (2%), Faecal Sludge (FS) not contained - emptied but not delivered to treatment (53%), FS not contained - not emptied (43%) and 1% of supernatant not delivered to treatment.

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

4.1 Offsite Systems

The city does not have any dedicated sewerage system. However, during field observation and HouseHold (HH) survey, it was found that there are certain areas where toilets are directly connected to open drains or storm sewer. Similarly, a portion of septic tanks are directly connected to open drains or storm sewer. Therefore, T1A1C6 system is considered as 2% of the total population of the city to generate the SFD graphic. Similarly, T1A2C6 system is considered as 6% of the total population of the

city to generate the SFD graphic. In the absence of sewerage system, the faecal sludge in T1A1C6 and the supernatant in T1A2C6 are directly discharged into the river or the environment untreated.

4.2 On-site Sanitation Systems

The percentages presented in Table 2 and discussed in this section are based on data collected through household survey, key informant interviews (KIIs) and Focus Group Discussions (FGDs) (Figure 4).

Figure 4: Household survey and consultations. Left: Household survey. Right: Consultation meeting.

Containment: Almost all the households (98%) in the city have their own latrine which is connected to single pits, twin pits, or septic tanks. A portion of the septic tanks at household level are actually fully lined tanks and the major portions are properly designed septic tanks with high desludging period in community, institutions and public toilets. However, very few of the latrines are environmentally safe. From the household survey, it was found that 25% of the city population uses septic tanks as the containment system, 60.9% of the toilets have single pit systems and 12% of people use double pits in the city. About 1.8% do not have any type of containment and discharges directly to the environment (KII, FGDs, HH survey, 2020).

According to the type of connectivity and features of containment technologies, the discharging points of the toilets are categorized as: 3% of the population uses septic tanks connected to soak pits (T1A2C5), 6% uses septic tanks connected to open drain (T1A2C6), 10% uses septic tanks connected to open water body (T1A2C7), 9% utilizes septic tanks connected to 'don't know where' (T1A2C9), 9% of the population uses lined tanks with impermeable walls and open bottom, connected to open ground (T1A4C8) and 61% of the population rely on lined pits with semi-permeable walls and open bottom with no outlet or overflow (T2A5C10). Thus, at containment stage, the city's excreta of only 3% of the population are contained. Figure 5 shows a couple of examples of these sanitation systems.

Figure 5: Containment technologies and their connections in Jamalpur. Left: Septic tank connected to nearby water body. Right: Toilet pipe connected to open drain.

Groundwater Pollution: The depth to groundwater in the city ranges from 4-7 m. The most common drinking water production technology is borehole with hand pump or motorised pump. Lateral separation between sanitation facilities and water source varies from one area to another. 47% of the water sources have a distance of 0-3 metres and 50% of the water sources have a distance of 3-10 metres. Considering all these factors, it is considered that there is a significant risk of groundwater contamination in the city.

Emptying: Around 61% of septic tanks are never desludged and the outlets of such septic tanks are mostly connected to drains and open environment. Only a small portion (7%) are connected to soak pits. We have considered the tank or pit as emptied if it has been emptied at least once in last 3 years. In Jamalpur municipality, 60% of the septic tanks are desludged within three years and 94% of the septic tanks are desludged within five years. Desludging of the septic tanks or pits are mostly (83%) done by private sweepers. Only in a few households, desludging is done by NGOs (6%). Around 82% of these withdrawal is done manually using bucket and rope for several reasons. This method highly risks the health and safety of the workers. A substantial number (9.7%) use manual pump and 2.6% use electric pumps. Municipal authority has two Vacu-tag, but there is no Vacu-tag operation in this municipality.

Transportation: The sludge withdrawn from the septic tanks and latrine pits by the cleaners is disposed of in various places. Most of the sludge (21%) is disposed of in the open environment like a drain, open ground, and water bodies. Three quarter (74%) is disposed in a dug hole and covered with soil. Only 3% is disposed into a Faecal Sludge Management (FSM) treatment plant.

Treatment/Disposal: There is one FSM pilot treatment plant in Jamalpur and the capacity of the FSM treatment plant is 5 m^3 per day. The existing land for FSM is 0.45 acre. The plant is not operated regularly. The treated sludge is reused by co-composting with biodegradable solid waste and used as soil conditioner. The plant was constructed under BRAC WASH program.

4.3 Open Defecation:

From HH surveys, KIIs and FGDs, it was found that there is no practice of open defecation.

5 Data and assumptions

The baseline survey conducted in October 2020 contains detailed data on different stages of the sanitation value chain. The SFD graphic relied on these data, collected during sample household surveys, along with key informant interviews and focus group discussions. Finally, data from all these sources were triangulated to produce the SFD graphic.

The last census was carried out about 10 years ago. So, the actual population, household and sanitation data is not updated yet. Most of the households with septic tanks do not know the actual type, size and

design desludging periods. Also, a large number of pit users are unaware about if they emptied their pits or not. Due to all these data gaps, some assumptions have been made to produce the SFD graphic

Following assumptions were made for developing the SFD graphic for Jamalpur:

✓ The proportion of FS in septic tanks, fully line tanks and line, open bottom tanks are considered 89%, 0% and 100% respectively, as per the guidance given in the Frequently Asked Questions (FAQs) in the Sustainable Sanitation Alliance (SuSanA) website.

✓ According to the population census in 2011 by the Bangladesh Bureau of Statistics (BBS), the Pourosova Population was 142,764. The urban population growth in Jamalpur is considered 2.5%.

✓ There are around 61% of single pit latrines as containment systems. So, it is assumed that all these single pit containment technology is defined as lined pit with semi-permeable walls and open bottom, no outlet or overflow, where there is a 'significant risk' of groundwater pollution (system T2A5C10, 61%).

✓ For system T1A2C5 (septic tanks connected to soak pits), since they are well-constructed as per the field visit observation, they were considered to be located in areas of low risk of groundwater contamination.

✓ Around 60% of HHs have emptied their septic tank with soak pit with desludging frequency of 0-3 years. Thus, variable F3 for system T1A2C5 is set to 60%.

✓ Lined pit with semi-permeable walls and open bottom, no outlet or overflow, is considered as a single pit latrine. Most of the single pit latrines are found to be emptied regularly. Thus, variable F3 for system T2A5C10 was set to 80%.

✓ 61% of septic tanks connected to the environment, never emptied. Only 10% of these type of septic tanks are emptied with desludging frequency of 1-3 years. Thus, variable F3 for systems T1A2C6, T1A2C7 and T1A2C9 is set to 10%.

✓ Lined pits with impermeable walls and open bottom, no outlet or overflow, is considered as double pits. Thus, variable F3 for system T1A42C8 is set to 0%.

✓ The FSM treatment plant is not operated regularly, and it has an small capacity to treat faecal sludge (5 m^3 per day). For these reasons, no faecal sludge is considered to be treated in the city. Thus, variables F4 and F5 for all systems were set to 0%.

6 List of Sources

Key Informant Interviews (KIIs)

- KII with Mayor, Jamalpur Municipality.

- KII with Secretary, Jamalpur Municipality.

- KII with Conservancy Inspector, Jamalpur Municipality.

- KII with Councilor, Jamalpur Municipality.

- Facilitators: Md. Mynul Islam Hemel, Field Coordinator, Tiller.

Focus Group Discussions (FGDs)

- A group of representatives from Bazar Committee.

- Sweepers and waste collectors.

- A group of representatives from Educational Institutions.

- Masons association (Septic tank builders).

Figure 5 : Focus Group Discussions in Jamalpur.

This SFD lite report is available from:

www.sfd.susana.org

SFD Promotion Initiative

sustainable sanitation alliance

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of
Federal Ministry for Economic Cooperation and Development

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