



SFD Report Kushtia, Bangladesh

prepared by:
Waste Concern
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Kushtia Municipality was established on April 1, 1869 under the Municipal Act, 1868. It has an area of 42.79 sq.km consisting of 21 Wards with a population of 467,197. It is situated in the south-western part of Bangladesh lying just south of the upper Padma River.

SFD GRAPHIC

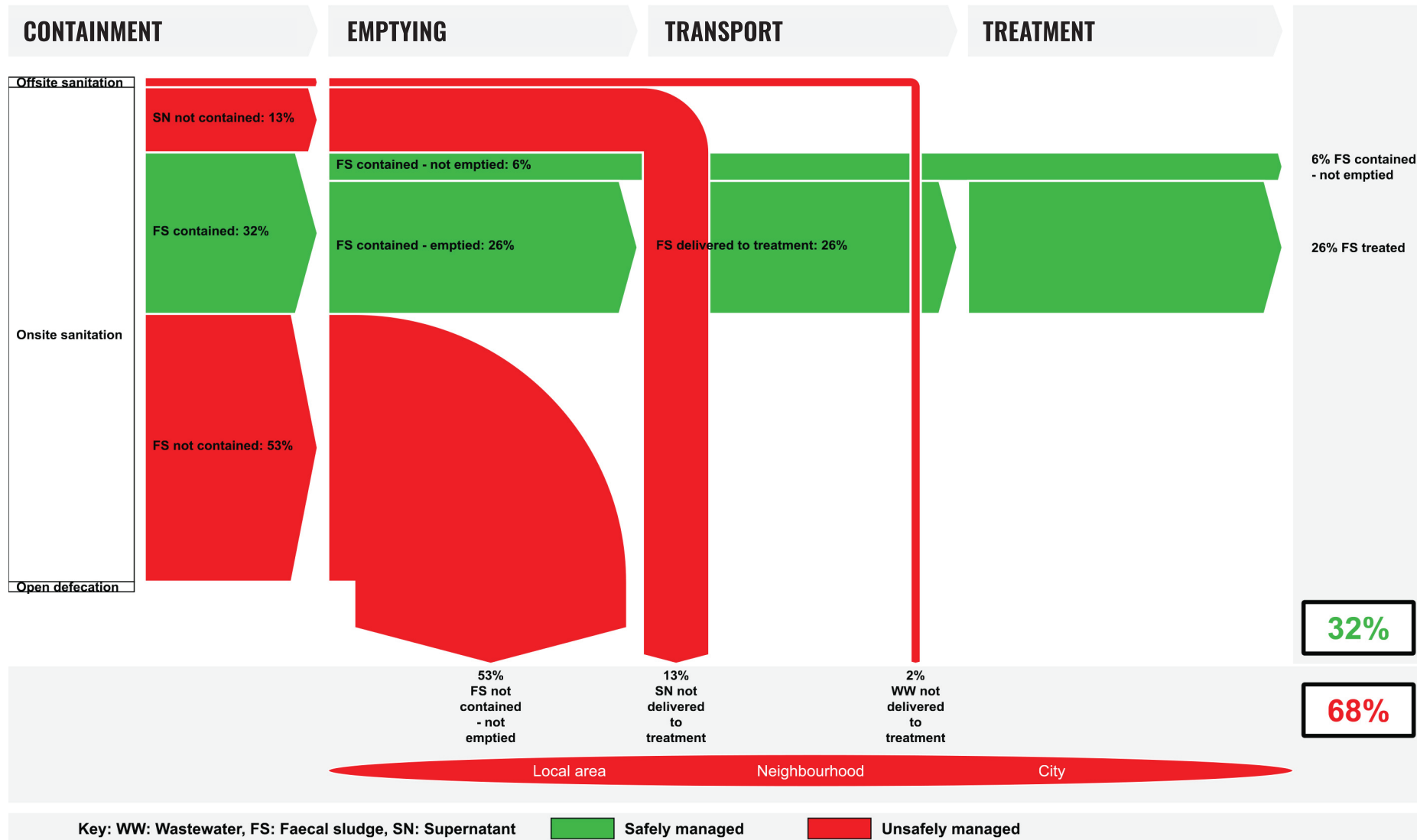
Kushtia, Khulna Division, Bangladesh

Version: Draft

SFD Level: SFD Lite

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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

The SFD generated shows that 32% of the wastewater is being safely treated/disposed, while 68% of the wastewater is not being safely treated or disposed.

SERVICE OUTCOMES

SFD MATRIX FOR KUSHTIA

Tabulated form of the grid selection for data entry

Kushtia Municipality , Khulna Division, Bangladesh, 17 Aug 2021. SFD Level : SFD Lite Population : 4,67,197						
Proportion of Tanks : Septic Tanks : 6%, Fully Lined Tanks : 26%, Lined, Open Bottom Tanks : 66%						
Containment						
System Type	Population	FS Emptying	FS Transport	FS Treatment	SN Transport	SN Treatment
	Pop	F3	F4	F5	S4e	S5e
System Label and Description	Proportion of population using this type of system (p)	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
T1A1C9 Toilet discharges directly to 'don't know where'	2.0					
T1A2C5 Septic tank connected to soak pit	6.0	100.0	100.0	100.0		
T1A3C10 Fully lined tank (sealed), no outlet or overflow	26.0	100.0	100.0	100.0		
T1A4C6 Lined tank with impermeable walls and open bottom, connected to an open drain or storm sewer	38.0	0.0	0.0	0.0	0.0	0.0
T1A4C7 Lined tank with impermeable walls and open bottom, connected to a water body	14.0	0.0	0.0	0.0		
T1A4C8 Lined tank with impermeable walls and open bottom, connected to open ground	14.0	0.0	0.0	0.0		

OFFSITE SANITATION SYSTEM

Kushtia Municipality does not have sewerage network and sewage treatment plant installed within its municipal area. Wastewater from disperse homesteads of the fringe area is drained and discharged into adjacent ditches or open drains. Wastewater and runoff from buildings, streets, parking lots, driveways, lawns and other areas are collected by tertiary drains and discharged into rivers and khals.

ONSITE SANITATION SYSTEM

CONTAINMENT:

Kushtia Municipality has about 6% of properly designed septic-tanks having two chambers and connected to soak pits, 26% of fully lined tank (one chamber) with no outlets or overflows and 66% of lined tanks with impermeable walls and open bottoms connected to drains/water bodies/open ground as a sanitation containment coverage. The twin pits and lined single pits are considered as lined tank with impermeable walls and open bottom.

Majority of the toilets are connected to drain and water bodies, only 6% of the toilets have soak wells. Containment units are not designed as per the Building Code. 26% of the containment units have no outlet or overflow. As such, 32% of the containment units require desludging. The soak-pit cannot function properly during rainy season as the water table remains very high.

EMPTYING:

There are two types of faecal sludge collection system practiced in Kushtia. Areas which can be accessed by vacuum trucks, mechanical emptying system is practiced. Faecal sludge collected using mechanical emptying is transported to the faecal sludge treatment plant (FSTP).



Mechanical emptying of FS

Areas with narrow streets where vacuum trucks cannot access, pit emptying is done manually by sweepers using buckets and in some cases using pumps. The collected sludge using manual method is disposed of in public drains or low lying areas. Desludging of septic tanks are not carried out regularly (once in every 2-3 years). There is a low demand for desludging as 68% of the toilets are connected to drain and water bodies.

TRANSPORTATION:

The emptied FS is transported using a desludging tanker, owned by Kushtia Municipality. 12 KL of faecal sludge is collected every day and only one FSTP is available in the landfill site. Since the FSTP is located at the landfill site, which is 10 km from the town center, 2-3 trips can be made by the vacuum trucks.

TREATMENT/DISPOSAL:

Kushtia Municipality has one FSTP with capacity of 18 KLD. The FSTP uses dewatering and co-composting process for treatment of the FS. The treated faecal sludge is used as soil conditioner after co-composting. Percolate from the drying bed is treated using trickling filter and the treated water is used for irrigation purpose.



FSTP in Kushtia

RISK TO GROUND AND SURFACE WATER:

During monsoon period which lasts for five months in a year, ground water table becomes high. Since 68% of the toilets are discharging waste water to open environment, there is a high risk of ground and surface water pollution.

GENERAL CITY INFORMATION

Kushtia Municipality was established on April 1, 1869 under the Municipal Act, 1868. It has an area of 42.79 sq.km consisting of 21 wards. It is in the Kushtia Sadar Upazila of Kushtia District under Khulna Division. It lies in between 23°52'26" to 23°56'54" N latitudes and 89°4'18" to 89°9'32" E longitudes. It is situated in the south-western part of Bangladesh lying just south of the upper Padma River.

Kushtia district has a tropical humid climate condition with about 75% humidity, an average temperature of 30.4 °C (86.7 °F), and average annual rainfall less than 2000 millimeters.



Kushtia city aerial view (Tselim Rezaa, CC BY-SA 4.0)

According to Bangladesh Bureau of Statistic (BBS) 2011, the total area was 13.4 sq. km. In 2015 the administrative area of this Municipality has been extended consisting 21 wards.

As a result, the population of this Municipality increased to 250,364 (in 2017) according to the

Municipality and estimated present population in 2021 is 467,197 where the growth rate is 1.69 and base year is 2017. The population density is 5,851 persons per km². Density varies in different wards. Highest population lives in ward no. 18 (36,986) and the lowest in ward no. 11 (5,137).

Kushtia is one of the fastest growing Municipality of Bangladesh with a potential to develop as an industrial urban center. The average growth of this Municipality is 1.69%.

The SFD was generated for the area in the administrative boundary of the Kushtia Municipality. Land use pattern of Kushtia Municipality comprises of agricultural 29.53%, circulation network 8.48%, core area 12.50%, established urban area 32.44%, new urban area 4.35%, restricted area 0.88%, water body 5.26% and rural site of 6.57% (Kushtia Municipality Master Plan Report 2019).

DETAILS OF POPULATION, KUSHTIA MUNICIPALITY

Ward No.	No. of Households*	Population*
1	1,587	14628
2	2,081	18049
3	2,262	19409
4	1,939	17640
5	3,272	34267
6	1,918	17082
7	1,665	17750
8	1,478	13866
9	1,551	14167
10	2,436	20856
11	1,097	9593
12	1,751	15364
13	2,538	23056
14	1,600	14346
15	1,670	14346
16	2855	26122
17	3,641	32634
18	7,530	69071
19	4,744	41641
20	1,623	14544
21	2,051	18765
Total	51,289	467,197

Source: * BBS. Population Census 2011, LGED, Kushtia Master Plan 2019

DATA AND ASSUMPTIONS

- Kushtia Municipality has a significant slum population which is 5.2% of the municipality's total population. SFD analysis includes the entire population living in the municipal area including the slum population.
- Based on a field survey conducted by the Department of Public Health Engineering (DPHE) in 2020, it is evident that 6% of the population have access to septic tanks 26% have access to lined tank and 66% of the population have access to lined tanks with open bottoms. The remaining 2% of the population does not have access to proper containment system.
- Although containment structures are being utilized by 98% of the population, in terms of containment outlets 68% are directly connected to drains, water bodies, or the ground.
- Only 6% of the containment structures are connected to soak wells and 26% of containment structures have no outlets. In the analysis, it is assumed that these 32% containment structures lacking outlets are properly storing the faecal sludge which is collected by the mechanical emptying system and treated in the FSTP.
- As per the Bangladesh National Building Code (1993), the faecal sludge generation rate varies between 0.04 cum/person/year to 0.07 cum/person/ year. Assuming per capita faecal sludge rate of 0.04 cum/person/year, the total faecal sludge generated in Kushtia is estimated at 18,688 cum/year or 51 cum/day. Based on the DPHE survey, 32% of the containment structures have no outlets. As such, the total daily demand for faecal sludge collection and treatment is 16.32 cum/day. Field data collected during the baseline survey indicates that daily faecal sludge disposed at the FSTP is 12 cum/day which is close to the theoretical calculation of the daily demand of 16 cum/day. The gap of 4 cum/day in faecal sludge collection may be served by the manual pit emptiers.

LIST OF DATA SOURCES

- Bangladesh Population & Housing Census 2011 (Bangladesh Bureau of Statistics)
- Household Survey Assessment Report for Kushtia (DevCon for DPHE (2020))
- Kushtia Municipality Master Plan : 2017-2037 (Local Government Engineering Department (LGED))
- Small Area Atlas report of Kushtia Zilla (Bangladesh Bureau of Statistics)
- Town planner, Kushtia Municipality
- WASH Baseline Assessment Report Kushtia Municipality 2021 (Waste Concern-BORDA)

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Prepared by :



Waste Concern

Level-3, House No. 270, Road No. 19
New DOHS, Mohakhali, Dhaka - 1206,
Bangladesh
T: +880-2-48810-841 / 842
office@wasteconcern.org

BORDA South Asia

Tarana, #7, 1st Floor, Kambipura,
Kengeri, Bangalore – 560060,
Karnataka, India
tsephel@borda-sa.org
www.borda-sa.org

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SFD Promotion Initiative



The Shit Flow Diagram was created
using the **SFD Lite Graphic Generator**
on the Susana website
<https://sfd.susana.org/>