

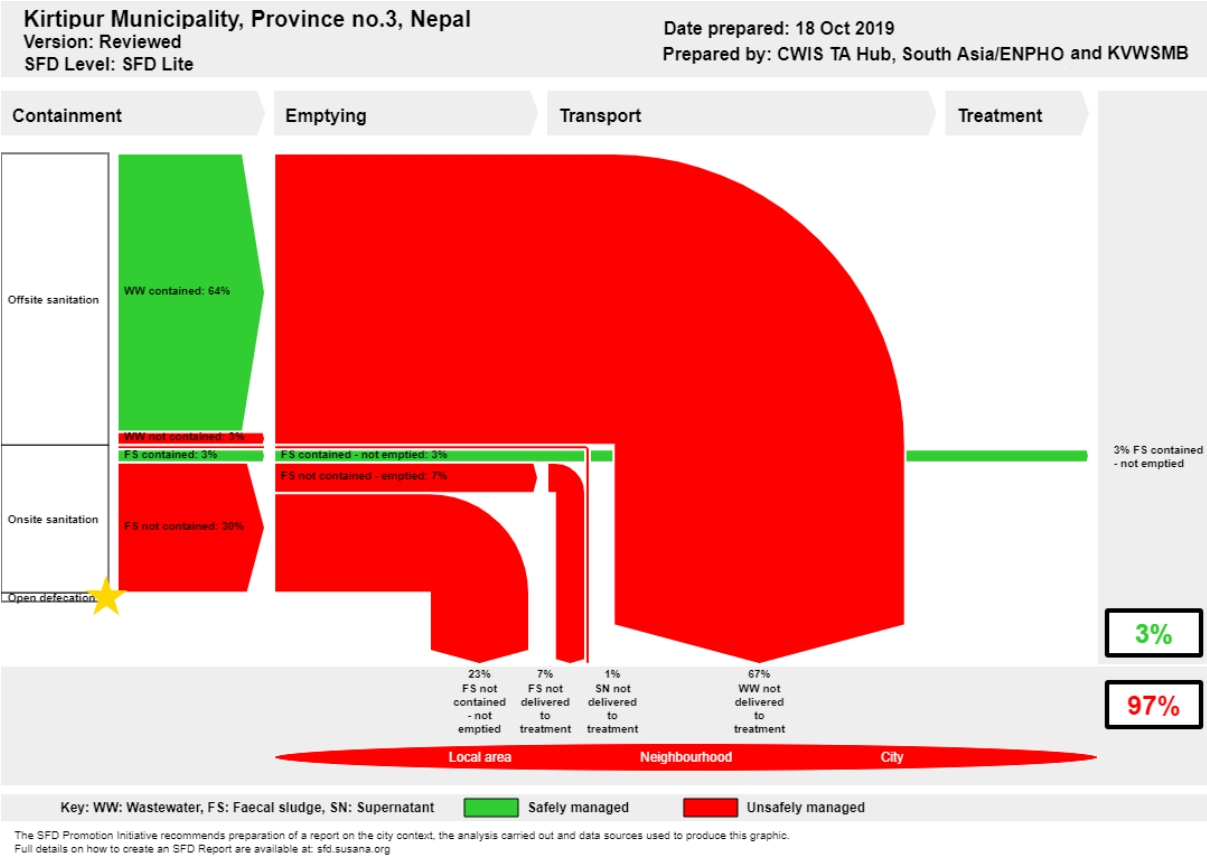
SFD Lite Report

Kirtipur Municipality Nepal

This SFD Lite Report was prepared by City-wide Inclusive Sanitation Technical Assistance Hub, South Asia (CWIS TA Hub, South Asia)/Environment and Public Health Organization (ENPHO) and Kathmandu Valley Water Supply Management Board (KVWSMB).

Date of production/ last update: 18/10/2019

1 The SFD Graphic



2 SFD Lite information

Produced by:

- The Shit Flow Diagram for Kirtipur Municipality was created by City-wide Inclusive Sanitation Technical Assistance Hub, South Asia (CWIS TA Hub, South Asia)/ENPHO and Kathmandu Valley Water Supply Management Board (KVWSMB) with the SFD graphic generator available on the SuSanA website.

Collaborating partners:

- Eco- Concern Pvt. Ltd.
- DevCon.

Date of production: 18/10/2019

3 General city information

Kirtipur is one of the historical cities, which was declared as municipality among 58 municipalities under the Municipal Act in 1996 (2053 B. S., in Nepali calendar) within the Kathmandu valley. The municipality consists of 10 wards covering an area of 14 Km² (Kirtipur Municipality profile, 2019). It is surrounded by Lalitpur Metropolitan city in the East, Chandragiri Municipality in the West, Kathmandu Metropolitan City in North and Dakchhinkali Municipality in the South. It lies with an altitude ranging from 1,224 metres to 1,524 metres above mean sea level (Annual Progress Report, 2018).

The total population of Kirtipur Municipality is 65,602 residing in 19,941 households (Annual Progress Report, 2018). People of Kirtipur Municipality rely on either municipal water supply or from other sources. The main sources of drinking water are public tap, wells and household bore water (KII1, 2019).

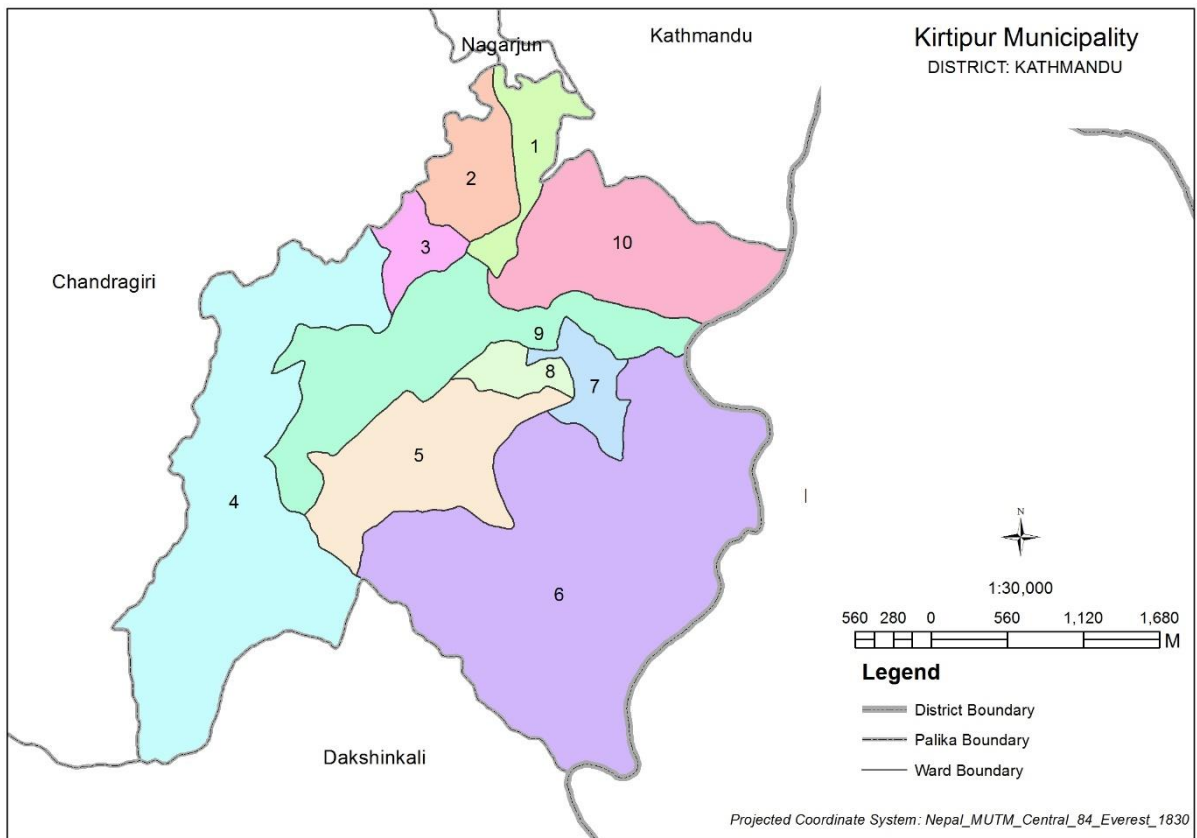


Figure 1: Map of Kirtipur Municipality (Source: Ministry of Federal Affairs and General Administration).

4 Service outcomes

Table 1: SFD Matrix for Kirtipur Municipality.

Kirtipur Municipality, Province no.3, Nepal, 18 Oct 2019. SFD Level: SFD Lite

Population: 65602

Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 97%

System label	Pop	W4a	W5a	W4c	W5c	F3	F4	F5	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 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
T1A1C1 Toilet discharges directly to a centralised combined sewer	64.0	0.0	0.0							
T1A1C6 Toilet discharges directly to open drain or storm sewer	3.0			0.0	0.0					
T1A3C10 Fully lined tank (sealed), no outlet or overflow	3.0					0.0	0.0	0.0		
T1A4C6 Lined tank with impermeable walls and open bottom, connected to an open drain or storm sewer	1.0					0.0	0.0	0.0	0.0	0.0
T1A4C8 Lined tank with impermeable walls and open bottom, connected to open ground	3.0					53.0	0.0	0.0		
T2A2C5 Septic tank connected to soak pit, where there is a 'significant risk' of groundwater pollution	1.0					0.0	0.0	0.0		
T2A4C1 Lined tank with impermeable walls and open bottom, connected to a centralised combined sewer, where there is a 'significant risk' of groundwater pollution	1.0					0.0	0.0	0.0	0.0	0.0
T2A4C10 Lined tank with impermeable walls and open bottom, no outlet or overflow, where there is a 'significant risk' of groundwater pollution	22.0					24.0	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	2.0					20.0	0.0	0.0		

4.1 Containment

Majority of the population is dependent on combined sewer system (T1A1C1, 64%) while 3% of population has the user interface connected directly to open drain (T1A1C6, 3%). Containment systems used by people include septic tanks connected to a soak pit (T2A2C5, 1%), fully lined tanks (T1A3C10, 3%), lined tanks with impermeable walls and open bottom (T2A4C1, 1%; T1A4C6, 1%; T1A4C8, 3% and T2A4C10, 22%) and lined pits with impermeable walls and open bottom (T2A5C10, 2%). As per the Household Survey (2019), the average volume of the containment system in Kirtipur Municipality is 6 m³ (Figure 2).



Figure 2: Containment system (Source: HHs Survey, 2019).

4.2 Emptying and transportation

Since there is no standard design for the construction of containments in Kirtipur Municipality, the emptying frequency differs even for the same type of containment (KII1, 2019). The household survey (2019) revealed dominance of mechanical emptying (57%) over manual emptying (43%) in Kirtipur Municipality. Manual emptying is done by labour or household member and mechanical emptying is done by a private service provider from the neighbouring municipality since Kirtipur Municipality has no services. The mechanically emptied faecal sludge is transported by a desludging vehicle, a tank equipped with a movable centrifugal pump on a truck. The wastewater and supernatant are transported through drains and the sewer system.

4.3 Treatment

There is no faecal sludge or wastewater treatment plant in Kirtipur Municipality.

4.4 Reuse and Disposal

Kirtipur Municipality lacks treatment plant, hence the wastewater, supernatant and faecal sludge are discharged directly into the Bagmati River untreated (KII1, 2019) (Figure 3).



Figure 3: Wastewater and supernatant discharged into Bagmati River untreated.

4.5 SFD Graphic

The SFD graphic shows that 97% of the faecal sludge (FS) is not safely managed and 3% is safely managed. 64% of the wastewater contained in the technology and 1% of supernatant not contained in the technology is discharged directly into the environment untreated. 3% of the wastewater not contained is directly connected to open drains and not treated. 30% of FS is not contained in the technology, out of which 7% is emptied and discharged into the environment without any treatment and the remaining 23% is not emptied and considered as unsafely managed since it comes from systems located in areas of high risk of groundwater pollution. 3% of the FS contained in fully lined tanks with no outlet or overflow is not emptied and considered as safely managed.

4.6 Groundwater Contamination

There is no published data available regarding groundwater table and soil profile of Kirtipur Municipality. So, the information was collected from KII1 (2019). Majority of population rely on underground sources of water which are from protected boreholes extracted within a depth of 5 to 10 metres consisting of medium sand. The lateral separation between sanitation facilities and groundwater sources with less than 10 metres is considered greater than 25% and the percentage of sanitation facilities that are located uphill of groundwater sources was estimated as less than 25% (KII1, 2019). Therefore, it has been estimated that there is high risk of groundwater pollution in Kirtipur Municipality.

5 Data and assumptions

The data for the SFD Matrix were estimated using the data collected from the household survey carried out by CWIS TA Hub, South Asia in 2019. The collected data were further discussed and finalized with key informants of Kirtipur Municipality.

The proportions of FS in septic tanks and fully lined tanks were set to 100% and the proportion of FS in lined tanks with impermeable walls and open bottom was set to 97% according to the relative proportions of the systems in the municipality, as per the guidance given in the Frequently Asked Questions (FAQs) in the Sustainable Sanitation Alliance (SuSanA) website.

The proportion of emptied faecal sludge for different types of containment connected to different technologies (variable F3) was estimated on the basis of the data collected from the household survey and Key Informant Interviews.

6 List of data sources

- *Municipality Profile, 2019, Kirtipur Municipality.*
- *Annual progress report, 2019, Kirtipur Municipality.*
- *HHs survey data, 2019, City-Wide Inclusive Sanitation Technical Assistance, South Asia.*
- *MoFALD, 2019, Ministry of Federal Affairs and General Administration.*
- *KII 1, October 2019, Interview with head staff of sanitation section, Kirtipur Municipality.*
- *KII 2, September 2019, Interview with Private desludging Service provider, Lalitpur municipality.*

SFD Kirtipur Municipality, Nepal, 2019

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