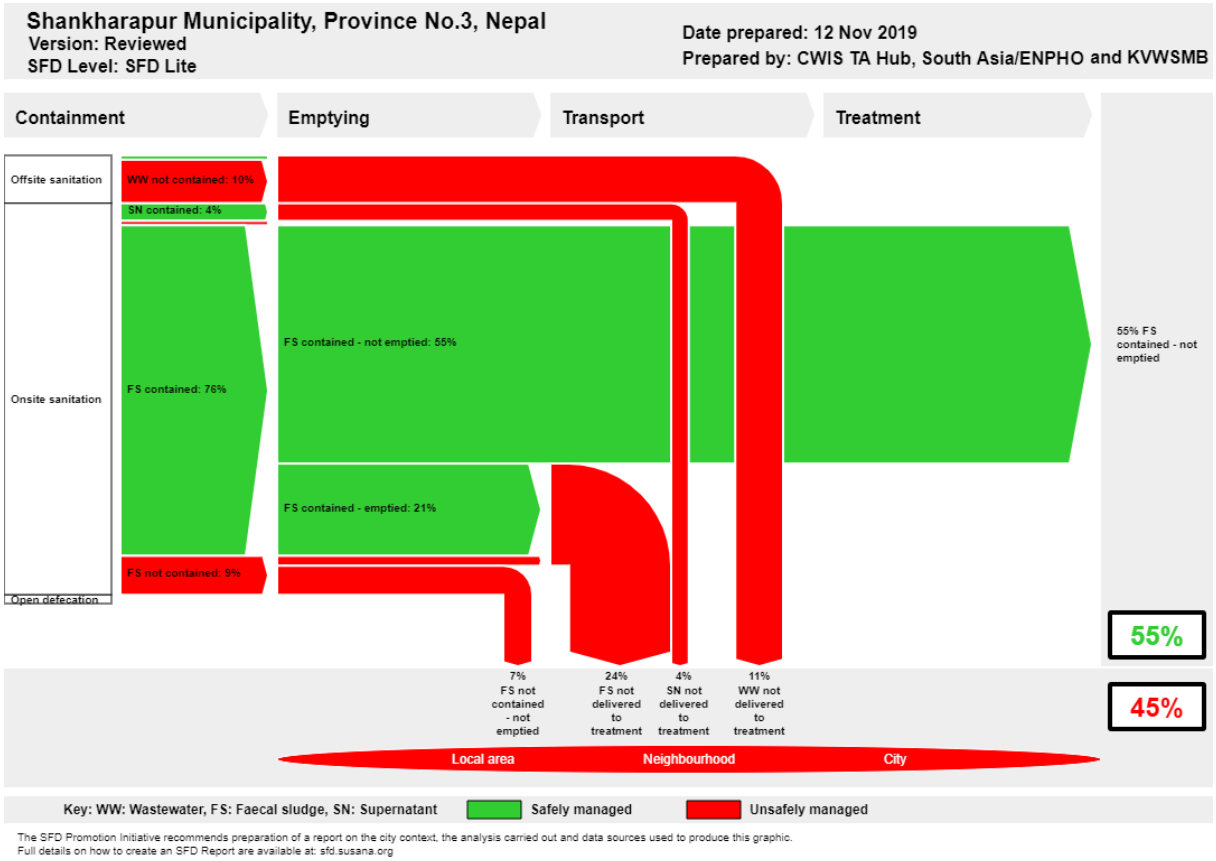
SFD Lite Report

Shankharapur 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: 12/11/2019

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:

- The Shit Flow Diagram for Shankharapur Municipality was created 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) with the SFD graphic generator tool available on the SuSanA Website.

Collaborating partners:

- Eco- Concern Pvt. Ltd.
- DevCon.

Date of production: 12/11/2019

3 General city information

Shankharapur Municipality is located in Kathmandu District in Province No. 3 of Nepal that was established on 2014 (2071 B.S in nepali calender) by merging the former Village development committees Bajrayogini, Indrayani, Lapsiphedi, Naglebhare, Pukhulachhi and Suntol . The municipality is bounded by Kathmandu metropolitan in the south, Kageshwori Manohora Municpality in the west, Melamchi Municipality in the east and north (Figure 1). The municipality consists of 13 wards with the total population of 27,202 people residing in 5,607 households and covering an area of 57 km^2 (Municipality Profile, 2019).

The main sources of drinking water in Shankharapur Municipality are public taps, household bores and wells. Majority of the population are dependent on the public water supply (75%) and remaining 25% of the households are dependent on their own sources such as tap water (bore water) and wells (KII2, 2019).

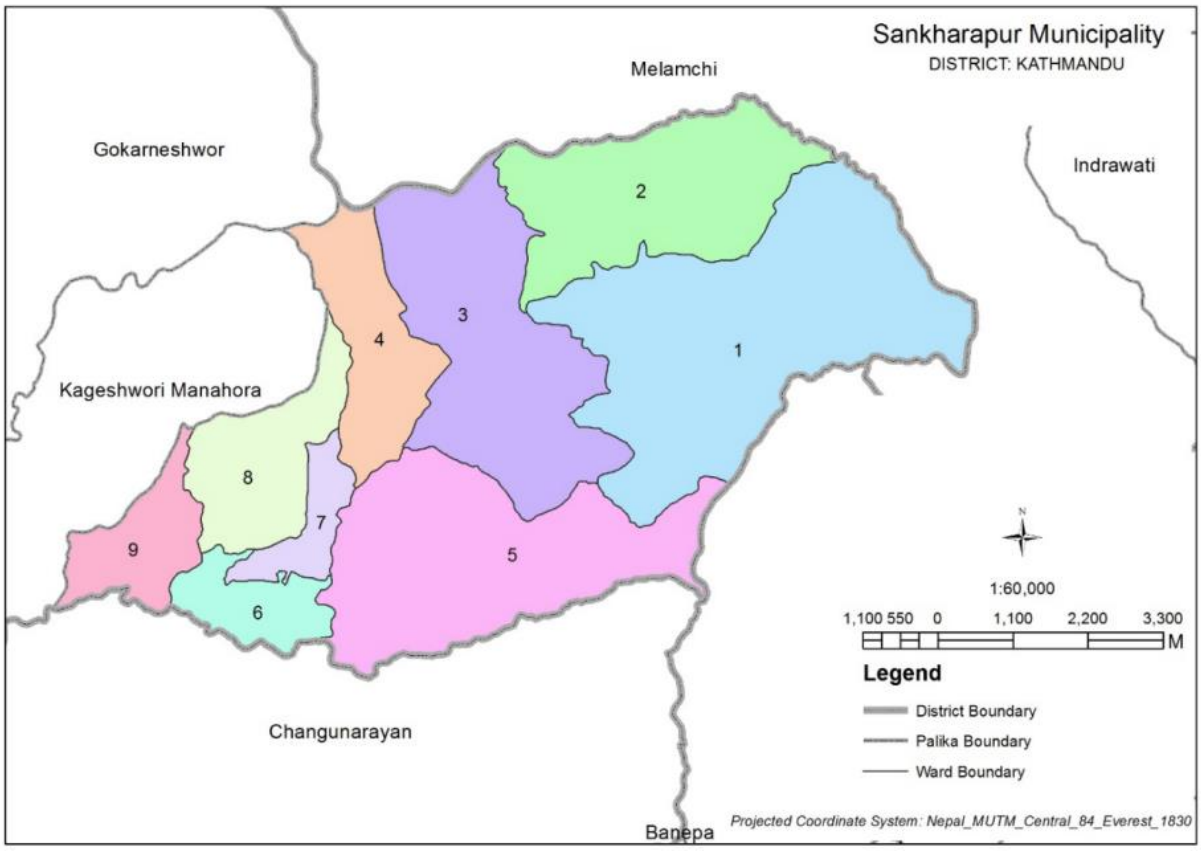


Figure 1: Map of Shankharapur Municipality (Source: Ministry of Federal Affairs and General Administration).

4 Service outcomes

Table 1: SFD Matrix for Shankharapur Municipality.

Shankharapur Municipality, Province No.3, Nepal, 12 Nov 2019. SFD Level: SFD Lite
Population: 27202
Proportion of tanks: septic tanks: 100%, fully lined tanks: 55%, lined, open bottom tanks: 98%

System label	Pop	W4a	W5a	W4c	W5c	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 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 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
T1A1C1 Toilet discharges directly to a centralised combined sewer	1.0	0.0	0.0									
T1A1C6 Toilet discharges directly to open drain or storm sewer	10.0			0.0	0.0							
T1A2C5 Septic tank connected to soak pit	1.0					25.0	0.0	0.0				
T1A3C1 Fully lined tank (sealed) connected to a centralised combined sewer	9.0					0.0	0.0	0.0	0.0	0.0		
T1A3C5 Fully lined tank (sealed) connected to a soak pit	1.0					25.0	0.0	0.0				
T1A4C10 Lined tank with impermeable walls and open bottom, no outlet or overflow	53.0					28.0	0.0	0.0				
T1A4C5 Lined tank with impermeable walls and open bottom, connected to a soak pit	2.0					25.0	0.0	0.0				
T1A4C6 Lined tank with impermeable walls and open bottom, connected to an open drain or storm sewer	2.0					33.0	0.0	0.0			0.0	0.0
T1A4C9 Lined tank with impermeable walls and open bottom, connected to 'don't know where'	6.0					28.0	0.0	0.0				
T1A5C10 Lined pit with semi-permeable walls and open bottom, no outlet or overflow	11.0					40.0	0.0	0.0				
T1A6C10 Unlined pit, no outlet or overflow	3.0					50.0	0.0	0.0				
T1B8C10 Pit (all types), never emptied, abandoned when full but NOT adequately covered with soil, no outlet or overflow	1.0											

4.1 Containment

As presented in Table 1, the most common type of containment used in Shankharapur Municipality are lined tanks with impermeable walls and open bottom (T1A4C10, 53%; T1A4C9, 6%; T1A4C5, 2% and T1A4C6), followed by fully lined tanks (T1A3C1; 9% and T1A3C5, 1%), lined pits with semi-permeable walls and open bottom with no outlet and overflow (T1A5C10, 11%), user interface directly connected to open drain (T1A1C6, 10%), unlined pits (T1A6C10, 3%), pits (all types), never emptied, abandoned when full but not adequately covered with soil (T1B8C10, 1%) and septic tanks (T1A2C5, 1%). 0.5% of population do not have access to toilet facilities which could not be shown in the SFD graphic since, it represents less than 1% of the total population (HHs survey, 2019). According to KII1 (2019), population residing on the edge of forests usually do not have toilet facilities as they openly defecate in nearby forest area. As per the household survey (2019), the average size of the containment is 7m^3.

Figure 2: Containment system with manhole cover (HHs survey, 2019)

4.2 Emptying and transportation

The emptying frequency widely varies since there is no standard design guidelines for the construction of containments in Shankharapur Municipality (KII1, 2019). So, the emptying frequency for different types of containments connected to different technologies (variable F3) is estimated on the basis of the household survey and Key Informant Interviews. The household survey revealed dominance of manual emptying (62%) over mechanical emptying (38%) in Shankharapur Municipality (HHs Survey, 2019). The mechanically emptied faecal sludge from onsite sanitation system is transported by a private desludging vehicle which consists of a tank equipped with movable centrifugal pump on a truck (KII2, 2019) whereas the manually emptied faecal sludge is disposed by the household member or labour in the household premises. There are no municipal desludging services in the municipality so the municipality relies on a neighbouring municipality. The manual emptying is done by a household member or labour. The wastewater and supernatant are transported through the sewer system.

4.3 Treatment

The municipality has got two collection tanks. So, the wastewater is collected in the collection tank and emptied when it gets full with the help of a desludging vehicle. The effluent from the collection tank is overflowed from the outlet of the collection tank in an open area as shown in Figure 3. The effluent discharged is used in irrigating the field by farmers (KII1 and KII2, 2019).

Figure 3: Effluent being flowed from the outlet of the collection tank.

4.4 Reuse and Disposal

Manually emptied faecal sludge is disposed by a household member or labour themselves in their household premises or in field. The sludge, collected from the collection tank and mechanically emptied faecal sludge are both disposed untreated in rivers of Kathmandu valley whereas the effluent discharged from the collection tank is used unsafely managed for irrigation purposes (KII1 and KII2, 2019).

4.5 SFD Graphic

As shown in the SFD graphic, 55% of the excreta generated are safely managed and 45% of the excreta generated are not been safely managed. 10% of wastewater not contained in the technology and 1% of wastewater gets discharged into the open environment untreated. Out of 9% of FS not contained in the technology, 2% of FS is emptied and discharged in the environment untreated whereas 7% of FS is not emptied and considered as unsafely managed. 76% of faecal sludge is contained, out of which 21% is emptied and discharged in the environment without any treatment and 55% is FS not emptied and considered as safely managed in the containment. However, in the medium- to long- term, for example as the population and population density increases, this latter practise may not be sustainable and improved sanitation management services may be required since those tanks and pits, eventually, will require emptying services.

4.6 Groundwater Contamination

There are no published data available regarding groundwater table and soil profile of Shankharapur Municipality. So, the information was collected from KII2 (2019). Less than 25% of population relying on underground sources of water are from protected boreholes extracted from a depth of greater than 10 metres consisting of fine sand, silt and clay in unsaturated zone. The lateral separation between sanitation facilities and groundwater sources with less than 10 metres is considered less than 25% and the percentage of sanitation facilities that are located uphill of groundwater sources was estimated greater than 25% (KII2, 2019). So, it has been estimated that there is high risk of groundwater pollution in Shankharapur 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 Shankharapur Municipality.

The proportions of faecal sludge in septic tanks, fully lined tanks and lined tanks with impermeable walls and open bottom were set to 100%, 55% and 98% respectively, 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

- *Shankharapur Municipality, 2019/2020, Municipality Profile, 2019.*
- *Household Survey, 2019, City-Wide Inclusive Sanitation Technical Assistance Hub, South Asia.*
- *MoFALD, 2019, Ministry of Federal Affairs and General Administration.*
- *KII1, November 2019, Interview with Municipal Water supply and sanitation officer Shankharapur Municipality.*
- *KII2, November 2019, Interview with Municipal Engineer Shankharapur Municipality.*
- *KII3, November 2019, Interview with Municipal IT officer Shankharapur Municipality.*
- *KII4 September 2019, Interview with Private desludging service provider, Lalitpur Metropolitan city.*

SFD Shankharapur Municipality, Nepal, 2019

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This Executive Summary and the SFD Report are available from:

www.sfd.susana.org

SFD Promotion Initiative