



SFD Lite Report

Nagarjun Municipality Nepal

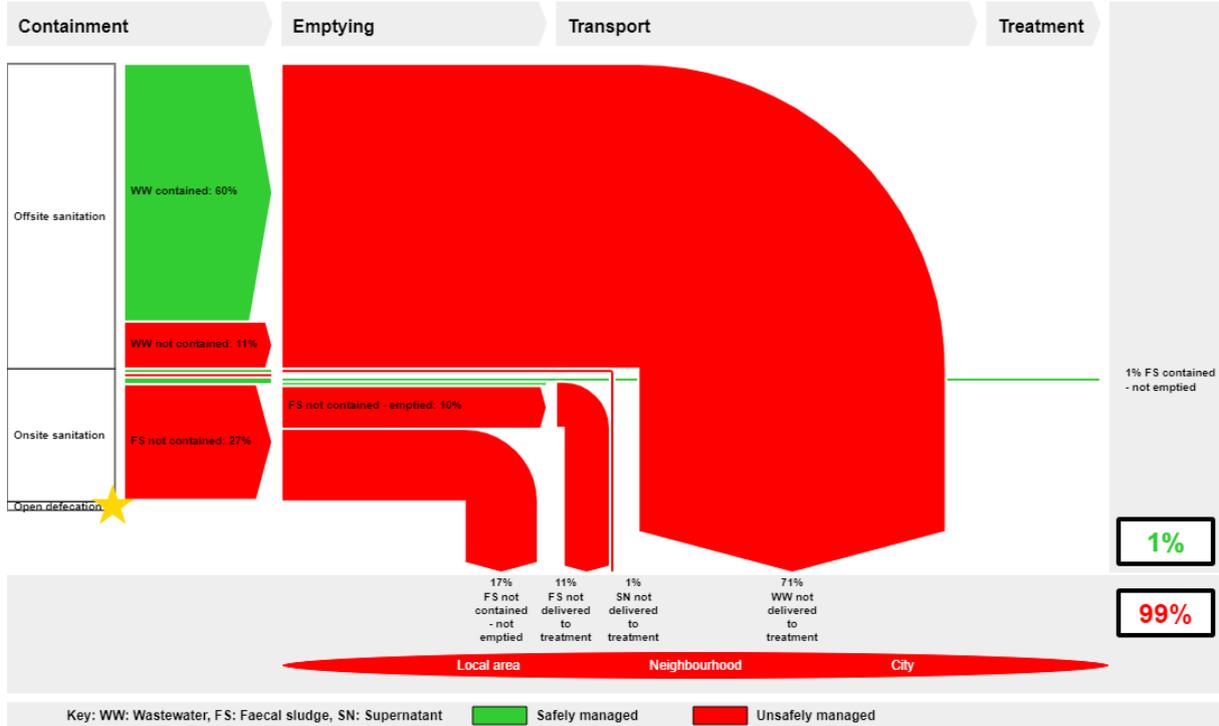
This SFD Lite Report was prepared by City-wide Inclusive Sanitation Technical Assistance Hub, South Asia (CWIS TA Hub, South Asia)/Environment and Public Health Organization (ENPHO) and Kathmandu Valley Water Supply Management Board (KVWSMB).

Date of production/ last update: 25/10/2019

1 The SFD Graphic

Nagarjun Municipality, Province no.3, Nepal
Version: Reviewed
SFD Level: SFD Lite

Date prepared: 25 Oct 2019
Prepared by: CWIS TA Hub, South Asia/ENPHO and KVWSMB



2 SFD Lite information

Produced by:

- The Shit Flow Diagram of Nagarjun Municipality was created by City-Wide Inclusive Sanitation Technical Assistance Hub, South Asia (CWIS TA Hub, South Asia)/Environment and Public Health Organizations (ENPHO) and Kathmandu Valley Water Supply Management Board (KVWSMB) using the SFD generator tool available on the SuSanA website.

Collaborating partners:

- Eco Concern Pvt.Ltd.
- DevCon.

Date of production: 25/10/2019

3 General city information

Nagarjun Municipality is located in Kathmandu district in Province no. 3 of Nepal, formed in 2071 (2014 in Georgian calendar). The municipality is bounded by Kathmandu Metropolitan city in the east, Dhunibesi Municipality in the west, Tarkeshwor Municipality in the north, Chandragiri Municipality in the South (Figure 1). The total area of the municipality is 29.8 Km² with an altitude ranging from 1,300 metres to 2,500 metres (Nagarjun Municipality profile, 2019).

The total population of the municipality is 67,420 people residing in 16,746 households. The major sources of drinking water in Nagarjun Municipality are public water supply, well, springs and stream water (KII 1, 2019).

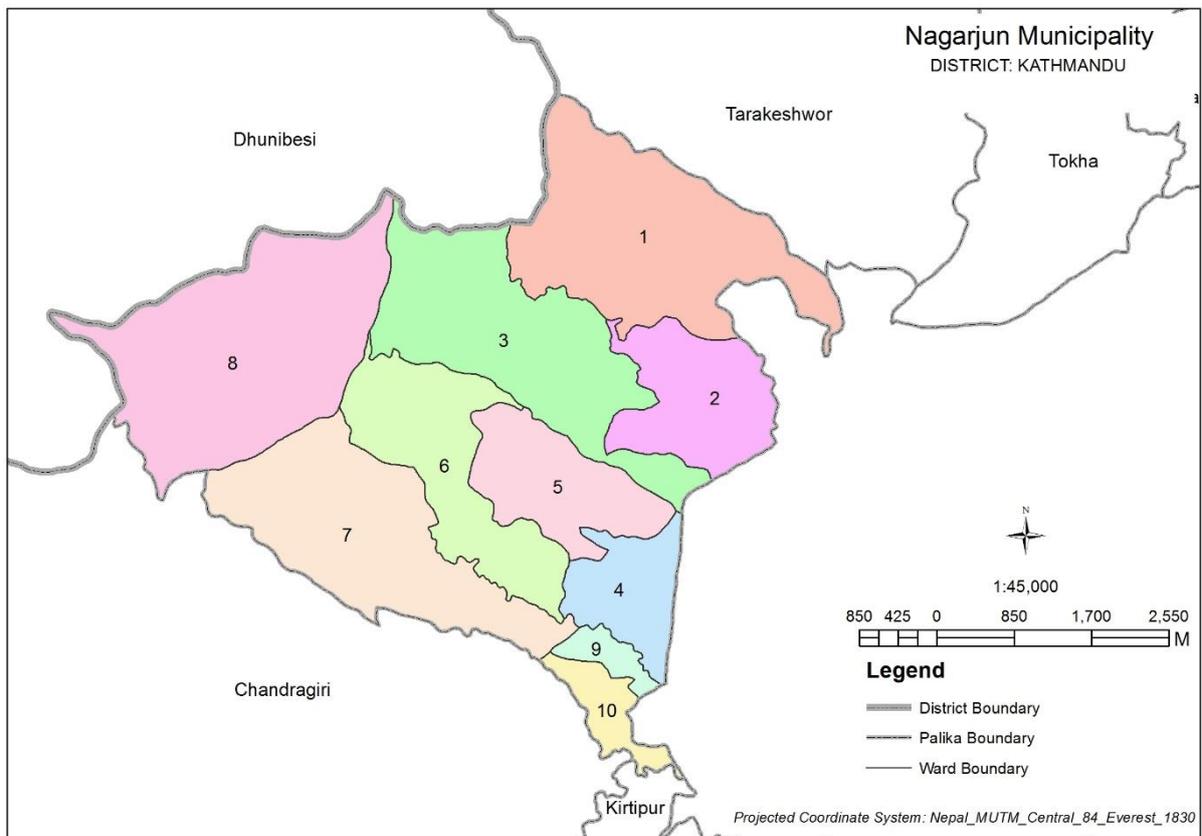


Figure 1: Map of Nagarjun Municipality (Source: Ministry of Federal Affairs and General Administration).

4 Service outcomes

Table 1: SFD Matrix for Nagarjun Municipality.

Nagarjun Municipality, Province no.3, Nepal, 25 Oct 2019. SFD Level: SFD Lite

Population: 67420

Proportion of tanks: septic tanks: 100%, fully lined tanks: 80%, lined, open bottom tanks: 96%

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	60.0	0.0	0.0									
T1A1C6 Toilet discharges directly to open drain or storm sewer	11.0			0.0	0.0							
T1A3C1 Fully lined tank (sealed) connected to a centralised combined sewer	2.0					50.0	0.0	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
T2A3C5 Fully lined tank (sealed) connected to a soak pit, where there is a 'significant risk' of groundwater pollution	3.0					25.0	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					50.0	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	16.0					36.0	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	6.0					58.0	0.0	0.0				

4.1 Containment

More than half of the population of Nagarjun Municipality is dependent on the sewer system (T1A1C1, 60%) followed by lined tanks with impermeable walls and open bottom (T2A4C1, 1%; T1A4C6, 1%; T2A4C10, 16%), user interface directly connected to open drain (T1A1C6, 11%), lined pits with semi-permeable walls and open bottom (T2A5C10, 6%) and fully lined tanks connected to a soak pit (T1A3C1, 2% and T2A3C5, 3%). There is no standard design guidelines for the construction of containments in Nagarjun Municipality (KII1, 2019). As per the HHs survey (2019), the average size of containment is 8m³.



Figure 2: Containment system in Nagarjun Municipality (source: HHs Survey, 2019).

4.2 Emptying and transportation

There is no standard design guidelines for the construction of containments in Nagarjun Municipality (KII1, 2019). So, the emptying frequency widely varies for each containment as they are not built in a standard way (KII2, 2019). The proportions of emptied faecal sludge for different types of containment connected to different technologies (variable F3) was estimated on the basis of data collected from the household survey and Key Informant Interviews. Both mechanical (67%) and manual (33%) emptying were found in Nagarjun Municipality. Mechanical service is provided by desludging vehicle, a tank equipped with centrifugal pump on a truck (HHs Survey and KII4, 2019) (Figure 3). Manual emptying is done by the labour or household member (KII2, 2019). The wastewater and supernatant is transported through sewer system (KII1, 2019).



Figure 3: Desludging vehicle: a tank equipped with movable centrifugal pump on a truck.

4.3 Treatment

Despite more than half of the population have access to the sewer facility, the municipality lacks treatment facilities for treating wastewater and faecal sludge.

4.4 Reuse and Disposal

All the wastewater, supernatant and emptied faecal sludge gets finally discharged in Manmati and Bhadramati Rivers (KII1, 2019).

4.5 SFD Graphic

As represented in the SFD graphic, 99% of faecal sludge (FS) and wastewater is unsafely managed and 1% is safely managed. 60% of contained wastewater in the technology is discharged into the environment without treatment and 11% of wastewater not contained in technology is connected directly to the open drain and discharged untreated into the environment. Out of the 27% of FS not contained, 10% is emptied and discharged into the environment untreated. 1% of supernatant contained in the technology connected to sewer system is discharged into the environment untreated, as well. The 1% of safely managed FS originates from the portion of FS not emptied from fully lined tanks (sealed) connected to a centralised combined sewer.

4.6 Groundwater Contamination

There is no published data available regarding groundwater table and soil profile of Nagarjun Municipality. So, the information was collected from KII1 (2019). Majority of population rely on underground sources of water which are from protected boreholes extracted from a depth of greater than 10 metres consisting of fine sand, silt and clay in the unsaturated zone. 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 greater than 25% (KII1, 2019). So, it has been estimated that there is high risk of groundwater pollution in Nagarjun 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 Nagarjun Municipality.

The proportions of FS in septic tanks, fully lined tanks and lined tanks with impermeable walls and open bottom were set to 100%, 80% and 96%, 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 containments 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

- *Nagarjun Municipality Profile, 2019.*
- *HHS survey data, 2019, City-Wide Inclusive Sanitation Technical Assistance, South Asia.*
- *MoFALD, 2019, Ministry of Federal Affairs and General Administration.*
- *KII1, October 2019, Interview with Municipal Engineer, Planning Section, Nagarjun Municipality.*
- *KII2, October 2019, Interview with Municipal Engineer, Planning Section, Nagarjun Municipality.*
- *KII3, October 2019, Interview with Municipal Engineer, Planning Section, Nagarjun Municipality.*
- *KII4, September 2019, Interview with Private Desludging service Provider.*

SFD Promotion Initiative



SFD Nagarjun Municipality, Nepal, 2019

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