



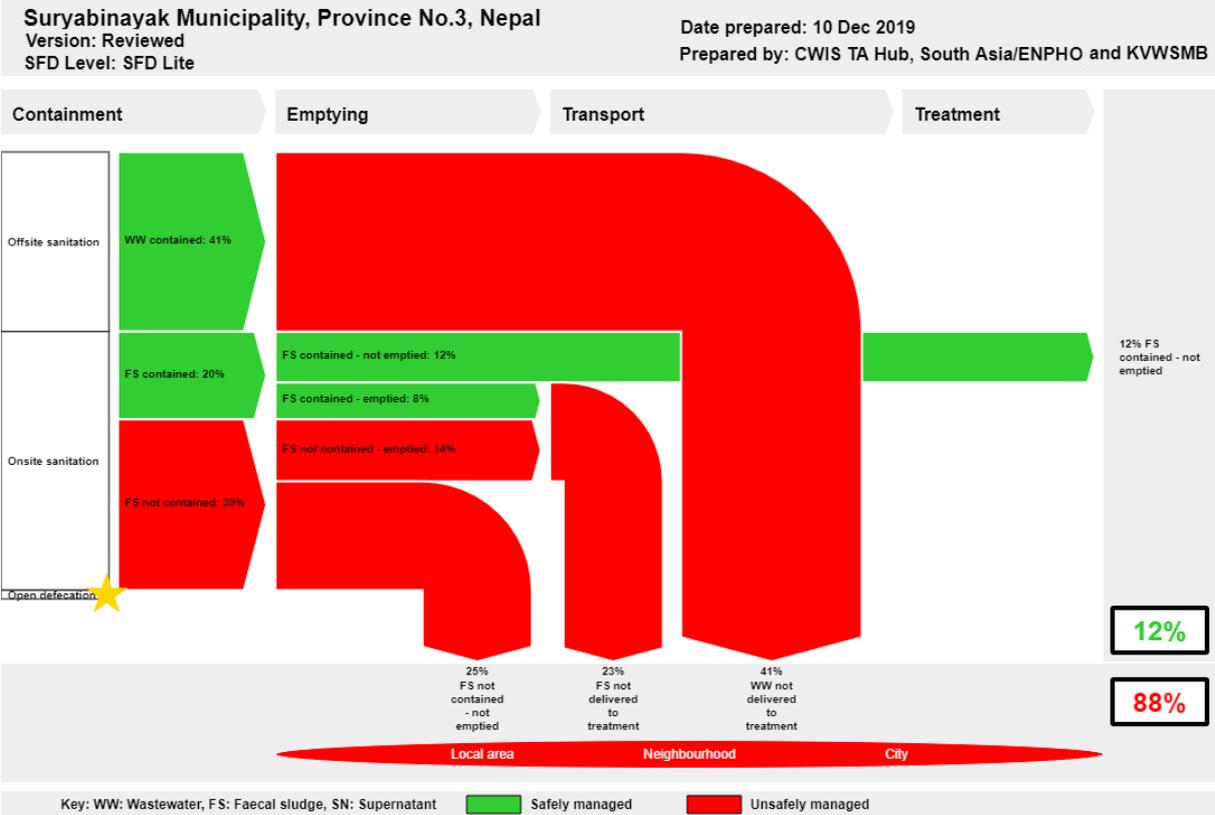
SFD Lite Report

Suryabinayak 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: 28/02/2020

1 The SFD Graphic



2 SFD Lite information

Produced by:

- The Shit Flow Diagram for Suryabinayak 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: 10/12/2019

3 General city information

Suryabinayak Municipality is located in Bhaktapur District in Province No. 3 of Nepal that was established on 2014 (2071 B.S in Nepali calendar) by merging the former Village development committees Katunje, Sipadol, Nankhel, Chitpol, Balkot, Sirutaar, Dadhikot and Gundu. The municipality is bounded by Mahalaxmi Municipality in the south, Madhyapur Thimi Municipality in the west, Banepa Municipality in the east and Bhaktapur and Changunarayan in the north (Figure 1). The municipality consists of 10 wards with the total population of 113,471 people residing in 19,179 households and covering an area of 42 km² (Total Sanitation Strategic Plan, 2019).

The temperature ranges from an average minimum of 3°C to a maximum of 28°C with an altitude ranging from 1,400 m to 2,000 m above mean sea level (Total Sanitation Strategic Plan, 2019). The main sources of drinking water in Suryabinayak Municipality are public taps, household bores and wells (KII1, 2019). According to the Total Sanitation Strategic Plan (2019), the majority (74%) of the households are dependent on piped water facility, 8% of the households rely on spring water and the remaining 18% are dependent on their own sources such as tap water (bore water) and wells.

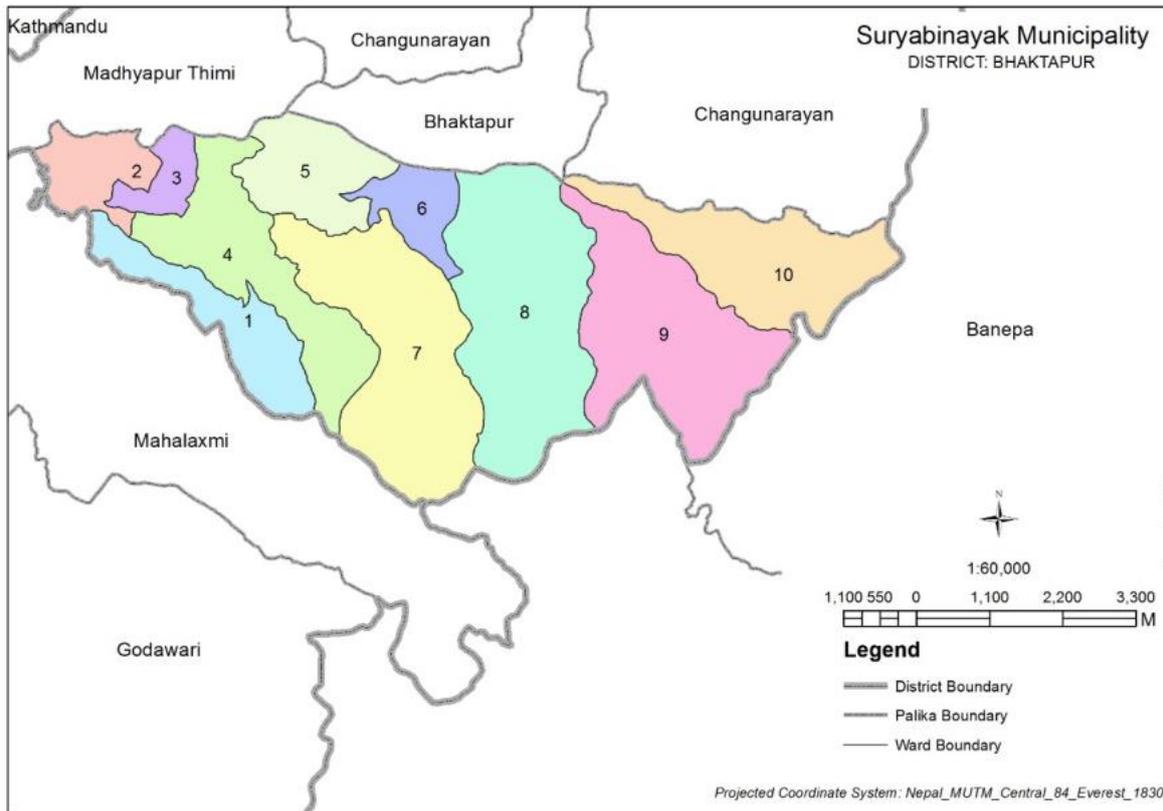


Figure 1: Map of Suryabinayak Municipality (Source: Ministry of Federal Affairs and General Administration).

4 Service outcomes

Table 1: SFD Matrix for Suryabinayak Municipality.

Suryabinayak Municipality, Province No.3, Nepal, 10 Dec 2019. SFD Level: SFD Lite

Population: 113471

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

System label	Pop	W4a	W5a	F3	F4	F5
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 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
T1A1C1 Toilet discharges directly to a centralised combined sewer	41.0	0.0	0.0			
T1A3C10 Fully lined tank (sealed), no outlet or overflow	20.0			42.0	0.0	0.0
T1A3C9 Fully lined tank (sealed) connected to 'don't know where'	3.0			25.0	0.0	0.0
T1A4C8 Lined tank with impermeable walls and open bottom, connected to open ground	4.0			25.0	0.0	0.0
T1A4C9 Lined tank with impermeable walls and open bottom, connected to 'don't know where'	6.0			25.0	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	26.0			42.0	0.0	0.0

4.1 Containment

As presented in Table 1, 41% of the population are dependent on the sewer system (T1A1C1) followed by people using lined tanks with impermeable walls and open bottom (T2A4C10, 26%; T1A4C9, 6% and T1A4C8, 4%) and fully lined tanks (T1A3C10, 20% and T1A3C9, 6%). As per the household survey (2019), the average size of the containment is 7m³.



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

4.2 Emptying and transportation

Even though it is mandatory to have a standard septic tank to get building permission, the municipality lacks standard design guidelines for the construction of containments (KII1, 2019). Emptying of the onsite sanitation facilities is either mechanical (69%) provided by a private desludging service provider or manual (31%) in Suryabinayak Municipality (HHs Survey, 2019). The transport of the mechanically emptied faecal sludge is done by a private desludging vehicle consisting of a tank equipped with movable centrifugal pump on a truck (KII2, 2019). Whereas, the manual emptying is done by a household member or labour. In case of the offsite sanitation system, the wastewater is transported through the sewer system.

4.3 Treatment

There is no any treatment facilities for treating wastewater and faecal sludge in Suryabinayak Municipality.

4.4 Reuse and Disposal

Manually emptied faecal sludge is disposed by the household member or labour themselves in their household premises or in field. Whereas, all the wastewater and emptied faecal sludge gets finally discharged in Hanumante River and other rivers of Kathmandu valley (KII1 and KII4, 2019).

4.5 SFD Graphic

As shown in the SFD graphic, 88% of the excreta generated are unsafely managed and 12% are safely managed. All the wastewater generated (41% of the total excreta generated) is contained in the technology but gets discharged into the open environment untreated. Out of the 39% of faecal sludge which is not contained in the technology, 14% is emptied and discharged in the environment untreated and 25% is not emptied but also considered as unsafely managed since it originates from systems located in areas of high risk of groundwater pollution. 20% of the faecal sludge is contained, out of which, 8% corresponds to faecal sludge emptied and discharged in an open environment without any treatment and 12% corresponds to faecal sludge not emptied from fully lined tanks (sealed) with no outlet or overflow.

4.6 Groundwater Contamination

There are no published data available regarding groundwater table and soil profile of Suryabinayak Municipality. So, the information was collected from KII1 (2019). Majority 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 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 Suryabinayak 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 Suryabinayak Municipality.

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

- *Suryabinayak Municipality, 2019, Total Sanitation Strategic Plan.*
- *Household Survey, 2019, City-Wide Inclusive Sanitation Technical Assistance Hub, South Asia.*
- *MoFALD, 2019, Ministry of Federal Affairs and General Administration.*
- *KII1, December 2019, Interview with Municipal Board member Suryabinayak Municipality.*
- *KII2, December 2019, Interview with Municipal officer Suryabinayak Municipality.*
- *KII3, December 2019, Interview with WASH Coordinator of Bhaktapur District UN/HABITAT.*
- *KII4, December 2019, Interview with Municipal Engineer Suryabinayak Municipality.*
- *KII5, September 2019, Interview with Private desludging service provider, Lalitpur Metropolitan city.*

SFD Suryabinayak Municipality, Nepal, 2019

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