



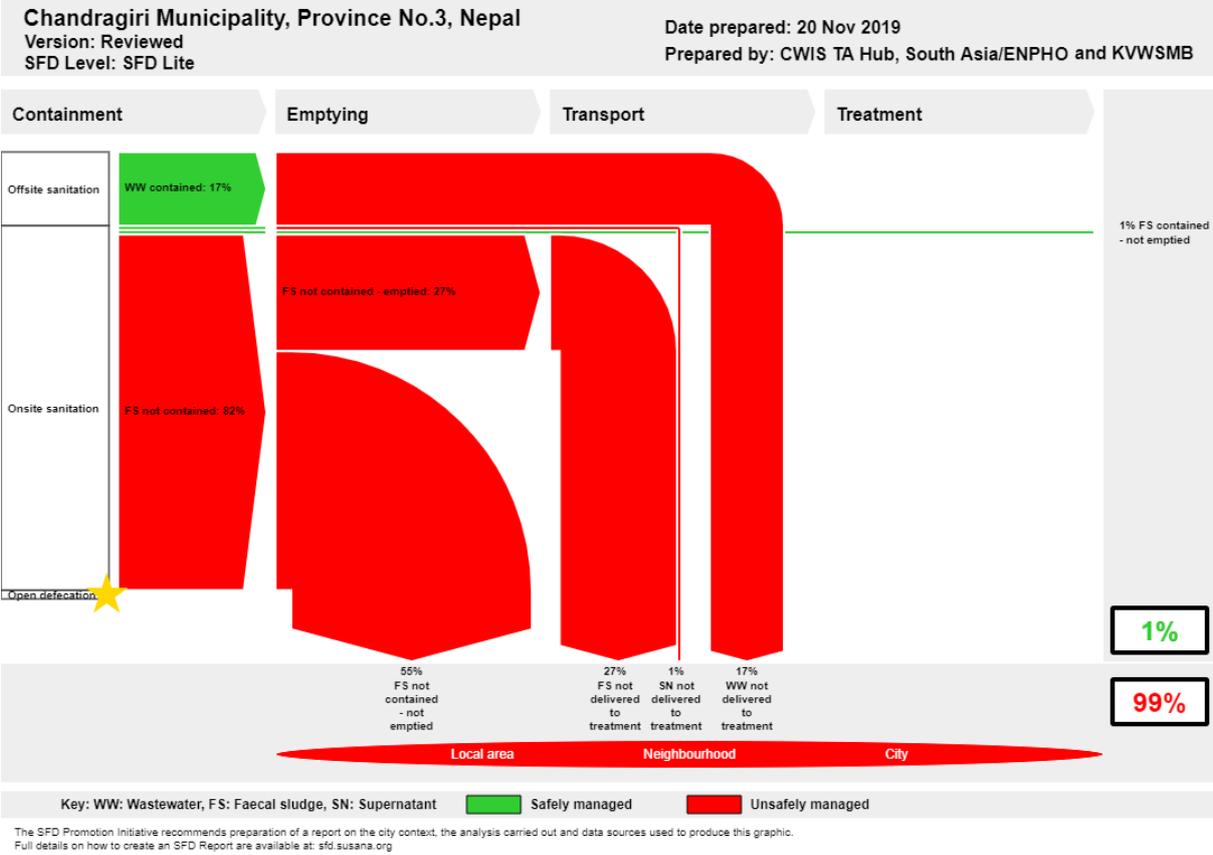
SFD Lite Report

Chandragiri 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: 20/11/2019

1 The SFD Graphic



2 SFD Lite information

Produced by:

- The Shit Flow Diagram for Chandragiri 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:

- EcoConcern Pvt.Ltd.
- DevCon.

Date of production: 20/11/2019

3 General city information

Chandragiri Municipality is located in Kathmandu 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 Thankot, Dahachowk, Naikap, Nayabhanjyang, Waadvhanjyang, Bolambu, Mahadevsthan, Tinthana, Satungal, Matatirtha, Machhegaun and Naikap purano bhanjyang. The municipality is bounded by Kritipur Municipality in the east, Dhunibesi Municipality in the west, Nagarjun Municipality in the North and Thaha Municipality in the south. The municipality consist of 15 wards with the total population of 85,198 residing in 20,532 households (Municipality Profile, 2019).

The main sources of drinking water in Chandragiri Municipality are public taps, household bores and wells. Majority of the households are dependent on public water supply (KII1, 2019).

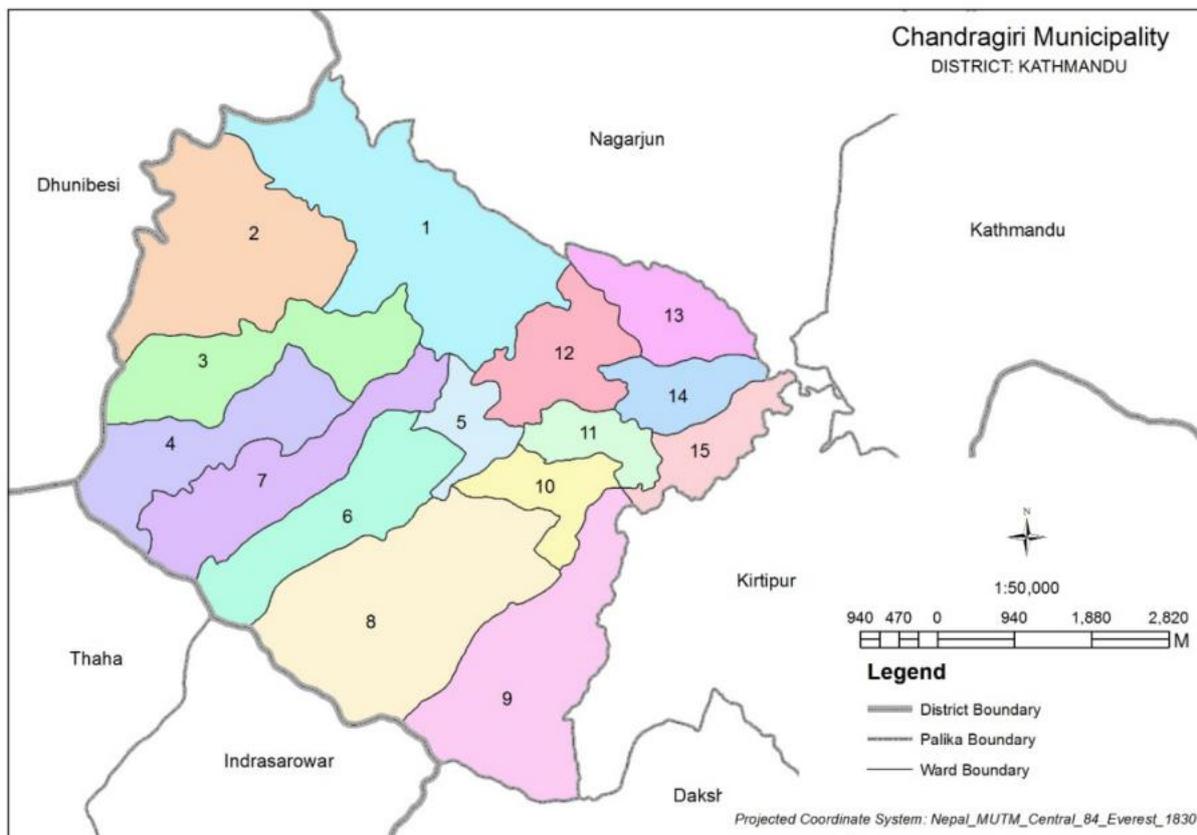


Figure 1: Map of Chandragiri Municipality (Source: Ministry of Federal Affairs and General Administration).

4 Service outcomes

Table 1: SFD Matrix for Chandragiri Municipality.

Chandragiri Municipality, Province No.3, Nepal, 20 Nov 2019. SFD Level: SFD Lite

Population: 85198

Proportion of tanks: septic tanks: 100%, fully lined tanks: 83%, lined, open bottom tanks: 100%

System label	Pop	W4a	W5a	F3	F4	F5	S4d	S5d
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	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
T1A1C1 Toilet discharges directly to a centralised combined sewer	17.0	0.0	0.0					
T1A3C1 Fully lined tank (sealed) connected to a centralised combined sewer	1.0			0.0	0.0	0.0	0.0	0.0
T1A4C7 Lined tank with impermeable walls and open bottom, connected to a water body	2.0			100.0	0.0	0.0		
T1A4C9 Lined tank with impermeable walls and open bottom, connected to 'don't know where'	10.0			48.0	0.0	0.0		
T2A3C5 Fully lined tank (sealed) connected to a soak pit, where there is a 'significant risk' of groundwater pollution	2.0			41.0	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	51.0			26.0	0.0	0.0		
T2A4C5 Lined tank with impermeable walls and open bottom, connected to a soak pit, where there is a 'significant risk' of groundwater pollution	10.0			41.0	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	7.0			29.0	0.0	0.0		

4.1 Containment

As presented in Table 1, majority of the population use lined tanks with impermeable walls and open bottom (T2A4C10, 51%; T2A4C5, 10%; T1A4C9, 10% and T1A4C7, 2%), followed by the user interface directly connected to the sewer system (T1A1C1, 17%), lined pits with semi-permeable walls and open bottom with no outlet or overflow (T2A5C10, 7%) and fully lined tanks (T1A3C1, 1% and T2A3C5, 2%).

4.2 Emptying and transportation

The emptying frequency widely varies since there is no standard design guidelines for the construction of containments in Chandragiri Municipality (KII2, 2019). So, the emptying frequency for different types of containments connected to different technologies is estimated on the basis of the household survey and key Informant Interviews. Mechanical desludging (77%) provided by a private desludging service provider was found in higher percentage than the manual emptying (23%) in Chandragiri Municipality (HHs Survey, 2019). The mechanically emptied faecal sludge is transported by a private desludging vehicle which consists of a tank equipped with movable centrifugal pump on a truck (KII2, 2019). There is no municipal 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 is transported through the sewer system.

4.3 Treatment

The municipality lacks treatment plant for treating wastewater or faecal sludge.

4.4 Reuse and Disposal

Manually emptied faecal sludge is disposed untreated by the household member or labour themselves in their household premises or in a field. All the wastewater and emptied faecal sludge gets finally discharged in Balkhu and Bolambu Rivers and other rivers of Kathmandu valley (KII2, 2019).



Figure 2: Wastewater discharged to Bolambu River untreated.

4.5 SFD Graphic

The SFD has shown that 99% of the excreta generated are unsafely managed and 1% are safely managed. Out of the 82% of faecal sludge which is not contained in the technology, 27% is emptied and discharged untreated into the local environment and 55% is not contained - not emptied. 17% of the population's excreta discharges directly to the sewer system where all wastewater generated ends up untreated into the environment. Only 1% of faecal sludge is safely managed since it originates from faecal sludge in fully lined tanks which are sealed and not emptied.

The faecal sludge not contained in the technology might lead to severe risk of groundwater pollution since more than 25% of the population are dependent on groundwater sources for drinking purposes. So, special attention and measures for faecal sludge management is needed.

4.6 Groundwater Contamination

There are no published data available regarding groundwater table and soil profile of Chandragiri Municipality. So, the information was collected from KII1 (2019). Majority of population are depending on underground sources of water which are from protected boreholes extracted from a depth of greater than 10 metres and consisting of sandstones 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 less than 25% (KII1, 2019). So, it has been estimated that there is high risk of groundwater pollution in Chandragiri 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 Chandragiri 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%, 83% and 100%, 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

- *Chandragiri Municipality Profile, 2019.*
- *HHs Survey data 2019, City-wide Technical Assistance Hub, South Asia.*
- *MoFALD, 2019, Ministry of Federal Affairs and General Administration.*
- *KII 1, November 2019, Interview with Municipal Engineer, Chandragiri Municipality*
- *KII 2, November 2019, Interview with Municipal officer, Planning section, Chandragiri Municipality*
- *KII 3, September 2019, Interview with Private mechanical desludging service provider, Lalitpur Metropolitan city.*

SFD Chandragiri Municipality, Nepal, 2019

Produced by:

City-Wide Inclusive Technical Assistance Hub,
South Asia (CWIS TA Hub, South Asia), Amrita
Angdembe

Environment and Public Health Organization
(ENPHO)

Kathmandu Valley Water Supply Management
Board (KVWSMB)

Editing:

Eco Concern Pvt.Ltd., Krishna Ram Yendyo

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