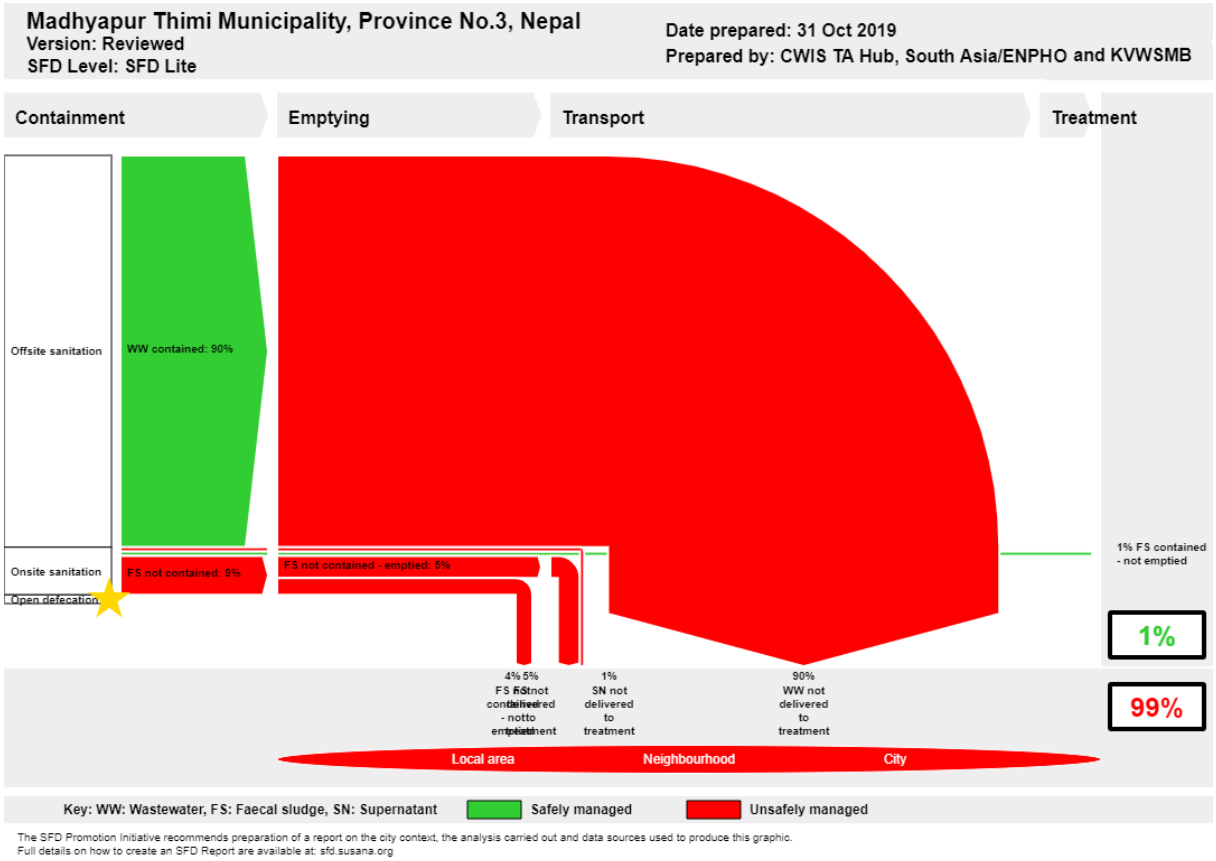
SFD Lite Report

Madhyapur Thimi 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: 31/10/2019

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 was for Madhyapur Thimi Municipality 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: 31/10/2019

3 General city information

Madhyapur Thimi Municipality is located in Bhaktapur district in Province no.3 of Nepal, consisting of 9 wards. The municipality is bounded by Kageshwori Manohora Municipality in the north, Suryabinayak Municipality in the south, Changunarayan Municipality in the east and Kathmandu Metropolitan city in the west (Figure 1). The total area of the municipality is 11.12 km^2. The total population of the municipality is 83,036 residing in 20,302 households. The annual temperature ranges from 1˚C to 35˚C (Madhyapur Thimi Municipality profile, 2019). Majority of the population rely on public water supply and People who do not have access to public water supply system get water from their own sources, mostly ground water such as well and tap water (KII 1, 2019).

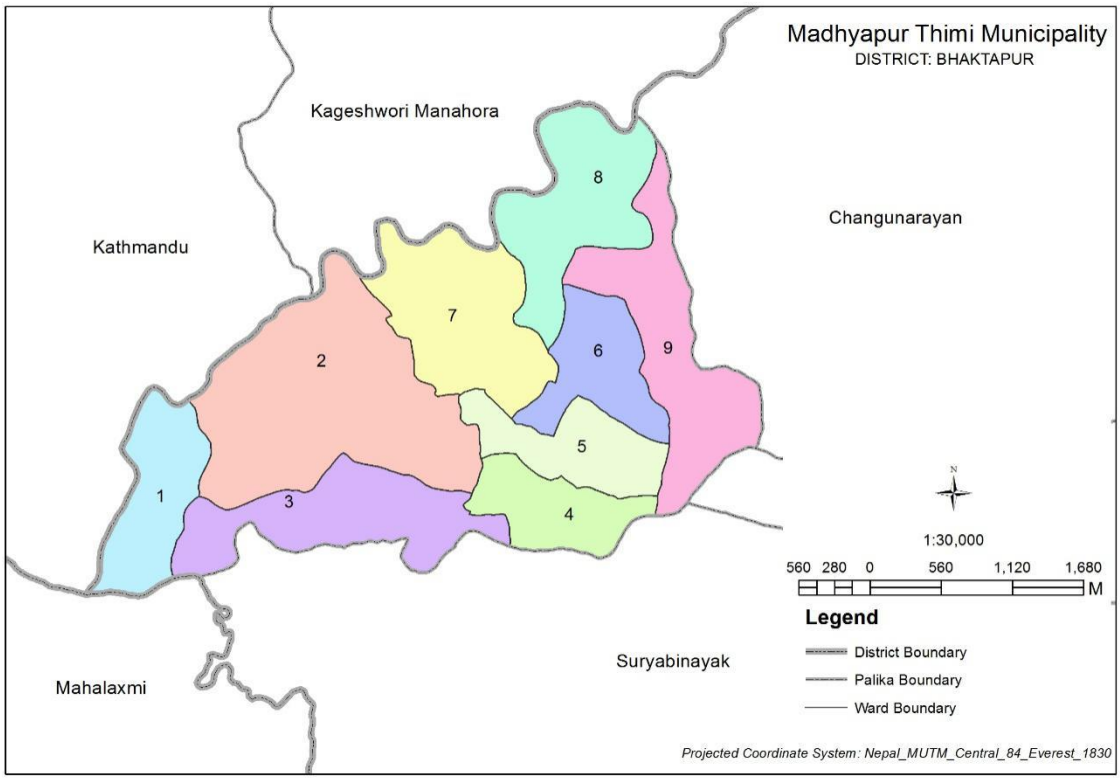


Figure 1: Map of Madhyapur Thimi Municipality (Source: Ministry of Federal Affairs and General Administration).

4 Service outcomes

Table 1: SFD Matrix for Madhyapur Thimi Municipality.

Madhyapur Thimi Municipality, Province No.3, Nepal, 31 Oct 2019. SFD Level: SFD Lite
Population: 83036
Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 94%

System label	Pop	W4a	W5a	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 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	90.0	0.0	0.0					
T1A3C10 Fully lined tank (sealed), no outlet or overflow	1.0			0.0	0.0	0.0		
T1A4C9 Lined tank with impermeable walls and open bottom, connected to 'don't know where'	2.0			80.0	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	4.0			70.0	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			25.0	0.0	0.0		

4.1 Containment

Combined sewers are predominantly found in Madhyapur Thimi Municipality (T1A1C1, 90%), followed by lined tanks with impermeable walls and open bottom (T2A4C1, 1%; T1A4C9, 2% and T2A4C10, 4%), lined pits with semi-permeable walls and open bottom with no outlet (T2A5C10, 2%) and fully lined tanks with no outlet or overflow (T1A3C10, 1%). As per the household survey (2019), the average size of the containment in Madhyapur Thimi Municipality is 7m^3.

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

4.2 Emptying and transportation

There is no standard design guidelines for the construction of containments in Madhyapur Thimi Municipality (KII2, 2019). Both manual (50%) and mechanical emptying (50%) were found prevalent in Madhyapur Thimi Municipality. Mechanical service is provided by private desludging service provider (HHs Survey & KII, 2019). There are no municipal services in the municipality and are dependent on the neighbouring municipality. 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.

The mechanically emptied faecal sludge is transported by the desludging vehicle, a tank equipped with movable centrifugal pump on a truck as shown in Figure 3. Wastewater and supernatant are transported through sewer system in Madhyapur Thimi Municipality.

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

4.3 Treatment

Despite having a huge coverage of sewer system, 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 Hanumante River (KII2, 2019).

4.5 SFD Graphic

As represented in the SFD graphic, 99% of the Faecal Sludge (FS) and wastewater is not safely managed and 1% of FS is safely managed. 90% of wastewater contained in the technology is discharged into the environment without any treatment. Out of the 9% of FS not contained, 4% of FS is not emptied and 5% is emptied but not delivered to treatment. 1% of the supernatant is discharged into the environment untreated. The 1% of safely managed FS is attributed to the population using fully lined tanks with no outlet and overflow, which are not emptied.

4.6 Groundwater Contamination

There is no published data available regarding groundwater table and soil profile of Madhyapur Thimi Municipality. So, the information was collected from KII2 (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 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 Madhyapur Thimi 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 Madhyapur Thimi 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 94% 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 data collected from the household survey and Key Informant Interviews.

6 List of data sources

- *Madhyapur Thimi 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, Madhyapur Thimi Municipality.*
- *KII2, October 2019, Interview with Municipal Engineer, Urban Planning Section, Madhyapur Thimi Municipality.*
- *KII3, September 2019, Interview with Private desludging service Provider.*

SFD Madhyapur Thimi Municipality, Nepal, 2019

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This Executive Summary and the SFD Report are available from:

www.sfd.susana.org

SFD Promotion Initiative