



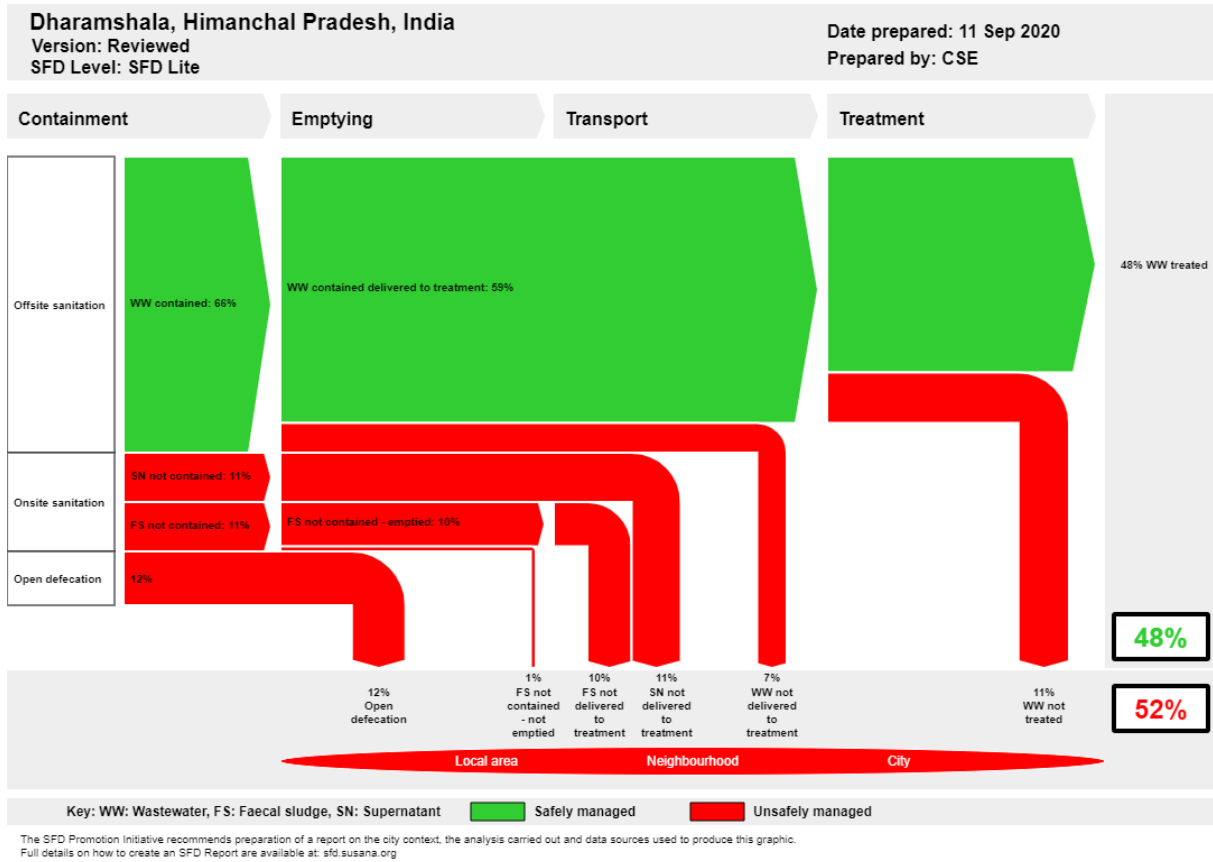
SFD Lite Report

Dharamshala India

This SFD Lite report was prepared by Centre for
Science and Environment (CSE)

Date of production/ last update: 11/09/2020

1 The SFD Graphic



2 SFD Lite information

Produced by:

- Centre for Science and Environment, New Delhi.
- This report was compiled as part of the SFD Promotion Initiative project funded by the Bill and Melinda Gates Foundation (BMGF). We would like to thank Shri Pradeep Thakur, Municipal Commissioner, Municipal Corporation Dharamshala; Mr. Sarvan Thakur, Executive Engineer, Municipal Corporation Dharamshala, and Mr. Satnam Singh, Executive Engineer Municipal Corporation Dharamshala.
- This report would not have been possible without the constant support of Municipal Corporation Dharamshala, Irrigation and Public Health Department, Smart City Dharamshala who helped in conducting sample surveys and FGDs in the field.

Collaborating partners:

- Municipal Corporation Dharamshala, Dharamshala, Himachal Pradesh, India

Date of production: 11/09/2020

3 General city information

Dharamshala is a town situated in the foothills of the Himalayas in the District of Kangra and State of Himachal Pradesh, India. Dharamshala has two distinct features namely Upper and Lower Dharamshala. Kotwali Bazaar and areas further down into the plains of the Kangra valley (at the average height of 1,250 metres) are called Lower Dharamshala while McLeod Ganj (at the height of nearly 1,800 metres) and its surrounding areas on the hillsides are known as Upper Dharamshala.

According to the 2011 census, the population of the city was 22,586 and the total number of households (HHs) was 7,806 and spread across an area of 10.63 km². The current population of the city is 53,543 (Table 1) and the total number of households (HHs) is 10,992 which is divided into 17 election wards with an area of 27.6 km². The current population of 53,543 has been considered for the preparation of this SFD report.

Table 1: Population Growth rate Dharamshala City.

Census Year	Population	Growth Rate (%)	Source
1991	17,493	-	Census 2011
2001	19,982	1.42	Census 2011
2011	22,586	1.30	Census 2011
2015	53,543	13.70*	Municipal Corporation of Dharamshala

The city has a tropical climate with a maximum temperature in summers of 27.1°C and a minimum temperature in winters less than 9.9°C with an annual rainfall of about 2,883 mm. The risk of groundwater contamination is low as the depth of groundwater level is 1.56 - 15.44 metres below ground level (mbgl).

The sources of water supply in the city are dependent on springs and streams originating high above in the Dhauladhar hills. This include Glenmore spring, the Bagsunag spring, the Charan Khad, the Bather khad, and the Gajeu khad. Other sources of water supply are 4 OHTs with an average of 5,000 litres of capacity, and 13 Under Ground Tanks ranging from 25,000 litres to 1.70 lakh (1.70 x 10⁵) litres capacity. There are 6,648 domestic connections and 720 commercial connections. Water is supplied for one hour on an average to each household connection at a rate of 85 litres per capita and per day (lpcd). The city has total water demand of 7.2 Million Litres per Day (MLD) out of which only 5.9 MLD is supplied through 5 main sources. At present, there is one Water Treatment Plant (WTP) of 1.29 MLD capacity located in Dharamkot.

4 Service outcomes

Table 1: SFD Matrix for Dharamshala.

Dharamshala, Himanchal Pradesh, India, 11 Sep 2020. SFD Level: SFD Lite

Population: 53543

Proportion of tanks: septic tanks: 50%, fully lined tanks: 50%, lined, open bottom tanks: 50%

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
T1A1C2 Toilet discharges directly to a centralised foul/separate sewer	66.0	90.0	81.0					
T1A3C6 Fully lined tank (sealed) connected to an open drain or storm sewer	22.0			90.0	0.0	0.0	0.0	0.0
T1B11 C7 TO C9 Open defecation	12.0							

The overview of technologies and methods used for different sanitation systems through the sanitation service chain is as follows:

4.1 Off-Site Sanitation Systems

The sewerage network has been laid in the city within the administrative boundary of Dharamshala with a total length of 72.8 km which accounts for 66% (T1A1C2) of the city's population (Field Observation; KII- 1, 2020; KII-2, 2020). The Department for Irrigation and Public Health (IPH) is responsible for the planning and construction of the sewerage system in the city. There is one Sewerage Treatment Plant (STP) in the city with an installed treatment capacity of 5.15 MLD (KII-1, 5, 2020). The STP is based on Upflow Anaerobic Sludge Blanket (UASB) technology. As per the current scenario, ~90% of the wastewater is reaching the STPs (W4a set to 90%) considering the leakages from old defunct sewer lines which finds its way to either stormwater drains and river (Figure 1). Presently, 4 MLD of wastewater is treated through STP out of a total of 5 MLD of capacity (KII-1, 2020; KII-5, 2020). Therefore, variable W5a is considered 80% in the SFD matrix. The treated wastewater from STP is discharged into *nallahs*/drains (KII-1, 2020; KII-5, 2020).



Figure 1: Wastewater from HHs flow into open drains/*nallahs* (Saiyami/CSE, 2020).

4.2 On-site Sanitation Systems

Containment: Based on sample household survey (Bhardwaj, 2020), Key Informant Interviews (KIIs), and Focus Group Discussions (FGDs) with relevant stakeholders, it was concluded that 22% of the population is dependent on the On-site Sanitation Systems (OSS) (Field Observation; KII- 2, 2020; KII- 3, 2020; FGD-1 & 2, 2020). The containment systems prevalent in the city are Fully Lined Tanks (FLT) connected to an open drain or storm sewer (T1A3C6, 22%) (Field Observation; FGD-1 & 2, 2020).

The general size of FLT varies from 10 – 12 ft x 8 - 10 ft x 10 – 15 ft (3.0– 3.6 m x 2.4 – 3.0 m x 3.0 – 4.5 m), depending upon the household size, income level, community, etc (Field Observation; FGD-1 & 2, 2020). The FLT are single-chambered with impermeable walls and sealed vaults (Figure 2).



Figure 2: Fully Lined Tank connected to open drain in a household (Saiyami/CSE, 2020).

Community Toilets/Public Toilets: There are 17 Public Toilets (PTs) with 130 seats in Dharamshala which have FLT connected to open drain (Field Observation; FGD-1 & 2, 2020). The average size of FLT in Public Toilets is 12 x 6 x 10 ft (3.6 x 1.8 x 3.0 m) which are emptied every 3-4 years. As per the Town and Country Planning report (TCP, 2015), 16% of the population was defecating in the open but Dharamshala Municipal Corporation (DMC) has constructed PTs across the city (Figure 3), especially near Open Defecation (OD) hotspots and as a result, though the number has substantially decreased, the city is still not Open Defecation Free (ODF) and this is purely attributed to behaviour of the people.



Figure 3: Fully lined tank connected to open drain in Forsytganz Public Toilet (Saiyami/CSE, 2020).

Emptying: The city is dependent on government and private-operated mechanized desludging services for emptying of faecal sludge from FLT (Field Observation; FGD-2, 2020; KII-2, 2020). The emptying frequency varies from 3 years to even 5 years (demand-based) across the city, depending upon the

nature and the size of the containment system (FGD-2, 2020). There are total of 3 (2 government and 1 private) vacuum trucks plying in the city, one for each municipal division (FGD-2, 2020). Each of these vacuum trucks are equipped with motorized pumps and have a storage capacity of 2,000 litres. Emptying service is carried out by 3-4 workers and charges are around INR 450 - 500/ trip (USD 6.0 - 6.7/trip) for government-operated vehicles and INR 1,300/trip (USD 17.5/trip) for private-operated vehicles (FGD-2, 2020). All the emptying vehicles are maintained properly by DMC at the designated depot (Field Observation). The municipal workers are provided with Personal Protective Equipment (PPEs) which they partially use it while emptying (FGD-2, 2020).

Transportation: The emptied septage is transported through the truck-mounted vacuum tankers (Figure 4) (FGD-2, 2020). The average time taken to dispose of the emptied septage is around ~20 minutes (FGD-2, 2020). Around 2 trips per week are made by each vehicle (FGD-2, 2020). The Faecal Sludge (FS) emptied by vacuum trucks is discharged untreated into agricultural land and *nallahs* in the vicinity (Field Observation, FGD-2, 2020).



Figure 4: Truck-mounted vacuum tanker
(Source: Saiyami/CSE, 2020).

Treatment/Disposal: The treated wastewater from STP, while complying with Central Pollution Control Board discharge standards, is disposed off into *nallahs*/drains which is eventually mixed with untreated wastewater. The sludge generated at STP is stored in sludge drying beds and given to the farmers for agriculture use as soil conditioner (Field observation, KII-5, 2020).



Figure 5: Faecal sludge disposed in nearby *nallahs*/open drains
(Source: Saiyami/CSE, 2020).

4.3 SFD graphic

The SFD graphic depicts that 52% of the excreta is discharged unsafely to the environment while 48% is safely managed.

The 48% of safely managed excreta comes from wastewater delivered to treatment and treated at the STP. The 52% of unsafely managed excreta originates from: wastewater delivered to treatment but not treated (11%) since the treatment efficiency is 80%, wastewater not delivered to treatment due to leakages in the sewerage system (7%), Supernatant (SN) not contained and not delivered to treatment (11%), FS not contained - emptied but not delivered to treatment (10%) and FS not contained - not emptied (1%) from fully lined tanks connected to sewers and excreta disposed in the open due to OD practises (12%).

5 Data and assumptions

Census 2011 was considered as the baseline and the data for all the stages of the sanitation chain were updated based on the data collected from the field through KIIs, FGDs, observations and secondary data collected from relevant stakeholders. The following assumptions were made for developing the SFD graphic for Dharamshala.

- The volume of wastewater generated is 80% of the water supplied.
- 66% of the population is covered by the sewerage network where around 90% of the wastewater produced is reaching the STP (W4a set to 90%). Treatment efficiency is considered to be 80% and thus, variable W5a is set to 80%.
- The proportion of the contents of each type of onsite container is considered as 50% faecal sludge (step two of the Graphic Generator).
- The proportion of OSS emptied is estimated as 90% considering the average desludging frequency of 3-4 years which is more than the required time (scheduled desludging) for an average containment size of 10 x 10 x 10 ft (3 m x 3 m x 3 m) and the rest 10% is not emptied considering that not all FS gets emptied due to less number of trips taken for emptying of one containment system by a vacuum tanker of 2,000 litres of capacity. Thus, Variable F3 for fully lined tanks (system T1A3C6) was set to 90%.
- All FS from FLT's is getting emptied by vacuum trucks and discharged untreated into agricultural land and *nallahs* in the vicinity. Thus, variables F4, F5, S4e and S5e for system T1A3C6 were all set to 0%.
- 16% of the population still defecate in the open (system T1B11 C7 TO C9).

6 List of data sources

Reports and literature

- District Census Handbook 2011 for Dharamshala (Houses and household amenities and assets table HH-08: percentage of households by the availability of the type of Latrine Facility <https://www.censusindia.gov.in/2011census/Hlo-series/HH08.html>)
- TCP, 2015. Dharamshala Planning Area Development Plan 2035. Town and Country Planning Department, Government of Himachal Pradesh, 2015
- Smart City Proposal, Dharamshala Municipal Corporation, 2017.
- City Development Plan, Dharamshala Municipal Corporation, 2017.
- Zurbrügg, C., (2001a). Baseline Study on Water Supply, Sanitation, and Solid Waste in Upper Dharamshala, India: SANDEC/ EAWAG, Dübendorf, Switzerland.
- Report on Liquid and Solid Waste Management Survey of Dharamshala Town- Dhaulaudhar Public Education Society (2001).

Key Informant Interviews (KII)

- KII-1, 2020; Interview with Mr. Sarvan Thakur, Executive Engineer, I&PHD.
- KII-2, 2020; Interview with Mr. Satnam, Executive Engineer, MCD.
- KII-3, 2020; Interview with Mr. Jatinder Kumar, Sanitation Supervisor, MCD.
- KII-4, 2020; Interview with Mr. Sanjay Puri, Work supervisor MCD.
- KII-5, 2020; Interview with Mr. Sapahiya (STP Incharge).
- KII-6, 2020; Interview with Mr. K.K. Kapoor, Assistant Engineer, I&PHD.
- KII-7, 2020; Interview with Mr. Ashok (Pardan of Ward 1,2,3).
- KII-8, 2020; Interview with Mr. Madan Lal (Vacuum Truck Service Provider).
- KII-9, 2020; Interview with Mr. Dullo (OHT in charge).
- KII-10, 2020; Interview with Mr. Ram Nanda (Private Vacuum Truck Service Provider).
- KII-11, 2020; Interview with Mrs. Nirmla Devi (Public Toilet Incharge).
- KII-12, 2020; Interview with Mr. Nageshwar (Vacuum Truck Service Provider).
- KII-13, 2020; Interview with Mr. Nanak Chand (Vacuum Truck Service Provider).
- KII-14, 2020; Interview with Mr. Nagpal (Public Toilet Care Taker).

Focus Group Discussions (FGD)

- FGD-1, 2020; Focus Group Discussion with masons.
- FGD-2, 2020; Focus Group Discussion with Emptying Service Providers.

Field Observations

- Bhardwaj, Saiyami (2020). Survey of 17 Public toilets.
- Visit 1 Sewage Treatment Plant (STP) located at Chelian.
- Visit 40 households covering Lower Income Groups (LIG), Middle Income Groups (MIG) and Higher Income Groups (HIG) spread throughout the city.

SFD Promotion Initiative



Dharamshala, India, 2020

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