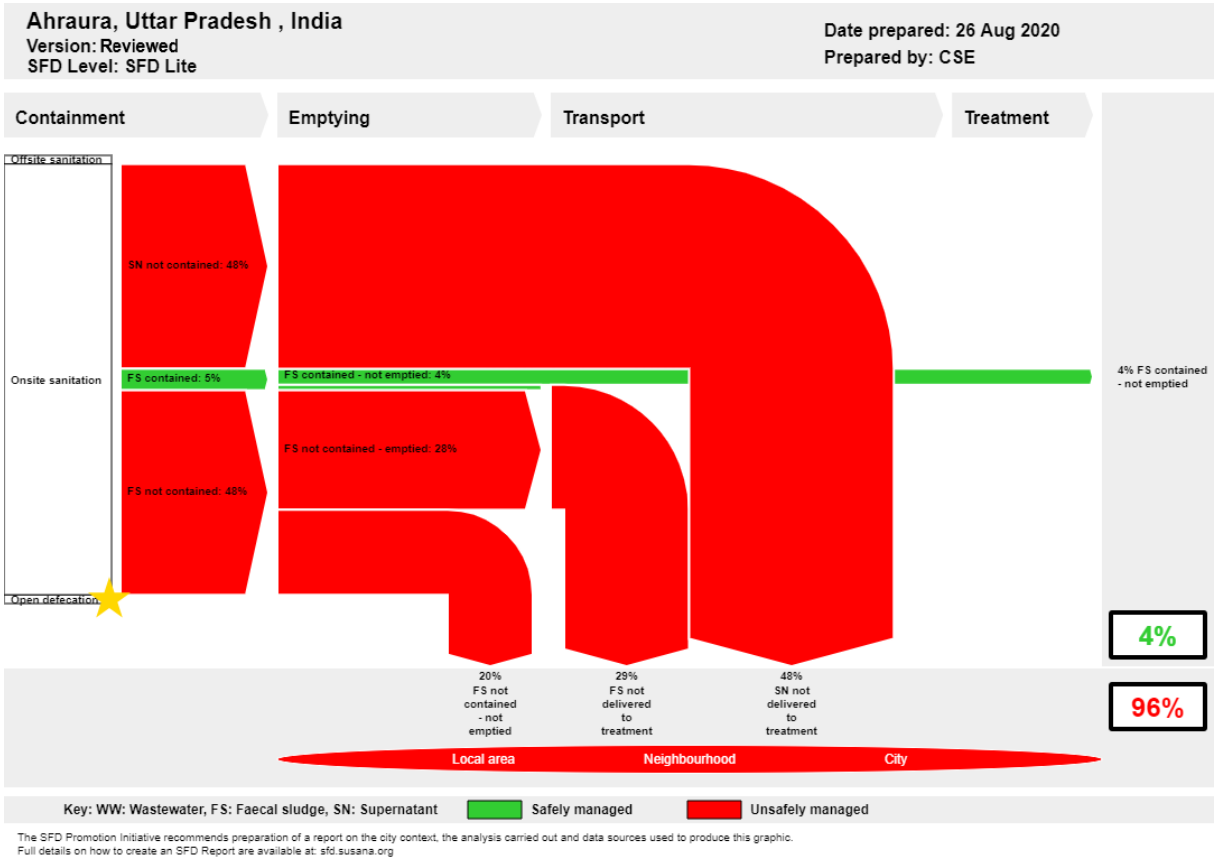
# SFD Lite Report

# Ahraura
# India

This SFD Lite Report was prepared by
Centre for Science and Environment.

Date of production/ last update: 10/09/2020

# 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:**

- Centre for Science and Environment
- 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 Mr Vinay Kumar Tiwari, Executive Officer (EO) ; Mr. Nitish Kumar, *Safai Nayak* ; Mr. Chandra Kant ,Computer Operator; Mr. Suresh Kumar, Pump Attendant , *JalKal Vibhag* and Mr.Prince, *Safai Nayak* for providing all the required secondary data and cooperating in conducting KII & FGDs.

**Collaborating partners:**

- Ahraura Nagar Palika Parishad (ANPP).

**Date of production:** 10/09/2020

# 3 General city information

Ahraura is situated at a distance of 60km from Mirzapur District, in the state of Uttar Pradesh, India. City lies in the Vidhyan Range, and at a distance of 340 km from the state capital, Lucknow. The population of the city, as per the Census of India, 2011 is 23,094. Population density of the city is 6,242 persons per sq.km, which is considerably high, when compared to that of Uttar Pradesh, i.e. 828 persons per sq.km. The current population according to *Swachh Survekshan* (SS) 2020 is 29,960. The population growth rate of the city is given in Table 1.

| Year | Population | Growth rate (%) |
|---|---|---|
| 1991 | 18,549 | - |
| 2001 | 23,142 | 24.76% |
| 2011 | 24,967 | 7.89% |
| 2020 (SS 2020) | 29,960 | 29% |

**Table 1: Population growth rate of Ahraura city (Source: ANPP 2020, Census 1991,2001 and 2011)**

In the premises of city *Lakhaniya Dari* is a water fall where people come to enjoy the beauty of nature. There is a *Bhandari Devi* temple where many people come for worship in festival and fairs like Sawan Mela and Teej Mela with 20k to 25k persons per year.

The city is located at 25.02$^0$ N latitude and 83.02$^0$ E longitude with an average altitude of 84 m above Mean Sea Level (MSL). The climate is dry sub-humid to moist sub humid. The temperature rises maximum to 41.8°C during peak summer season and drops down to minimum of 9.6°C during the winter season[1]. Ahraura city lies in a moderate to high rainfall region with the lowest being in April up to 3 mm and highest in August up to 345 mm (UPJN, 2014).

# 4 Service outcomes

Ahraura, Uttar Pradesh , India, 26 Aug 2020. SFD Level: SFD Lite
Population: 29960
Proportion of tanks: septic tanks: 50%, fully lined tanks: 50%, lined, open bottom tanks: 50%

| System label | Pop | F3 | F4 | F5 | S4e | S5e |
|---|---|---|---|---|---|---|
| System description | Proportion of population using this type of system | 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 |
| T1A2C5 Septic tank connected to soak pit | 5.0 | 50.0 | 0.0 | 0.0 | | |
| T1A2C6 Septic tank connected to open drain or storm sewer | 40.0 | 70.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| T1A3C6 Fully lined tank (sealed) connected to an open drain or storm sewer | 55.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Table 2: SFD Matrix for Ahraura (CSE, 2020)**

Overview on technologies and methods used for different sanitation system through the sanitation service chain is as follows:

## Offsite sanitation

[1] District Census Handbook 2011 for Mirzapur (HH-8 Households by Availability of type of Latrine Facility Table For Uttar Pradesh) , https://censusindia.gov.in/2011census/dchb/DCHB_A/09/0968_PART_A_DCHB_MIRZAPUR.pdf

According to Census 2011, there was a sewerage network in the city which covered about 1.5%[2] of the population, but the field-based study revealed that neither there is any functional sewerage network in the city nor any kind of sewage treatment plant.

## Onsite sanitation

In absence of any kind of sewerage system in the city, 100% of the population is dependent on onsite sanitation systems[3]. There is no wastewater treatment plant in the city.[4]

### Containment

Three types of containment systems are prevalent in Ahraura city - septic tank connected to open drain, septic tank connected to soak pit and fully lined tank connected to open drain. 40% population is dependent on septic tanks connected to open drain (T1A2C6), 55% on fully lined tank connected to open drain (T1A3C6) and 5% on septic tank connected to soak pits (T1A2C5).[5] The size of containment system depends on space availability and affordability of households. Whether it's a fully lined tank or septic tank both are locally known as septic tank. Under the recent scheme of *Swachh Bharat* (Clean India) Mission, NPP Ahraura constructed 1,723 Individual Household Latrines (IHHL), 25 seats for community toilet and 5 seats for public toilet within the administrative boundary.[6] It was observed in the field, that open defecation is still being practiced in the wards, where the new toilets are under construction.


**Figure 1: Septic Tank under construction and fully lined tank connected to open drain (Manish/CSE,2020)**

*Community Toilets/Public Toilets*: There are 4 community toilets and 1 public toilet in Ahraura which have Septic Tank connected to open drain (STOD).[7] The average size of septic tanks in community toilet is 8 x 5 x 6 Cubic feet which are desludged every 1 -1.5 years. The average size of septic tanks in public toilet is 8 x 5 x 6 Cubic feet which are desludged in 0.5-1 years' time. The Ahraura Nagar Palika Parishad (ANPP) owns two mobile Bio Toilets 6-seater each which are installed at the Exhibition ground during public gatherings in addition to the existing public toilets.

[2] District Census Handbook 2011 for Mirzapur (HH-8 Households by Availability of type of Latrine Facility Table For Uttar Pradesh) , https://censusindia.gov.in/2011census/dchb/DCHB_A/09/0968_PART_A_DCHB_MIRZAPUR.pdf

[3,4] KII with Sanitary Incharge ,Executive Officer of NPP Ahraura and field observation, August 2020

[5] Random Household Survey in LIG, MIG and HIG, FGD with local masons and government Desludger

[6] Nagar Palika Parishad and SBM document 2020

[7] Field observations from visits to different Community & Public Toilet, August 2020

Even though Ahraura has been declared as an Open Defecation Free city the instances of open defecation can still be observed.[8] According to ANPP, the rare case of open defecation can be attributed to behavioural issue but the field observation suggests that there are still certain individual household toilets that are under construction and that also contributes to open defecation in the city.


**Figure 2: Mobile Toilet Used for public events in Ahraura (Manish/CSE, 2020)**

## Emptying

The local body has one vacuum tanker of 5,000 litres capacity but it hardly makes one or two trips in one week. The sanitary workers of the ANPP uses all personal protective equipment (PPE) like gloves, boots and mask during emptying of Onsite Sanitation System (OSS) and cleaning of drains.[9] In general, frequency of emptying is less than 12 years. The fees for mechanical emptying is INR 3,500 (47.76 USD). The field survey revealed that most of the settlements in the city are informal and unplanned and hence many containment systems are inaccessible to any kind of emptying vehicle. The manual emptying is still prevalent in the city and is usually carried out by two to four people at a time. The number of people deployed depends on the size of the containment and the degree of solidification of FS at the bottom of the containment. Spade and bucket are used by manual emptiers for emptying OSS without any safety gears. The manual emptying service fee ranges from INR 2,000 to INR 2,500 (27.29USD – 34.11USD).[10] Based on the sample household survey, FGD with emptiers it was concluded that 50% to 70 % of population is using their systems with emptying (F3).


**Figure 3: Government Desludging Tanker of Capacity 5kl (Manish/CSE,2020)**

## Transportation

[8] Field observation, August 2020
[9] KII with Government Desludger, August 2020
[10] KII with Computer Operator at ANPP, August 2020

The faecal sludge emptied mechanically using a vacuum tanker gets transported to a temporary trenching site. The tanker has to cover a distance of 8 to 10 kms for a round trip.[11] There is no leakage or spillage during transportation of Faecal Sludge and Septage (FSS). The faecal sludge emptied manually is transported using hand/cycle carts and is discharged into open drains or at any low-lying areas in and around the city. Supernatant (SN) is conveyed through open drains in the city, which finally converge into eight major nullahs which further terminates at open fields (Agricultural Land).[12] Since no supernatant is delivered to any treatment facility S4e is considered zero.


**Figure 4: Conveyance of wastewater and supernatant through open drain (Manish/CSE,2020)**

### Treatment

Ahraura does not have any treatment facility for faecal sludge and supernatant so we consider S4e and S5e as zero in SFD matrix. There is a designated site (*Lakhaniya Dari* a hilly area about 10 km from NPP Ahraura) for disposal of FSS. There is no Sewage Treatment Plant STP for treatment of supernatant or wastewater, hence all the wastewater and Super Natant SN eventually outfalls into agricultural field.


**Figure 5: Final disposal of WW and SN at Agricultural field (Manish/CSE,2020)**


**Figure 6: Designated site for disposal of FS (Manish/CSE,2020)**

## 5 Data and assumptions

### The availability and accessibility of data

- Two key sources of data are used; Census of India, 2011 and published documents of relevant departments. Ministry of Housing and Urban Affairs, Government of India, *Swachh Bharat* Mission, *Swachh Survekshan* 2020. Most of the data is then updated by Key Informant Interviews (KIIs), Focused Group Discussions (FGDs) and Field observations.
- Data on containment is available in Census but has been updated based on FGDs and KIIs. Data on emptying and transport has been collected by KIIs. However most of the data is qualitative

### Assumptions followed for preparing SFD

- 80% of water supplied is considered as wastewater generated
- 50% of the contents of tanks and pits is Faecal sludge

[11] FGD with *Safai Nayak* and Desludger(Driver), August 2020

[12] Document from Ahraura *Jalkal Vibhag* , August 2020

- Proportion of OSS emptied is considered as 50% assuming 10 years as the threshold, based on the size of the tank and no. of people dependent on that system. So, households getting their systems emptied in less than 10 years are considered to be using their system with emptying and those who are taking more than 11 years are considered as good as not emptying their systems.

# 6 Context adapted SFD Graphic

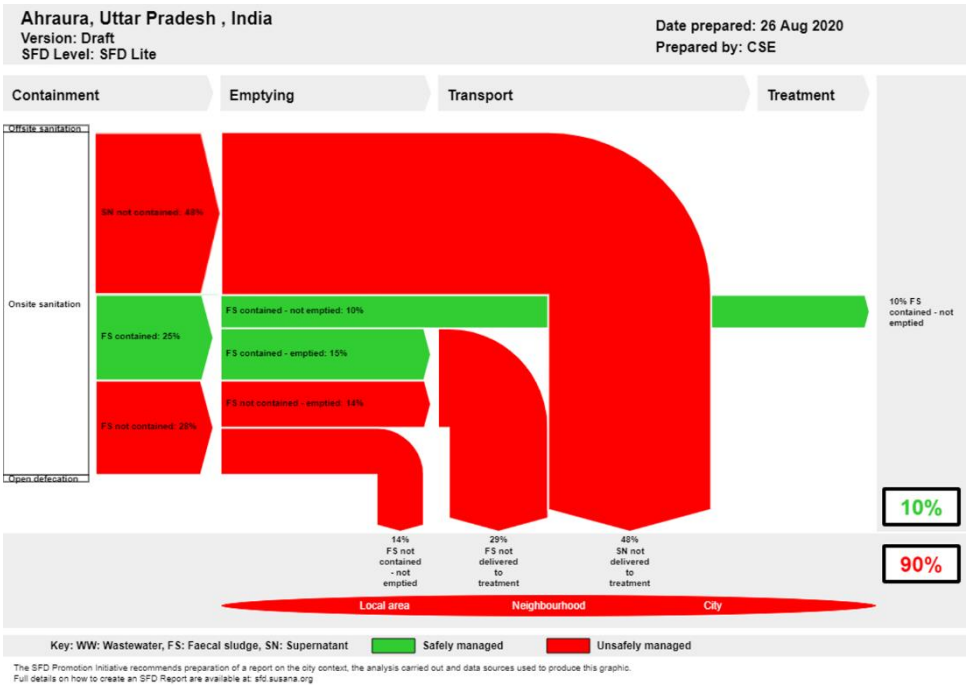



**Figure 7: Context adapted SFD Graphic for Ahraura**

The only difference suggested in the context adapted SFD is at containment stage for correctly designed septic tanks, though connected to open drains. With an earlier assumption of 50% of the proportion of the content of the septic tank which is solid FS, generated and collected inside the septic tanks. 50% of the content is supernatant which attributes to be 47% of the population, flows through open drains. The solid FS collected in the septic tank is considered to be contained and hence 28% of FS is contained (represented green in colour at containment stage). Followed by this, 15% FS contained is emptied. The supernatant generated from the septic tank connected to open drain is not contained and hence considered to be unsafely managed (represented red in colour). Overall, excreta of 90% population is not managed safely according to the context adapted SFD.

# 7 List of data sources

Reports and literature

- District Census Handbook 2011 for Ahraura (Houses and household amenities and assets table HH-08: percentage of households by availability of the type of Latrine Facility http://censusindia.gov.in/DigitalLibrary/MFTableSeries.aspx
- District Census Handbook 2011 (Population Census Abstract Data Table (India & State/UTs-Town/Village/WardLevel) http://censusindia.gov.in/2011census/population_enumeration.html

- CGWB. 2014. Groundwater Year Book. Uttar Pradesh: Central Ground Water Board. Ministry of Water Resources, River Development and Ganga Rejuvenation
- *Swachhta Sarvekshan* 2020, Ministry of Housing and Urban Development


Key informant interviews

- Executive Officer, *Nagar Palika Parishad* Ahraura (NPPA)
- Pump Attendant, *JalKal Vibhag*
- *Safai Nayak*, NPPA
- Computer Operator, NPPA
- *Safai Nayak 2* (contractual), NPPA

Focus group discussions

- Masons
- Residents
- Mechanical and manual emptiers
- Sanitary workers, NPPA


SFD Promotion Initiative

Ahraura, India, 2020

Produced by:

CSE, Manish Mishra

Editing:

CSE, Dr Suresh Kumar Rohilla

CSE, Bhitush Luthra





This SFD lite report is available from:

www.sfd.susana.org