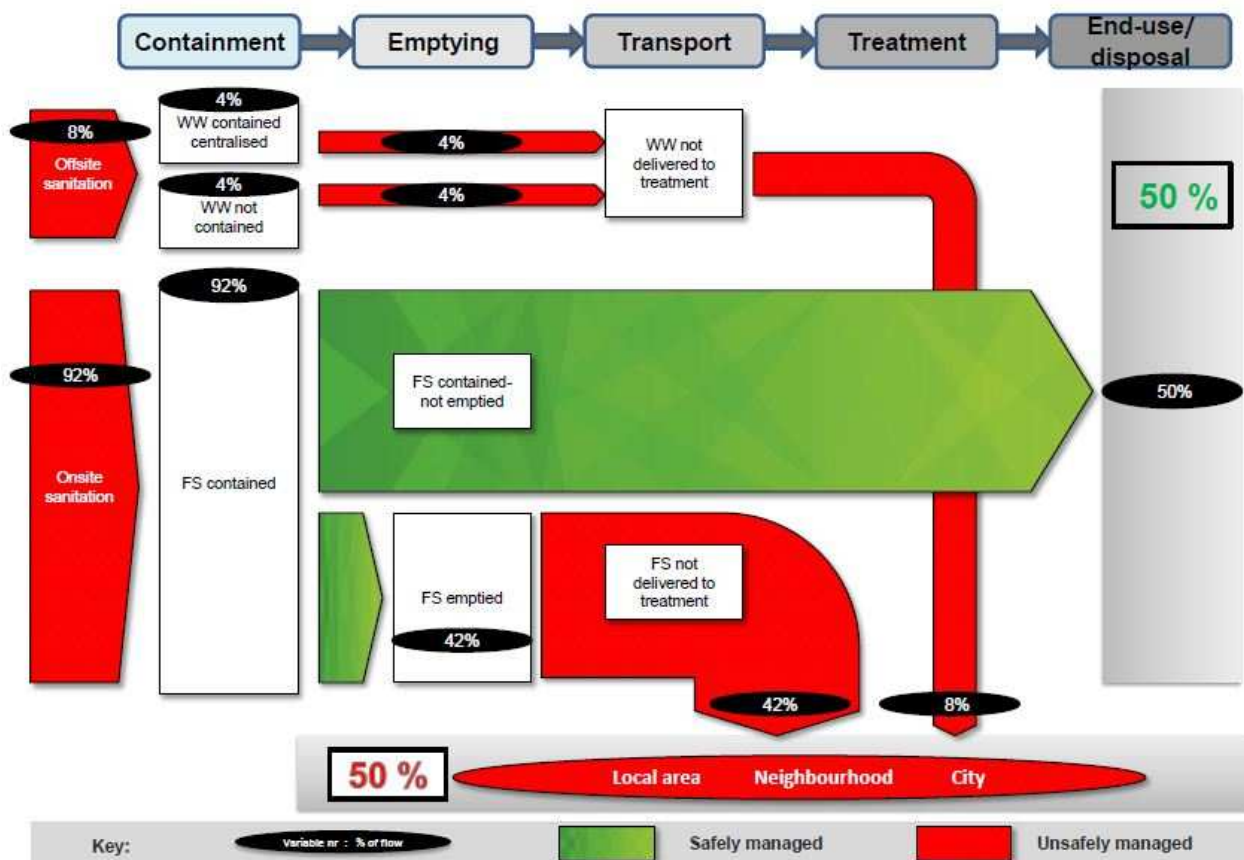


1. The Diagram

Aizawl- 29 July 2015
Desk based

Status: Draft



2. Diagram information

Desk or field based:

This is a desk based SFD

Produced by:

Centre for Science and Environment (CSE),
New Delhi

Status:

This is a draft SFD

Date of production:

29/07/2015

3. General city information

Aizawl, capital of Mizoram state, lies in east Himalayan region of India. It is the largest city of the state. Area under municipal council, which is 103.93 sq.km, has been chosen for the study. Aizawl Municipal Council (AMC) is further divided into 19 Wards.

The population of city under AMC, as per 2011 Census, is 293,416 persons. The density of city is 2,823 persons per sq.km which is very high when compared to state average of 52 persons per sq.km (CSP, 2014). Mizoram state has low density as most of the places are found to be uninhabitable. Aizawl has no visible slum pockets.

The topography of city is very undulating and the slopes vary between 30° and 45°. The altitude of the city varies at different points between 700 m and 1188 m above MSL (SMP, 2014).

4. Service delivery context

In 2008, the Ministry of Urban Development (MoUD) issued the National Urban Sanitation Policy (NUSP). The policy aims to: raise awareness, promote behaviour change; achieve open defecation free cities; develop citywide sanitation plans; and provide 100% safe confinement, transport, treatment and disposal of human excreta and liquid wastes. The NUSP mandates states to develop state urban sanitation strategies and work with cities to develop City Sanitation Plans (CSPs). Furthermore, it explicitly states that cities and states must issue policies and technical solutions that address onsite sanitation, including the safe confinement of faecal sludge (USAID, 2010).

The objectives of NUSP are to be realized through CSPs and state sanitation strategies. As of now there are very few cities which have finalized their CSPs, and those plans are also not implemented. This remains a major drawback in implementation of NUSP.

The advisory note on septage management in urban India, issued by MoUD in 2013, recommends supplementing CSPs with Septage Management Sub-Plan (SMP). Still septage management in India is not prominent due to lack of knowledge, consideration of septage management as an interim solution, lack of sufficient funding and many other socio-political issues.

There are no specific legal provisions relating to septage management, but there are a number of provisions relating to sanitation services and environmental regulations, which majorly stems from, The Environment (Protection) Act, 1986 and the Water (Prevention and Control of Pollution) Acts. Municipal acts and regulations usually refer to management of solid and liquid wastes but may not provide detailed rules for septage management (MoUD, 2013).

Aizawl has initiated and prepared SMP, which is under review with MoUD. Though there is no regulation private emptiers have to get themselves registered with MPCB, to get license for operating in the city. Three disposal sites, away from the city, have also been located.

5. Service outcomes

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

Containment: Presently there's no sewerage system. The city is majorly dependent on septic tanks which are generally not adhering to design

prescribed by Bureau of Indian Standards (BIS). The effluent from the septic tank flows into soak pit. Some households are also connected to pits.

Emptying: There are 40 private emptiers active in city, registered under Mizoram Septic Service Association (MSSA), an association of private emptiers and 5 vacuum tankers owned by Urban Development and Poverty Alleviation (UD & PA). The private emptiers utilize blow mould tank of 2000 litres capacity to carry septage and generator motor for emptying purpose, whereas UD & PA provides quality emptying by well designed vacuum tankers of 2000 litres capacity. Private emptiers attract customers through advertisements in television and local newspapers, and their emptying fee is generally 62 to 78 USD per trip. On the other hand emptying fees charged by UD & PA is 48 USD per trip. Some instances of manual emptying is also reported (SMP, 2014; KII 2015).

Transport: Both private emptiers and UD & PA emptiers transport septage by mini truck (TATA 407) to disposal sites. Since private service providers carry septage in blow mould tank, many times septage spills on the road during transportation. Disposal sites are generally 10 -15 kms away from the city.



Figure 1: AMC vacuum tanker (Source: Shantanu/CSE, 2015)



Figure 2: Private vacuum tanker (Source: SMP, 2014)

Treatment: There is no treatment facility for waste water and septage.

End-use/Disposal: Wastewater flows through drain along the road network disposed into low lying land. All the septage emptied is disposed to three recognized disposal sites. Two among them are private lands. The septage is disposed indiscriminately from the upper region to a low lying area down the hill. Emptiers pay 1.57 USD per trip for permission to discharge septage on private lands. There is one government owned site (commonly known as oxidation pond), used for septage discharge, located at backyard of solid waste disposal site (SMP, 2014). None of the existing sites have post-disposal monitoring system. Some instances of using septage directly on agricultural fields have been reported.

According to Census, only 8% of city is dependent on offsite systems, population connected to sewer line is 4% and user interface directly discharging in open drain is only 4%, but since there's no treatment it's shown unsafe in SFD.

Rest of the 92% of the city is dependent on onsite sanitation systems (OSS), out of which 85% is dependent on septic tanks and 7% on pits. The public latrines are connected to septic tanks and hence are incorporated in onsite systems. Faecal sludge (FS) from OSS is contained as the effluent from septic tanks infiltrates through soak pits and ground water table is very low.

There is no clear differentiation between percentage of effluent and septage produced from septic tanks, hence it's assumed to be 50% each. Therefore, 42% of FS, which is effluent, infiltrates through soak pit or pits and 42% is emptied from tanks whenever full. Some FS is always left in the tanks and pits and is assumed to be 8%.

6. Overview of stakeholders

The 74th Constitutional Amendment Act of 1992 reformed the sector by transferring responsibility for domestic, industrial, and commercial water supply and sewerage (WSS) from state agencies, such as Departments of Public Health Engineering and State Water Boards, to Urban Local Bodies (ULBs). This transfer has resulted in a variety of implementation models, as well as lack of clarity in allocation of roles and responsibilities between state and local agencies, which sometimes results in large gaps in implementation (USAID, 2010).

The following stakeholders are responsible for sanitation service delivery in Aizawl.

Key Stakeholders	Institutions / Organizations
Public Institutions	State Investment Program Management and Implementation Unit (SIPMIU), UD & PA, Public Health and Engineering Department (PHED), AMC, Mizoram Pollution Control Board (MPCB)
Private Sector	MSSA, private emptier, private land owners
Development Partners, Donors	Asian Development Bank (ADB)

Table 1: Key stakeholders (Source: Compiled by CSE, 2015)

SIPMIU: Single window for facilitating liaison between state government and ADB, liaison between PHED/ municipalities, DUDA, health and MPCB. UD & PA is responsible for state urban development. It delegates work to district level officers. Sanitation wing, is under this department, and runs state owned emptiers in city. PHED is responsible for water supply to city. AMC, established in November 2010, at present is responsible mainly for solid waste management, regulatory system and septage management. MPCB's role is to regulate measures for septage and solid waste disposal operation, licensing for environmental check etc.

Private individuals make money by allowing discharge of septage on their land with/without taking government approval.

7. Credibility of data

Three key sources of data are used; Census of India, 2011, draft of Septage Management Plan 2014, and draft of CSP, 2014. Most of the data is then updated by Key Informant Interviews (KIIs). Eight KIIs have been conducted with stakeholders.

Data on containment is available in census. Data on emptying and transport is collected by KII's. However most of the data is qualitative.

Some of the issues and challenges are listed below:

- Data insufficiency & non availability:
 - No data available on how many septic tanks are connected to open drains
 - No data on waste water generated from commercial hubs, institutions etc.
- Accuracy: Discrepancy observed between Census data and actual ground situation

- Data available at different time lines
- Limited data available on reuse (formal / informal)

Assumptions followed for preparing SFDs:

- Data provided by Census, 2011 is correct
- Septic tanks and sewer connections on ground are as per septic tanks & sewer connections defined in Census
- 100 % septic tanks are connected to soak pits
- 90% of the people get their tanks emptied
- Soak pits are properly functioning
- No transportation losses have taken into account
- Volume of waste water generated is 80 % of water supplied

8. Process of SFD development

Data is collected through secondary sources, and then a visit to the city is done to conduct KIIs with relevant stakeholders, to fill in the gaps in data and to crosscheck the data collected.

To start with, a relationship between sanitation technologies defined in Census of India and the ones defined in project is established.

The data is fed into the calculation tool to calculate the excreta flow in terms of percentage of the population.

No treatment of wastewater and septage reported, which means excreta of 50% of the city is not safely managed, hence shown red in colour. Since FS of 50% of city is contained it is shown green in colour. No open defecation has been reported.

Limitations of SFD:

It's dependent on secondary data and true picture of the city may differ.

The data available is at different timelines, for example data on containment is from census 2011, and data on emptying and transportation is collected through KIIs conducted in 2015.

Whether excreta is safely managed or not is

dependent on whether the system is contained or not, and not on whether waste is safely handled.

9. List of data sources

Below is the list of data sources used for the production of SFD.

- Published reports and books:
 - Census of India 2011, House listing and Housing data, Government of India
 - Service Level Benchmarks of Aizawl, Govt. of Mizoram, 2015
 - Rapid Base Assessment, MoUD, 2013
 - Excreta Matters- volume 2, Centre for Science and Environment, 2012
 - A Rapid Assessment of Septage Management in Asia, USAID,2010
- Un-published documents:
 - CSP of Aizawl, UD & PA, Government of Mizoram, 2014
 - SMP of Aizawl, UD & PA, Government of Mizoram, 2014
- KIIs with representatives from
 - Government agencies: AMC,SIPMIU, UD&PA
 - Service providers: private emptiers
 - Residents

Aizawl, India, 2015

Produced by:
Centre for Science and Environment (CSE),
New Delhi.

© Copyright

All SFD Promotion Initiative materials are freely available following the open-source concept for capacity development and non-profit use, so long as proper acknowledgement of the source is made when used. Users should always give credit in citations to the original author, source and copyright holder.

This document is available from:
www.sfd.susana.org

SFD Promotion Initiative

