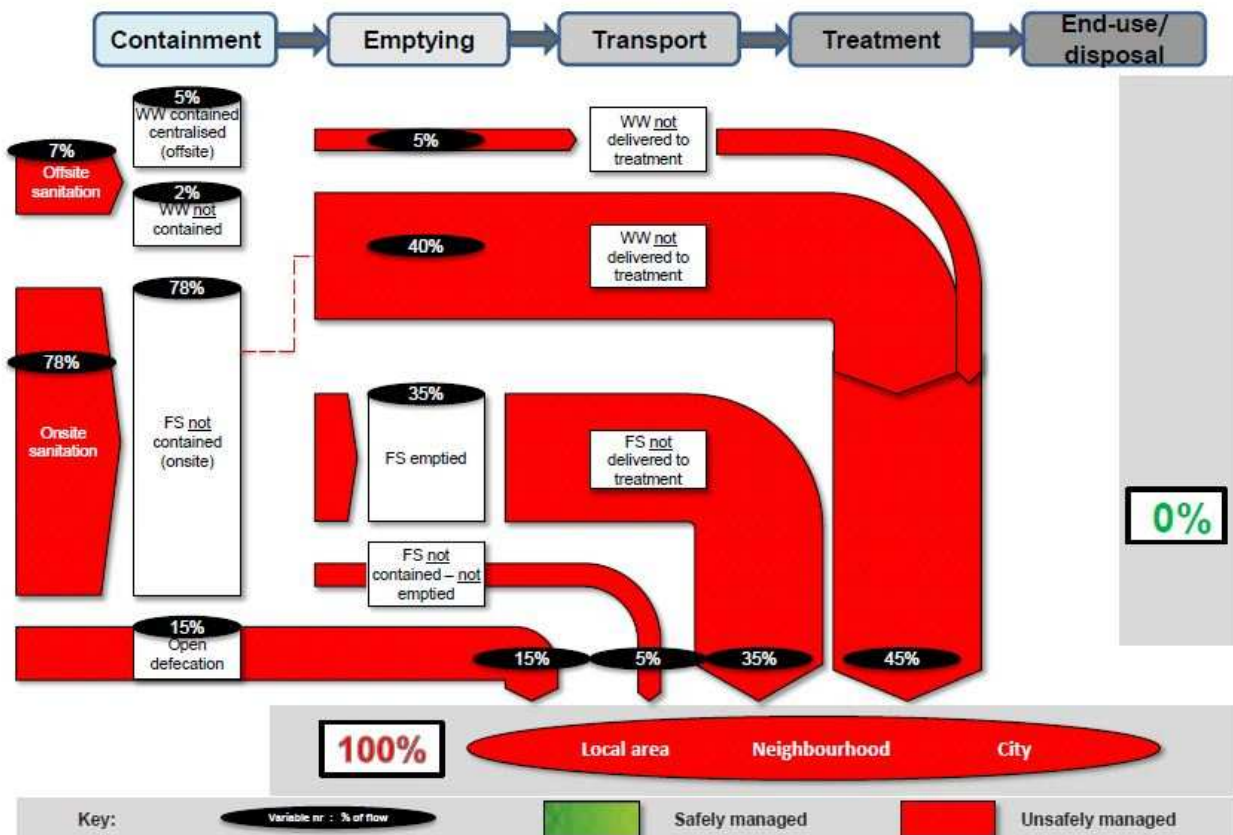


1. The Diagram

Srikakulam- 31 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:
31/07/2015

3. General city information

Srikakulam is a coastal city located in the state of Andhra Pradesh (AP). It is the district headquarters and is an important administrative and commercial centre. It is one of the oldest municipalities of the state, established in 1856. It is located adjacent to the National Highway number 5 connecting Chennai and Kolkata. River Nagavali flows through the city (CSP, 2011).

The population of city, as per the 2011 Census, is 133,911 persons. The density of city is 6,419 persons per sq.km which is very high when compared to state average of 308 persons per sq.km. Total slum population is 49,405 persons which constitutes 37% of the total population (MA&UD, Govt. of AP, 2015).

Municipal boundary has been chosen for the current study. It comprises of an area of 20.9 sq.km (MA&UD, Govt. of AP, 2015).

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).

5. Service outcomes

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

Containment: There is negligible sewerage network and it is not connected to any Sewage Treatment Plant (STP). 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 open drains. Some households are also connected to pits.



Figure 1: Private vacuum tanker (Source: Rahul/CSE, 2015)



Figure 2: Wall Poster of septic tank emptying service in local language (Source: Rahul/CSE, 2015)

Emptying: There are five private emptiers operating in the city, they have a fleet of seven vacuum tankers with capacity of 5000 litres each. The emptying fees ranges from 23 to 39 USD per trip. Private emptiers use innovative marketing strategies to attract customers. This actually shows extent of competition between private emptiers. There are no instances of manual scavenging reported.

Transport: Private emptiers transport septage by vacuum tankers to disposal sites.

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

End-use/Disposal: All the waste water generated is disposed in to Nagavali River, which is a source of potable water. As there is no dedicated disposal site, private emptiers dispose outside the town in dry lands. Sometimes dried septage is used as compost in farms. It is generally used for cultivating Eucalyptus trees.

According to Census, only 7% of city is dependent on offsite systems, population connected to sewer line is 5% and user interface directly discharging in open drain is only 2%, but since there's no treatment it is considered as unsafe.

Rest of the 78% of the city is dependent on onsite sanitation systems (OSS), out of which 76% is dependent on septic tanks and 2% on pits. The public latrines are connected to septic tanks and hence are incorporated in onsite systems. Faecal sludge (FS) from OSS is not contained as the septic tanks are connected to open drains and pits are polluting the ground water.

There is no clear differentiation between percentage of effluent and septage generated from septic tanks, hence it's assumed to be 50% each. Therefore, 38% of FS, which is effluent, goes into open drain and rest is emptied from tanks whenever full. Some FS is always left in the tanks and is assumed to be 5%.

There is no treatment of wastewater and septage, therefore the whole system is unsafely managed, which also includes 15% of city that defecates in open.

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 Srikakulam:

Key Stakeholders	Institutions / Organizations
Public Institutions	Public Health and Municipal Engineering Department (PHMED), Urban Local Body(ULB)-Srikakulam Municipality, State Pollution Control Board (SPCB)
Private Sector	Private emptiers

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

PHMED is responsible for planning and executing sewerage schemes. After completion, operation and maintenance is handed over to ULB.

Srikakulam Municipality is responsible for operation and maintenance of open drains, sewerage, construction and maintenance of public toilets. Municipality don't do any activity

related to septage management. There is absolutely no regulation of private emptiers. Even though sanitation is an obligatory responsibility of a ULB, septage management is often neglected.

SPCB is responsible for monitoring and evaluation of STPs.

Private emptiers are solely responsible for septage management. They are providing services within and around the city.

7. Credibility of data

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

Data on containment is available in Census. Data on emptying and transport is collected by KIIs. However most of the data is qualitative.

Some of the issues and challenges are listed below:

- Data insufficiency and 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
- Volume of waste water produced is 80 % of water supplied
- All septic tanks are connected to open drains
- 90% of the people get their tanks emptied when full

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.

FS and waste water are not contained in their respective sanitation systems and there is no treatment as well; hence all the arrows shown in SFD are depicting the faecal waste of the city is not handled safely.

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 KIs 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 development of SFD.

- Published reports and books:
 - Census of India 2011, House listing and Housing data, Government of India
 - Service levels in water and sanitation sector, MoUD, 2012
 - Excreta Matters- volume 2, Centre for Science and Environment, 2012
 - A Rapid Assessment of Septage Management in Asia, USAID, 2010
- Un-published documents:
 - Draft CSP of Srikakulam, MA&UD, Govt. of Andhra Pradesh, 2011
- KIs with representatives from
 - Government agencies: Srikakulam Municipality, PHMED
 - Service providers: Private emptiers
 - Residents
- Websites/web links:
 - <http://cdma.gov.in/SRIKAKULAM/>
 - <http://MoUD.gov.in/cityplan>

SFD Promotion Initiative



Srikakulam, 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