



SHIT FLOW DIAGRAM (SFD)

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SFD Description

A Sanitation (or Shit) Flow Diagram presents a clear picture of how excreta flows are managed within the city. The diagram clearly depicts how excreta flows from user interface to the final disposal. It has the following stages:

Containment

- According to Census 2011, city has coverage of 10% households connected to pipe sewer system but during the field based study including Key Informant Interview (KII) with ULB, it was found that there is no household connected to functional underground drainage system
- Households in the city are mostly dependent on 3 chambered septic tanks connected to soak pits. Household having pit as containment are constructed with concrete rings or granite stones with an open bottom
- The size of the septic tank and pit are based on the space availability and affordability of the household

- According to Kerala Municipal Building Rules 1999 (KMBR), each house must have a septic tank connected to a soak pit. Plan for construction will not get approved if the household does not comply with KMBR 1999
- KMBR states that 'No leech pit, soak pit, refuse pit, earth closet or septic tank shall be allowed or made within a distance of 7.5 metres radius from any existing well used for supply of water for human consumption or domestic purpose or within 1.20 metres distance from the plot boundaries'
- Few households have constructed tanks large in capacity irrespective of household size with the general perception of emptying the septic tanks only after an interval of 15-20 years
- Desludging being an expensive affair is not preferred often. It is observed that when pit is full, it is covered with soil, closed permanently and abandoned. Preferably another pit is constructed within compound of a household which costs





Photo 1: Circular Pit built with concrete rings



Photo 2: Rectangular tank built with rock stones

less as compared to cost of emptying service. This case is mostly prevalent in hilly areas

- FS contained or not is dependent on the system polluting the groundwater. Depth of groundwater table <10m from the sanitation system is considered to pose a significant risk
- Types of on-site containments observed during field visit: -
 - Rectangular tank made of granite stone with open bottom
 - Circular pits constructed of concrete rings and open bottom
 - Septic tanks connected to soak pit
- FS contained is attributed to be from 23% population (7% from tanks made of granite stones which are never emptied but abandoned when full and covered with soil and 16% from those which are emptied)
- FS not contained is attributed to be from 73% population (60% septic tanks connected to soak pits where there is risk of groundwater contamination and 13% circular pits constructed of concrete rings and open bottom)
- Open defecation is attributed to be from 4% population



Photo 3: 3-chambered septic tank with soak pit

Emptying and Transportation

- The emptying service is only provided by private emptiers which are not stationed in town, but are called from outskirts of the city. According to the KII with ULB, private emptiers are called upon from Calicut city
- The emptiers advertise their contact no. in local newspapers on alternate days. In order to avail the emptying service, a resident has to contact emptiers through phone call
- Emptying service is provided late night only, as this practice keeps the emptiers away from police and local people who may get offended and troubled by the emptying business
- The capacity of the vacuum tanker is typically 5000 liters. The emptying duration is dependent on the size and type of containment. But generally it takes about half an hour for emptying one septic tank
- The charges are 6000-10000 INR/containment (KII with owner of private emptiers)
- A pump of 2 hp is attached to the truck which is the source of power to process suction for emptying the containment systems
- As per KII with private emptier, each truck makes 4 to 5 trips per day
- As per KII with ULB, there is a stream called Moniyangod river, which emerges from the mountains and flows through the city and the households on the riverside might be discharging their wastewater into it



Photo 4: Grey water discharged to open ground

- Only for grey water disposal, a separate soak pit is constructed within the premises of a household. Thus, no wastewater (black and grey) is leaving the household premises and is managed on the site. Only a few households are discharging their grey water to open ground
- Due to no clear differentiation between the volume of the effluent and solid FS generated from the containment, it is assumed to be 50% each to reduce maximum error
- FS not contained not emptied is attributed to be from 40% population. It includes part of infiltration from the containment with open bottom and part of FS remains at the bottom of the containment even after emptying
- FS not contained emptied is attributed to be from 33% population

Treatment and Disposal

- There is no treatment of sewage and septage generated in the city and the faecal sludge collected by the vacuum tankers is disposed at open low-lying areas outside the city
- The private emptiers informed that disposing of FS is a huge issue as there is no specific place for discharging faecal sludge. The emptiers have threat from the local police for which they have to pay them bribe sometime
- In total, FS of 84% population is unsafely managed and 16% population is safely managed



Photo 5: Washing clothes in Moniyangod River stream

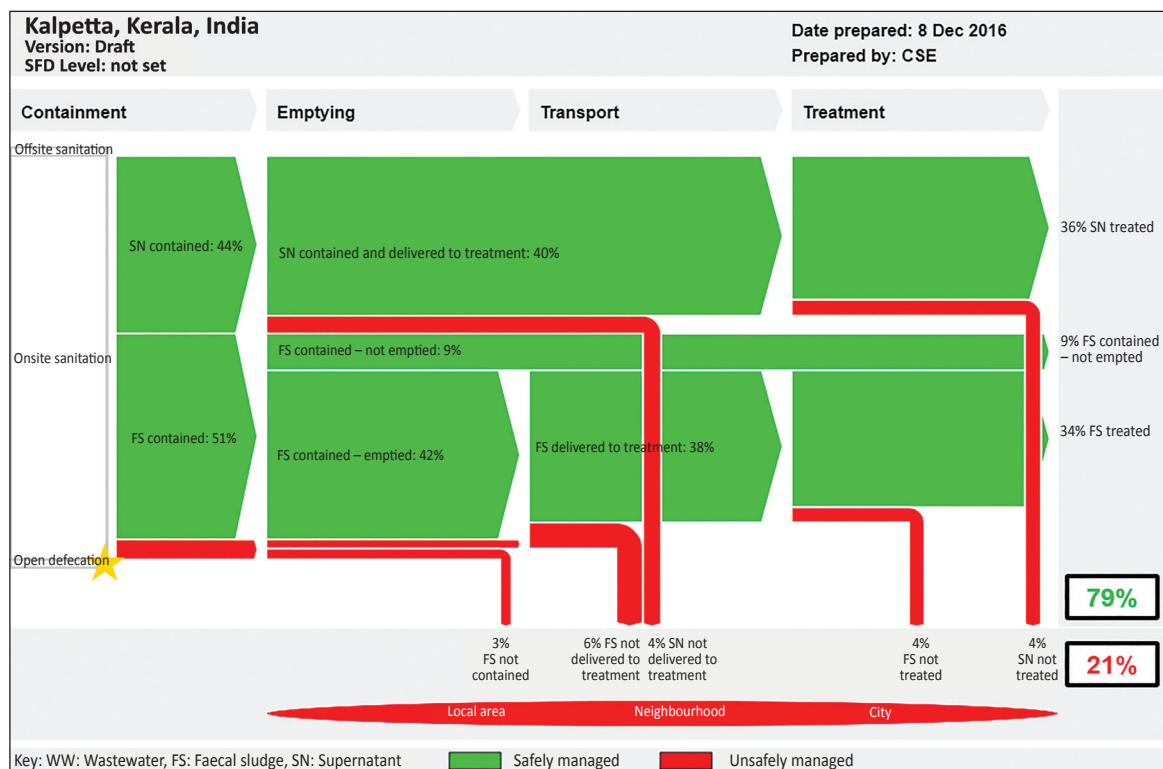
Suggestions

Short term goals

- Recognize the private emptiers and issue them license to operate
- Buy vacuum trucks, if there is a shortfall
- Identify 1-2 suitable disposal/treatment sites (so that the distance traveled by the trucks is optimized). The land could be taken on lease or could be a vacant plot in the nearby area
- Develop DPRs for FSTPs (faecal sludge treatment plants)

Medium term goals

- Demarcate land for STPs/FSTPs in the master plan
- Enforce scheduled desludging
- Implement decentralized waste water treatment systems at institutions/commercial establishments and at neighborhood level wherever applicable to treat supernatant and grey water



SFD Promotion Initiative

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für Internationale
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On behalf of



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