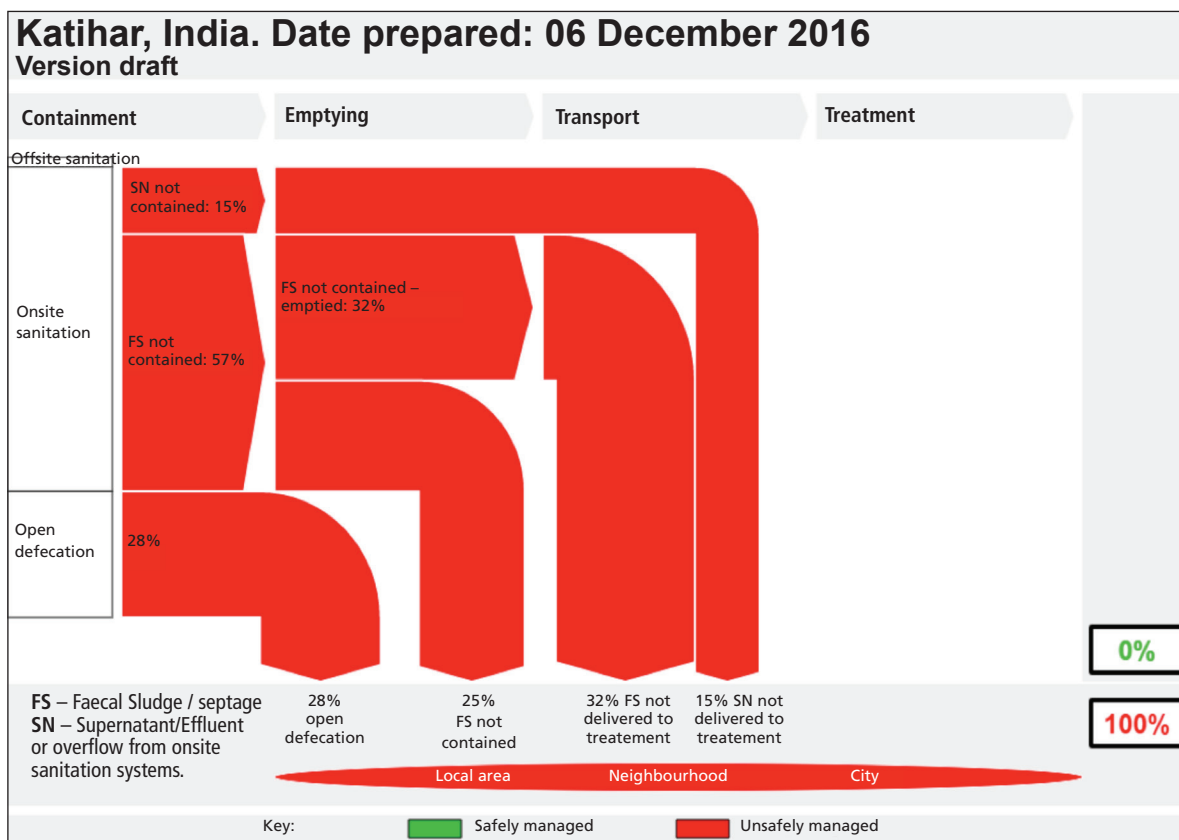




# SHIT FLOW DIAGRAM (SFD)

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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:

### 1) Containment

The city of Katihar has an area of 33.46 sqkm that includes out growth. The core of the city is densely populated. Whereas the households in peripheral area of the city have rural settlements which are primarily dependent on agriculture and are considerably lower income settlements.

As per primary survey conducted in November 2016, the city has three different types of containment systems that vary on the basis of income of the households.

- Septic tank with an outlet connected to open drain or soak pit is the most common type of containment system within the central wards of

the city. According to key informant interview (KII) with the municipal corporation's sanitary inspector the percentage of effluent discharged into open drain and soak pit is 50 % each

- Lower income settlements like slums and squatter settlements have pit latrines as containment. Pits are constructed using concrete rings, each measuring 3 feet in diameter and 8 inches in height. Semi permeable walls with open bottom (honey comb) as containment structures is also observed in few settlements during field based study. People staying in the peri-urban areas are generally practicing open defecation due to no access to toilets
- Most of the septic tanks were found to be well designed with three separation chambers along with an outlet
- Other land uses like commercial, public and semi-public units have septic tank as containment systems with an outlet connected to open drains or soak pit

KATI HAR, BIHAR



Following is the share of population dependent on type of containment systems:

Containment type	Population dependency in percentage
Septic tank connected to soak pit	13
Septic tank connected to open drain	31
Unlined pit with no overflow	28
Open defecation	28



Figure 1: A pit latrine toilet constructed under housing scheme of PMAY in ward no 1



Figure 2: Pit latrine system in slum of ward 22 and a septic tank connected to open drain in central area of city

## 2) Emptying

- The emptying service is only provided by the municipal corporation, and there are no private players in this business
- Emptying service is only provided to households who pay property tax. Tax is also applicable on agricultural lands
- The corporation owns 3 vacuum tankers, two of which have 3500 litres capacity and one has 9000 litres capacity
- In order to avail the service, a resident has to submit an application to the in-charge of sanitary department & cashier and attach a copy of the property tax along with it. A record is maintained on daily basis by the sanitary department
- It is also learned during a KII that around 50% trips are off the records as the higher authorities & influential people directly contact the sanitary inspector and avail the service
- Usually, a driver is accompanied by two laborers for emptying containment; and it

takes around 10-15 minutes to empty 3000 litres capacity containment, depending upon the type of containment

- Emptiers do not use any safety gears during the emptying service
- The corporation charges Rs.750 and Rs.2,500 per trip for the 3,000 litres and 9,000 litres capacity vacuum tankers respectively and pays monthly remuneration of Rs.7,700 to the driver and Rs.7,000 to the laborers. On an average, the vacuum trucks make 2-3 trips per day. Monthly maintenance of a vacuum tanker costs Rs.5,000 to the corporation

- Manual emptying is practiced in households with narrow lanes where the septic tanks are inaccessible. Lower caste community is engaged in manual scavenging, residing in peri-urban areas
- FS not contained is attributed to be from 57% population
- FS not contained but emptied is attributed to be from 32% population
- FS not contained not emptied is attributed to be from 24% population, which includes a part of infiltration of FS from unlined pit and septic tank connected soak pits and FS that remains at the bottom in the containment after emptying



Figure 3: Emptying of soak pit containing effluent from septic tank and grey water

### 3) Transportation

- Vacuum tanker is tractor mounted assembled by Kam Avida Company based in Pune.
- The emptiers take about three to four trips per day for which they travel a distance of 12 to 13

kilometers per emptying.

- SN not contained is attributed to be from 16% population out of 31 % population dependent on septic tanks with an outlet connected to open drain



Figure 4: Tractor mounted tanker at Katihar municipal office

#### 4) Treatment and Disposal

- The reconnaissance survey of the city revealed that the city has a bowl-shaped topography, the wastewater generated within the city keeps flowing in the drains till it reaches a low-lying area
- There is no treatment of sewage and septage generated in the city; and the faecal sludge

collected by the vacuum tanks is disposed of at insanitary landfill located at Udam Rakha in Ward 45

- Waste water generated from 15 wards is carried by major storm water drains and disposed at water body adjacent to municipal boundary of ward no 45



Figure 5: Waste water disposed at lower lying areas in ward 45



Figure 6: Waste water from nearby areas collected in ward 22 and septage dumped at municipal trenching site

#### SFD Promotion Initiative

sustainable  
sanitation  
alliance

**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH

On behalf of



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