

# Mapping faecal waste and mainstreaming citywide sanitation in Ganga basin - Uttar Pradesh (U.P)

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# BACKGROUND : India journey - Sewage / Sewerage Focus to Sanitation



**National Urban Sanitation Policy**, Ministry of Urban Development, GOI.

**NUSP : Provided for Preparing City Sanitation Plan (CSPs)**



**Advisory note on septage management**, Ministry of Urban Development, GOI.



Swachh Bharat Mission



Atal Mission for Rejuvenation and Urban Transformation

**BILL & MELINDA GATES foundation**

CSE- BMGF partnership to upscale citywide sanitation in Ganga Basin through City Sanitation Plans.



National Policy on Faecal Sludge and Septage Management

CSE conducts deep dive surveys in target cities of Uttar Pradesh and Bihar to develop CSPs.



**Policy Paper on Septage Management**, prepared by CSE to assist MoUD.



**CSE Report & SFD Promotion Initiative**



giz

CSE-GIZ partnership to scale citywide sanitation in select cities of Andhra Pradesh, Telangana, and Kerala through City Sanitation Plans.

**FSM4 2017**



CSE, CPR, CEPT, ASCI and other organisations come together to make an alliance

**SBM - ODF ++**



MOUNT, developed by CSE



SANIKIT, developed by CSE



# Background

- In FSM 4, 2017, CSE had presented how SFDs can help in better understanding the existing sanitation scenario of **cities**
- To understand the **gaps in sanitation across Ganga basin**, Shit Flow Diagram for 66 major cities in the state of Uttar Pradesh are developed
- These SFDs are used to develop the **state level SFD** and **basin level SFD**
- **Aim of the study is to mobilize state level functionaries to implement FSM for achieving citywide sanitation**



## Using excreta flow diagrams (SFDs) as an integral part of city wide sanitation planning for Indian cities



### NEED

Many cities of India don't have a City Sanitation Plan (CSP). The few CSPs that exist today are rarely implemented. One of the major reasons for non-implementable CSP is the costly centralised sewerage systems proposed in the plans, despite high dependence of cities on onsite sanitation systems. Hence there is a need to examine the excreta management of the city before proposing any solution.

### BRIEF SUMMARY

- To understand the excreta management of 27 selected cities, SFDs (Shit Flow Diagrams) are developed and introduced at different stages of development of CSPs
- In all three scenarios, SFDs clearly show high dependence of cities on onsite sanitation systems and extent of untreated waste ending up into the environment
- CSTF (City Sanitation Task Force) or decision makers get a better understanding of sanitation scenario, based on the SFD



### METHODOLOGY

The SFDs are developed for three different scenarios

#### SCENARIO 1 (S1):

Eleven cities were chosen from different agro-climatic zones of India. Most of the cities already had the CSPs, and neither of them talked about FSSM in their plans

#### SCENARIO 2 (S2):

CSE in collaboration with GIZ India did capacity building of ULBs (Urban Local Bodies) for developing CSPs of cities from three southern states. Despite hand holding training none of the cities had FSSM in their plans, hence CSE helped six champion cities to develop SFDs before their CSPs are finalised

#### SCENARIO 3 (S3):

CSE is doing capacity building of ULBs for developing CSPs of ten small and medium cities in Ganga Basin. CSE in collaboration with the ULBs developed SFDs at the very initial stage of development of CSPs. SFDs are also presented in the CSTF meetings



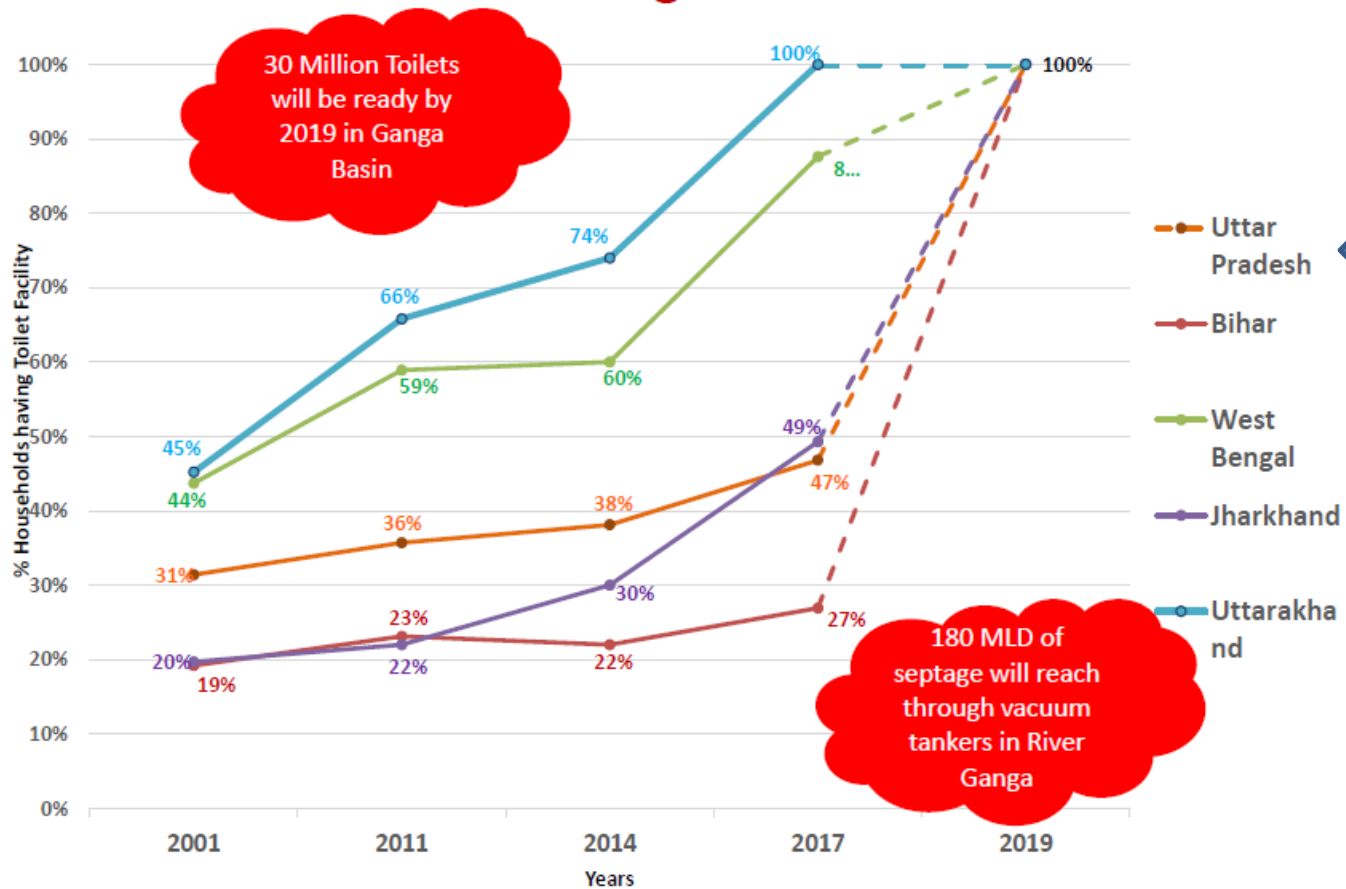
## Institutional Capacity Building Of Ganga Basin Cities For Their Journey Beyond ODF

S.K. Rohilla  
R. Sardar, R. Gupta

Centre For Science and Environment



# Ganga Basin towards ODF



In this study  
**CSE**  
 concentrated  
 on the state  
 of **Uttar Pradesh (U.P)**

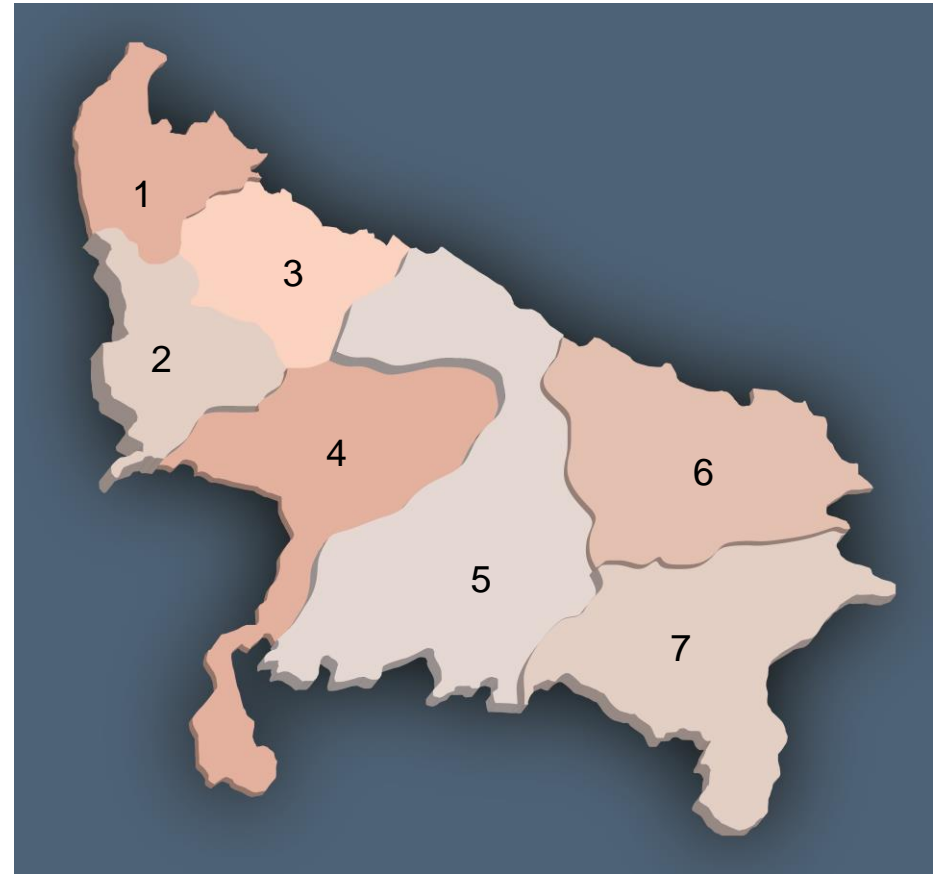


AfricaSan

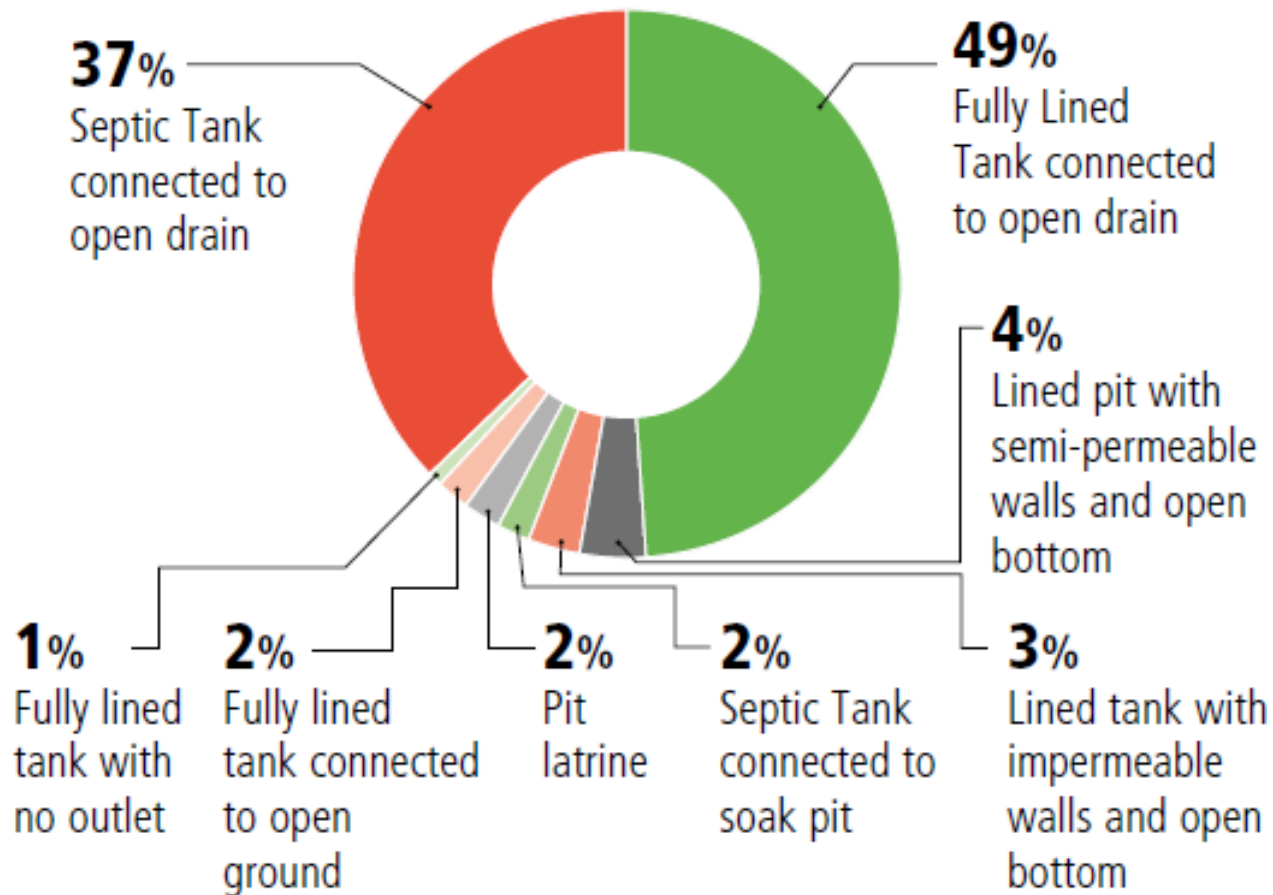
FSM

# Methodology

- State was divided into seven zones of 8-10 cities
- A team of two researchers spent 3-4 days in the city
- Data was collected using SFD PI methodology
- An SFD was developed for each city along with lite report
- Based on the population of the city, state was divided into four clusters
- Using all the collected data SFD for the state as well as basin was developed



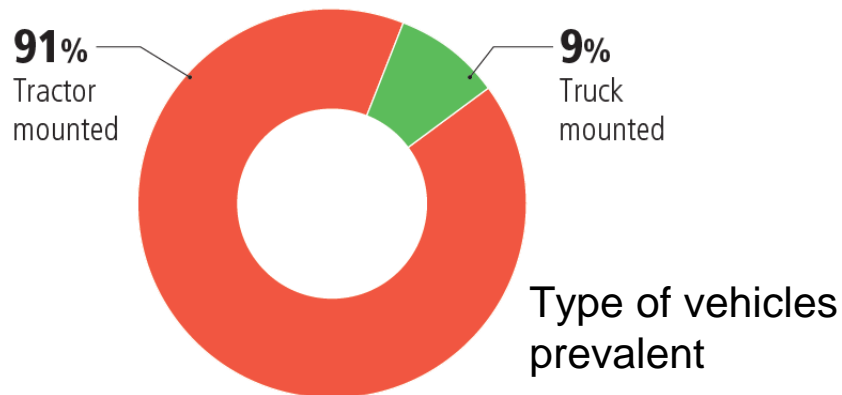
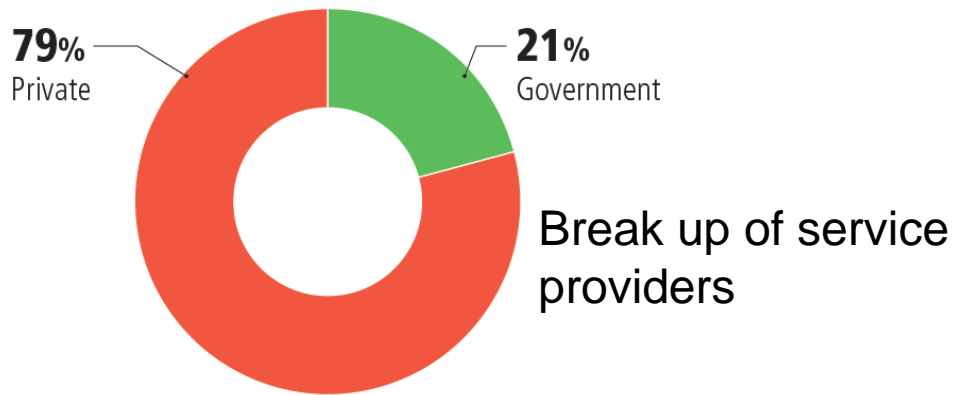
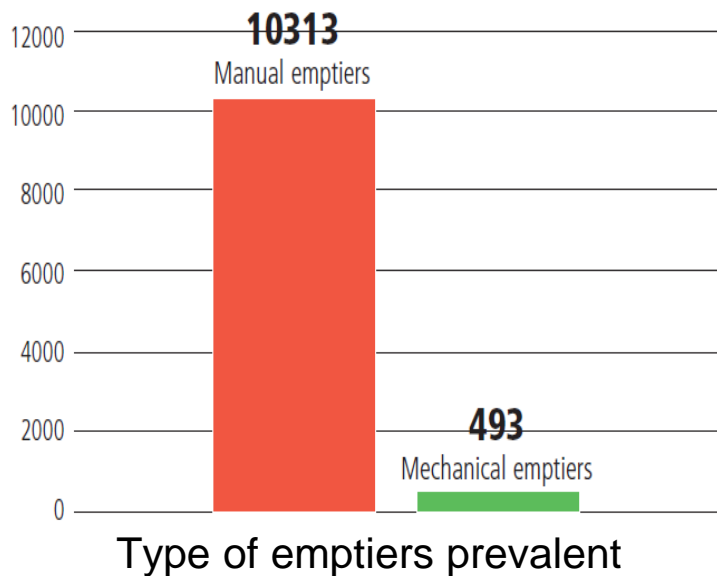
# Type of Containment Systems in select 66 cities



# Type of Containment Systems



# Emptying practices in select 66 cities





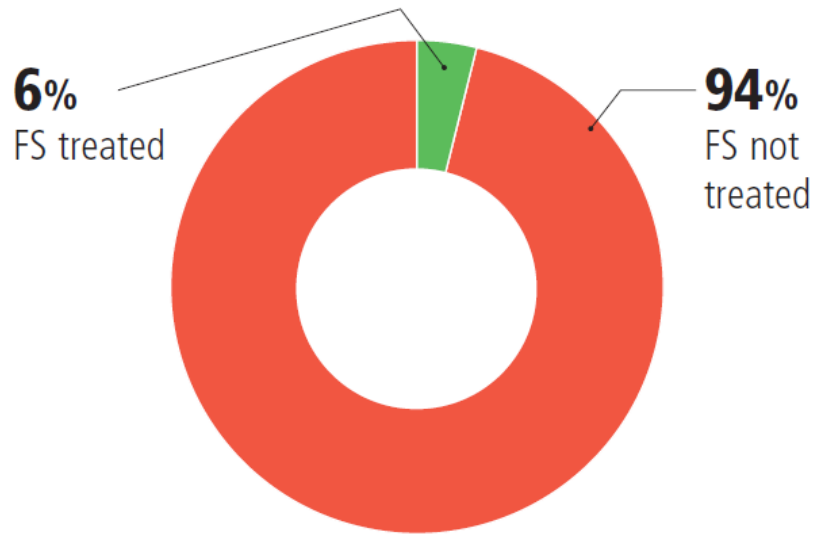
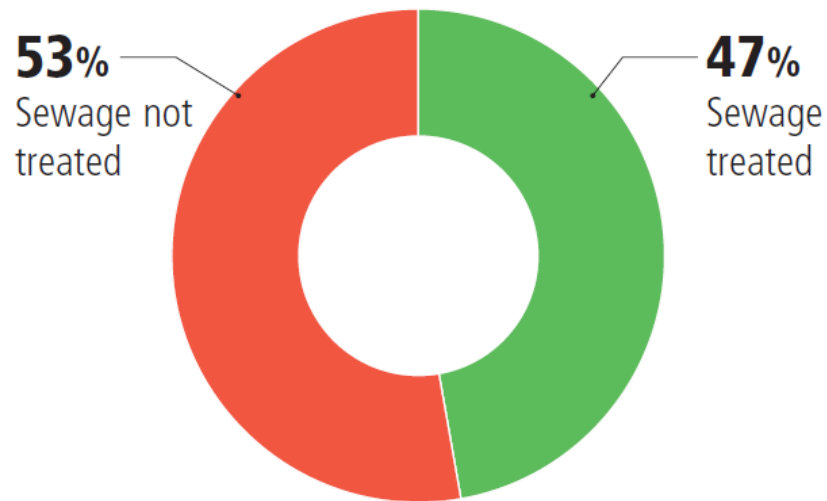
# Type of Emptying



# Transportation



# Extent of Sewage and faecal sludge treatment



# Treatment and Disposal



# Assessment of Faecal Sludge and Septage Management in Uttar Pradesh

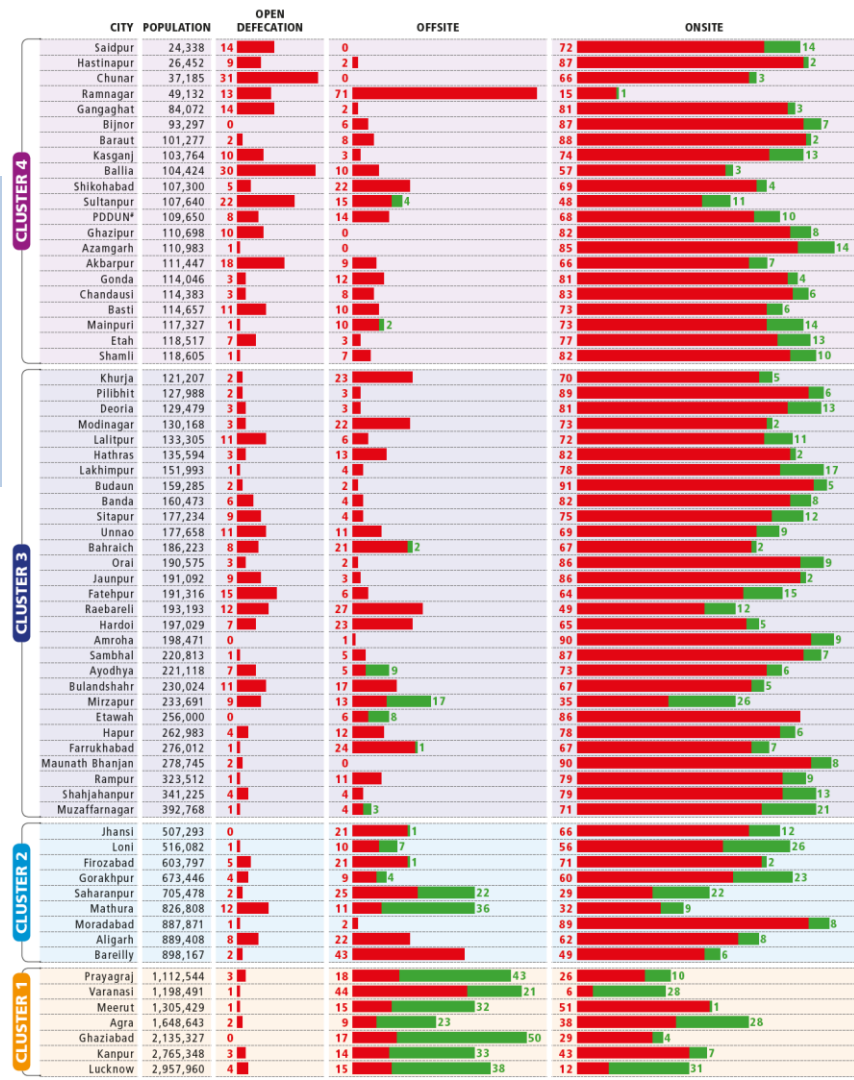
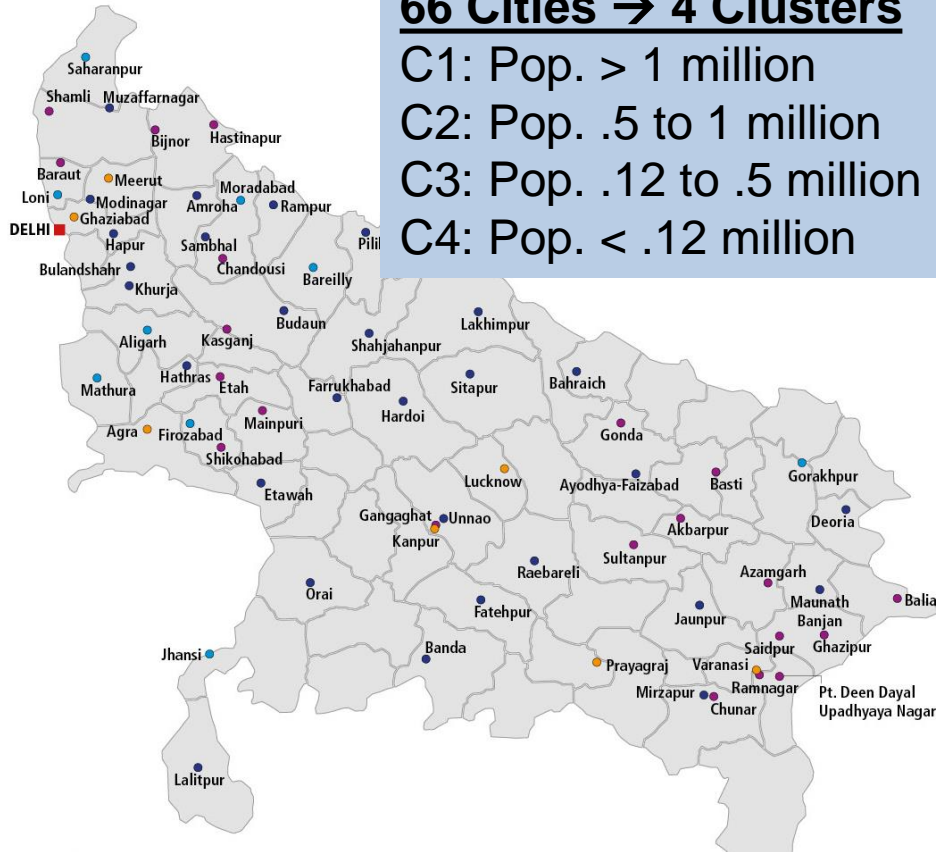
**66 Cities → 4 Clusters**

C1: Pop. > 1 million

C2: Pop. .5 to 1 million

C3: Pop. .12 to .5 million

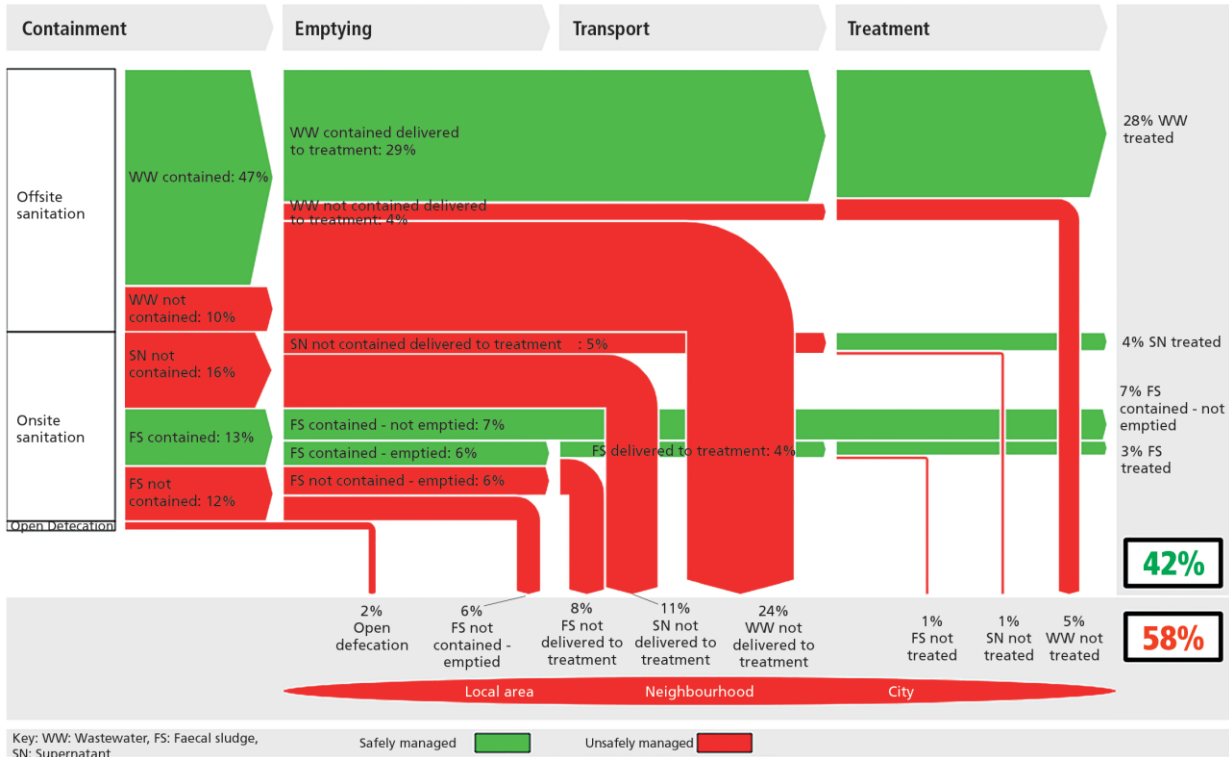
C4: Pop. < .12 million



# Cluster 1: Large cities ( More than 1 Million)

**Cluster 1, Uttar Pradesh, India**  
 Version: Draft  
 SFD Level: 2 - Intermediate SFD

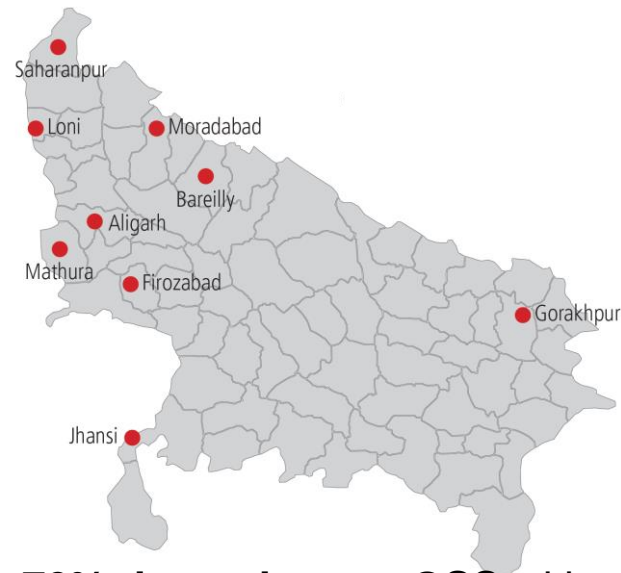
Date prepared: 7 December 2018  
 Prepared by: CSE



- **47% Sewerage Coverage**
- 41% connected to OSS
- 38% OSS emptying 15 -20 yrs
- FS discharge at PS or STPs
- **43 STPs in the Cluster:**
- Capacity - 1952 MLD
- Receive - 1532 MLD



# Cluster 2: Medium cities (.5 - 1 million)



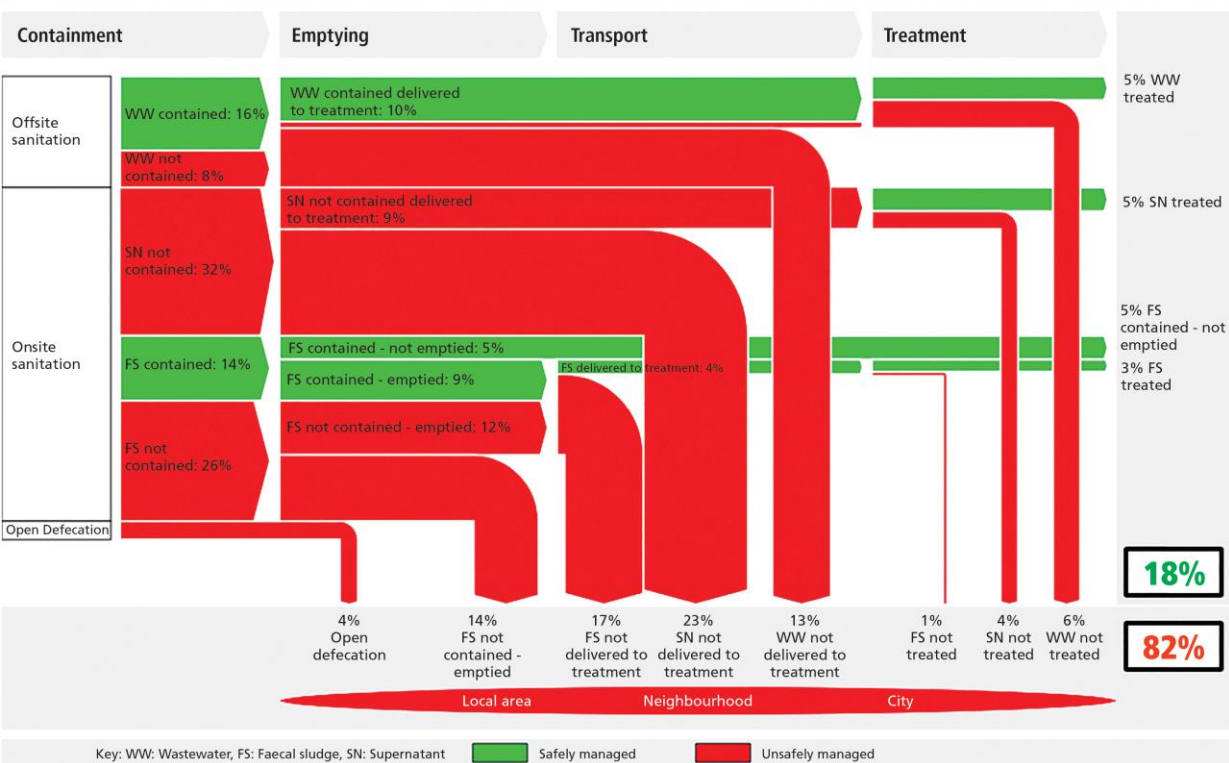
## Cluster 2, Uttar Pradesh, India

Version: Draft

SFD Level: 2 - Intermediate SFD

Date prepared: 17 December 2018

Prepared by: CSE



- **72% dependent on OSS** with 60% overflowing into drains
- 38% OSS emptying 15 -20 yrs
- Majority of STPs: **interception and diversion** of open drains
- **11 STPs in the cluster**
- Capacity - 230 MLD
- Receive - 168 MLD



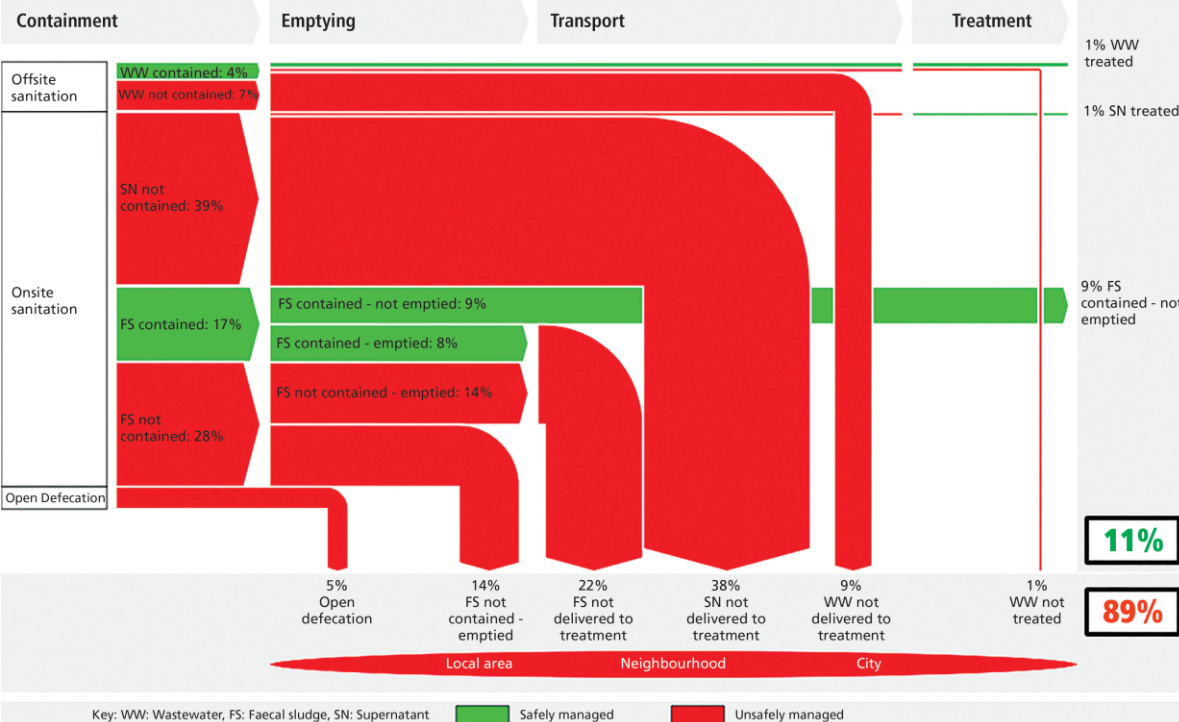
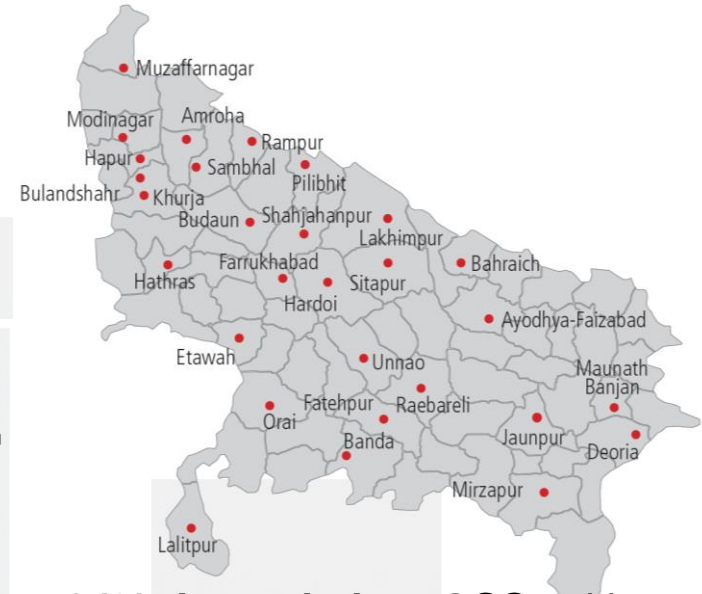
# Cluster 3: Small and medium cities (.12 - .5 million)

## Cluster 3, Uttar Pradesh, India

Version: Draft  
SFD Level: 2 - Intermediate SFD

Date prepared: 7 December 2018

Prepared by: CSE



- **84% depended on OSS; with 75% overflowing into drains**
- **28% well designed septic tanks**
- **46% OSS emptied 15 -20 yrs**
- **5% Open Defecation**
- **Total 10 STPs in the cluster: Cater to excreta of only 2% population**





# Cluster 4: Small cities (less than .12 million)

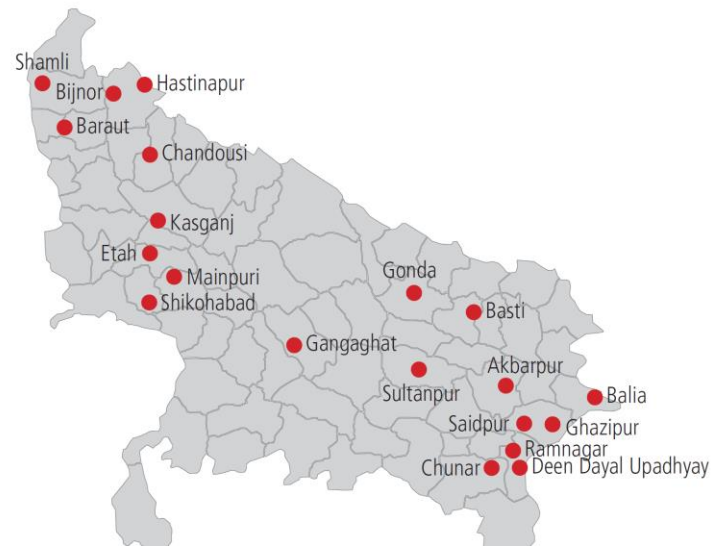
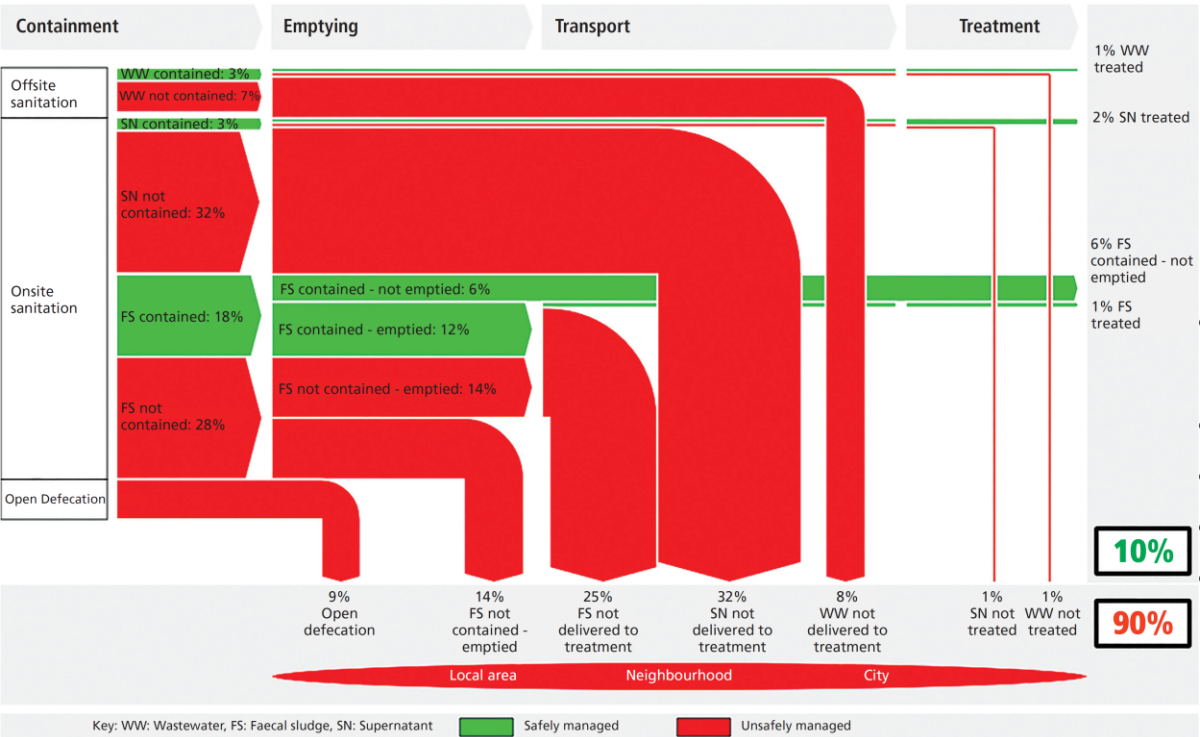
## Cluster 4, Uttar Pradesh, India

Version: Draft

SFD Level: 2 - Intermediate SFD

Date prepared: 17 December 2018

Prepared by: CSE



- **81% dependent on OSS**; with 70% overflowing in drains
- **9% Open Defecation**
- 40% pop. OSS emptied: 15 -20 yrs
- 97% of tankers are tractor mounted
- **STPs in only 3 out of 21 cities** in the cluster

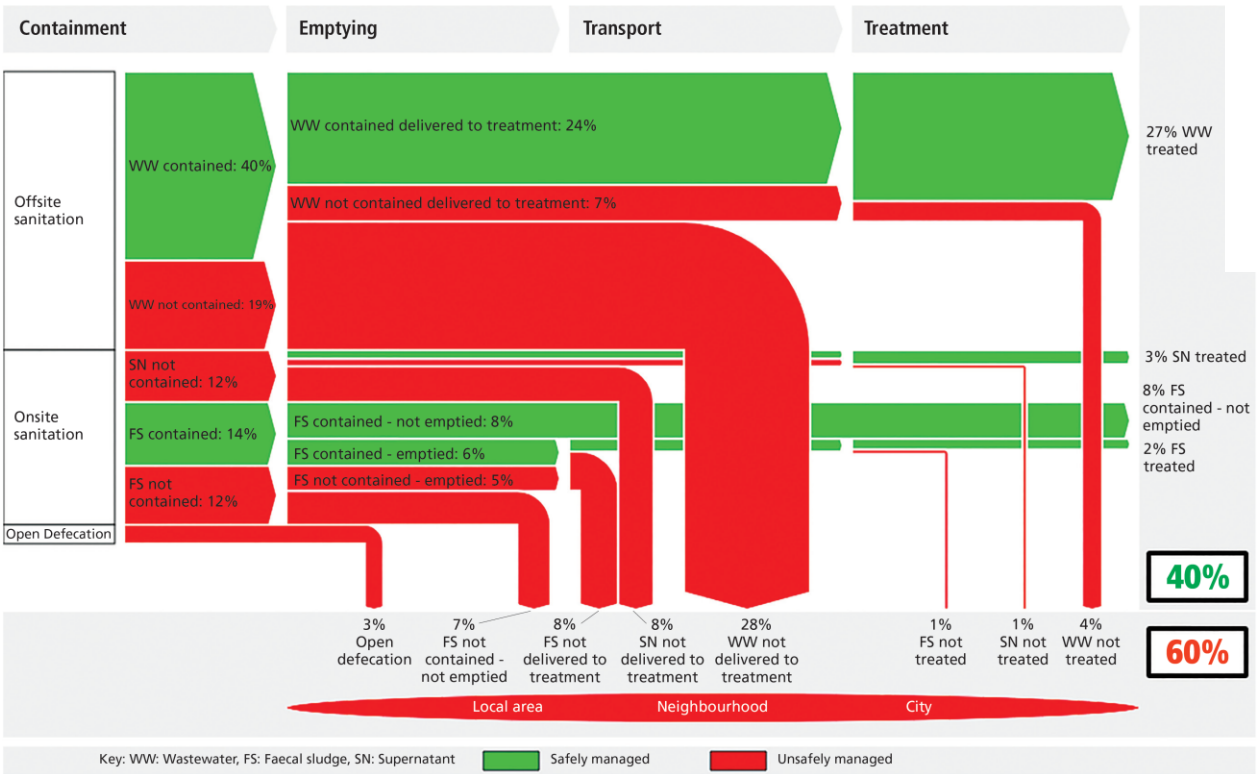
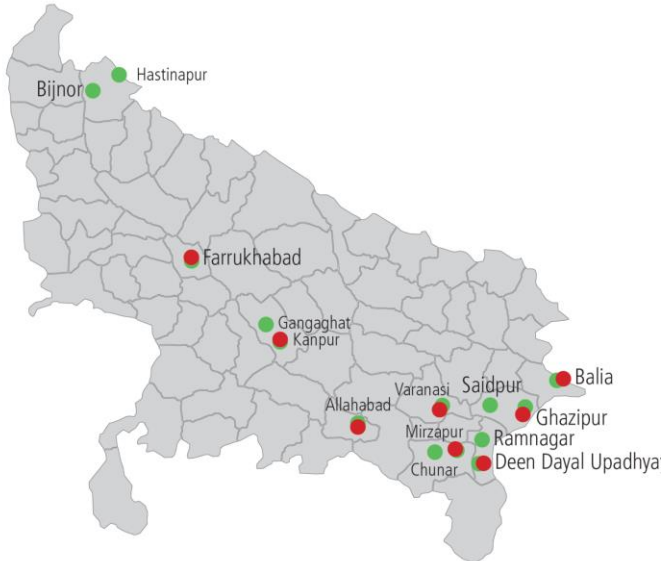


# Cluster 5: Select cities along the River Ganga

## Cluster 5, Uttar Pradesh, India

Version: Draft  
SFD Level: 2 - Intermediate SFD

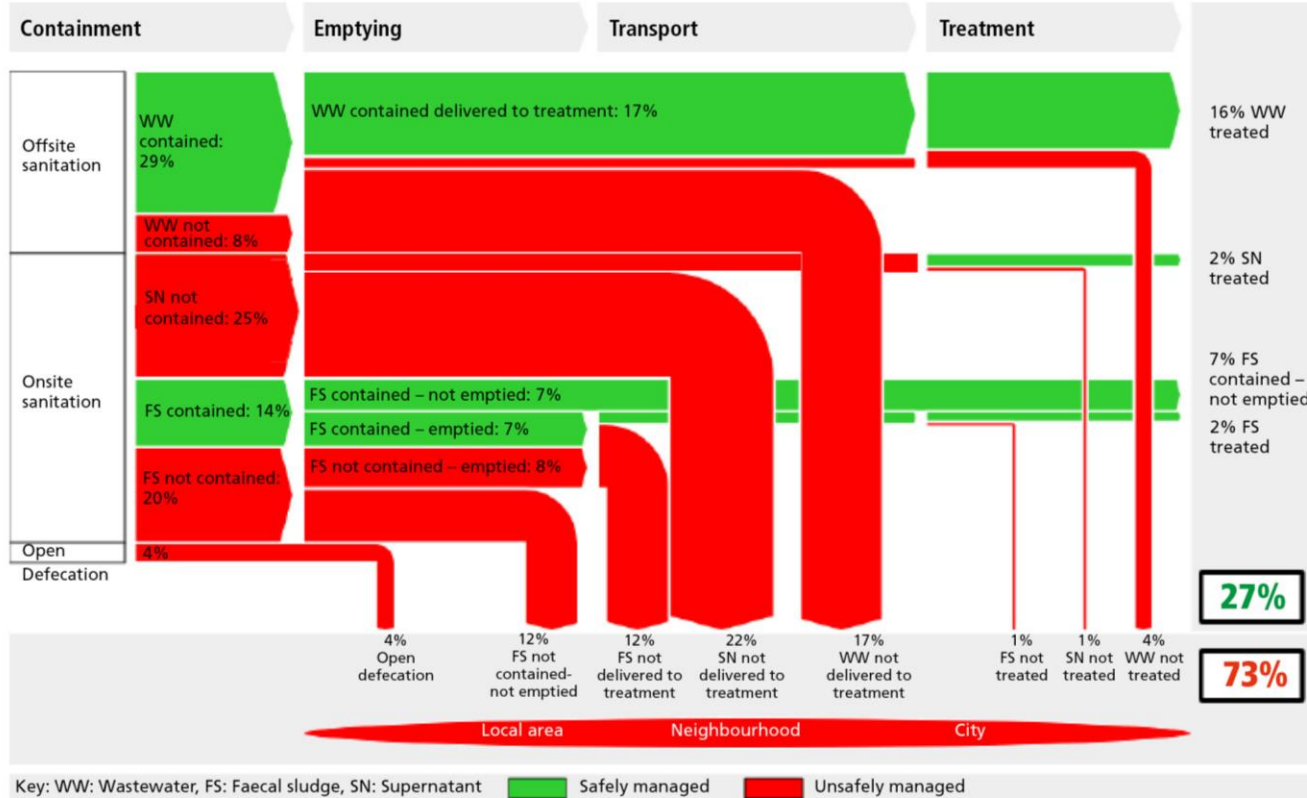
Date prepared: 27 December 2018  
Prepared by: CSE



- **40% Sewerage Coverage,**
- **Excreta treated 27%.**
- **38% population connected to OSS; with 24% overflow into drains**
- **19% directly discharging in drains**
- **18 STPs in the cluster:**
- **Capacity 826.5 MLD**
- **Receive - 655.7 MLD**



Key: WW: Wastewater, FS: Faecal sludge, SN: Supernatant    Safely managed    Unsafely managed



Note: This SFD is done based on study of 66 towns and cities, representing 60% of urban population in UP  
 To know more about SFDs, visit <https://sfd.susana.org>

# Key Observations

More than  
**60%**

of the total population is dependent on onsite sanitation systems like septic tank and pit latrine. Out of which, the excreta of 4% of the population is treated

Septic tank effluent (overflow) of  
**50%**  
of the population is discharged in open drains, of which, 2% is treated by tapping of nullahs and drains

**29%**  
of the population is connected to sewerage network. Of which, sewage of 16% of the population is treated

More than  
**80%**  
of the sewerage network in state is found in 7 cities (out of 635)

Sanitation provision through sewer system increases with the increase in population of cities

Excreta of  
**8%**  
of the population is discharged directly in open drains

**4%**  
of the population still defecates in the open

Excreta of  
**27%**  
of the total population is safely managed. 7% of which is safely stored in containment systems

No city is  
**100%**  
sewered

\*This study is done based on data collected by CSE in October, 2018



# Proposed action plan for cities (Cluster 1, 2 & 3)

Category	Actions	Year 1				Year 2				Year 3				Year 4				Year 5				
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
CLUSTER 1 > 10 Lakh population	A1																					
	A2																					
	A4																					
	A3 + A6 + A13																					
	A7 + A9																					
	A8																					
	A10 + A15																					
	A11																					
A12 + A14																						
CLUSTER 2 & 3 1.2 - 5 Lakh population and 5 - 10 Lakh population	A1																					
	A2																					
	A4																					
	A3 + A5 + A6 + A13																					
	A7 + A9																					
	A8																					
	A10 + A15 + A16																					
	A11																					
A12 + A14																						

**A1:** Baseline Survey & CSTF  
**A2:** FSM Plan  
**A3:** Licensing  
**A4:** CSP Prep.

**A5:** Trenching  
**A6:** Co-Treatment (existing STP)  
**A7:** FSTP (demand)  
**A8:** Cap. Building

**A9:** Safe C&T of FS  
**A10:** Sch. Desludging  
**A11:** DWWTs  
**A12:** Safe OSS in all HHs

**A13:** Co-Treatment (new STPs)  
**A14:** Geo-Tagging  
**A15:** Ban manual Scavenging  
**A16:** 100% FS treatment



# Proposed action plan for cities (Cluster 4)

Category	Actions	Year 1				Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
CLUSTER 4 < 1.2 Lakh population	A1	█	█																		
	A2	█	█	█																	
	A4		█	█	█	█	█	█													
	A3 + A5 + A13			█	█	█															
	A7 + A9				█	█	█	█													
	A8	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
	A10 + A15 + A16								█	█	█	█	█	█	█	█	█	█	█	█	█
	A11								█	█	█	█	█	█	█	█					
	A12 + A14	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

**A1:** Baseline Survey & CSTF  
**A2:** FSM Plan  
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**A4:** CSP Prep.

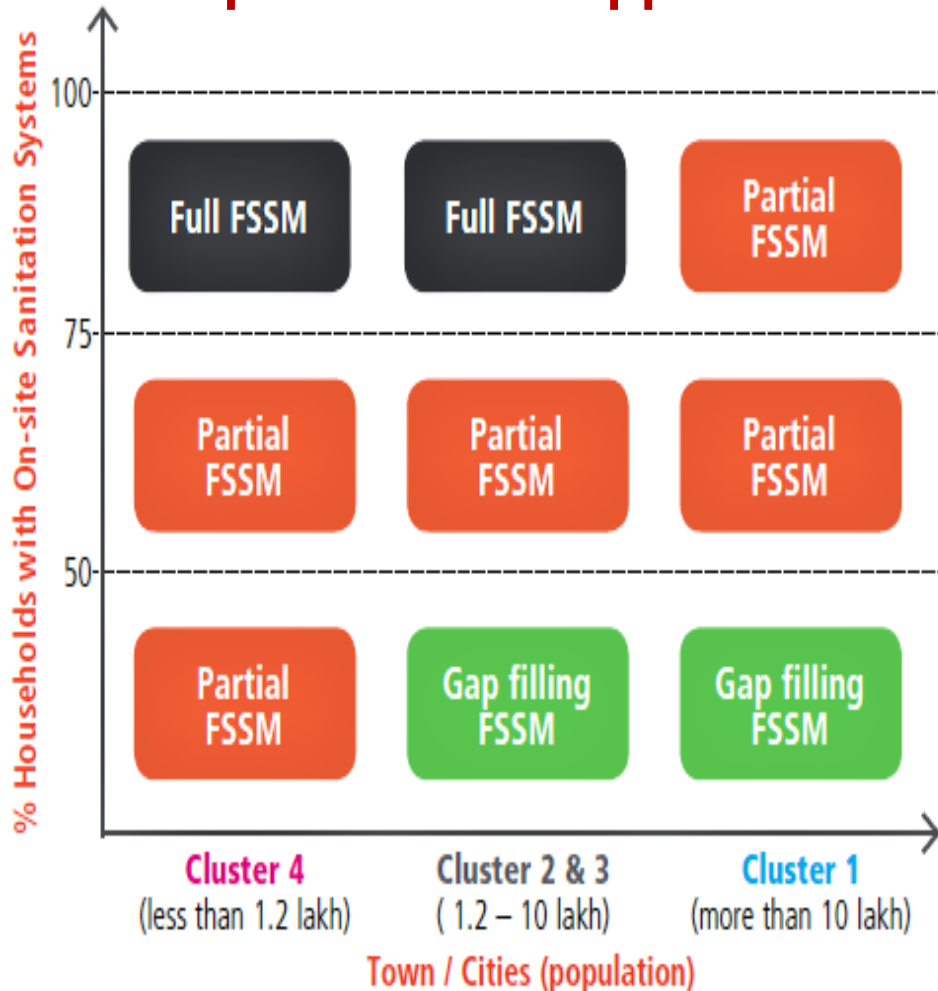
**A5:** Trenching  
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**A13:** Co-Treatment (new STPs)  
**A14:** Geo-Tagging  
**A15:** Ban manual Scavenging  
**A16:** 100% FS treatment



# Proposed FSSM approach for urban areas in Uttar Pradesh



## Full FSSM:

Full FSSM with dedicated treatment facility.

## Partial FSSM:

Combined FSSM and Sewerage system; Co-Treatment, DEWATS, Onsite Treatment systems, FSTP where necessary.

## Gap Filling FSSM:

Complete Sewerage System; FSSM for non-sewered pockets; Treatment at Co-Treatment or FSTP



## Updates as on date:

- Govt. of India launched national flagship programme AMRUT **sub-mission** linking Citywide Sanitation /**FSM to river pollution abatement** for Ganga basin town/ cities
- **33 cities** have taken **credible action towards citywide sanitation**
- 52 FSTPs / Co-treatment of FS at STPs – public funded projects by govt. are in tender stage.
- **4 cities declared ODF ++ in 2019 in the state.**
- **State task force to mainstream city wide sanitation and effective FSM** set up by Uttar Pradesh





# SANI-KIT

PREPARING A CITY SANITATION PLAN

- ALL ( 12 )
- STAKEHOLDERS ( 3 )
- DATA ( 3 )
- ACTION PLAN ( 3 )
- IMPLEMENTATION ( 3 )

- 1 CONSTITUTE A CSTF**: Icon showing three people sitting around a table.
- 2 ROLES AND RESPONSIBILITIES**: Icon showing a person standing next to a desk with a calendar.
- 3 STANDARD OPERATING PROCEDURE**: Icon showing a gear connected to a flowchart.
- 4 DATA COLLECTION**: Icon showing a document with a circular arrow around it.
- 5 PRIMARY DATA COLLECTION**: Icon showing an eye looking at a document.
- 6 DATA ANALYSIS**: Icon showing a bar chart on a stand.
- 7 IDENTIFY KEY ISSUES**: Icon showing a magnifying glass over a line graph.
- 8 FORMULATE STRATEGIES**: Icon showing a person walking through a path of 'x' marks.
- 9 PREPARE YOUR ACTION PLAN**: Icon showing a person climbing a staircase.
- 10 FINANCE FRAMEWORK**: Icon showing the Indian Rupee symbol (₹).
- 11 IMPLEMENTATION**: Icon showing a circular seal with the word 'ENDORSED'.
- 12 RE-CHECK**: Icon showing a circular arrow with a checkmark.

## WHAT IS SANI-KIT?

Sani-Kit is a web-based portal with a comprehensive collection of essential tools to enhance the capability of urban local bodies in India to prepare a high quality, city owned, city sanitation plan.

[READ MORE>>](#)

## WHAT IS A CITY SANITATION PLAN?

A city Sanitation Plan is a vision document on sanitation which consists of strategic planning processes in order to achieve the objectives of citywide sanitation with a 25-30 year horizon.

[READ MORE>>](#)

## WHY CSP

A city Sanitation Plan is a vision document on sanitation which consists of strategic planning processes in order to achieve the objectives of citywide sanitation with a 25-30 year horizon. For more information, visit this page

[READ MORE>>](#)



## MOUNT is one stop shop for sustainable sanitation solutions for un-sewered areas

MENU ON UN-NETWORKED TECHNOLOGIES

### Background

Nearly 61% of the global population (4.5 billion people) lack safely managed sanitation services (use of a toilet or latrine that leads to treatment or safe disposal of excreta). In a country like India only 40% of urban households are connected to sewerage network, [read more](#)

### About MOUNT

MOUNT is an aggregator platform for various sustainable technologies, encouraging and disseminating knowledge and good practices for wastewater management. On this platform the information you can get is on: • 4 categories of technologies • 19 technologies [read more](#)

### How To Use MOUNT

Depending on your need you can search on MOUNT on the basis of [technology](#), [sub-technology](#) or [case study](#). In case you are confused between the meanings of the terms use the glossary, in case you are not, you can move on to search [read more](#)

For further details visit: <https://www.cseindia.org/managing-septage-in-cities-of-uttar-pradesh-9268>

<https://www.cseindia.org/managing-septage-in-cities-of-uttar-pradesh-9268>



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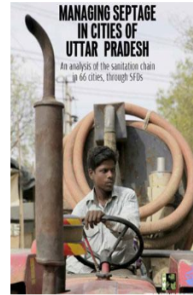
## Managing Septage in Cities of Uttar Pradesh

FEBRUARY 11, 2019

According to Census 2011, Uttar Pradesh has an urban population of 44.47 million people – which is 11.79 per cent of the total urban population of the country. The state has 653 urban local bodies (ULBs) including 17 Municipal Corporations (Nagar Nigams), 198 Nagar Palika Parishads and 438 Nagar Panchayats. The ULBs, with their limited local resources and state support, are responsible for provision of municipal services.

A sanitation snapshot of urban Uttar Pradesh clearly indicates that households with onsite sanitation systems (see Box: The three pathways) like septic tanks (47 per cent) far exceed those with sewer connections (28 per cent). According to the State Annual Action Plan 2017, most cities have reported more than 80 per cent coverage of latrines, but out of the 60 AMRUT cities, 34 have reported zero efficiency regarding collection and treatment of sewage.

This study is available in two volumes. **Volume 1, 2nd edition** (Managing Septage in Cities of Uttar Pradesh- An analysis of the sanitation chain in 66 cities, through SFDs) briefly describes about each stage of sanitation chain, analysis through cluster SFDs and also proposes action plan. **Volume 2, 2nd edition** (Assessment of excreta management- Factsheets for 66 cities in Uttar Pradesh), on the other hand



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February 11, 2019



[The SFD Approach](#)[The Story Behind the SFDs](#)[SFDs Worldwide](#)[The SFD Promotion Initiative](#)

## The SFD Promotion Initiative

This SFD Promotion Initiative is supported by the Bill & Melinda Gates Foundation and managed by GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH) under the umbrella of the Sustainable Sanitation Alliance (SuSanA). Implementing partners of the Initiative are: the Centre for Science and Environment (CSE, India), the Swiss Federal Institute of Aquatic Science and Technology's Department of Sanitation, Water and Solid Waste for Development (Eawag/Sandec), the University of Leeds (UofL), Loughborough University's Water, Engineering and Development Centre (WEDC) and the former Water and Sanitation Program of the World Bank (current Global Water Practice).

<https://sfd.susana.org/about/the-sfd-promotion-initiative>



AfricaSan



Thank you

