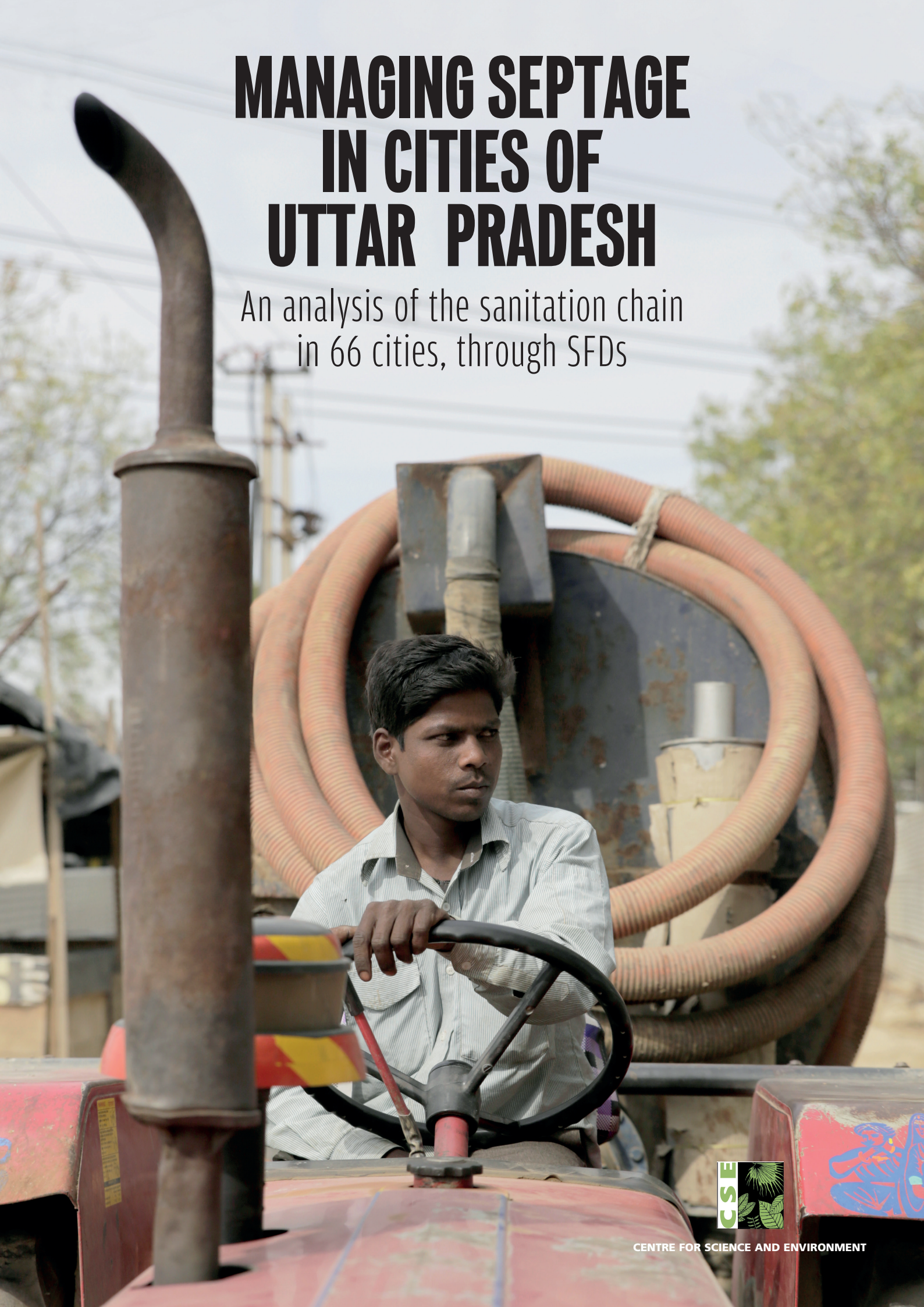


# MANAGING SEPTAGE IN CITIES OF UTTAR PRADESH

An analysis of the sanitation chain  
in 66 cities, through SFDs



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This report would not have been possible without the constant support of Local Body Directorate of Uttar Pradesh, Jal Nigam and Urban Local Bodies of target cities



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We are grateful to Bill and Melinda Gates Foundation for their support to CSE -Department of Urban Development, Uttar Pradesh for mainstreaming Faecal Sludge and Septage Management in Uttar Pradesh

Suresh Rohilla, Bhitush Luthra et al 2019. *Managing Septage in Cities of Uttar Pradesh: An Analysis of the sanitation chain in 66 cities through SFDs*, Centre for Science and Environment, New Delhi

Material from this publication can be used, but with acknowledgement.

Printed at Bravo Printex

# MANAGING SEPTAGE IN CITIES OF UTTAR PRADESH

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CENTRE FOR SCIENCE AND ENVIRONMENT



# INTRODUCTION

## THE SCENARIO IN UTTAR PRADESH

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 2017-20, 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.

In the absence of even a single city that is completely seweraged; most households, institutions, commercial areas and public/community toilets in the state depend on onsite sanitation systems like septic tanks and pit latrines. And as there is no designated site for disposal, the emptied faecal sludge ends up in open drains/nullahs/open fields, which eventually lead to polluting

the Ganga. According to the Central Pollution Control Board (CPCB), the main stem of the river receives 121.52 tonnes per day of BOD load from domestic sewage generated in Uttar Pradesh. A considerable amount of faecal coliform has also been detected in the river (see Box: *Sewage vs faecal sludge*).

## CSE'S FSSM STUDY OF UTTAR PRADESH

Safe containment, emptying, transport, treatment and end use of faecal sludge and septage is known as Faecal Sludge and Septage Management (FSSM). CSE has analysed 66 cities of the state through all the stages of their sanitation chain (see Figure 1: *Sanitation chain*) – this briefing paper is an effort towards documenting the analysis.

One of the aims of the Union Ministry of Housing and Urban Affairs, under the Swachh Bharat Mission (SBM), is containment of human waste. The ministry, recognising that the end objectives and corresponding benefits of SBM cannot be achieved without proper management of faecal sludge and septage across the sanitation chain, has notified a National Policy on FSSM in February 2017. According to this policy, each state in India – and eventually, cities – is supposed to notify an FSSM action plan/strategy/operative guidelines.

The CSE study links itself to this national objective by aiming to analyse the sanitation scenario of Uttar Pradesh, so that the need for FSSM can be quantified for some of the major cities in the state.

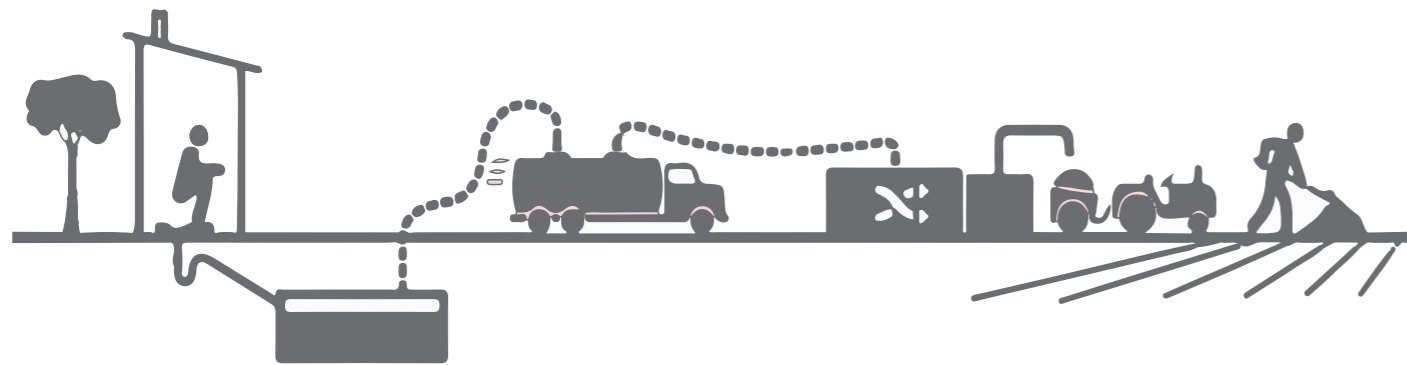
To understand the FSSM requirement, CSE is developing an SFD – Shit Flow Diagram (see Box: *What is an SFD?*) – for each of the state's 62 major cities. For this purpose, the state has been divided into seven zones of eight or nine cities each (see Figure 2: *Sixty six target cities in Uttar Pradesh*). The CSE team conducted secondary research before visiting each city; in the cities, it conducted key informant interviews, focussed group discussions and field observations.

This work has been divided into two phases – 25 cities were visited in Phase 1 and the rest in Phase 2. The analysis of data collected in Phase 1, Phase 2 along with four cities (Bijnor, Chunar, Ramnagar and Gangaghat) that already have an SFD, is presented in this report.

Figure 2: Sixty six target cities in Uttar Pradesh



Figure 1: Sanitation chain



	Containment	Emptying and transport	Treatment	Disposal and end use
Definition	An onsite sanitation system into which a user interface discharges	Manual or motorized removal and transportation of faecal waste from the containment system	Process of converting faecal sludge into a product that is safe for end use	Disposal or utilization of output products derived from sanitation systems
Examples	Septic tanks, soakpits and cesspools	Vacuum trucks or carts	FSTPs, constructed wetlands and dewatering	Manure

Source: Compiled by CSE, 2016

**THE THREE PATHWAYS** Excreta generated in a city can follow three pathways:

- **Offsite sanitation:** Toilets connected to drainage networks like a sewerage system which conveys the excreta away from the site, preferably to a sewage treatment plant.
- **Onsite sanitation:** Toilets connected to a tank or a pit, which stores the excreta within the site. These systems generally produce partially treated effluent and faecal sludge/septage that needs periodic emptying.
- **Open defecation:** Users do not have an access to a toilet and hence defecate in the open.

### SEWAGE VS FAECAL SLUDGE

Sewage is untreated wastewater which contains faeces and urine – this wastewater gets conveyed through the sewerage system. Generally, grey water from the kitchen and bathroom also become part of sewage. The BOD of sewage ranges from 150-350 mg/l and all sewage treatment plants are designed for this load. Faecal sludge/septage is semi-solid slurry – it is emptied out of septic tanks/pits and is much more concentrated than sewage. The BOD of faecal sludge ranges from 1,000-20,000 mg/l.

**WHAT IS AN SFD?** An excreta flow diagram (also often described as Shit Flow Diagram, SFD) is a tool to readily understand and communicate how excreta physically flows through a city or town. SFDs show how excreta is or is not managed as it moves from defecation to disposal or end-use. The SFD report presents the service delivery context of the city or town and the data sources used for the assessment.

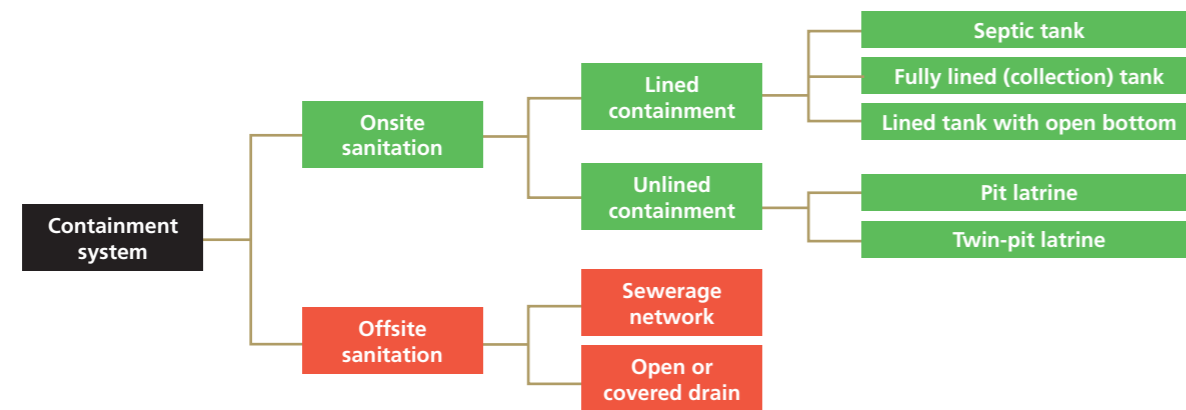


# CONTAINMENT

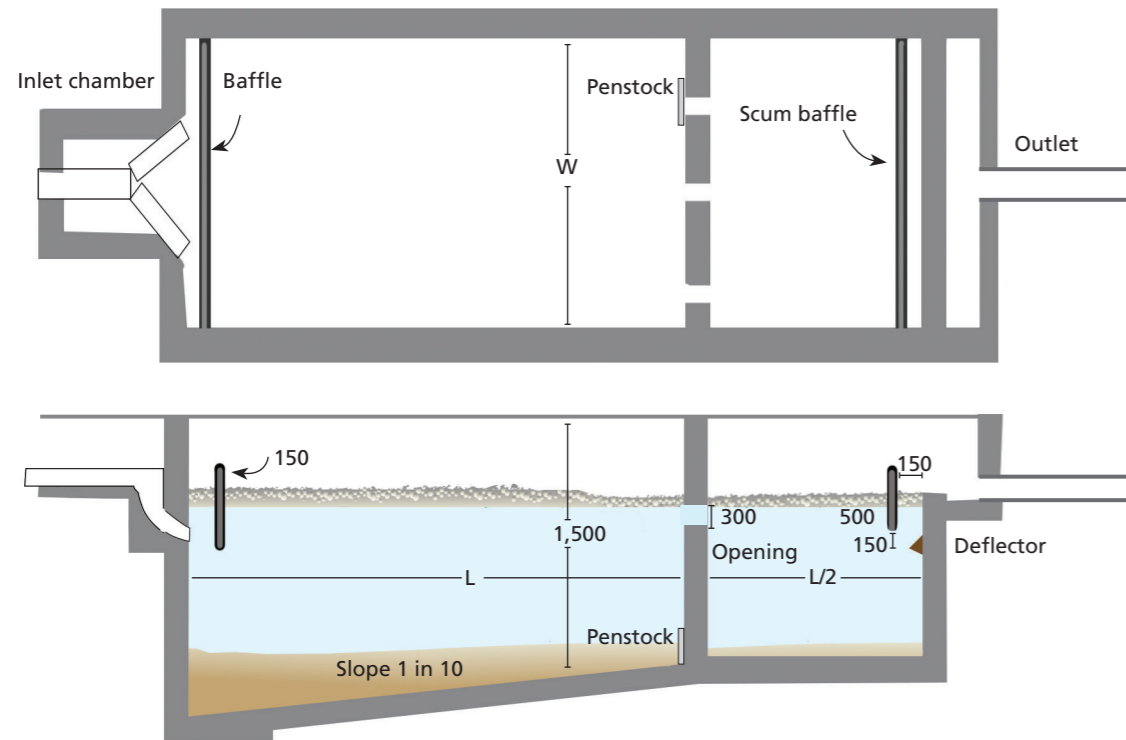
Containment system, to which toilet is connected to, helps in restricting the human interaction with excreta either through offsite sanitation system like underground drainage network or through onsite sanitation system like septic tank, refer **Figure 3: Type of containment system**. In Uttar Pradesh, CSE team found various types of systems in place, which are modifications of septic tank, as prescribed by

Bureau of Indian Standards, refer **Figure 4: Standard septic tank design**. Due to unplanned growth in urban areas and minimal enforcement of building bye-laws the designs implemented on ground are a prerogative of the households and masons. To reduce the frequency of emptying, households prefer to build tanks as big as possible and leave the bottom of the tank open.

**Figure 3: Type of containment system**



**Figure 4: Standard septic tank design**

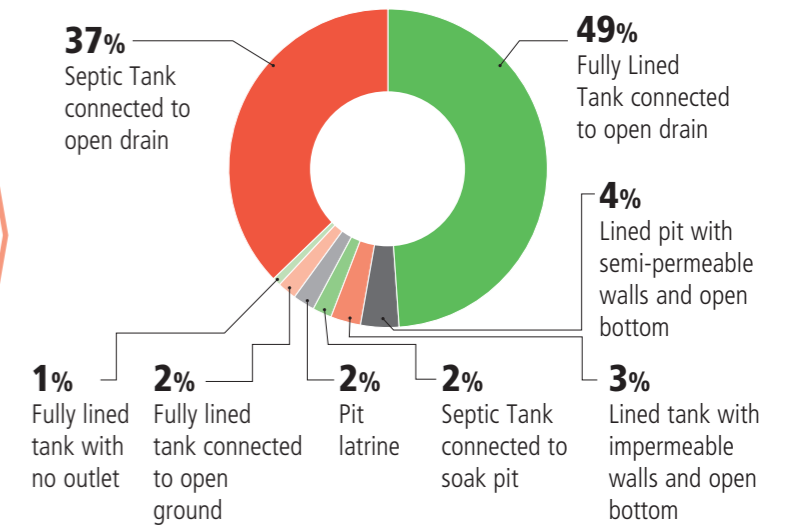


All measurements in millimetres (mm)  
Source: Manual on Sewerage and Sewage Treatment—Part A: Engineering. CPHEEO, 2012

## THESE CONTAINMENT SYSTEMS GENERATE TWO TYPES OF BY-PRODUCTS:

- (i) **Faecal sludge**, that should be emptied periodically but is only emptied when the tank gets full and there is a backflow to the toilet
- (ii) **Effluent**, the semi-treated liquid component, which ideally should be infiltrated into ground through a soak-pit (in case of low risk of ground water pollution) or undergo further treatment, but is discharged into open drains

**Figure 5: Break up of containment systems**



**Septic tank under construction, Hardoi**



**Twin pit latrine, Saharanpur**



**Outlet of a containment discharging into open drain, Lakhimpur**



# EMPTYING

The process of extracting faecal sludge/septage from onsite sanitation systems is known as emptying. It is done both mechanically and manually. The Prohibition of Employment of Manual Scavengers and their Rehabilitation Act, 2013 prohibits employment or engagement of manual scavengers, however in many locations in U.P., which are inaccessible to mechanical emptying, manual scavenging is prevalent.

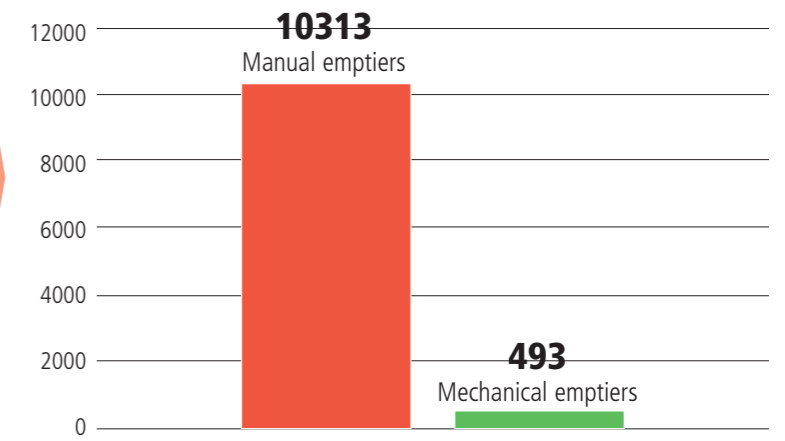
Other than manual emptying, mechanized methods include use of vacuum trucks or tractor-mounted vacuum tankers. Mechanized systems are usually accompanied by a driver and a helper (sometimes two helpers). No personal protective equipment (PPE) is used by the operators while emptying the tanks or pits, posing a serious health risk.

There is no schedule of emptying maintained in any of the cities, and the user calls for an emptying service only when the tanks get full with sludge. This service is majorly provided by private operators but in some cities government trucks also ply. The majority of the personnel involved in emptying business, belong to a particular caste and there is a notion that people from that caste, who were initially involved in manual scavenging, would only do this job. In many cities safai karamcharis, contracted with the government, would also end up doing manual scavenging to earn quick money. Fees charged for emptying, ranges from INR 500 to 3000 across the state, and in general a tanker does 1-3 trips per day. Break up of emptiers is shown in *Figure 6: Break up of emptiers*.

## THE PROHIBITION OF EMPLOYMENT AS MANUAL SCAVENGERS AND THEIR REHABILITATION ACT, 2013

This act prohibits employment of manual scavengers and insanitary latrines - Laying strong emphasis on rehabilitation of manual scavengers. The broad objectives of the act are to eliminate insanitary latrines, prohibit the employment of manual scavengers and the hazardous manual cleaning of sewer and septic tanks, and to maintain a survey of manual scavengers and their rehabilitation

Figure 6: Break up of emptiers



Mechanical emptying of containment system, Pilibhit



Emptying of a pit latrine



Mechanical emptying without using personal protective gears, Ghazipur



# TRANSPORT

Faecal sludge/septage and waste water/sewage both need to be transported to the treatment/disposal site. Sewage is conveyed using underground drainage network also called sewerage network. In absence of sewerage network, the septic tank's effluent (supernatant) along with grey water, finds its way into storm water drains/open drains/nullahs. On the other hand, the emptied faecal sludge is collected in a container installed on a vehicle to transport it to the designated site of disposal.

In case of manual emptying a cycle cart is used

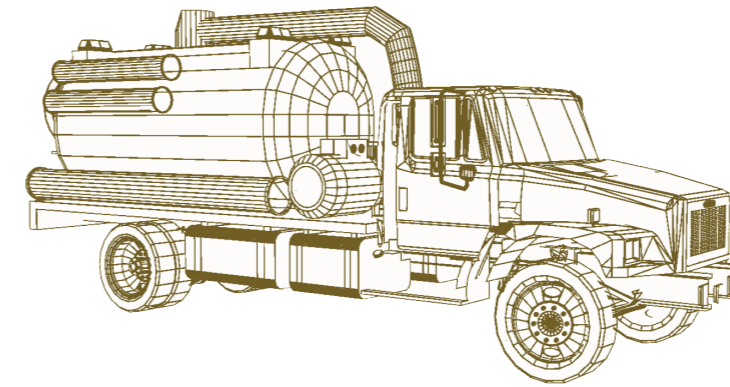
to transport faecal sludge. Whereas for mechanized emptying, tractors, mini trucks and indigenously developed vehicles mounted with suction pumps are predominantly used. Two main types of vehicles used are shown in *Figure 7: Two types of vehicles prominent in Uttar Pradesh*. The capacities of tanks attached to vehicles vary from 500 to 10,000 litres. Break up of types of vehicle prominent in Uttar Pradesh is given in *Figure 8: Types of vehicles used* and details of service providers is given in *Figure 9: Breakup of service providers*.

*Government owned truck mounted vacuum tanker, Ghazipur*

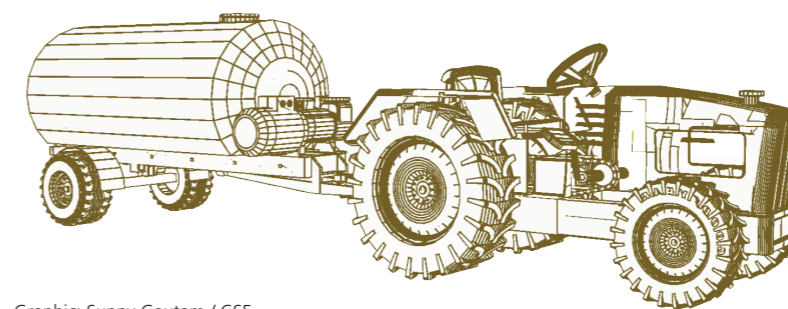


*Figure 7: Two types of vehicles prominent in Uttar Pradesh*

*A truck-mounted vacuum tanker*

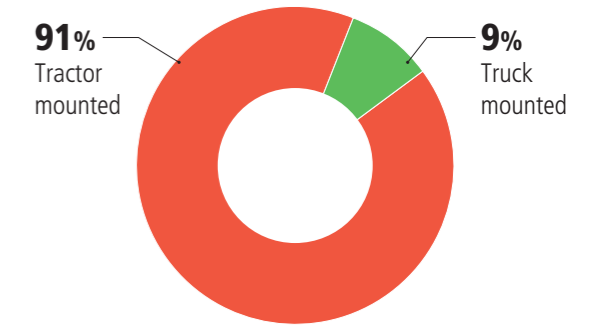


*Tractor-mounted vacuum tanker*

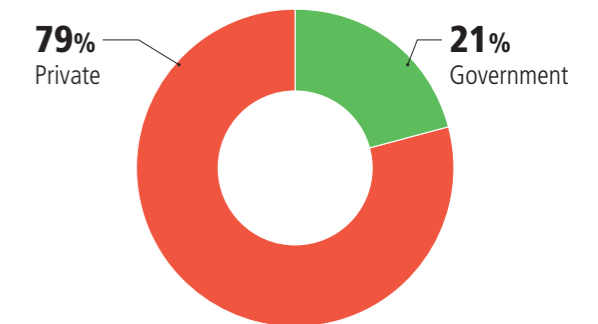


Graphic: Sunny Gautam / CSE

*Figure 8: Types of vehicles used*



*Figure 9: Breakup of service providers*



*Household discharging wastewater directly into nullah, Unnao*



*Tractor mounted vacuum tanker, Deoria*



*Cart used for transporting manually emptied faecal sludge, Deoria*



# TREATMENT AND DISPOSAL

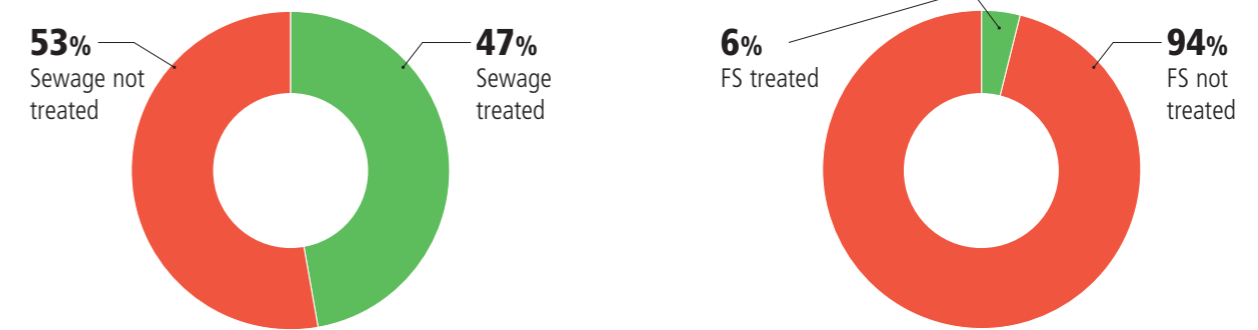
Wastewater, faecal sludge and supernatant, all three should be properly treated and/or safely disposed for improved sanitation. Though, faecal sludge is most concentrated of all, its treatment is not given due attention in the state. It's often disposed of untreated in storm-water drains, nullahs, canals, vacant plots, and agricultural fields. Extent of waste water and faecal sludge treatment is shown in *Figure 10: Pie charts showing Waste Water and Faecal Sludge treatment*.

Sewage and supernatant with or without treatment end up into lakes and rivers of the State. Many at times the untreated faecal sludge also finds its way into the

water bodies, as the operator dumps the faecal sludge to the nearest drain/nullah from the site of emptying. There is no regulation in place to restrict the uncontrolled dumping of faecal sludge in and around the cities.

Jhansi is the first city in UP to implement faecal sludge treatment plant, which was recently commissioned, as the authorities realised that laying down of sewerage network was not possible due to rocky strata. Despite treatment plant in place, due to lack of regulation, there is no binding to the truck operator to dispose the collected sludge in the treatment plant and hence uncontrolled dumping is still observed.

Figure 10: Pie charts showing Waste Water and Faecal Sludge treatment

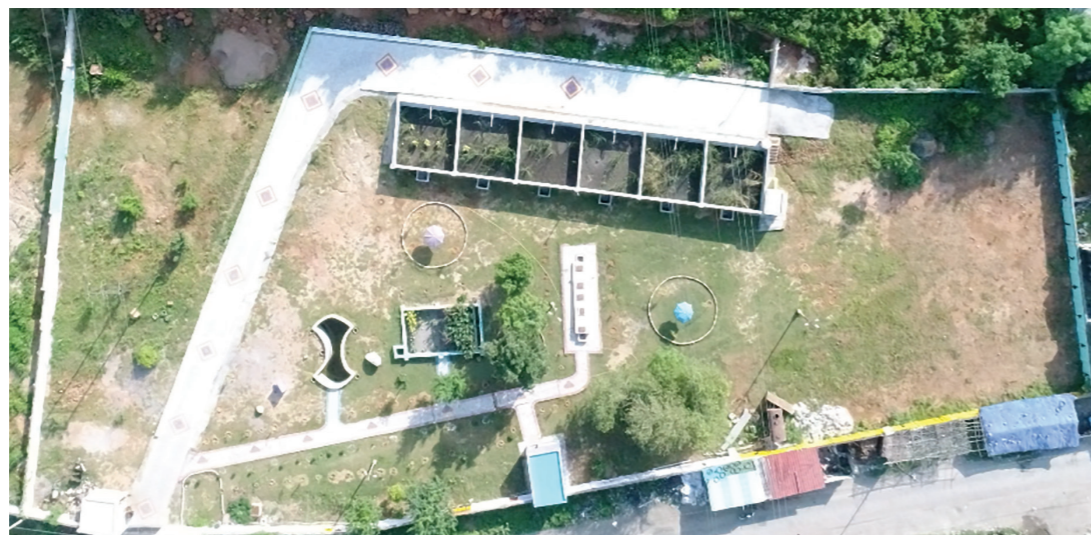


Wastewater treatment plant, Agra



Faecal sludge discharged on low lying area in Banda

Faecal sludge treatment plant, Jhansi



Faecal sludge discharged in open drain, Hathras



# CITIES WITH POPULATION OF MORE THAN 10 LAKH



City	Population	FS collected based on current demand (in KLD)	FS generated in KLD (based on once in 3 years emptying)
Allahabad	1,112,544	50	223
Varanasi	1,198,491	30	246
Meerut	1,305,429	92	370
Ghaziabad	1,648,643	108	202
Agra	2,135,327	130	783
Kanpur	2,765,348	320	388
Lucknow	2,957,960	280	657
<b>Total</b>	<b>13,123,742</b>	<b>1,010</b>	<b>2868</b>

## CHARACTERISTICS OF THE CLUSTER

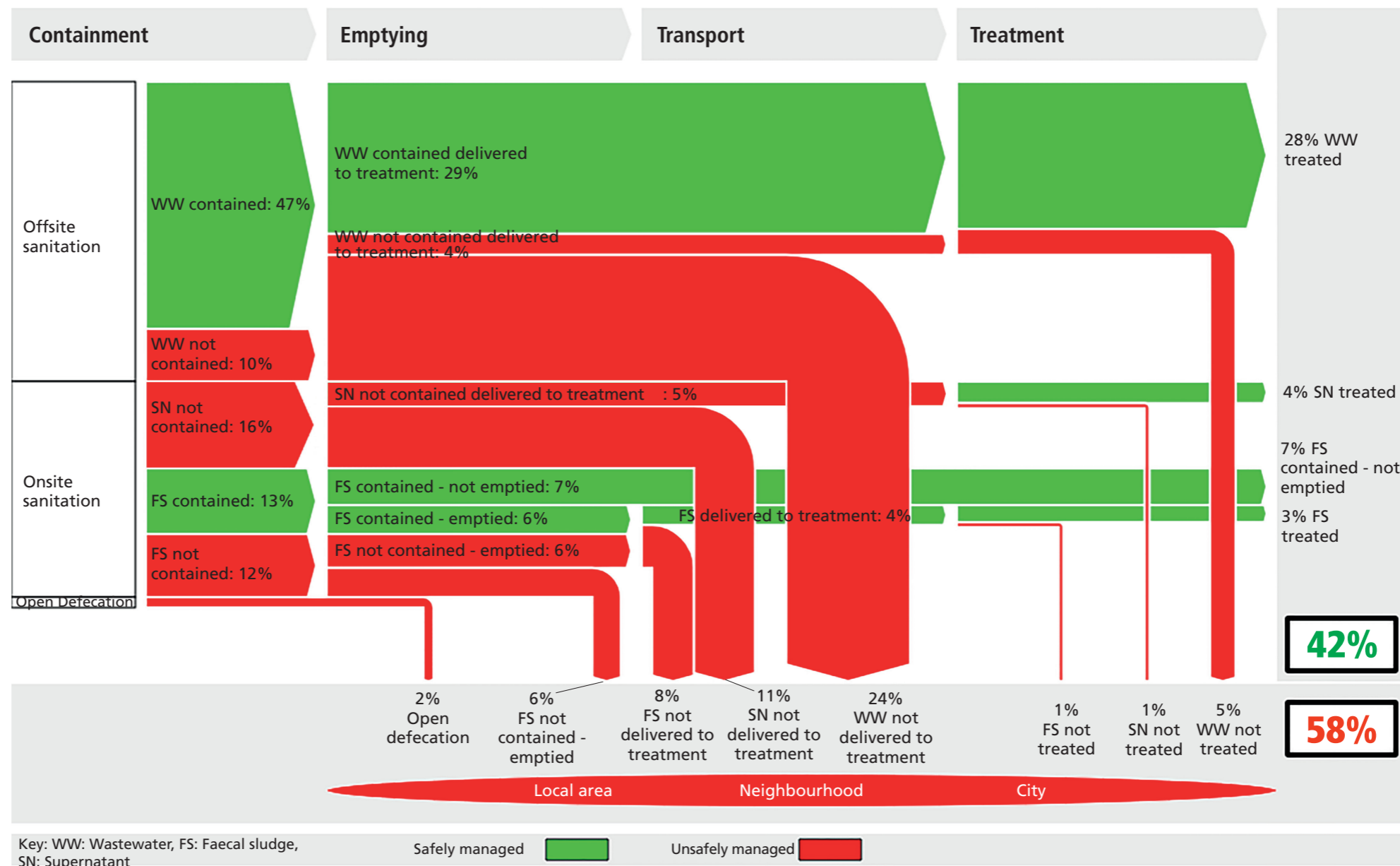
- Roughly **80% of onsite sanitation system** over flow in an open drain
- In absence of scheduled desludging, only **40-50% of FS generated gets emptied**, rest remains in the tank and reduces the treatment efficiency of the septic tank
- **85% of the vacuum tankers are tractor mounted** rest are truck mounted
- Due to inaccessible tanks, manual emptying is also observed
- There are **43 STPs, spread across all the cities** in the cluster, with **cumulative capacity of 1952 MLD**, but **receive 1532 MLD of sewage**
- More than **64 private operators** are registered with local bodies
- As a preliminary measure **Agra, Allahabad, Ghaziabad and Lucknow have allowed the discharge** of collected faecal sludge to its pumping stations and **Kanpur allows it to be directly discharged into its STP.**
- The faecal sludge collected by unregistered operators is disposed in drains/fields/ponds

## Cluster 1, Uttar Pradesh, India

Version: Draft  
SFD Level: 2 - Intermediate SFD

Date prepared: 7 December 2018

Prepared by: CSE



## EXPLANATION OF SFD

**57%** of the population is dependent on offsite sanitation systems, 47% of which is connected to sewerage network but excreta of 28% is managed through STPs

**41%** of the population is dependent on onsite sanitation systems like septic tanks and pits, 21% of which have correctly designed systems, but excreta of roughly 14% is managed

Around 26% population never gets their tanks emptied or get them emptied only after 15-20 years

**2%** population still defecates in open

**7%** 'FS contained -not emptied' only means that sludge is safely stored in containment systems, that are not emptied for long time

**4%** SN treated denotes that some drains are being tapped to treat the liquid waste.

**3%** FS treated denotes that either FS is getting discharged into drains that gets tapped or it is discharged into sewerage system and gets co-treated with sewage at STPs

**Overall excreta of 42%** population is being managed despite inefficient emptying and transport



# CITIES WITH POPULATION BETWEEN 5 AND 10 LAKH



City	Population	FS collected based on current demand (in KLD)	FS generated in KLD (based on once in 3 years emptying)
Jhansi	507,293	15	222
Loni	516,082	45	235
Firozabad	603,797	100	241
Gorakhpur	673,446	118	314
Saharanpur	705,478	51	286
Mathura	826,808	24	188
Moradabad	887,871	170	478
Aligarh	889,408	125	346
Bareilly	898,167	30	274
<b>Total</b>	<b>6,508,350</b>	<b>678</b>	<b>2,586</b>

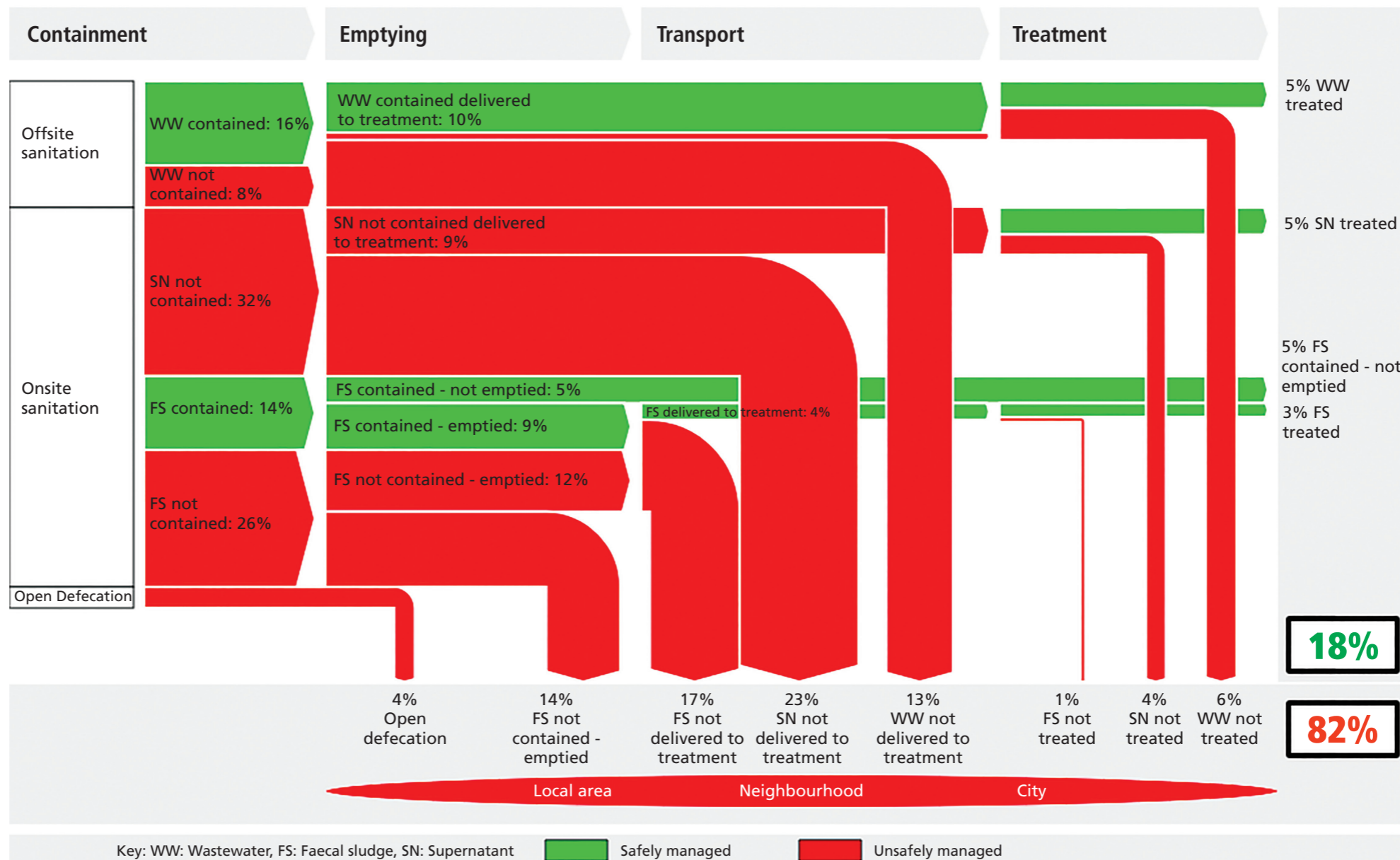
## Cluster 2, Uttar Pradesh, India

Version: Draft  
SFD Level: 2 - Intermediate SFD

Date prepared: 17 December 2018  
Prepared by: CSE

### CHARACTERISTICS OF THE CLUSTER

- More than **60% population is dependent** on tanks connected to open drain and less than half of them qualify to be called as septic tanks
- In absence of scheduled desludging, only **50% of FS generated gets emptied**, rest remains in the tank and reduces the treatment efficiency of the septic tank
- **92% of the vacuum tankers are tractor mounted** rest all are truck mounted
- Due to inaccessible tanks, manual emptying is rampant
- There are **11 STPs of cumulative capacity of 230 MLD** which receive 168 MLD of sewage and 1 FSTP of 6 KLD, which receives around 3KLD as on date
- Only Jhansi has a designated disposal site, in rest of the cities the collected faecal sludge is disposed in drains/ fields/ponds



### EXPLANATION OF SFD

**24%** of the population is dependent on offsite sanitation systems, 10% of which are connected to sewerage network but excreta of only 5% is managed through STPs

**72%** of the population is dependent on onsite sanitation systems like septic tanks and pits, 17% of which have correctly designed systems, but excreta of roughly 14% is managed

**Around 38%** population never gets their tanks emptied or get them emptied only after 15-20 years

**4%** population still defecates in open

**5%** SN and 5% FS treated denotes that a lot of drains are being tapped to treat the liquid waste. As a lot of times the collected FS is dumped in drains, the FS also gets treated

**Overall excreta of 18%** population is being managed despite inefficient emptying and transport



# CITIES WITH POPULATION BETWEEN 1.2 AND 5 LAKH



Target towns / cities under programmes

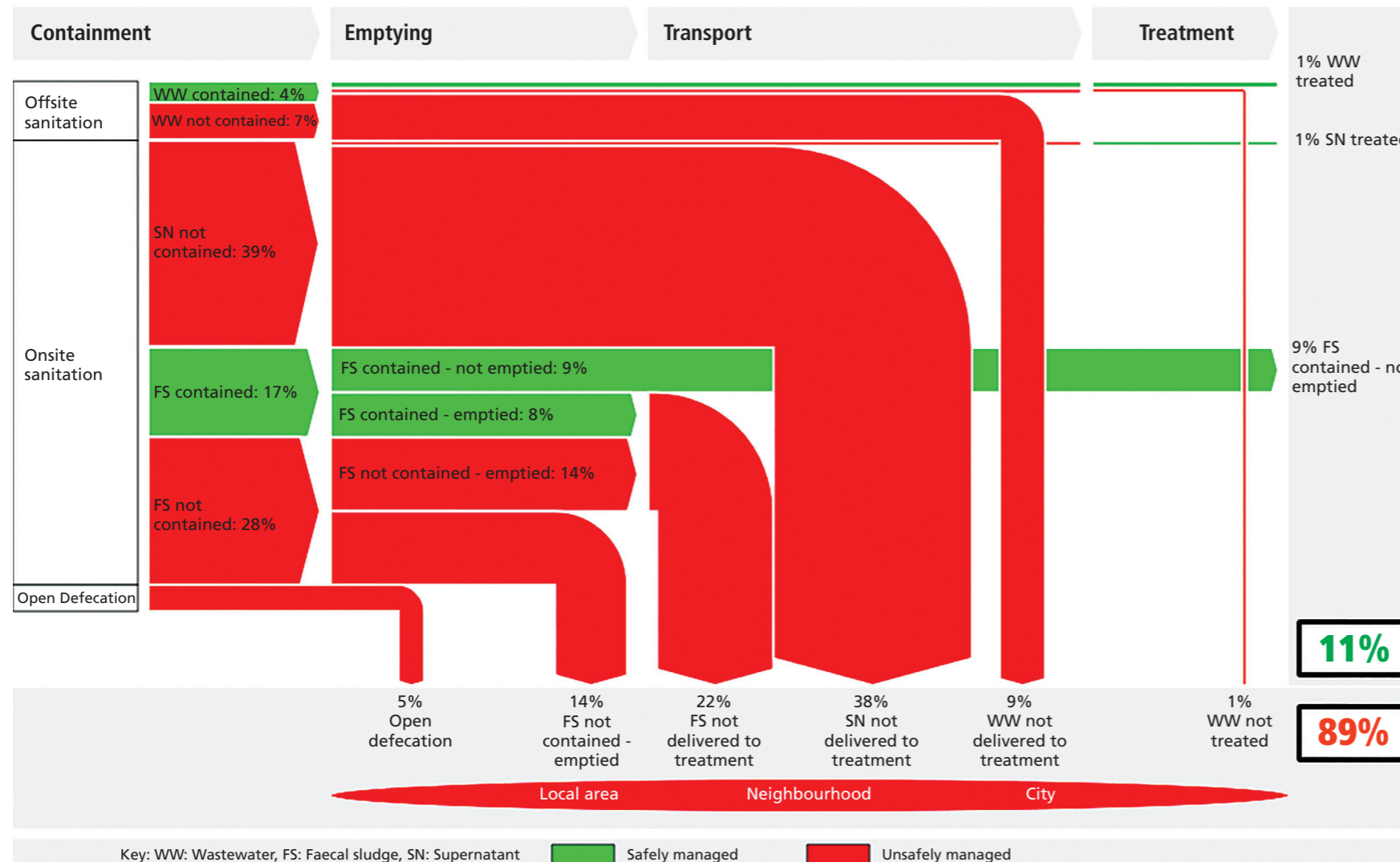
City	Population	FS collected based on current demand (in KLD)	FS generated in KLD (based on once in 3 years emptying)
Khurja	121,207	18	51
Pilibhit	127,988	15	68
Deoria	129,479	18	68
Modinagar	130,168	15	55
Lalitpur	133,305	1	61
Hathras	135,594	16	63
Lakhimpur	151,993	17	80
Budaun	159,285	3	83
Banda	160,473	9	80
Sitapur	177,234	14	85
Unnao	177,658	14	76
Bahraich	186,223	30	74
Orai	190,575	24	100
Jaunpur	191,092	6	96
Raebareli	191,316	32	65
Fatehpur	193,193	34	101
Hardoi	197,029	62	77
Amroha	198,471	72	109
Sambhal	220,813	14	113
Ayodhya - Faizabad	221,118	32	97
Bulandshahr	230,024	43	91
Mirzapur	233,691	12	79
Etawah	256,000	14	124
Hapur	262,983	48	117
Farrukhabad	276,012	21	114
Maunath Banjan	278,745	20	152
Rampur	323,512	26	158
Shahjahanpur	341,225	32	174
Muzaffarnagar	392,768	42	201
<b>Total</b>	<b>5,989,174</b>	<b>704</b>	<b>2,811</b>

## Cluster 3, Uttar Pradesh, India

Version: Draft  
SFD Level: 2 - Intermediate SFD

Date prepared: 7 December 2018

Prepared by: CSE



### CHARACTERISTICS OF THE CLUSTER

- More than **75% of the population** is dependent on tanks connected to open drain and 28% of them qualify to be called as septic tanks
- In absence of scheduled desludging, **less than 50% of FS generated** gets emptied, rest remains in the tank and reduces the treatment efficiency of the septic tank
- **90% of the vacuum tankers** are tractor mounted rest are truck mounted
- Due to inaccessible tanks, manual emptying is rampant
- Though there are **10 STPs of cumulative capacity** of 120 MLD, it takes care of only 2% population of the cluster
- There is no designated disposal site for the collected faecal sludge hence it is disposed in drains/ fields/ponds

### EXPLANATION OF SFD

**84%** of the population is dependent on onsite sanitation systems like septic tanks and pits, 31% of which have correctly designed systems, but excreta of roughly 10% is managed

**Around 46%** population never gets their tanks emptied or get them emptied only after 15-20 years

**5%** population still defecates in open

**9%** 'FS contained -not emptied' only means that sludge is safely contained in systems which are either not emptied for long time or safely infiltrate the effluent without polluting the ground water

**1%** SN treated denotes that some drains are being tapped to treat the liquid waste.

**Overall excreta of 11%** population is being managed despite inefficient emptying and transport



# CITIES WITH POPULATION LESS THAN 1.2 LAKH

## Cluster 4, Uttar Pradesh, India

Version: Draft  
SFD Level: 2 - Intermediate SFD

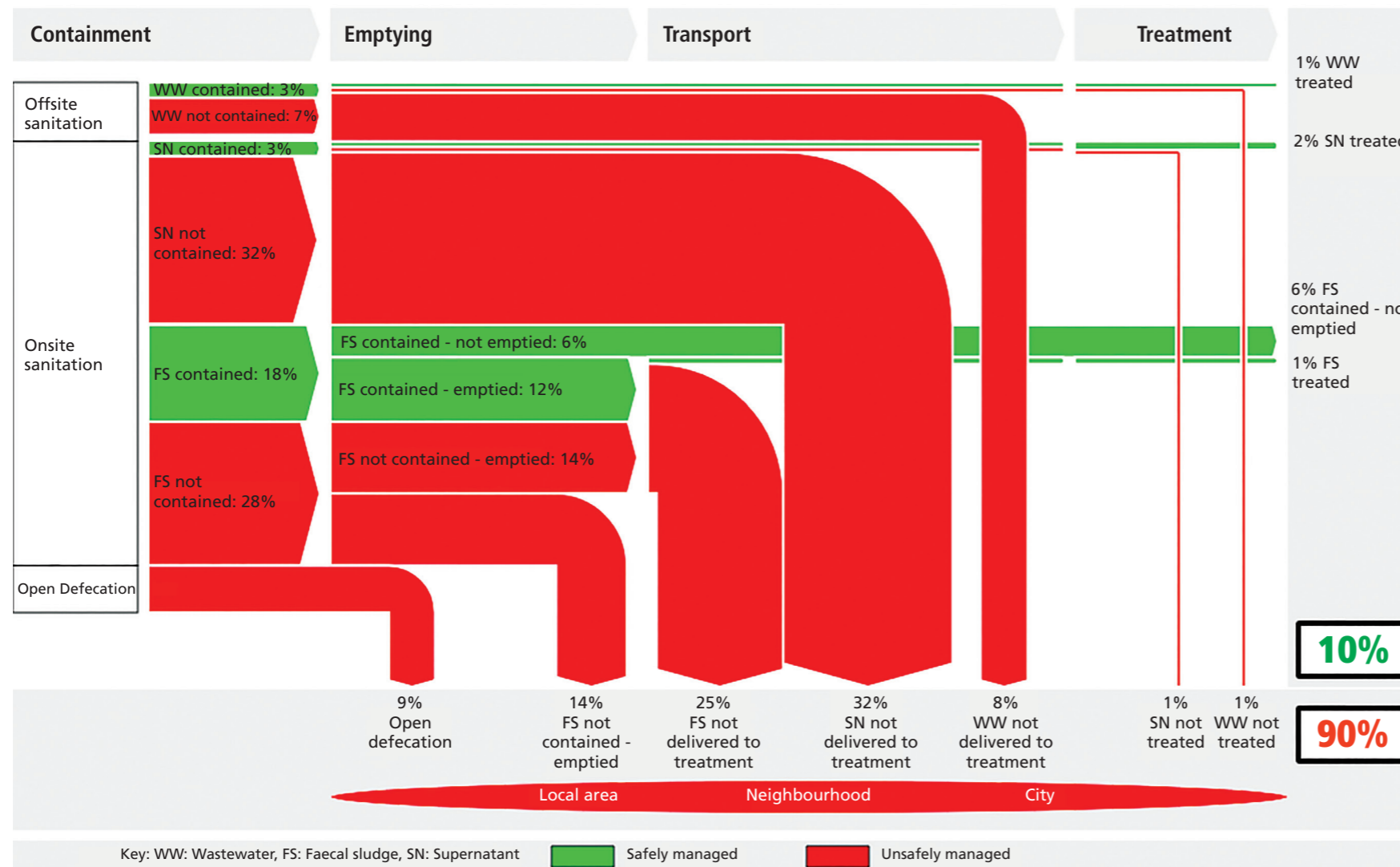
Date prepared: 17 December 2018

Prepared by: CSE



Target towns / cities under programmes

City	Population	FS collected based on current demand (in KLD)	FS generated in KLD (based on once in 3 years emptying)
Saidpur	24,338	3	11
Hastinapur	26,452	3	11
Chunar	37,185	6	15
Ramnagar	49,132	3	4
Gangaghat	84,072	6	39
Bijnor	93,297	12	49
Kasganj	101,277	10	50
Baraut	103,764	32	51
Balia	104,424	34	35
Shikohabad	107,300	10	43
Sultanpur	107,640	15	35
Pt Deen Dayal Upadhyaya Nagar	109,650	10	48
Ghazipur	110,698	12	56
Azamgarh	110,983	12	61
Akbarpur	111,447	14	45
Gonda	114,046	43	53
Chandousi	114,383	45	53
Basti	114,657	38	50
Mainpuri	117,327	26	45
Etah	118,517	30	59
Shamli	118,605	32	61
<b>Total</b>	<b>1,979,194</b>	<b>396</b>	<b>874</b>



### CHARACTERISTICS OF THE CLUSTER

- More than 70% population is dependent on tanks connected to open drain and roughly half of them qualify to be called as septic tanks
- Quite a few households don't even have an open drain in their neighbourhood
- In absence of scheduled desludging, roughly 50% of FS generated gets emptied, rest remains in the tank and reduces the treatment efficiency of the septic tank
- 97% of the vacuum tankers are tractor mounted
- Due to inaccessible tanks, manual emptying is rampant
- Except **Sultanpur (5 MLD), Mainpuri (23 MLD) and Bijnor (24 MLD)**, no other city has any functional sewage treatment plant
- There is no dedicated faecal sludge treatment plant in any of the cities in the cluster, the collected faecal sludge is disposed in drains/fields/ponds

### EXPLANATION OF SFD

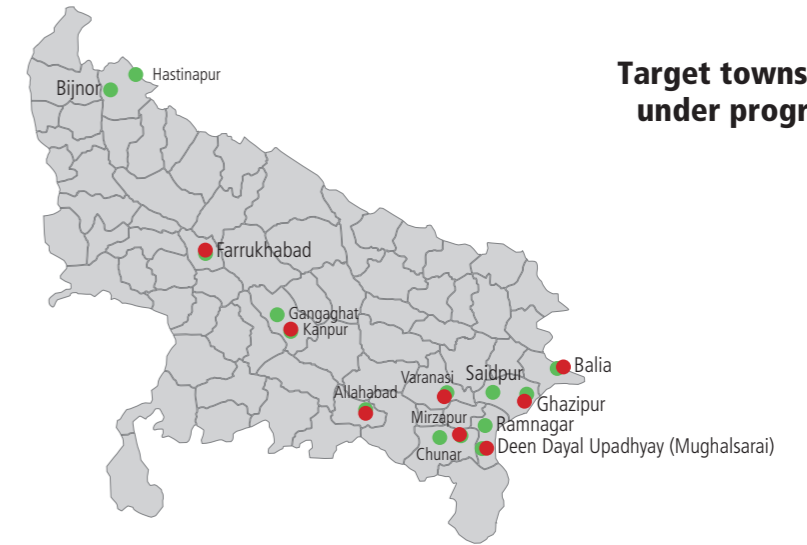
- 10% of the population is dependent on offsite sanitation systems, 3% of which is connected to sewerage network but only 1% collected wastewater gets treated
- 81% of the population is dependent on onsite sanitation systems like septic tanks and pits, 36% of which have correctly designed systems
- Excreta of roughly 6% population is managed, as it is stored safely and 2% of supernatant and 1% of faecal sludge is tapped from open drains and treated at STPs
- Around 40% population never gets their tanks emptied or get them emptied only after 15-20 years
- 9% population still defecates in open
- Overall excreta of 10% population is being managed despite inefficient emptying and transport



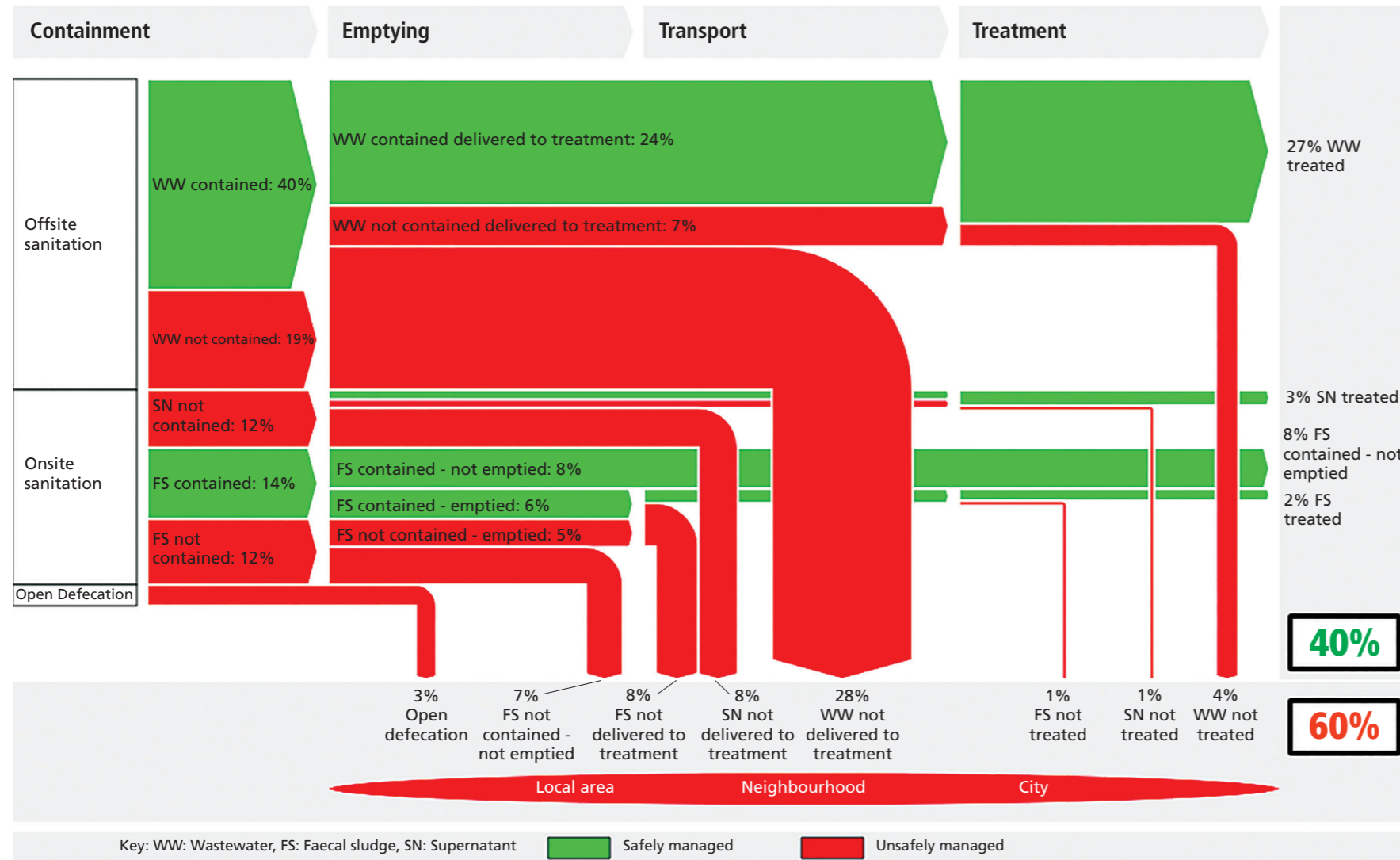
# SELECT CITIES ALONG THE MAIN STEM OF RIVER GANGA

Cluster 5, Uttar Pradesh, India  
Version: Draft  
SFD Level: 2 - Intermediate SFD

Date prepared: 27 December 2018  
Prepared by: CSE



Target towns / cities under programmes



City	Population	FS collected based on current demand (in KLD)	FS generated in KLD (based on once in 3 years emptying)
Saidpur	24,338	3	11
Hastinapur	26,452	3	11
Chunar	37,185	6	15
Ramnagar	49,132	3	4
Gangaghat	84,072	6	39
Bijnor	93,297	12	49
Balia	104,424	34	35
Pt Deen Dayal Upadhyaya Nagar	109,650	10	48
Ghazipur	110,698	12	56
Mirzapur	233,691	12	79
Farrukhabad	276,012	21	114
Allahabad	1,112,544	50	223
Varanasi	1,198,491	30	246
Kanpur	2,765,348	320	388
<b>Total</b>	<b>6,141,262</b>	<b>522</b>	<b>1,318</b>

## CHARACTERISTICS OF THE CLUSTER

- **60% of the population** is dependent on offsite systems, 40% of which are connected to sewerage network but excreta of around 27% is managed through STPs
- **19% of the population** neither has a containment system nor are connected to sewerage network
- **24% of the population** is dependent on tanks connected to open drain
- In absence of scheduled desludging, **less than 40% of FS generated** gets emptied, rest remains in the tank and reduces the treatment efficiency of the septic tank
- **95% of the vacuum tankers** are tractor mounted rest all are truck mounted
- Due to inaccessible tanks, manual emptying is rampant
- There are **18 STPs of cumulative capacity of 826.5 MLD** which receive **655.7 MLD of sewage**

## EXPLANATION OF SFD

**38%** of the population is dependent on onsite sanitation systems like septic tank and pits, 12% of which has correctly designed septic tanks.

**Around 30%** of the population never get their tanks emptied or get them emptied only after 15-20 years.

**8%** 'FS contained-not emptied' only means that sludge is safely contained in lined systems which are not emptied for long time

**11%** of FS is emptied, of which, only 2% undergoes co-treatment at sewage treatment plants

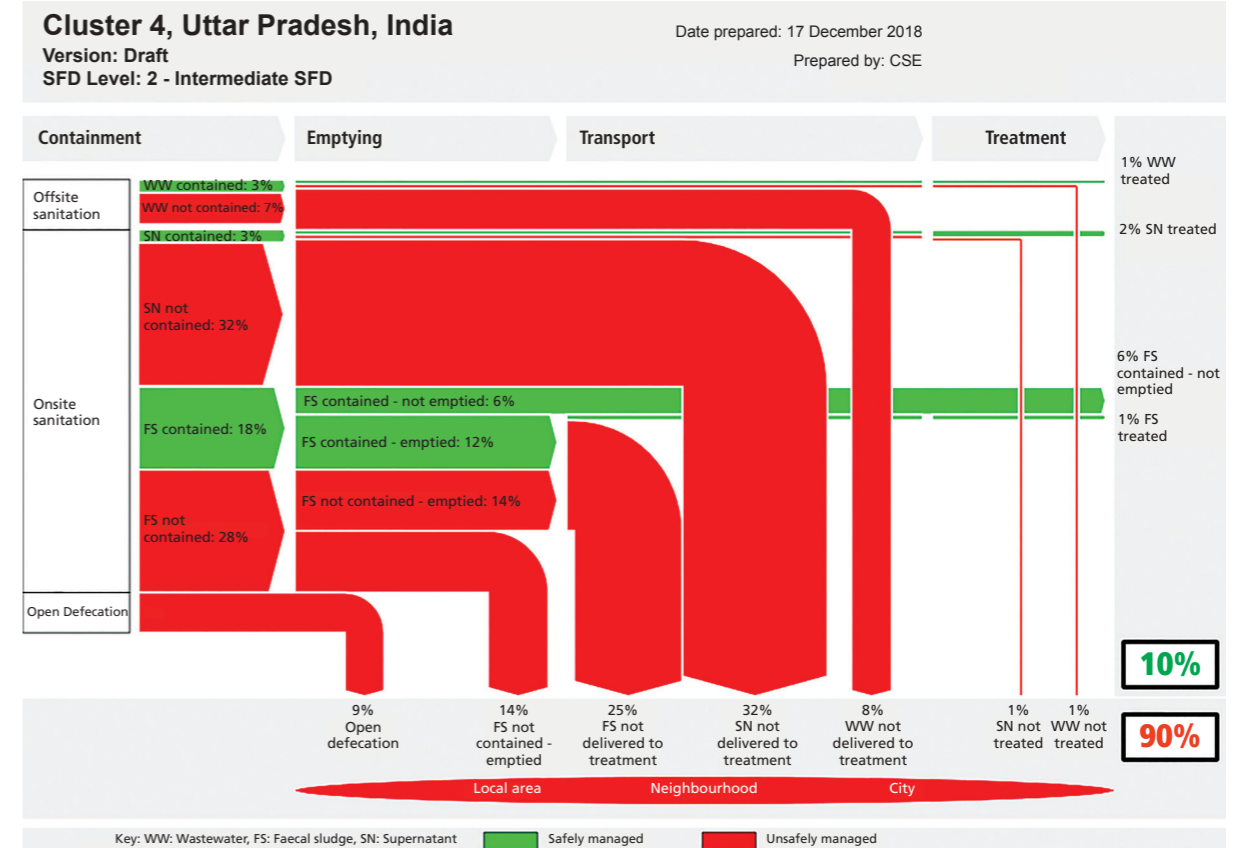
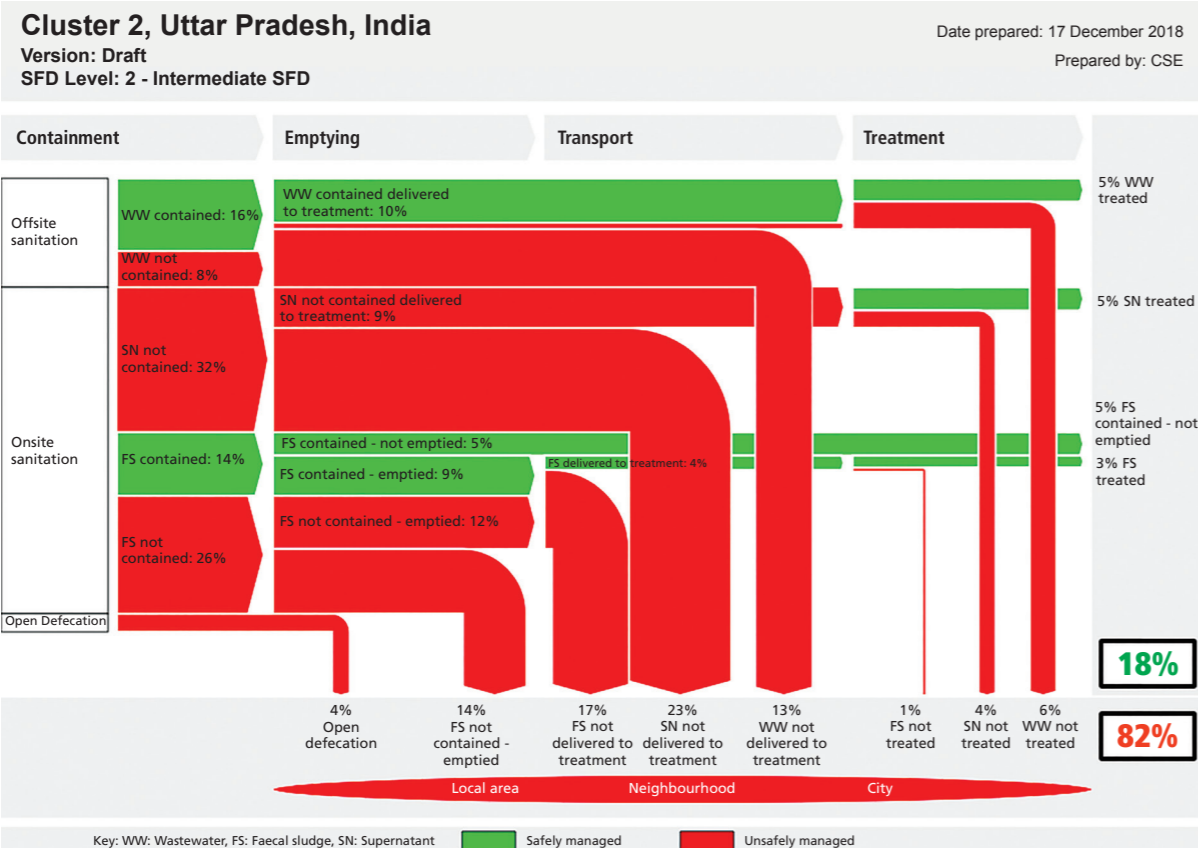
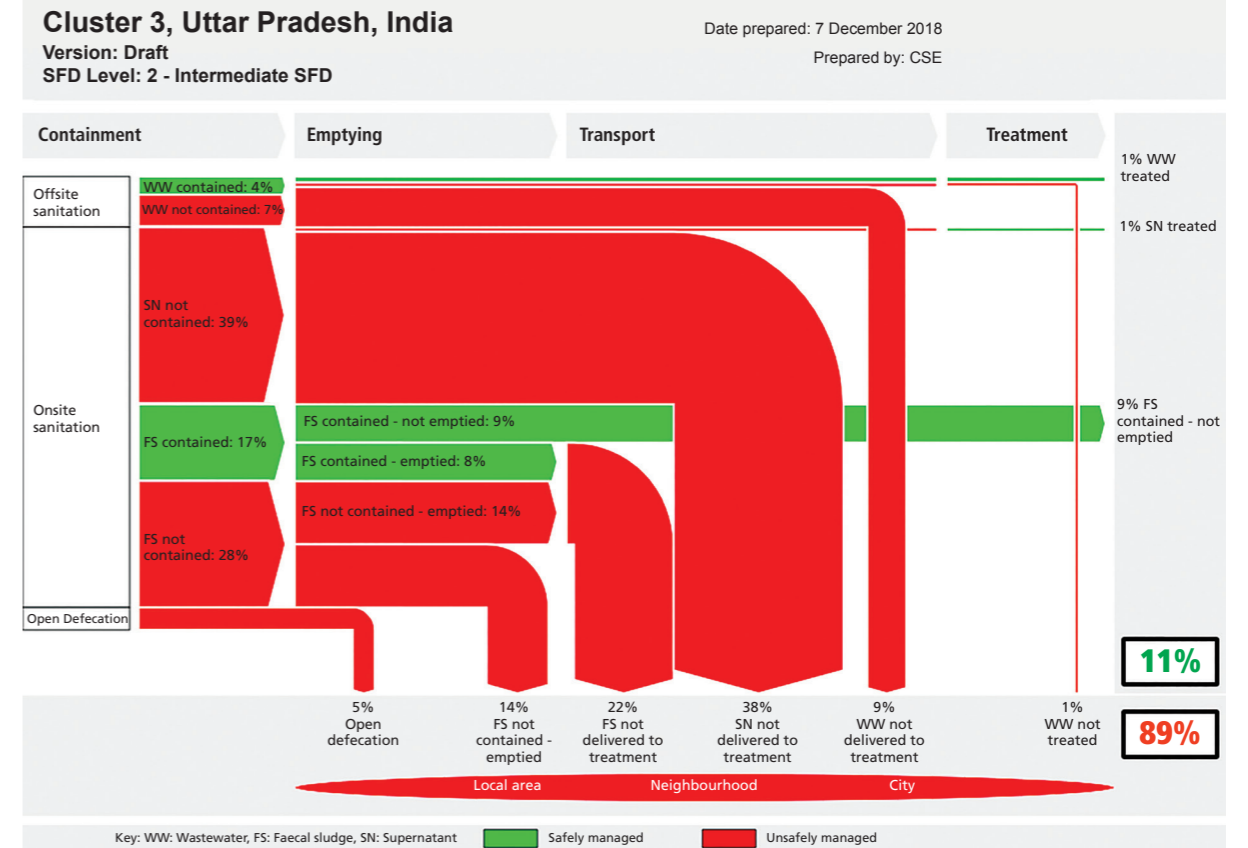
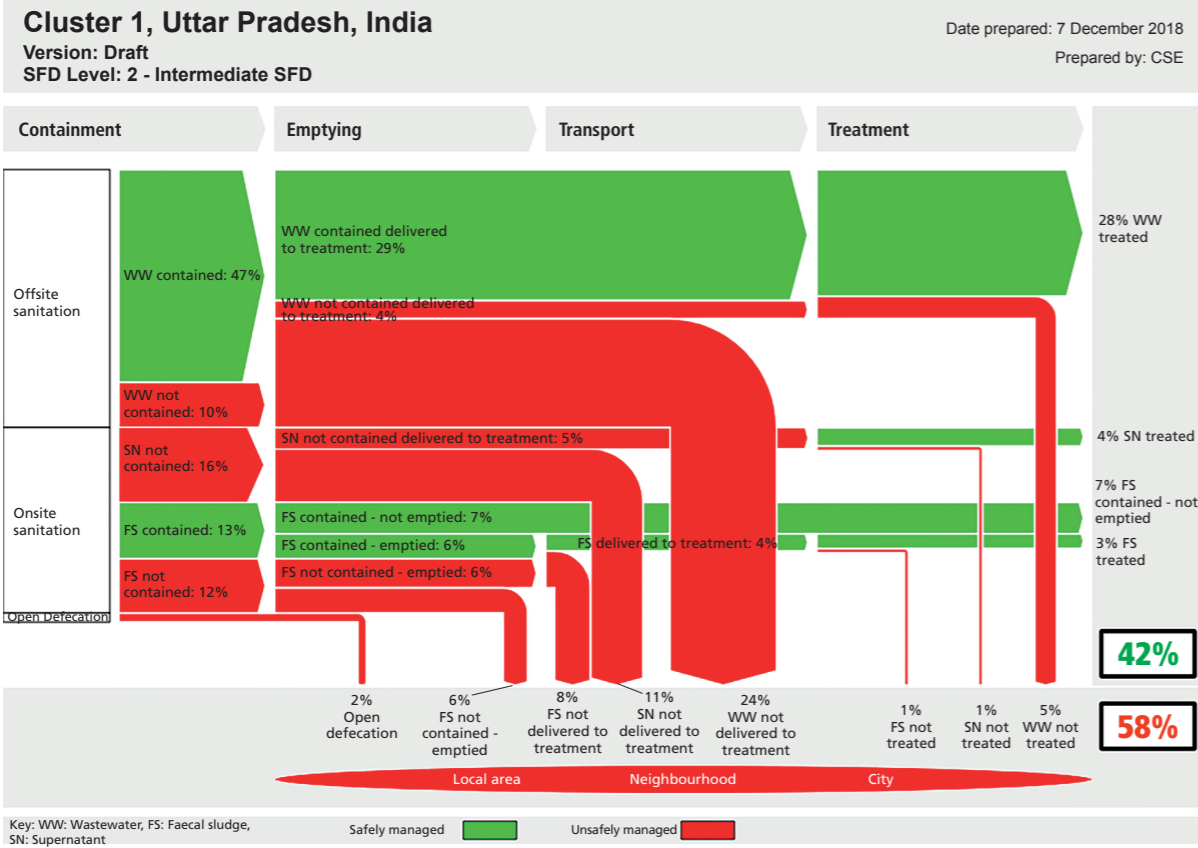
**3%** SN treated denotes that some drains are being tapped to treat the liquid waste

**3%** of population still defecates in open

**Overall excreta of 40%** population is being managed despite inefficient emptying and transport



# COMPARISON OF CLUSTER SFDS



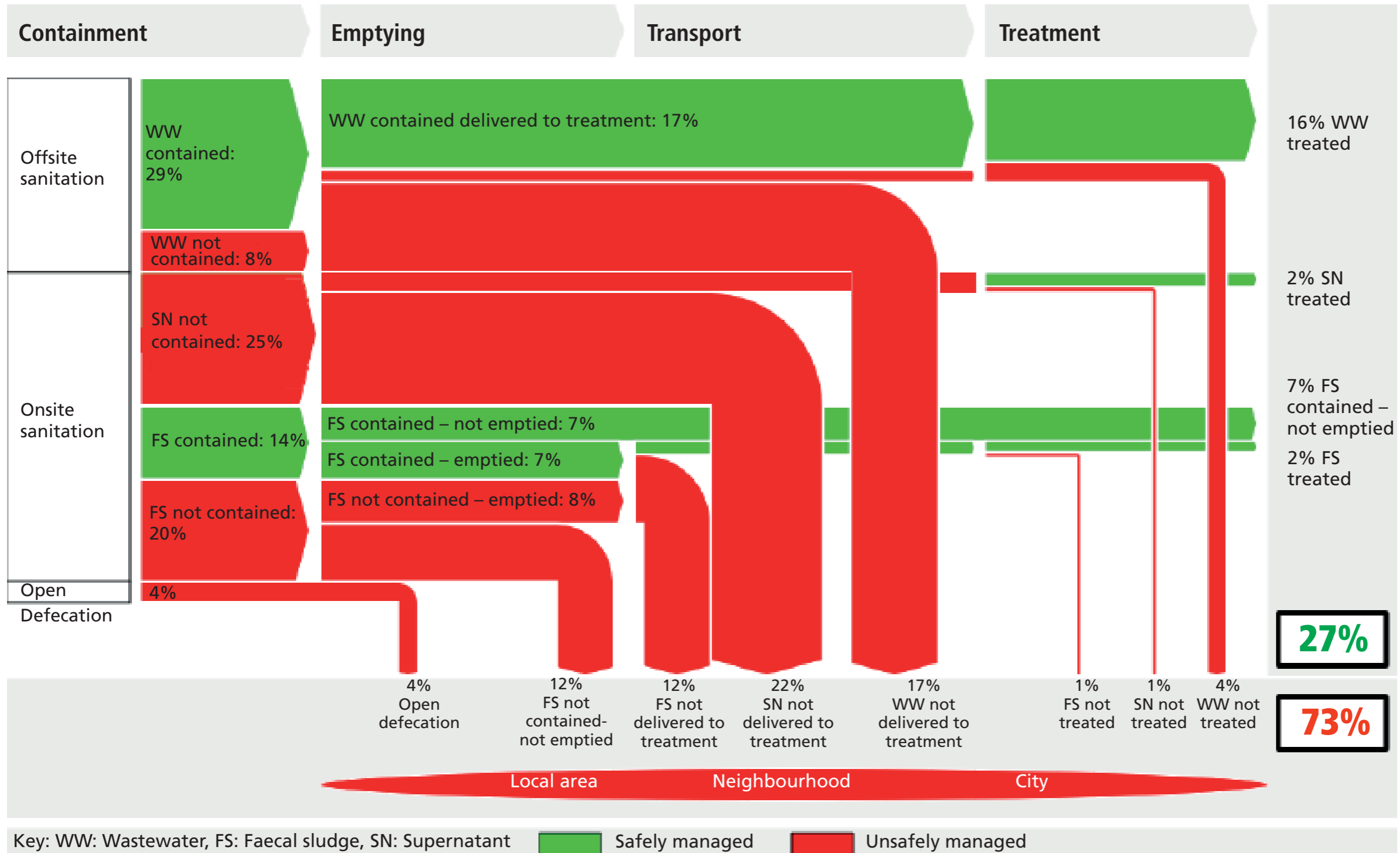


# Uttar Pradesh (Urban), India

## SFD Level: 2 - Intermediate SFD

Date prepared: 23 December 2018

Prepared by: CSE



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>

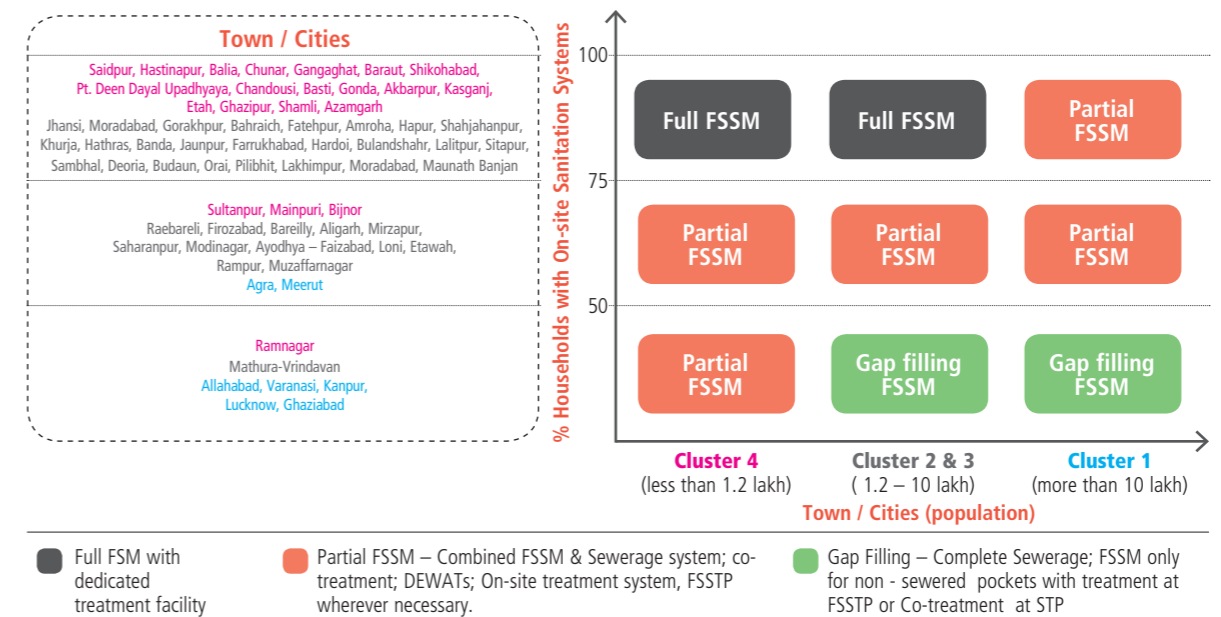


# PROPOSED ACTION PLAN FOR CITIES

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	Green	Green																		
	A2	Green	Green	Green																	
	A4	Green	Green	Green	Green																
	A3 + A6 + A13			Green	Green	Green															
	A7 + A9				Green	Green	Green	Green	Green	Green											
	A8	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A10 + A15							Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A11							Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A12 + A14	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
CLUSTER 2 & 3 1.2 - 5 Lakh population and 5 - 10 Lakh population	A1	Green	Green	Green																	
	A2	Green	Green	Green	Green																
	A4	Green	Green	Green	Green	Green															
	A3 + A5 + A6 + A13				Green	Green	Green														
	A7 + A9					Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A8	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A10 + A15 + A16									Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A11									Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A12 + A14	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
CLUSTER 4 < 1.2 Lakh population	A1	Green	Green																		
	A2	Green	Green	Green																	
	A4		Green	Green	Green	Green	Green	Green													
	A3 + A5 + A13			Green	Green	Green															
	A7 + A9				Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A8	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A10 + A15 + A16									Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A11									Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	A12 + A14	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

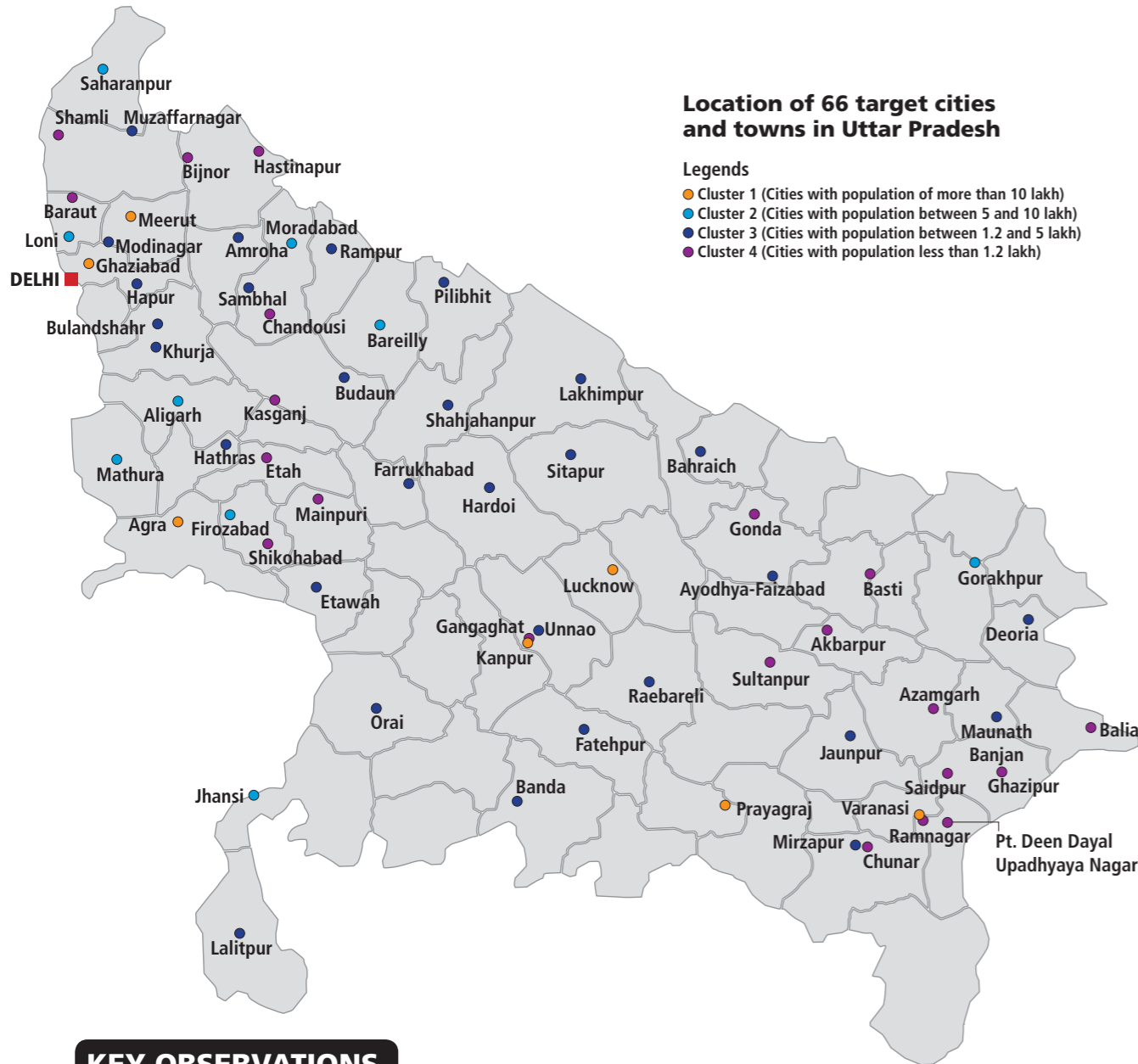
- A1:** Baseline data collection and formation of City Sanitation Task Force
- A2:** Preparation of city - level strategy on Faecal Sludge and Septage Management including decentralised liquid waste management
- A3:** Regulating & licensing of private desludgers and installation of GPS devices in each vacuum tanker (ULB-owned and private)
- A4:** Preparation of Citywide Sanitation Plan
- A5:** Identification, construction and designation of trenching sites for safe disposal of faecal sludge, till the time scientifically - designed treatment plant is in place
- A6:** Operationalising co-treatment at existing STP and/or co-composting with municipal solid waste wherever feasible for safe treatment of collected FSS
- A7:** Construction and commissioning of faecal sludge treatment plants with effective reuse of by-products (wherever feasible) for safe management of all the collected FSS
- A8:** Capacity building programme for ULB, service providers, masons, operators etc.
- A9:** Ensure adequate manpower and efficient equipment for collection and transport of FSS
- A10:** Implement scheduled desludging, initially on a pilot-scale and eventually extending across the city
- A11:** Operationalise decentralised wastewater treatment systems for the effluent generated from onsite sanitation systems and greywater
- A12:** All households with individual toilet in non - sewerred areas to have safe onsite sanitation system
- A13:** Incorporate FSS co-treatment modules in the STPs which are in planning/designing/construction phase
- A14:** Conduct GIS survey for geo-tagging of all properties in the city
- A15:** Ensure enforcement of 'The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013' and provisions for penalising the defaulters
- A16:** Gap analysis and construction & commissioning of FSTP(s) for safe management of all the generated FSS , in conjunction with the implementation of scheduled desludging

## PROPOSED FSSM APPROACH FOR URBAN AREAS IN UTTAR PRADESH





# Needs assessment of faecal sludge and septage management in Uttar Pradesh



## 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

	CITY	POPULATION	OPEN DEFECACTION	OFFSITE	ONSITE
CLUSTER 4	Saidpur	24,338	14	0	72
	Hastinapur	26,452	9	2	87
	Chunar	37,185	31	0	66
	Ramnagar	49,132	13	71	15
	Gangaghat	84,072	14	2	81
	Bijnor	93,297	0	6	87
	Baraut	101,277	2	8	88
	Kasganj	103,764	10	3	74
	Ballia	104,424	30	10	57
	Shikohabad	107,300	5	22	69
	Sultanpur	107,640	22	15	48
	PDDUN*	109,650	8	14	68
	Ghaziipur	110,698	10	0	82
	Azamgarh	110,983	1	0	85
	Akbarpur	111,447	18	9	66
	Gonda	114,046	3	12	81
Chandausi	114,383	3	8	83	
Basti	114,657	11	10	73	
Mainpuri	117,327	1	10	73	
Etah	118,517	7	3	77	
Shamli	118,605	1	7	82	
CLUSTER 3	Khurja	121,207	2	23	70
	Pilibhit	127,988	2	3	89
	Deoria	129,479	3	3	81
	Modinagar	130,168	3	22	73
	Lalitpur	133,305	11	6	72
	Hathras	135,594	3	13	82
	Lakhimpur	151,993	1	4	78
	Budaun	159,285	2	2	91
	Banda	160,473	6	4	82
	Sitapur	177,234	9	4	75
	Unnao	177,658	11	11	69
	Bahraich	186,223	8	21	67
	Orai	190,575	3	2	86
	Jaunpur	191,092	9	3	86
	Fatehpur	191,316	15	6	64
	Raebareli	193,193	12	27	49
	Hardoi	197,029	7	23	65
	Amroha	198,471	0	1	90
	Sambhal	220,813	1	5	87
	Ayodhya	221,118	7	5	73
	Bulandshahr	230,024	11	17	67
	Mirzapur	233,691	9	13	35
	Etawah	256,000	0	6	86
	Hapur	262,983	4	12	78
Farrukhabad	276,012	1	24	67	
Maunath Bhanjan	278,745	2	0	90	
Rampur	323,512	1	11	79	
Shahjahanpur	341,225	4	4	79	
Muzaffarnagar	392,768	1	4	71	
CLUSTER 2	Jhansi	507,293	0	21	66
	Loni	516,082	1	10	56
	Firozabad	603,797	5	21	71
	Gorakhpur	673,446	4	9	60
	Saharanpur	705,478	2	25	29
	Mathura	826,808	12	11	32
	Moradabad	887,871	1	2	89
CLUSTER 1	Aligarh	889,408	8	22	62
	Bareilly	898,167	2	43	49
	Prayagraj	1,112,544	3	18	26
	Varanasi	1,198,491	1	44	6
	Meerut	1,305,429	1	15	51
CLUSTER 1	Agra	1,648,643	2	9	38
	Ghaziabad	2,135,327	0	17	29
	Kanpur	2,765,348	3	14	43
	Lucknow	2,957,960	4	15	12

NOTE: The numbers above represents excreta in terms of contributing percentage of population  
\*Pandit Deen Dayal Upadhyaya Nagar

Unsafe management Safe management

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



# FORUM OF CITIES THAT MANAGE SEPTAGE

The 2017 National Policy on Faecal Sludge and Septage Management provides specific milestones for states and urban local bodies. Under its directives, each state and city in the country needs to formulate its own FSSM strategy and integrate it in their respective state/city sanitation plans.

CSE is working with cities in the state to support them on effective septage management. As part of this initiative, it has launched the Forum of Cities that Manage Septage to recognise those urban local bodies which have achieved some progress on FSSM, and to channelize all the initiatives and efforts in a more organized and sustainable form.

## Key Objectives of the Forum

- Developing a knowledge exchange platform for participating cities
- Training and capacity building on interventions across the sanitation chain and citywide sanitation
- Tracking and assessing the progress of cities
- Identifying 'pioneer cities' which can then handhold other cities on technical, economic and social aspects of FSSM and for preparing City Sanitation Plans
- Collating feedback and inputs from Forum cities and providing policy relevant information to state governments and Centre on FSSM
- Documentation of best practices



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