Not only Indore: clean water needs a sewage-first approach

Sunita Narain

Centre for Science and Environment

New Delhi

Not only Indore

- Indore is ranked as India's cleanest cities. Deaths because of drinking water tragic and shocking
- this is not really about Indore,
- It is not about water supply
- It is about sewage—the excreta that we flush and forget every day

Water woes: a snapshot

At least 5,800 people fell ill and 34 died from diseases linked to contaminated tap water across cities in India in just one year, between February 2025 and January 8, 2026

City, State/UT	Disease	Date on which reported	Number of people who became sick
NOIDA, Uttar Pradesh	Vomitting, diarrhoea, fever	08-Jan-26	**50**
Raipur, Chhattisgarh	Diarrhoea	04-Jan-26	**100**
Gandhinagar, Gujarat	Typhoid	03-Jan-26	**150**
Indore, Madhya Pradesh	Diarrhoea	31-Dec-25	**3200**
Chennai, Tamil Nadu	Diarrhoea	28-Dec-25	**10**
Gurugram, Haryana	Diarrhoea	08-Dec-25	**60**
Pune, Maharashtra	Diarrhoea	Oct-25	**100**
Almora, Uttarakhand	Fever	14-Oct-25	**50**
Chandigarh	Diarrhoea	27-Sep-25	**140**
Puducherry	Water-borne disease	25-Sep-25	**30**
Puducherry	Diarrhoea	25-Sep-25	**28**
Puducherry	Water-borne disease	12-Sep-25	**2**
Agartala, Tripura	Jaundice, Hepatitis A, Typhoid, and other stomach-related diseases	04-Sep-25	**100**
Puducherry	Diarrhoea	27-Aug-25	**16**
Puducherry	Diarrhoea	1-Aug-25	**30**
Bhubaneswar, Odisha	Diarrhoea, cholera	14-Jun-25	**1200**
NOIDA, Uttar Pradesh	Diarrhoea	08-Apr-25	**200**
NOIDA, Uttar Pradesh	Diarrhoea	08-Feb-25	**334**

Source: Media reports, January 2025 to January 7, 2026. These are reports on piped/tap water contamination linked to sewage

Water story in cities

Planners obsessed with water, not supply

Water sourced from further and further away

Leads to increasing cost of supply

Leads to high distribution losses

Less water to supply at end of pipeline

Less water means more costly water

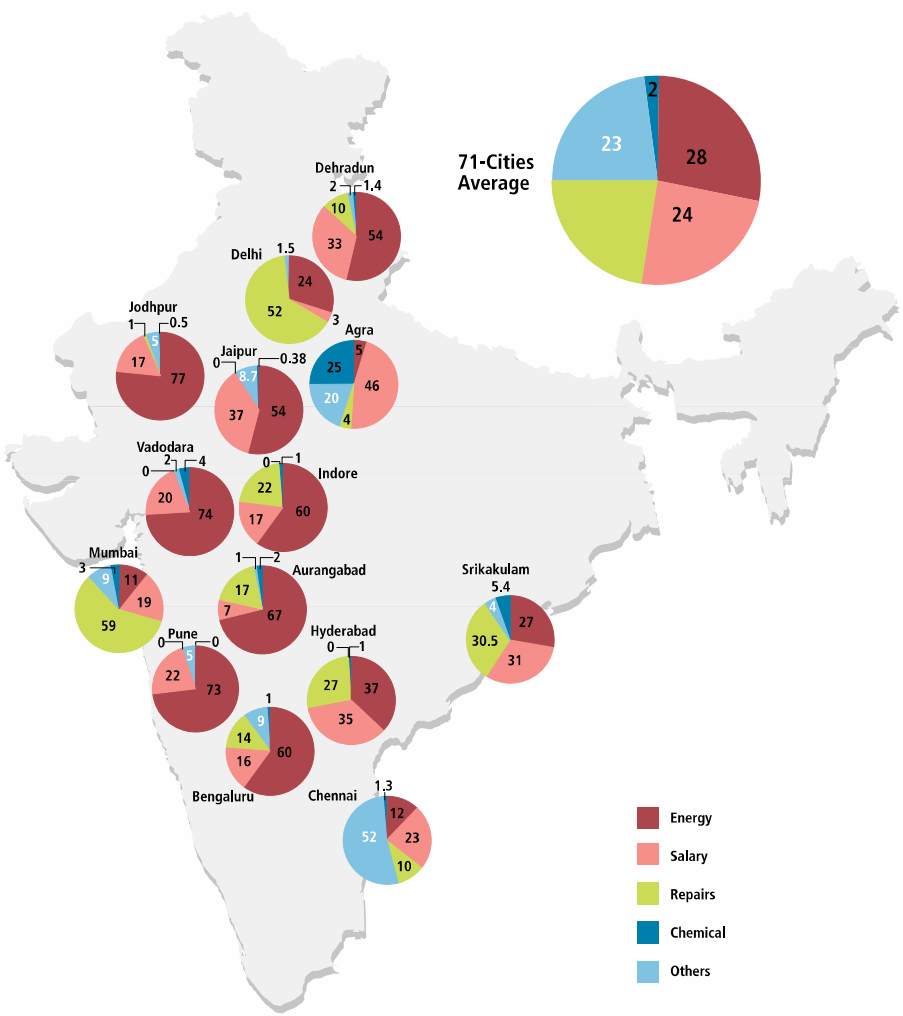
Cities not able to recover costs of supply, have no money to invest in sewage

Energy costs are highest component of water supply

Make supply expensive

Difficult to reach all

COMPONENTS OF WATER SUPPLY IN DIFFERENT CITIES (IN PER CENT)



Source: Anon 2011, *71-City Water-Excreta Survey, 2005-06*, Centre for Science and Environment, New Delhi

Water=waste

Cities plan for water, **forget waste**

80% water leaves homes as sewage

More water=more waste

Cities have **no accounts** for sewage

Cities have **no clue** how they will convey waste of all, treat it, clean rivers

Planning for hardware

Cities plan for treatment not sewage

- Treatment plants are not simple answers
- Most cities do not have underground sewage
- But engineers sell pipe-dreams of **catching up with infrastructure**

Conventional systems of sewage management are capital intensive and resource intensive; we cannot play catch up anymore; even after

50% increase in sewage capacity in country (2014-2020)

STP capacity 35,000 mld in 2020

STP utilization 20,000 mld

STP meeting standards 12,000 mld

Gap between wastewater generated and treated is growing

Excreta: sums that don't add up

Cities get water from longer distance as local water is not available/contaminated

Cost of supply of water is increasing/distribution losses are increasing/ cannot recover costs

Costs of taking back wastewater – intercepting it; conveying it; and then treating it to portable levels for discharge in rivers with low assimilative capacity – high – unaffordable

Cities treat waste of some/mixed with untreated waste of majority = pollution

Sewage-first approach needed

- Indore/Delhi
- Cost of bringing water is high; cannot supply everyone
- People then depend on groundwater
- Cities have not invested in sewage infrastructure because of cost
- Contamination happens; will happen
- Way ahead is to put sewage-first
- Way ahead is to ensure water supply cost is reduced
- Way ahead is to ensure sewage cost is reduced

Cities need to relearn the art of local water and waste management

- Water stress is growing across cities in the South
- Current paradigm of bringing water long distances adds to cost of supply; distribution losses; adds to inequity in supply
- Current practice of wastewater management through infrastructure for intercepting sewage at each household is capital and resource intensive; adding to inequity in sanitation and then pollution
- **Opportunity to reinvent is now an imperative**

Groundwater: critical for city's water security

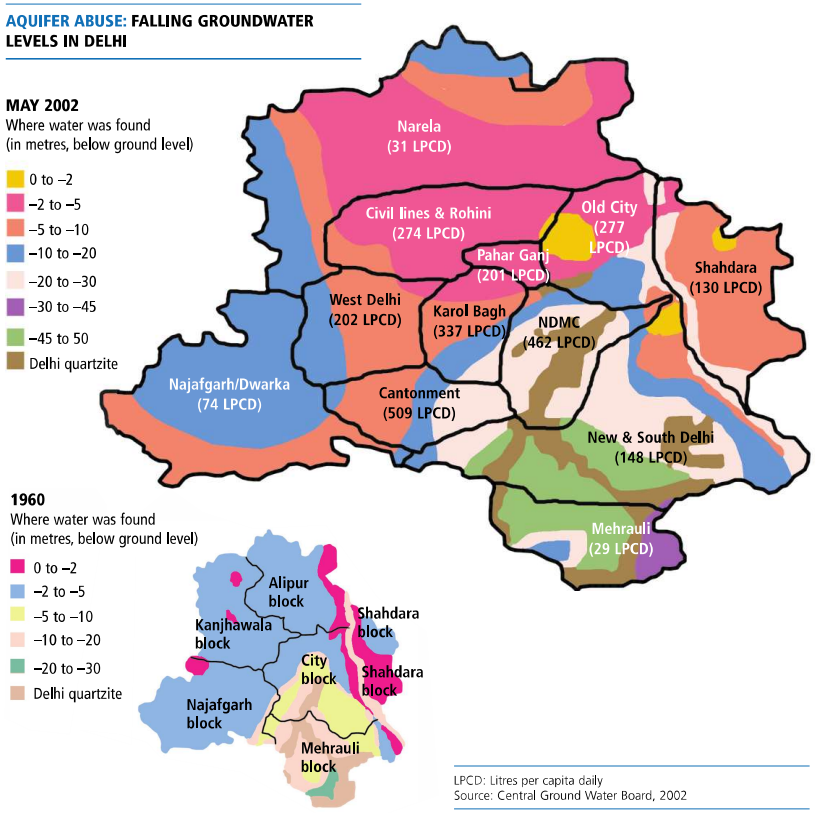
When water supply does not reach all people have no alternative but to move to **groundwater**

Millions depend on private wells, tanker mafia, bottled water

Water supply shortfalls show up in the groundwater table of the city

But as groundwater is not part of 'official' water system we do not plan for its sustainbility

Where pipeline does not reach
People depend on groundwater
Falling groundwater levels tell us about inequity



‘Unofficial’ groundwater means no attention to recharge

Indian cities are building over waterbodies

We see land, not water

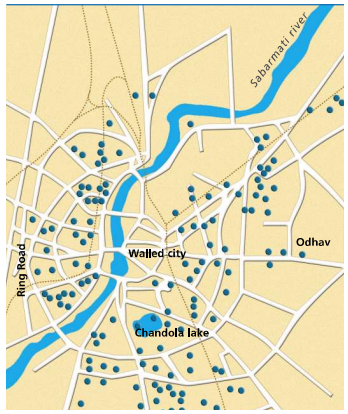
But in this age of climate change we will have to plan for harvesting rain, holding it for recharge

Otherwise, we will see drought and then floods

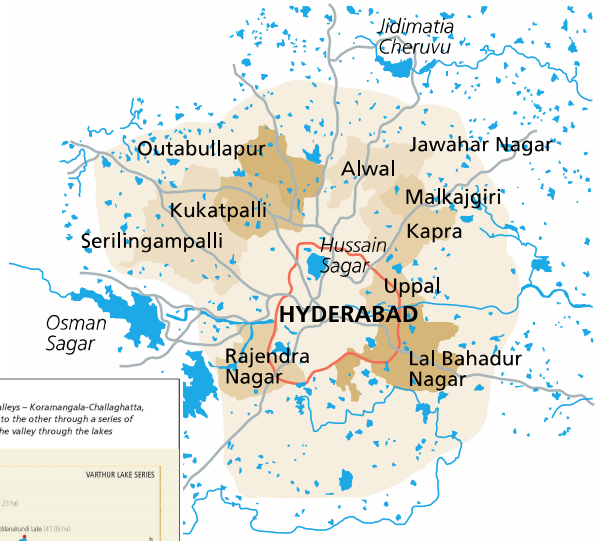
Cities need sponges

CITY OF LAKES AND FAKES

The 137 lakes of Ahmedabad, as listed by the collector’s office. 65 of these are already been built upon, found the AMC

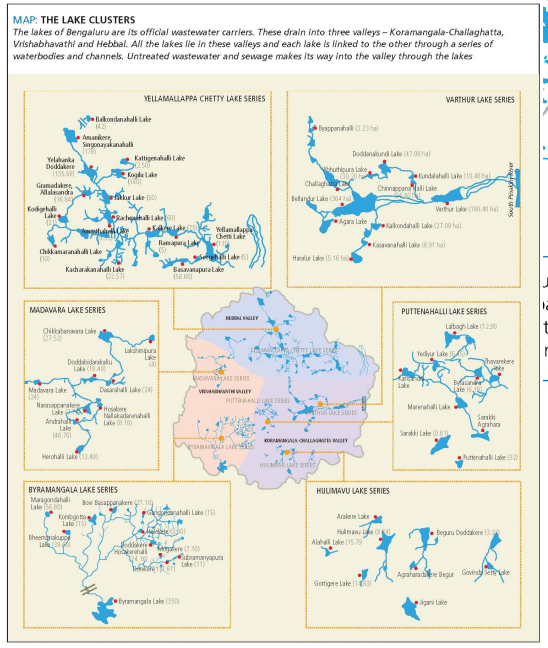


HYDERABAD: LOST GLORY



MAP: THE LAKE CLUSTERS

The lakes of Bengaluru are its official wastewater carriers. These drain into three valleys – Koramangala-Challaghatta, Vrishabhavathi and Hebbal. All the lakes lie in these valleys and each lake is linked to the other through a series of waterbodies and channels. Untreated wastewater and sewage makes its way into the valley through the lakes



Source: Anon 2006, *City Development Plan for Bangalore*, Jawaharlal Nehru National Urban Renewal Mission, Bengaluru

…upati Ramachandraiah and Manikoda Vedakumar …bad’s Water Issues and the Musi River: need for …tions’, paper presented in the International Water …rlin, September 1-4, *mimeo*

Time to reset/reprioritize agenda

- We do not know how much wastewater is generated and this means that estimation that 100% wastewater generated is treated is not accurate
- **How is wastewater calculated?**
- Wastewater is estimated based on 80% of the total water supply – it is estimated that between 4500 MLD water is supplied and so wastewater is 3600 MLD.
- Calculation of water supply is based on population x 185 lpcd and 80% of this is estimated to be wastewater
- But there is no data on current population
- Then between 40-60% of water supplied is 'lost in distribution' and so this gap between supply and demand is met through tankers/etc. But it ends up in the wastewater accounts
- Millions live in what is known as unauthorized settlements, which are not connected to official sewage systems

Cities do not have drains
New growth cities are growing without drains
Backlog and front-log impossible to fix
As cities fix one drain, another goes under

71-CITY SURVEY: AREA COVERED BY CLOSED DRAINS SHOWS REAL STATE OF SEWAGE COLLECTION

% of area covered	
0-10	Cuttack, Guwahati, Jabalpur, Jammu, Ranchi, Thane, Aizawl, Bathinda, Bhilwara, Siliguri, Srikakulam
10-30	Agra, Alwar, Aurangabad, Indore, Mathura, Meerut, Puducherry, Thiruvananthapuram, Dehradun, Dewas, Hubli-Dharwad, Jhansi, Kozhikode, Lucknow, Solapur, Tumkur, Udaipur, Ujjain, Dhanbad
30-50	Allahabad, Bengaluru, Bhopal, Delhi, Lucknow, Patna, Srinagar, Amritsar, Bhubaneswar, Jodhpur, Mumbai
50-70	Faridabad[2], Hyderabad, Jaipur[1], Kanpur, Kolkata, Nagpur, Gwalior, Mussoorie, Nainital, Rajkot, Vadodara, Yamunanagar
> 70	Chennai, Pune, Surat, Gurgaon[2]

[1]Claims 80% coverage in CSE survey, 65% in City Development Plan for JNNURM; [2]Faridabad and Gurgaon: only old-city within municipal limit included
Source: Anon 2011, *71-City Water-Excreta Survey, 2005-06*, Centre for Science and Environment, New Delhi

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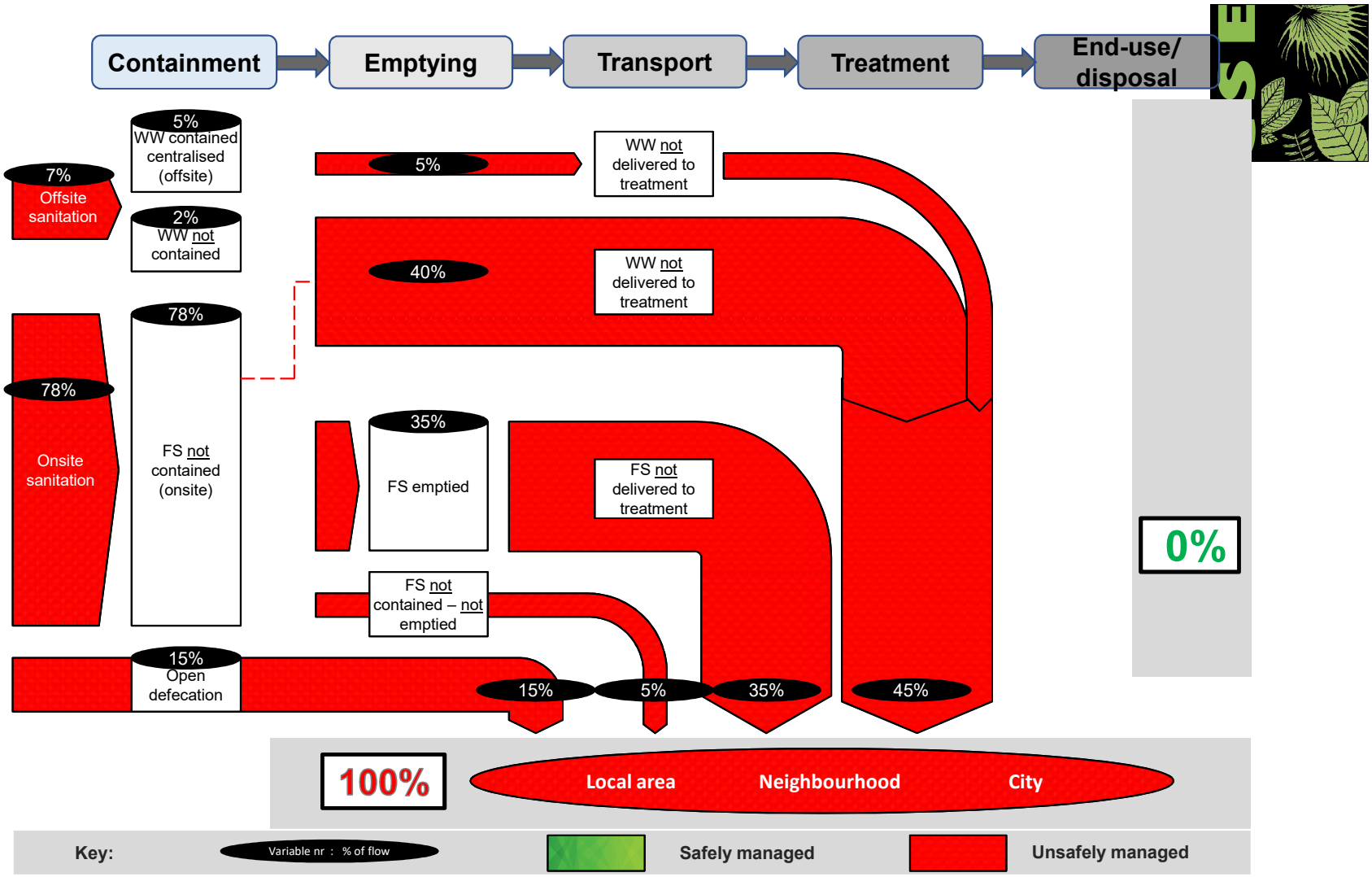
Guwahati, Jabalpur, Jammu, Ranchi, Thane, Aizawl, Bathinda, Bhilwara, Jammu, Jabalpur, Siliguri, Srikakulam

Waste-wise is water-wise

- When we mapped excreta flows in our cities, we found majority were not connected to official sewage systems
- They have ‘on-site’ treatment
- But river cleaning is designed to intercept sewage from underground/connected households
- Sewage of these millions of non-sewered households is collected and dumped in the same waterway or drained directly
- As a result ‘treated’ sewage of the minority gets mixed with the ‘untreated’ sewage of the majority = pollution

Srikakulam- 31 July 2015
Desk based

Status: Final



Solapur-01 August 2015
Desk based

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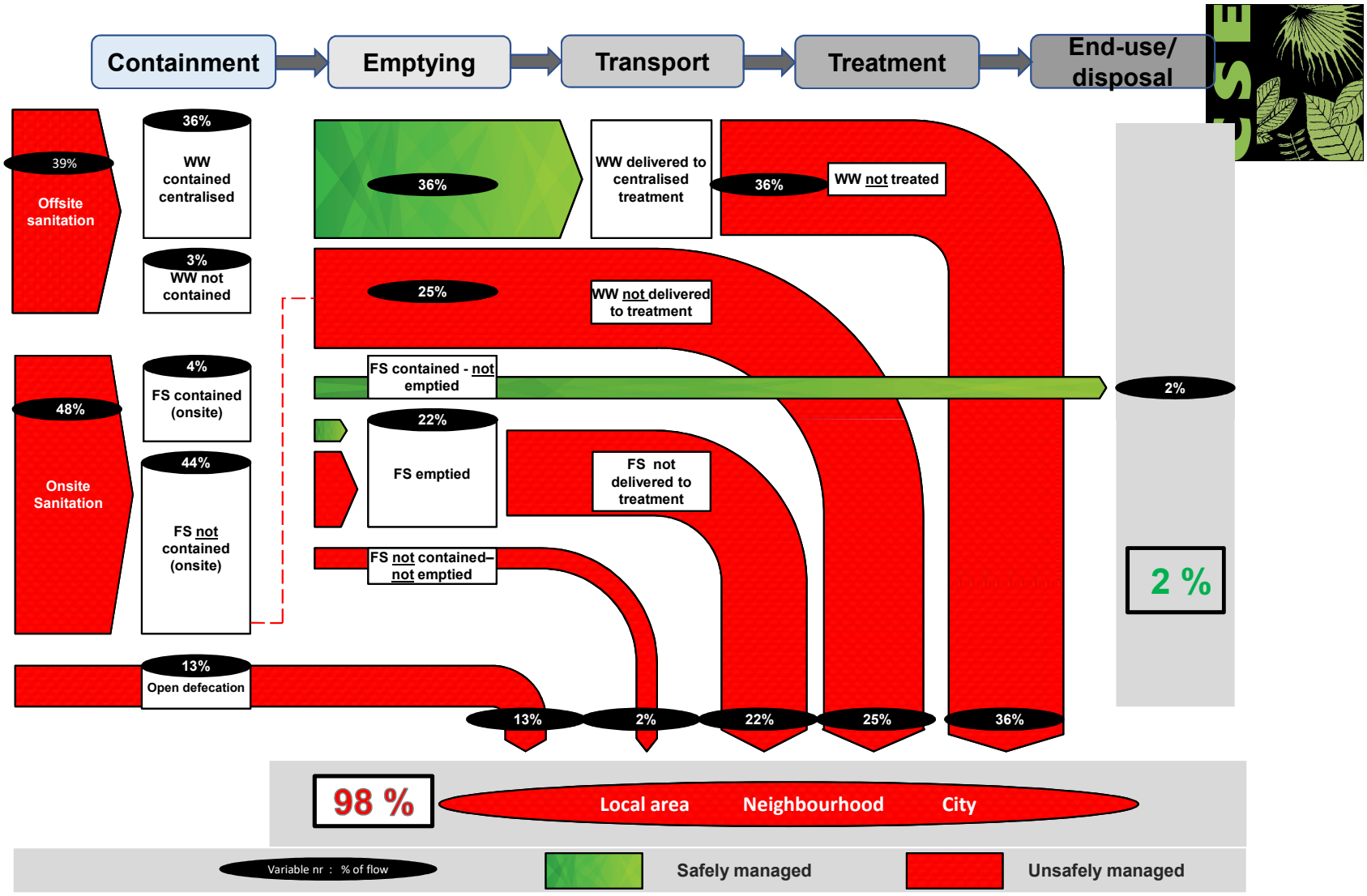

Dewas- 30 January 2016
Desk based

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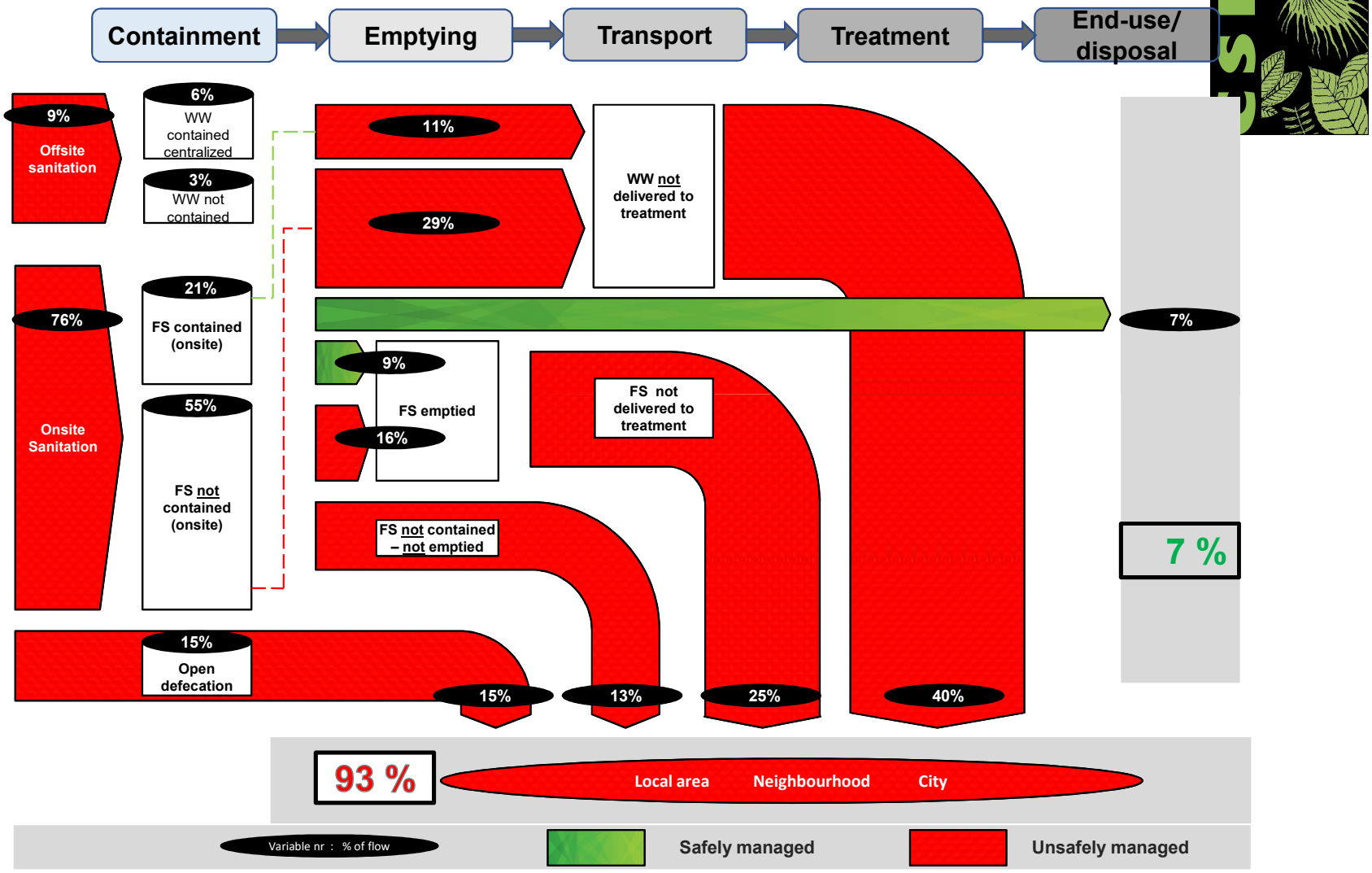

Gwalior-13 October 2015
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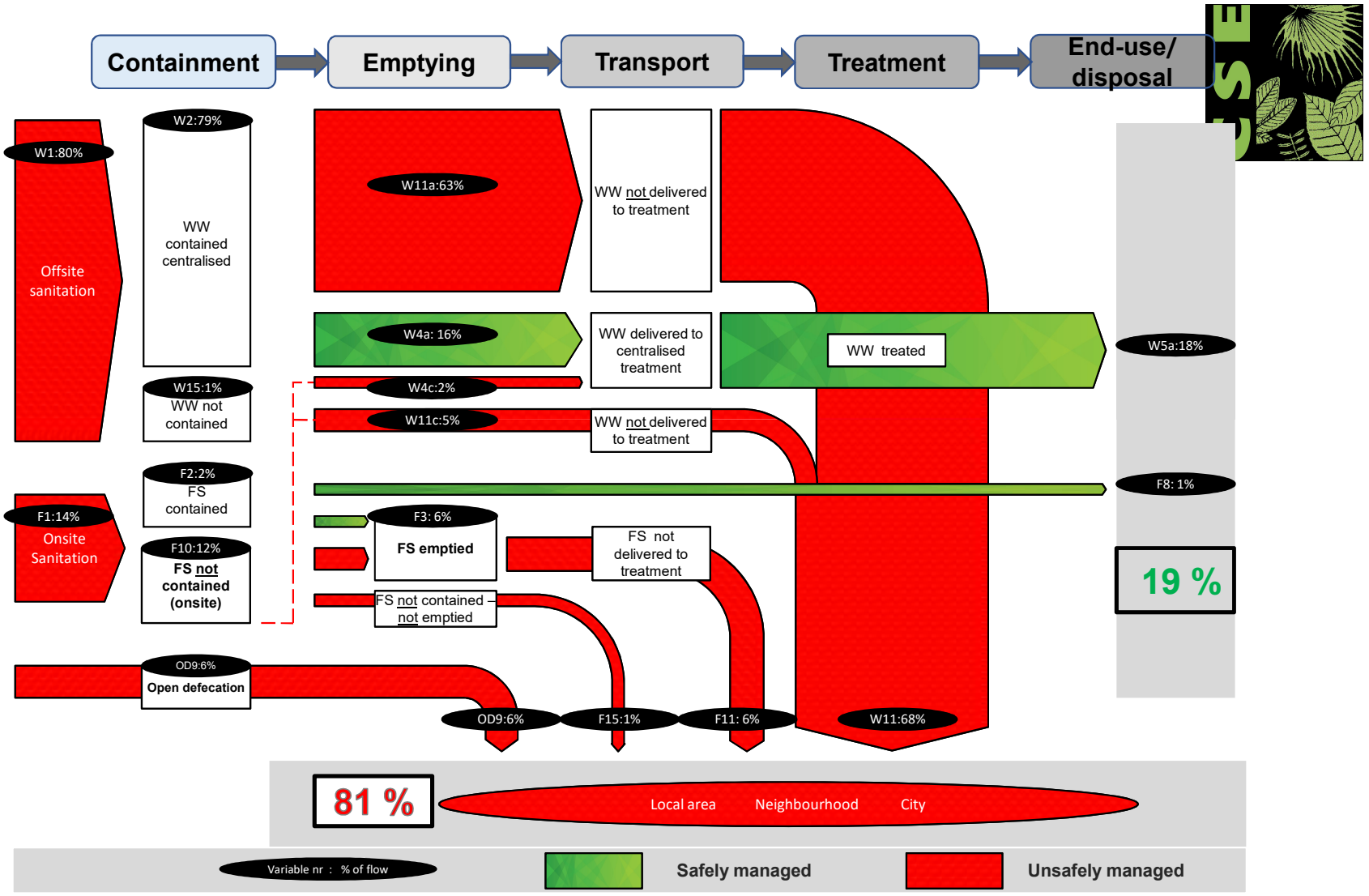

Cuttack- 28 July 2015
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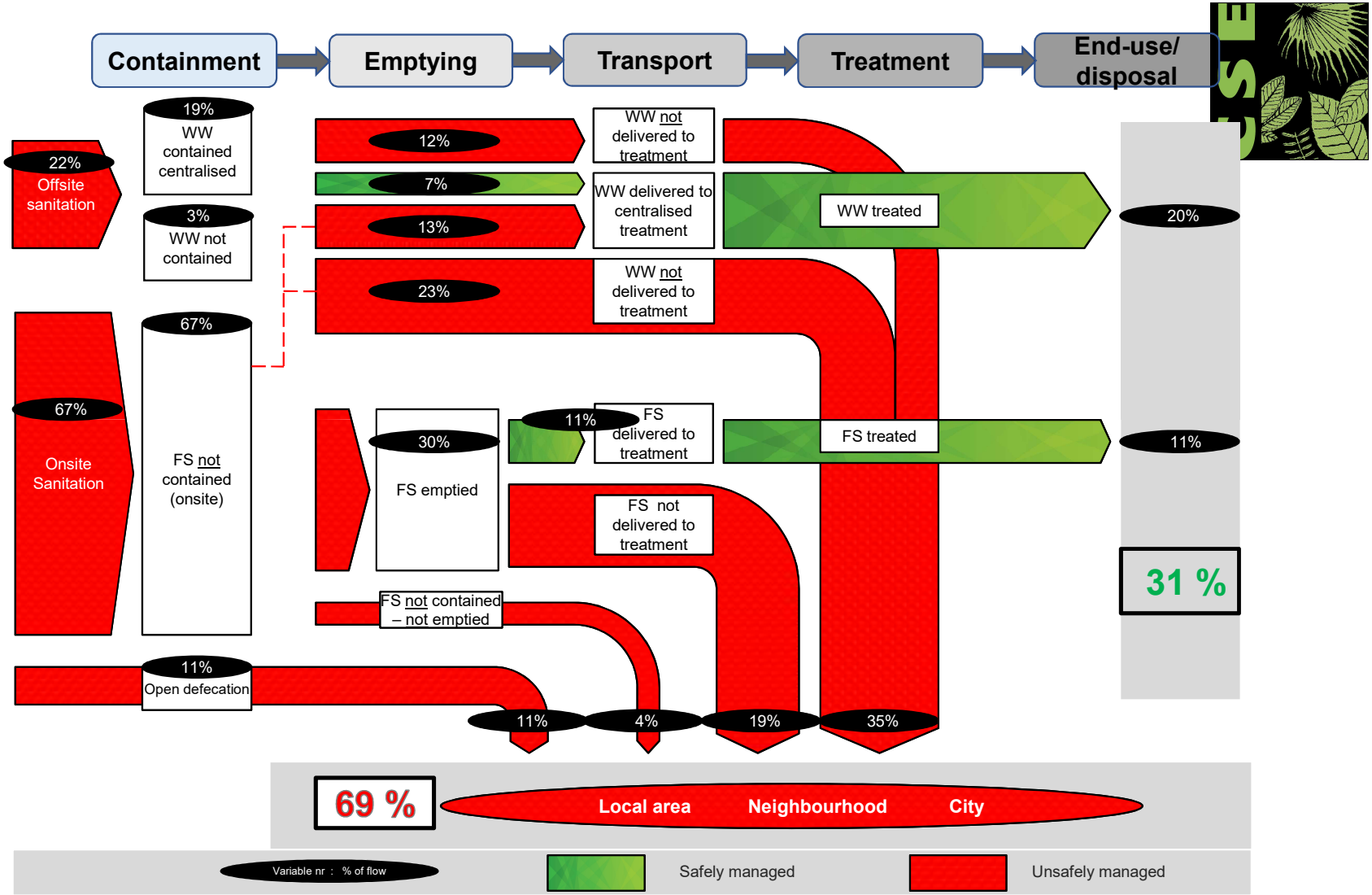

Aizawl- 29 July 2015
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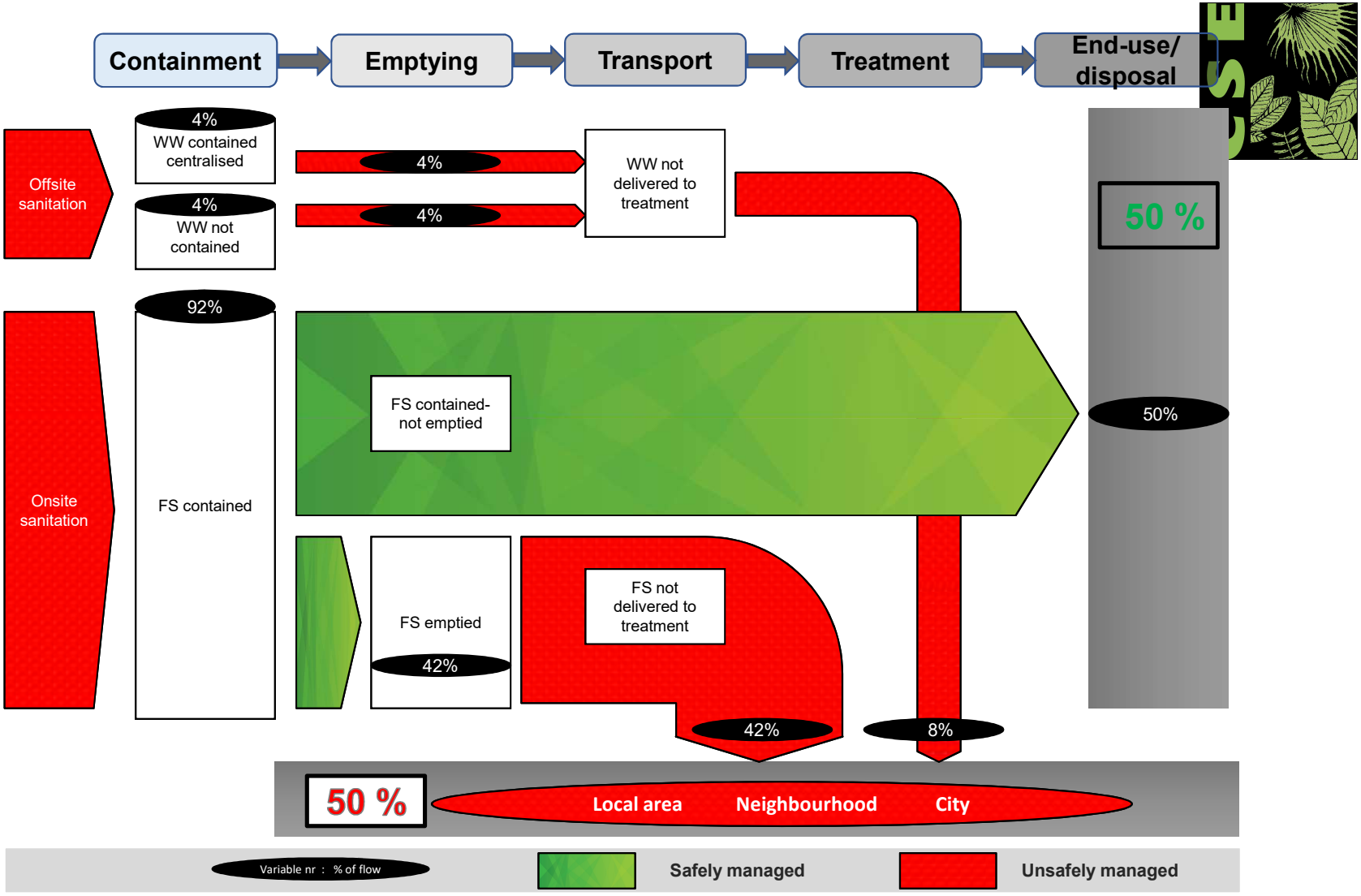
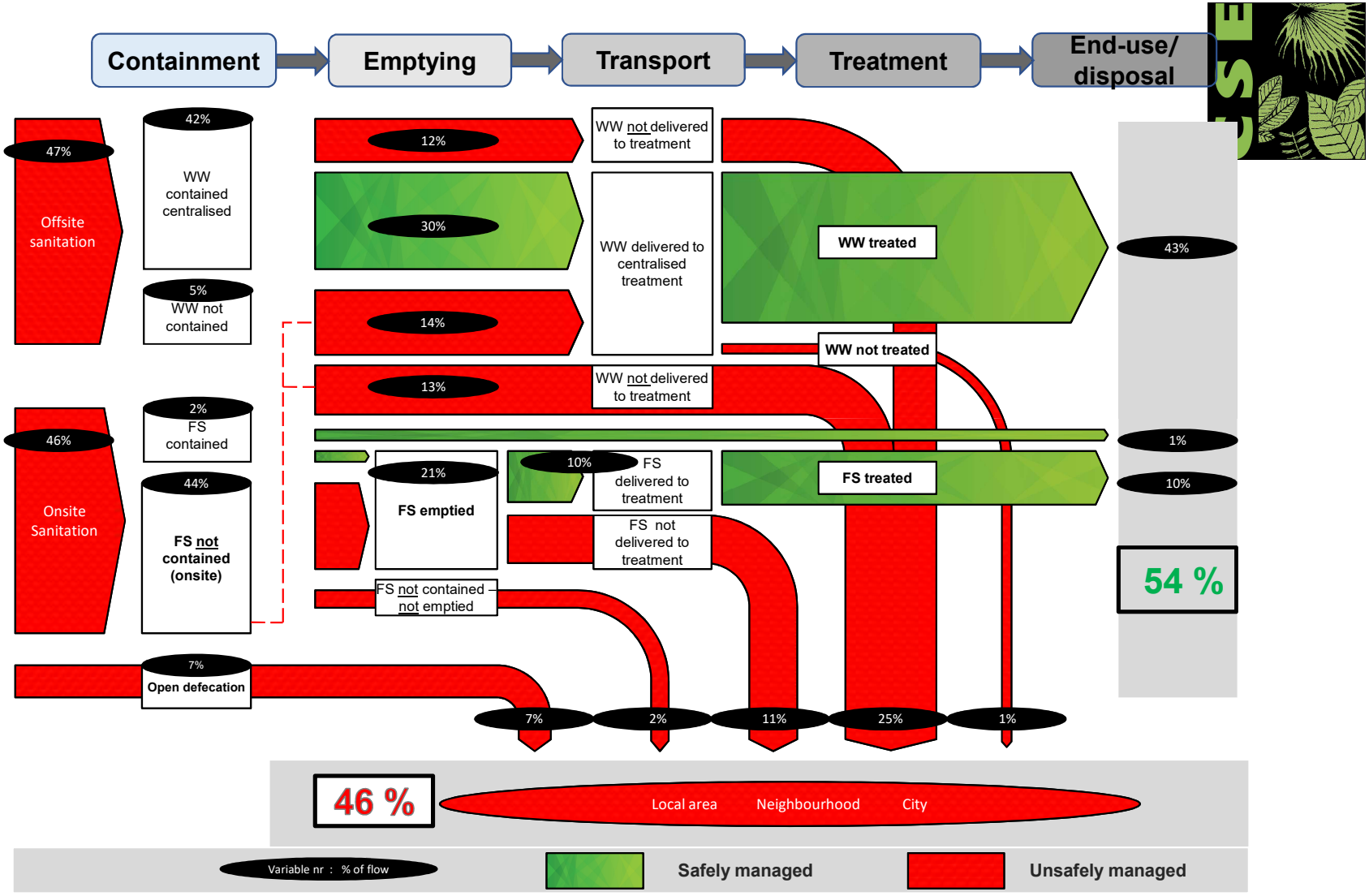


Agra – 21 October 2015
Desk based

Status: Final



Tumkur- 03 August 2015
Desk based

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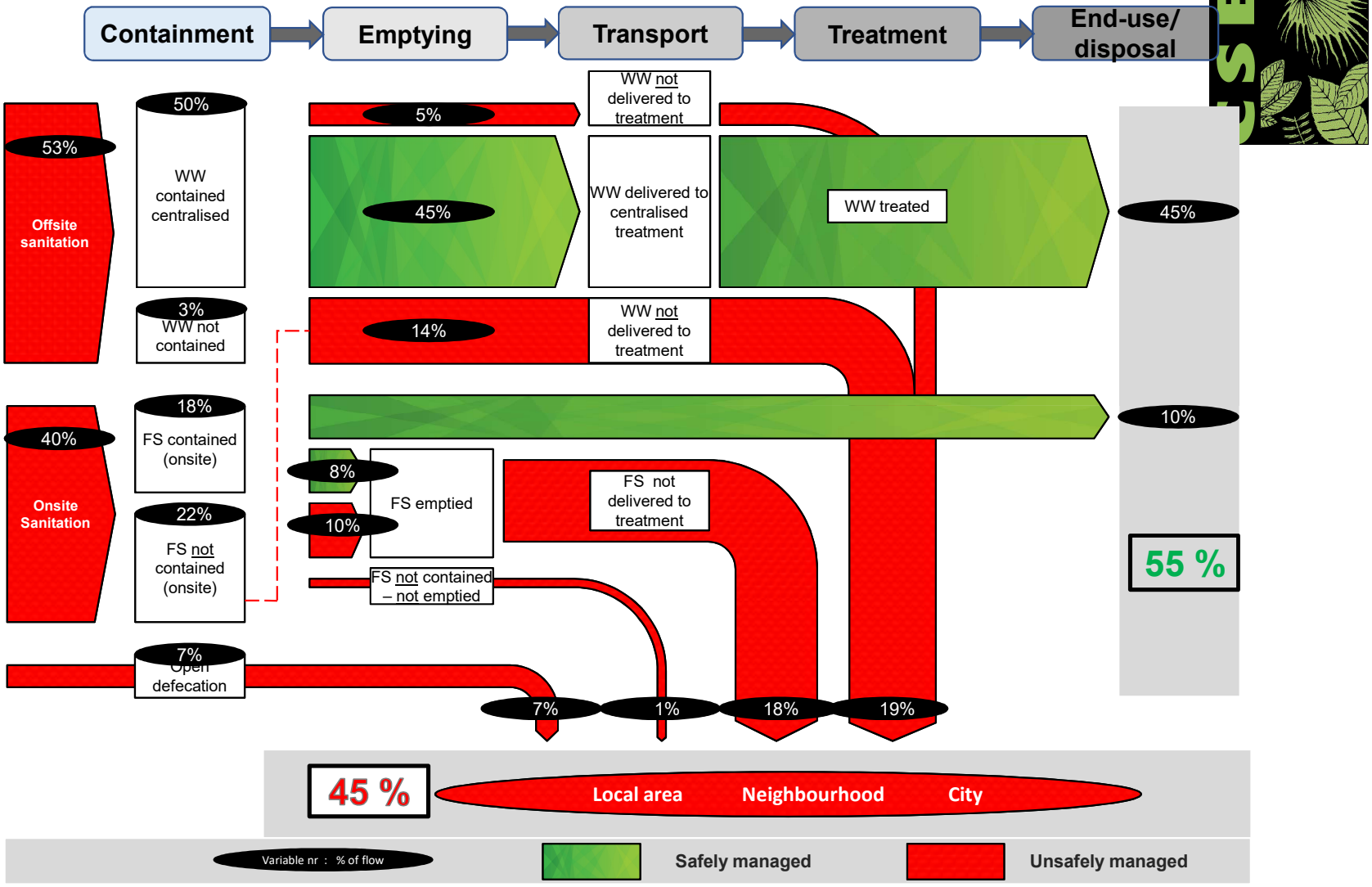

Delhi – 8 February 2016
Field based

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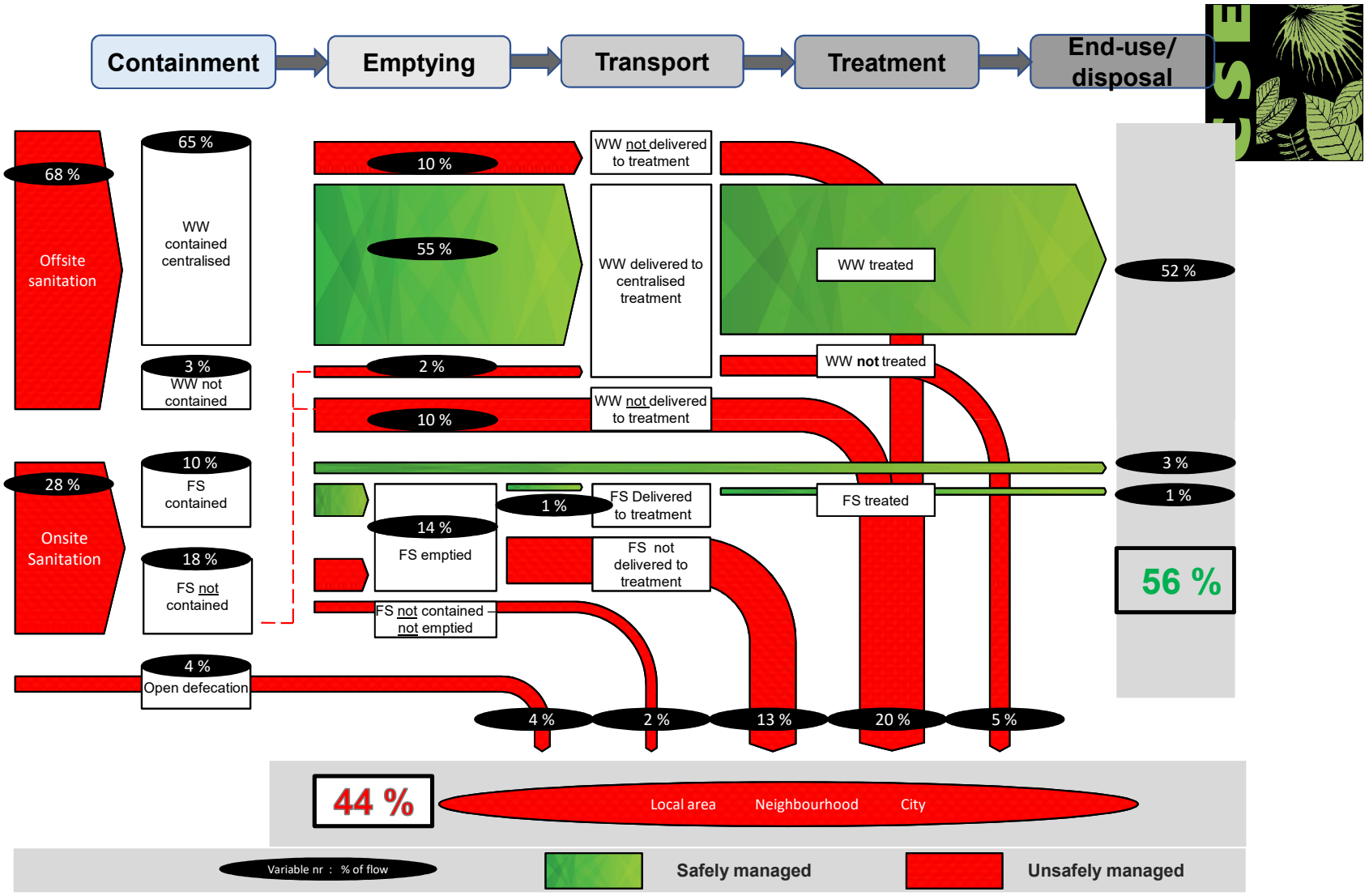

Bikaner- 14 September 2015
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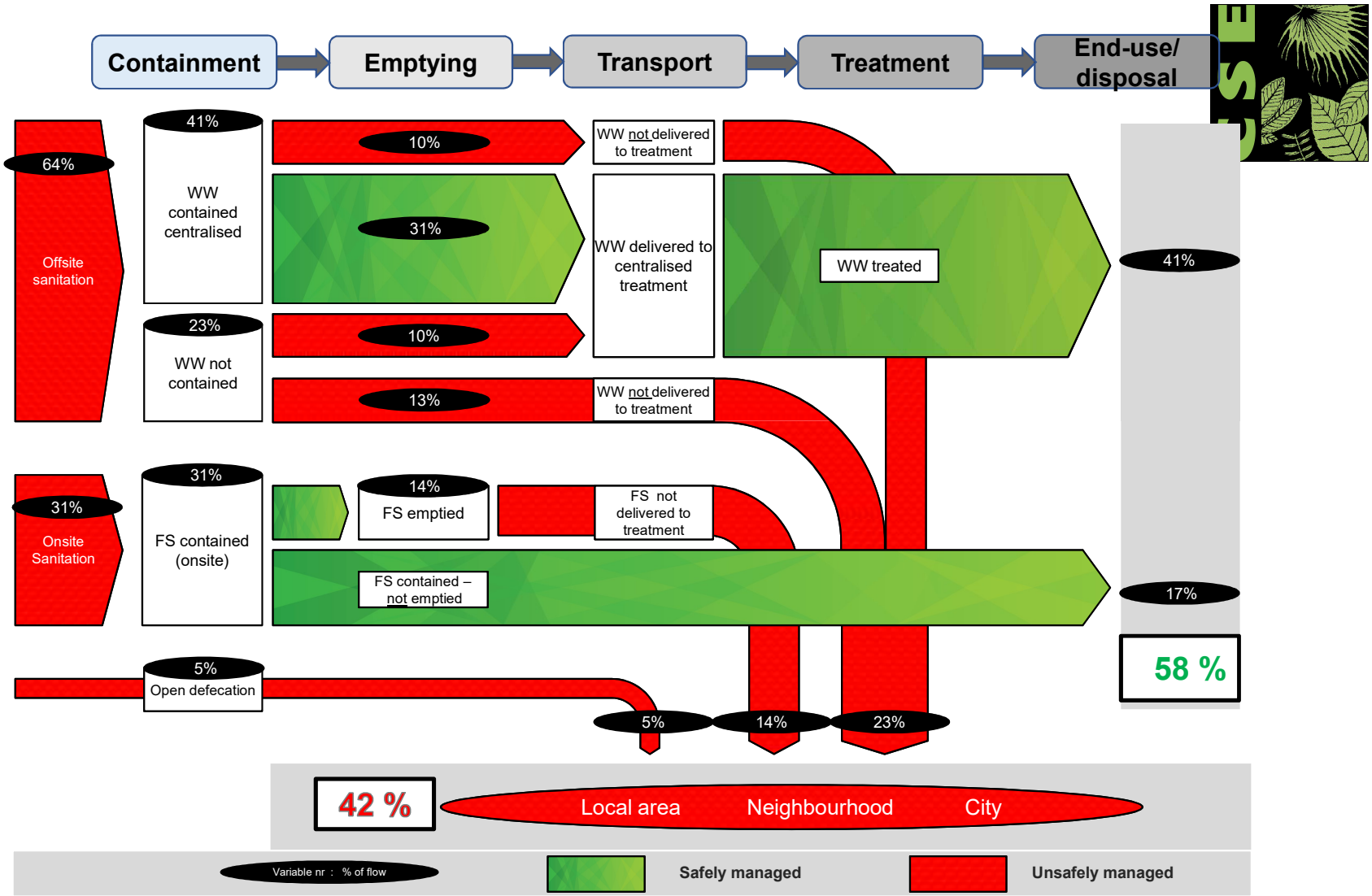
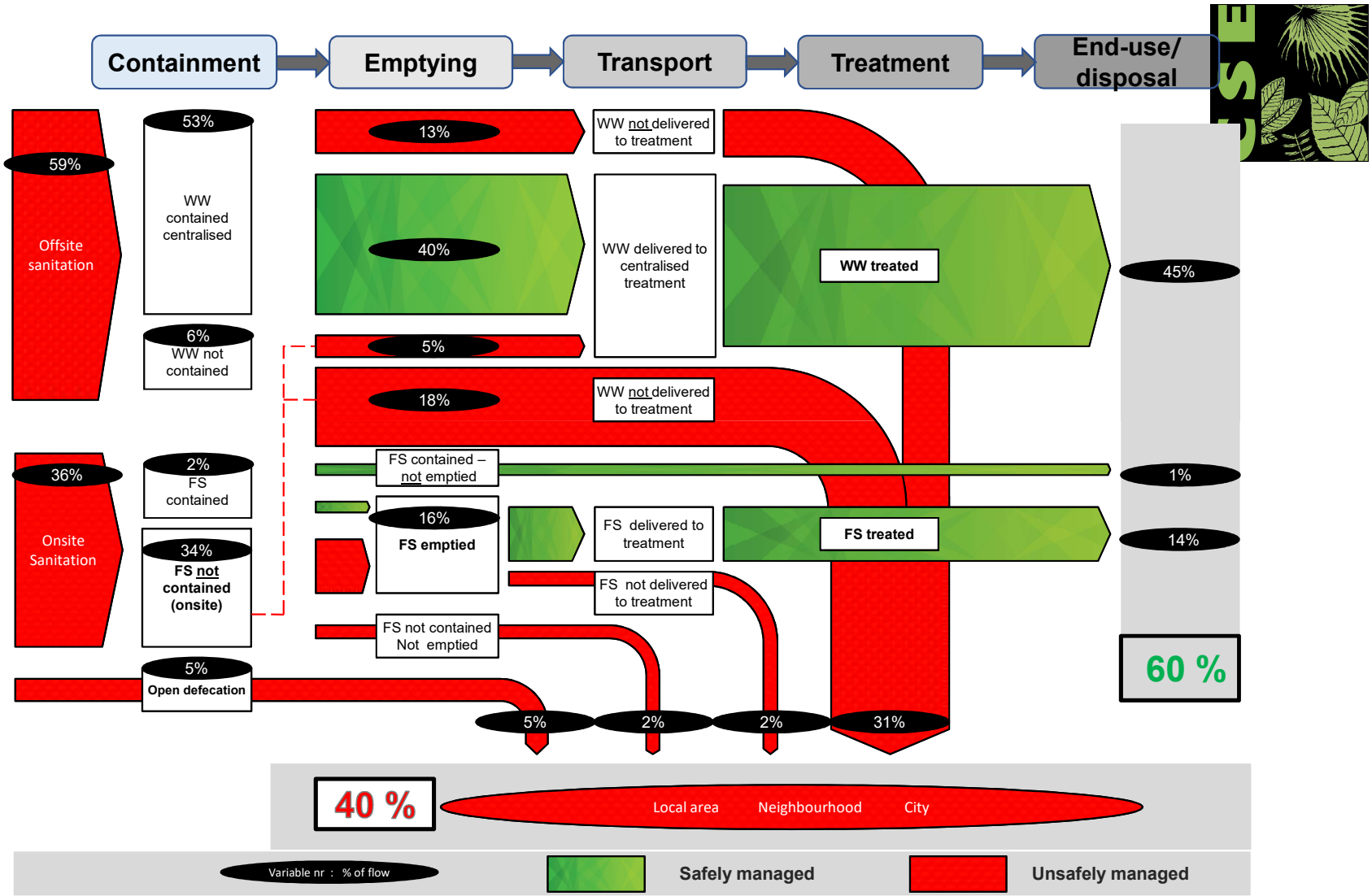


Tiruchirappalli- 26th September 2015
Desk based

Status: Final



Thriving private business: but where does this go?

Delhi outskirts: untreated faecal sludge dumped in fields


Disposal in storm
water drain
Ghitorni, Delhi

Disposal in Sholapur: garbage dumps

Learnings: Make old the new

Majority cities are **unsewered**;

Shit Flow Diagrams found majority use **on-site systems**; connected to septic tanks: drains or/and informal collection systems

Recognize reality; build with it

Regulate tankers so that they take faecal sludge to treatment plant

Move on sewers; to non-sewer approach; transport sewage on land

Design the sewage plant so that treated wastewater is reused; treated biosolid is put back on land as nutrient

Reset the agenda: do not mix treated and untreated in drains

- Sewage is treated in STPs
- As many of these are located far from river; treated wastewater is discharged into the drain that is close to the STP
- Problem is that the same drain is carrying untreated wastewater discharged by unsewered areas/desludging tankers
- End result is mixing of treated and untreated wastewater
- End result is pollution

Agenda: Reuse treated water so that it is not mixed in drains

- 331-473 MLD is reused
- This is between 10-14% of treated wastewater
- Each STP needs a plan not only for treatment but for how it is discharging its treated wastewater
- Otherwise, we are cleaning and then wasting

Table 4: Treated wastewater supply for various purposes

Details	Unit (MLD)
Treated effluent supplied from Keshopur STP for irrigation, horticulture	20.46
From Okhla STP to CPWD and Irrigation Department for horticulture/irrigation	137.64
From Coronation Pillar STP for DDA Golf Course at Bhalswa, Gammon India for construction purposes. Minor Irrigation Department at Palla	80.05
From Rithala STP to PPCL for their plant at Bawana and NDPL for their owner plant at Rohini, DDA for horticulture	26.60
From Vasant Kunj to Sanjay Van	12.65
From Mehrauli STP to Garden of Seven Senses	12.65
From Delhi Gate and Sen Nursing Home STP to PPCL	17.86
From Nilothi STP to Flood Control and Irrigation Department for irrigation purposes	1.86
From Papankalan STP for irrigation purposes to DDA	6.81
From Commonwealth Games Village STP to DDA horticulture	0.45
From Yamuna Vihar to STP's horticulture	1.86
From Narela to private agency for washing of vehicles	0.19
From Najafgarh to WTP Dwarka for horticulture	0.26
From Chilla STP to internal horticulture of STP	0.74
From Kondli STP to DDA, PPCL and for horticulture	11.16
Total	331.23

Source: Economic Survey of Delhi, 2023-24

Reality: Landline or mobile?

- 20 years ago, India was building landlines to connect people with phones
- Today, we go through satellites – mobile phones
- 10 years ago, world was building energy grids to connect people with electricity
- Today, people are installing solar systems on rooftops
- If we can **jump-skip-leapfrog** the landline-grid route in connectivity and access to energy then **why not in sanitation**?

Land-based: agenda

- Nutrients-Food-Excreta-Nutrients-Food
- Excreta can be used as nutrients for soil – reused in agriculture or compost
- If we design to remove pathogens and deliberately design for re-use
- Option to combine compost; make pellets for energy…
- Need to scale up; otherwise we will collect, even treat; but have vast amounts of sludge to handle

Joining the water-wastewater practice for climate resilience

- Water supply to be more affordable by **increased dependence on local water sources**; groundwater recharged through sponges (lakes-ponds-rainwater harvested in underground wells)
- Wastewater to be more affordable by **interception and treatment designed for all –** not 'waste' time and money in building infrastructure
- **Wastewater to be replenished for reuse**
- **Extreme rain events will be mitigated** because of sponges; more water available for scarcity
- Treated wastewater is used for **recharge in local waterbodies** and increasing water availability
- **Treated bio-solid** is used for nutrient improvement in soils

Way ahead: rework programme for cities Sewage-first approach

- AMRUT guidelines must be redesigned to prioritise sewage management, including total interception of excreta from households.
- To make it affordable, cities should be incentivised to use existing network of on-site septage tanks.
- The plan is that tankers, not underground pipes, take this septage to treatment facilities. This is faster, cheaper and more inclusive.
- AMRUT guidelines must incentivise reuse; cities should be paid so that they send the treated wastewater for reuse and the sludge for bio-enrichment or fuel.
- Water projects must be connected to local sources, including the rejuvenation of waterbodies. This will reduce costs of long-distance transfers, make groundwater more sustainable and water supply more affordable.

We all live downstream