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TAMIL NADU URBAN SANITATION SUPPORT PROGRAMME

iihs™

INDIAN INSTITUTE FOR HUMAN SETTLEMENTS

In Association With:

Keystone — A GROUP FOR ECO-DEVELOPMENT INITIATIVES

Gramalaya

CDD Consortium for DEWATS Dissemination Society

Training programme on Fecal Sludge Management for Engineers in Trichy Corporation

Introduction to FSM

Did you know?

In India...

595 million people do not use toilets and resort to unsafe open defecation

Source: WHO

1000 children die from unsanitary defecation practices, every day

Source: UNICEF

65,000 tons of excrement are openly discharged, every day

Source: WHO

One gram of feces has:

10,000,000 viruses

1,000,000 bacteria

Source: UNICEF

43% of children suffer from disease

caused by open defecation

Source: UNICEF

Proof of toilet alone increasing the sanitation problem

Children in households with poor FSM had 3.78-10 times higher prevalence of diseases (enteric infection) when compared with children in other households, even those without toilets. CMC Vellore Study

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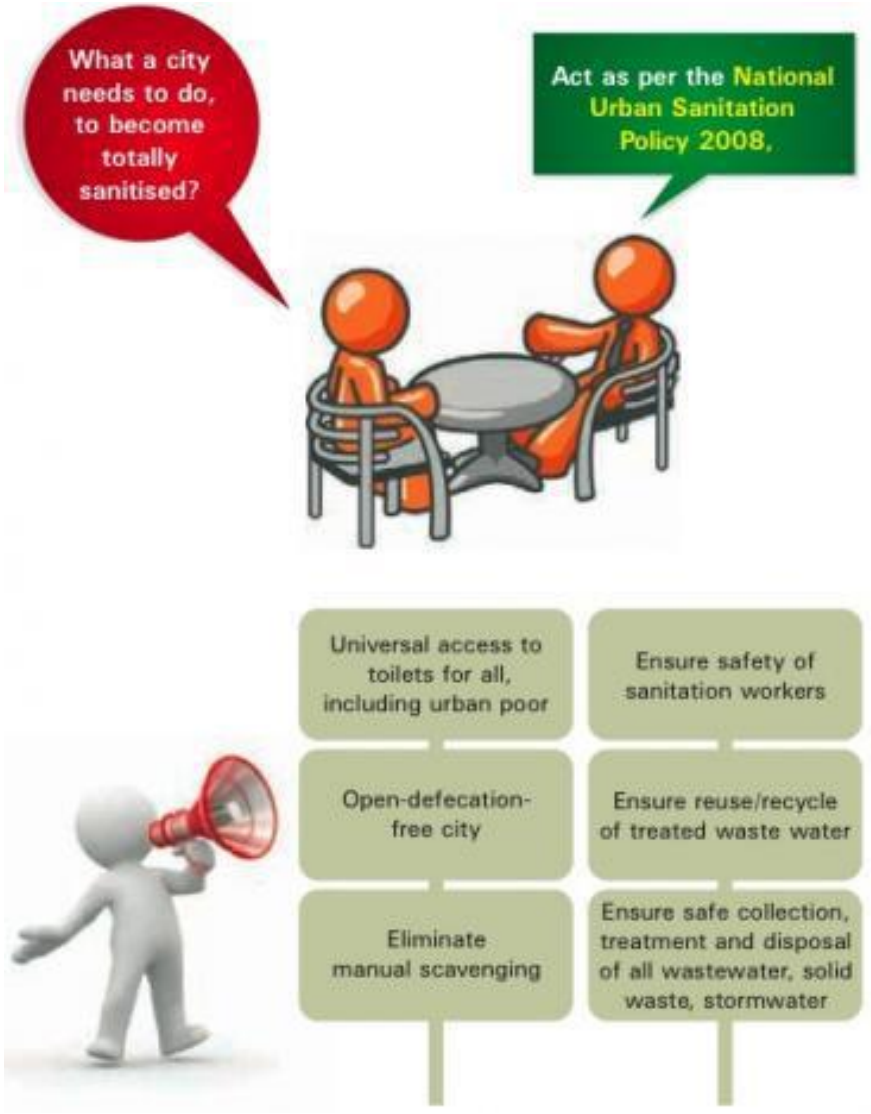
Policy Goals of Sanitation

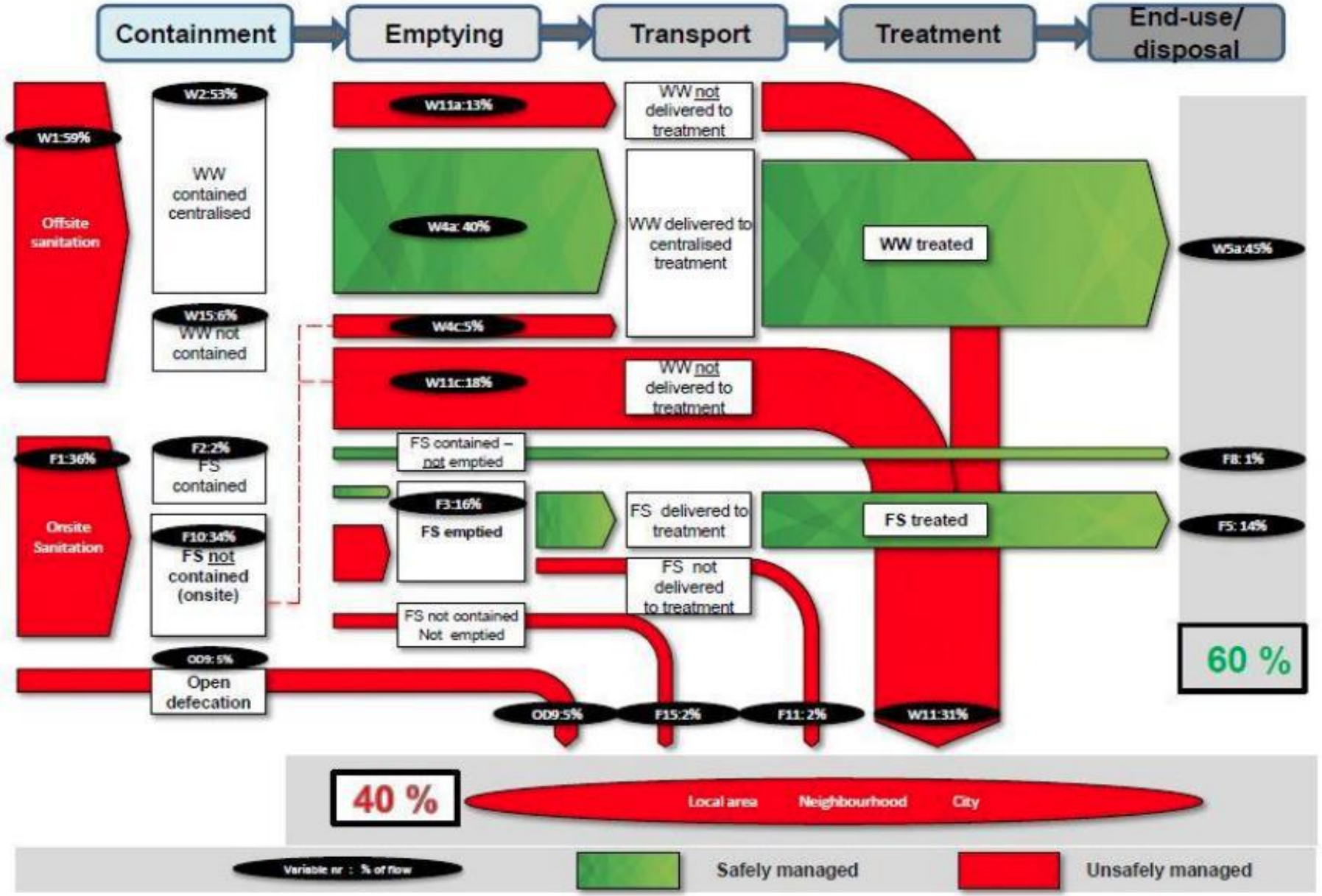
1. **Public Health : Especially Children**
2. **Environment : Especially lakes**
3. **Inconvenience : Visual and smell**
4. **Safety : Especially for women**

Toilet (without treatment) addresses successfully the last two problems but unintentionally increases the first two

Sanitation problem doesn't end, but starts after building toilets + (urbanization)



SFD - Trichy



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What is an SFD?

An excreta flow diagram (also often described as shit flow diagram, SFD) is a tool to readily understand and communicate visualizing how excreta physically flows through a city or town. It shows how excreta is or is not contained as it moves from defecation to disposal or end-use, and the fate of all excreta generated. An accompanying report describes the service delivery context of the city or town.

Status of liquid waste in India

Containment | Emptying | Transport | Treatment | Reuse/ Disposal

1

20% WC/ Sewer

2

70% On-Site Facility/ FSM

3

10% OD /

6.7%

93.3%

Domestic Environment

Agriculture field

Receiving Waters

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Budget for wastewater

Description	Total Budget	Wastewater	
	INR	%	INR/capita/ annum
AMRUT	41 B	31%	10
State and City	13 B	100%	10
Smart City	32 B	25%	6
National River Conser	4 B	50%	1
SPM Rurban Mission	3 B	30%	1
Namami Gange	23 B	60%	10
External Assistance	220 B	5%	8
Total			46

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Source: CDD internal research by Stanzin

Cost and budget for sewer system

Cost Per Capita

Cost budgeted per capita per annum

Source: CDD internal research by Stanzin

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What is Faecal Sludge?

Faecal sludge (FS) comes from onsite sanitation technologies, and has not been transported through a sewer. It is raw or partially digested, a slurry or semisolid, and results from the collection, storage or treatment of combinations of excreta and blackwater, with or without greywater.

Faecal Sludge and Septage

Faecal Sludge

Solid or settled contents of pit latrines and septic tanks. Differs from household to household, from city to city and country to country

Septage

Settled solid matter in a semi-solid condition at the bottom of septic tank alone; mixture of solids and water with offensive odor

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Wastewater and Faecal Sludge

Domestic Wastewater

Wastewaters originating from plumbing fixtures and appliances such as sanitary (toilets), bath, laundry, dish washing, garbage disposal, and cleaning wastewaters are defined as domestic wastewater

Faecal Sludge

Faecal sludge (FS) comes from onsite sanitation technologies, and has not been transported through a sewer. It is raw or partially digested, a slurry or semisolid, and results from the collection, storage or treatment of combinations of excreta and blackwater, with or without greywater.

Sanitation value chain

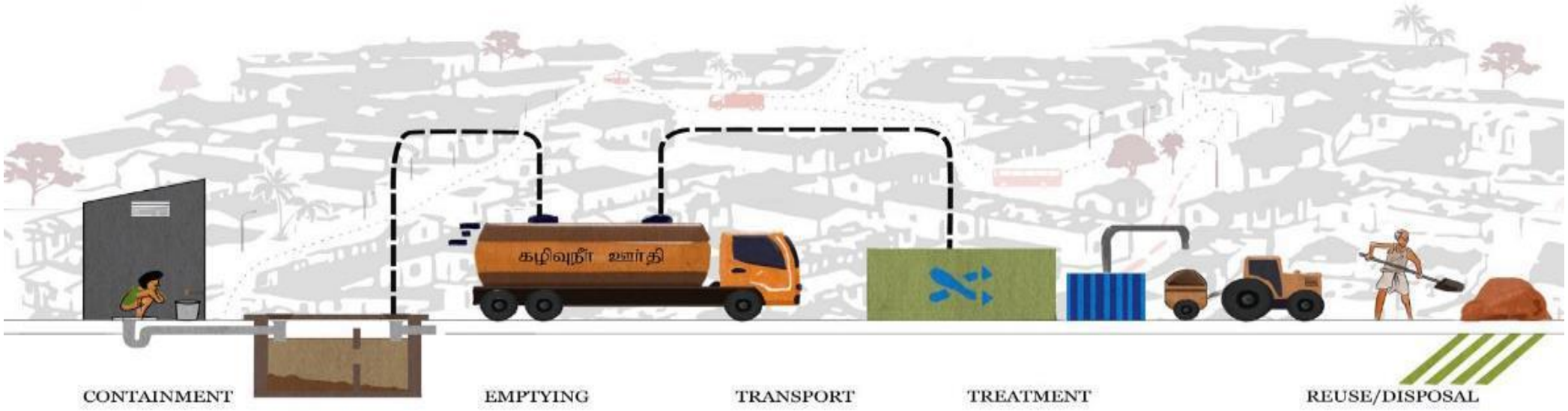
Capture – any type of latrine or tank which is used to capture and store faecal sludge;

Emptying – any type of device used to empty storage devices;

Transport – physically moving the sludge from the storage device to the treatment plant;

Treatment – treating sludge so that it is safe to disposed of or, ideally, reused;

Reuse – regaining value from the sludge by making it's nutritional or calorific content available for agriculture, energy, etc.



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Toilet (user interface)

Urine diversion dry toilet

Pedestal type toilet

Cistern flush toilet

Pour flush toilet

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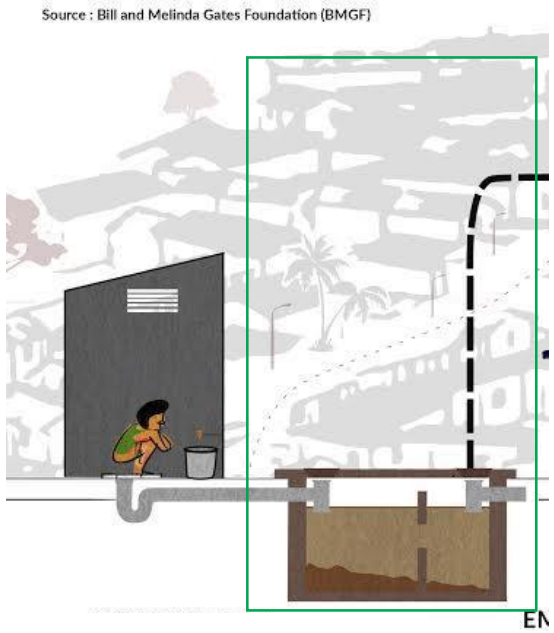
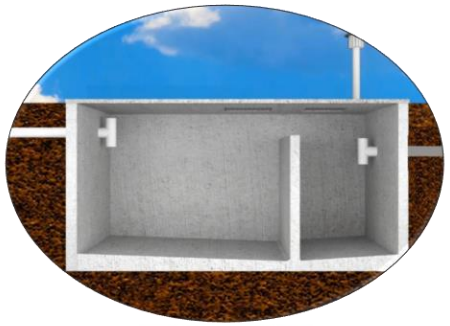
Containment



Soak pit

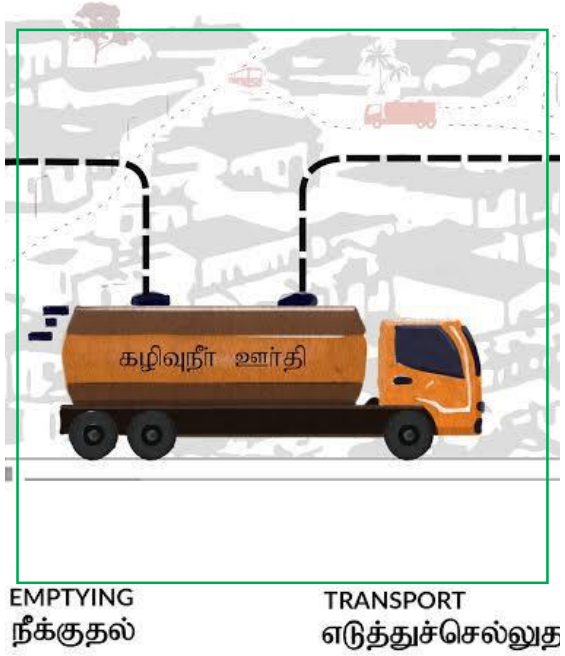
Twin pit



Septic tank

Transportation

Honey sucker



Sewer system

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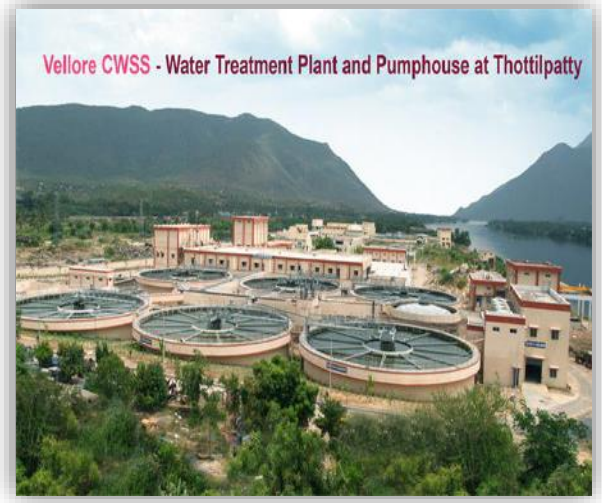
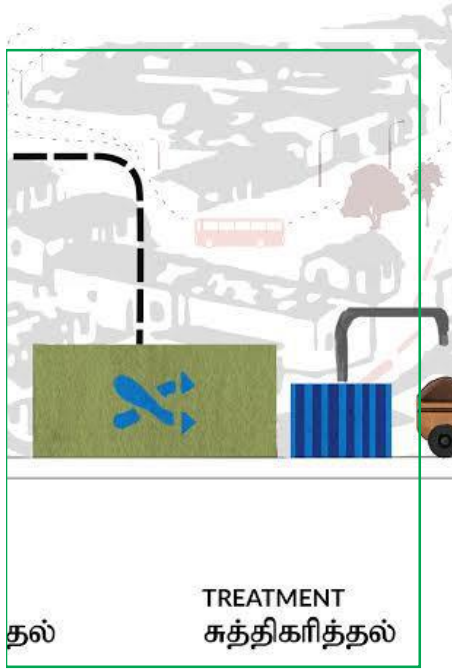
Treatment



Centralized treatment plant



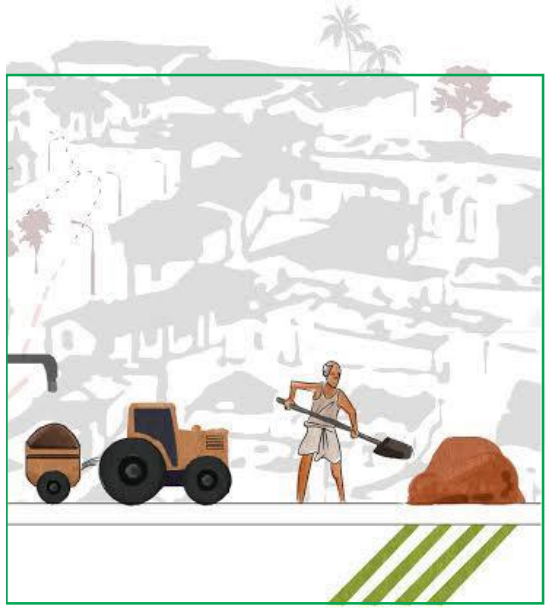
Decentralized treatment plant

Disposal & Reuse

Farm land

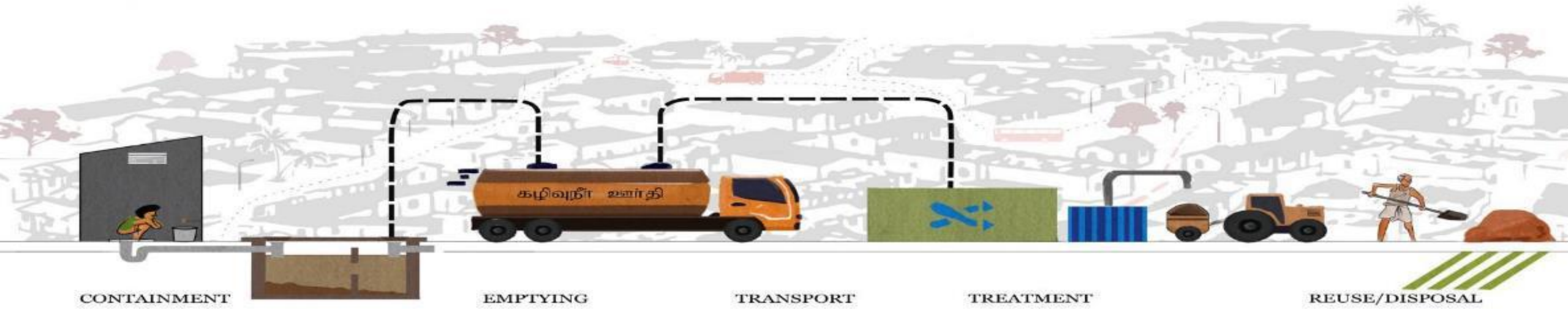
Lake / river

Landscaping



REUSE / DISPOSAL
மறுபயன்பாடு/அகற்றுதல்

Threats across the chain



Septic Tanks Pit Latrines Soak Pits	Vacuum Trucks	DEWATS™, STP, FSTP	Agriculture lands Farmlands Landfills
Improper construction and absence of soak away Irregular emptying Poor O&M	Unsafe emptying, transport and disposal Private sector is bridging the gap but poor regulation/ enforcement by	Most cities do not have STPs Septage in many cases not brought to STP	No safe disposal (standards) Re-use of treated water not being effectively carried out

Poor awareness, monitoring, regulation and enforcement weak finances and institutional capacities

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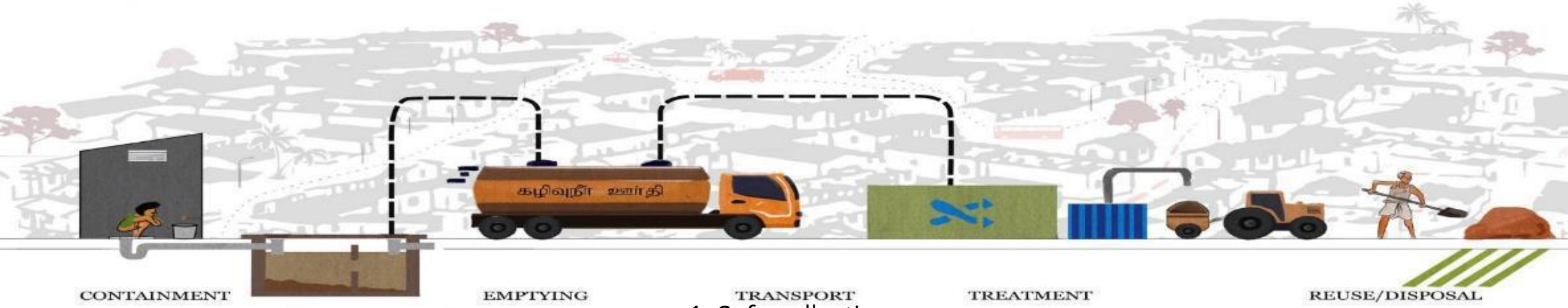
The Solution...



1. Reduce Open Defecation
2. Improving the existing latrines and provision of soak aways

1. Standard Containment systems to avoid leakages in to the system

1. Safe collection and transportation of FS to avoid health hazard and leakage into environment

1. Treating septage to safe levels of disposal

1. Reuse of end products to close nutrient cycle and bring economic benefits

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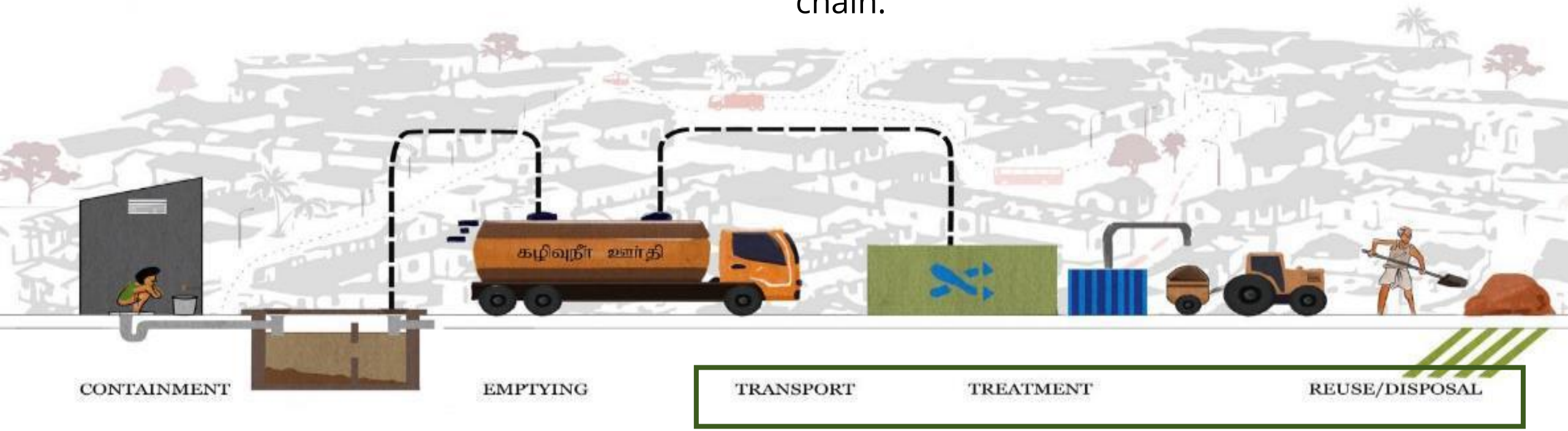
What is FSM?

Fecal sludge management includes emptying, transportation, treatment, and use or disposal of fecal sludge from an on-site sanitation technology (like a pit latrine or septic tank). It addresses the last three components of the sanitation value chain.



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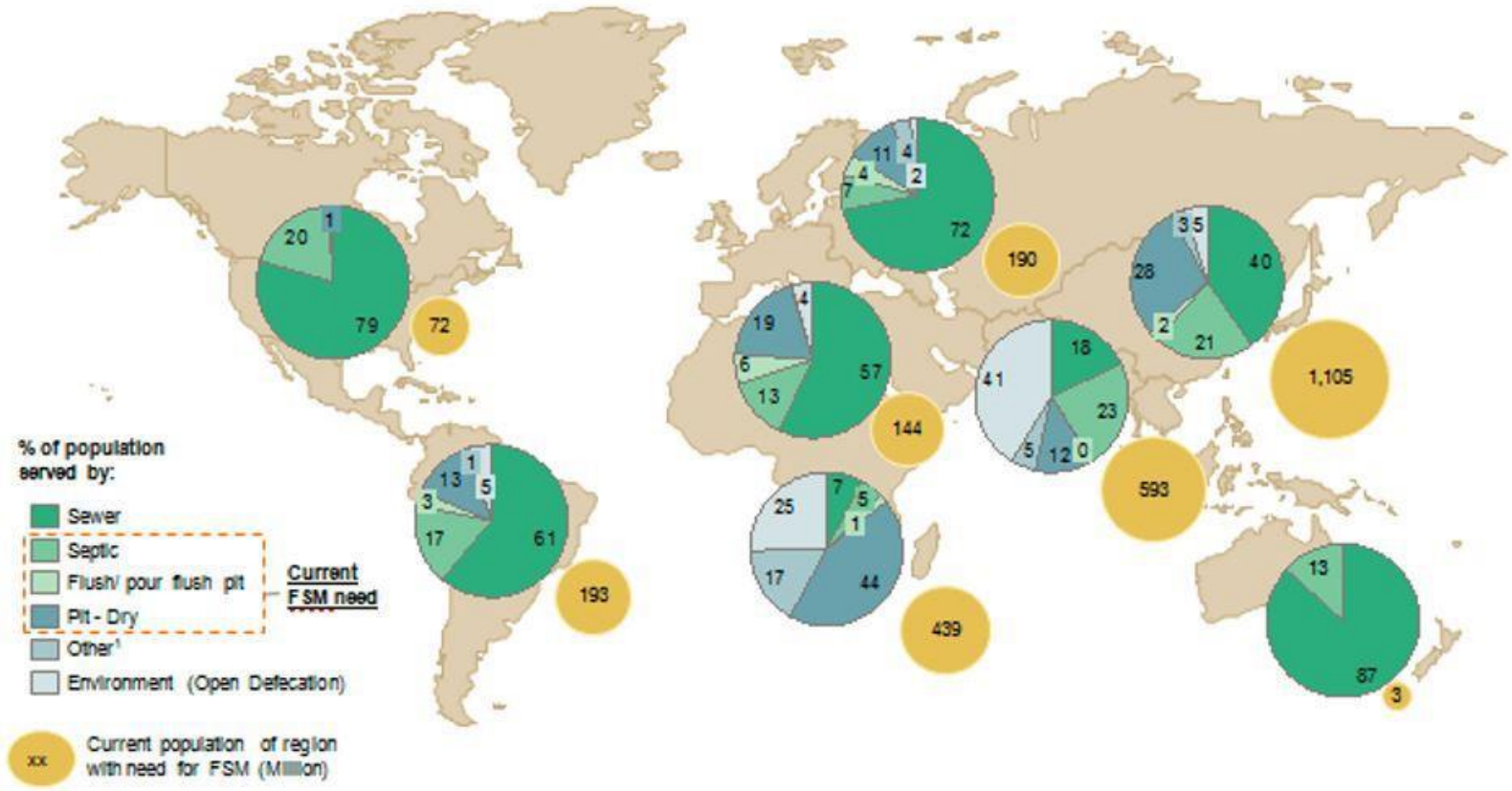
Importance of FSM?



2.7 Billion people are in the need of FSM interventions across the globe

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Source: BCG Report on Onsite Sanitation System

Thank You