SUSTAINABLE URBAN SANITATION

SCBP-ACADEMIA ENGAGEMENT 2018

National Institute of Urban Affairs

scbp.niua.org

Sanitation Capacity Building Platform

What is it?

Collaborative effort by NIUA & Partners for Mainstreaming Decetralized Sanitation Solutions at the state level and national sanitation agenda.

Focus : State Level Support, Capacity Building and Advoacy

We have sanitation challenges!

ULB

We can help you!

NIUA

asci Leadership through Learning

CENTRE FOR POLICY RESEARCH

CEPT UNIVERSITY

Consortium for DEWATS Dissemination Society

CSE

STEP

iDECK

UMC URBAN MANAGEMENT CENTRE

WASHi

SCBP Objectives

- **Improved Awareness, Knowledge and Skills** of State governments and Urban Local Bodies staff, to plan and implement decentralised sanitation solutions
- **Institutional Strengthening** (Training Institutes, Academia and Private sector), for supporting capacity building for FSSM at scale
- **Evidence based Research and Advocacy** to address urban sanitation challenge

Objectives of Academia Engagement

- **Support Universities in Discovering and Developing a Perspective** on Urbanisation, Urban Planning and Decentralised Sanitation solutions. Academia is eminently placed to question and explore ideas, should not be reduced to training agencies.
- **Integrating within existing curriculum and developing new courses** : concepts of decentralized planning, technology, economic, management, Legal and Institutional perspective of waste water management
- **Provide a Platform** for Cross Learning and Development of Curriculum and Faculty
- **Pool of practitioners, researchers and policy makers**

URBANIZATION & SANITATION IN INDIA

Perspectives of Urban Development

Why Towns, specially smaller towns have poor infrastructure

- What Guides the Commissioners or Executive Officers : what are their priorities ?
- What is the Urban Development Perspective Plan if any, of the State Govt or their Policy makers ?
- Is there a Political Economy Perspective to Urban Development?

What impedes Decentralised Urban Sanitation Solutions

- Resources/Funds
- Perspective – of the Chairperson/Counsellors
- Implementation Bottlenecks : DPR preparation, Coordination within line departments, etc.

- Political Will
- Administrative Will

Trend of Urbanisation in India: 1961–2011

Year	Urban Population (in million)	Percentage of Urban Population to Total Population	AEGR (%)
1961	78.9	17.97	2.34
1971	109.1	19.91	3.21
1981	159.5	23.31	3.83
1991	217.6	25.71	3.09
2001	286.1	27.82	2.73
2011	377.1	31.14	2.76

- *Note: AEGR - Annual Exponential Growth Rate*
- *Calculations based on Census of India data for various years*
- *Source: URBAN INDIA, HSMI-HUDCO CHAIR-NIUA, 2017*

Urbanization trends in India

- **Urban Population - 377 million** (31.16 %)
- **Total number of urban centers: 7935**
- **Statutory Towns (4041 nos.) are administered by Urban Local Bodies**
- **Census towns have trebled over a decade. Increase in Statutory Towns has been much slower.**

Type of Urban Units	2011 Census	2001 Census
1. Towns:	7,935	5,161
(a) Statutory Towns	4,041	3,799
(b) Census Towns	3,894	1,362
2. Urban Agglomerations	475	384

Census Towns are administered via rural administration – provision of urban services not mandatory in these areas

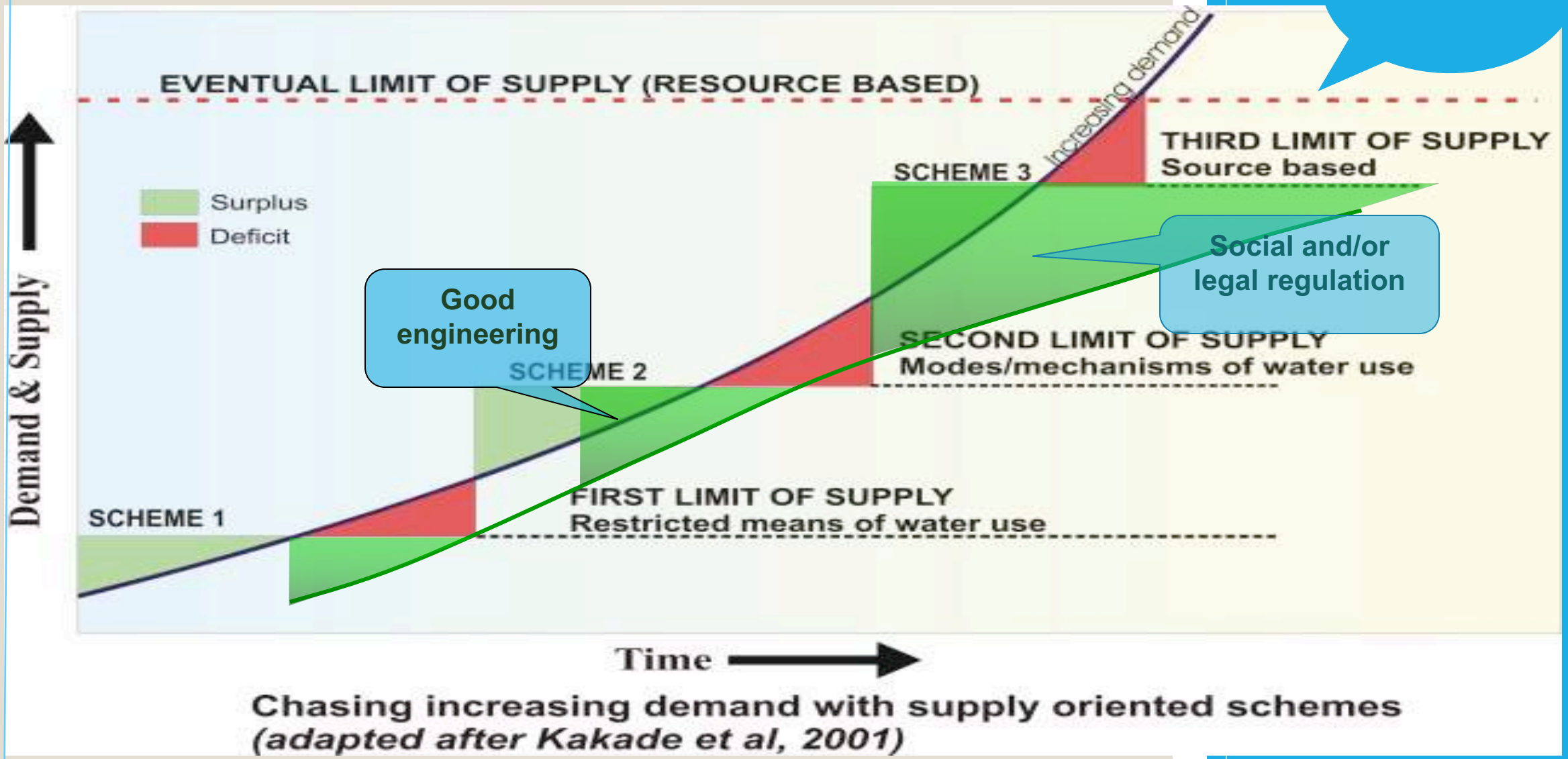
- *Calculations based on Census of India data for 2011*
- *Source: GIZ presentation*

Sustainability : Urbanization context

- What do we mean by sustainability? Social, Economic, Environmental, etc.
- If sustainability is about self preservation of environment, no significant externalities to environment, then can urbanization beyond a point be sustainable ? Sustainable at what cost ?
- What Perspective to use to promote sustainability :
  - More intensive urban development, more technology solutions?
  - Control pressure on urban systems : through regulation and governance

Water Supply, Demand...& Availability

??Governance



Chasing increasing demand with supply oriented schemes
(adapted after Kakade et al, 2001)

ACWADAM

Estimate availability, develop supplies and manage demand..*to ensure security*

WHY SEPTAGE TREATMENT

Key Sanitation facts from CENSUS 2011 - INDIA

18.6% URBAN HHs HAVE REPORTED **NO** TOILETS

32.7% OF URBAN HHs HAVE ACCESS TO **PIPED SEWER**

38.2% HHs HAVE **SEPTIC TANKS**

6% OF HHs DEPEND ON **PUBLIC TOILET**

12.6% OF HHs RESORT TO **OD**

Source: CEPT

Urban Sanitation Situation in India - Access to Toilet and drainage

Percentage Distribution of Households by Types of Toilet: 2011

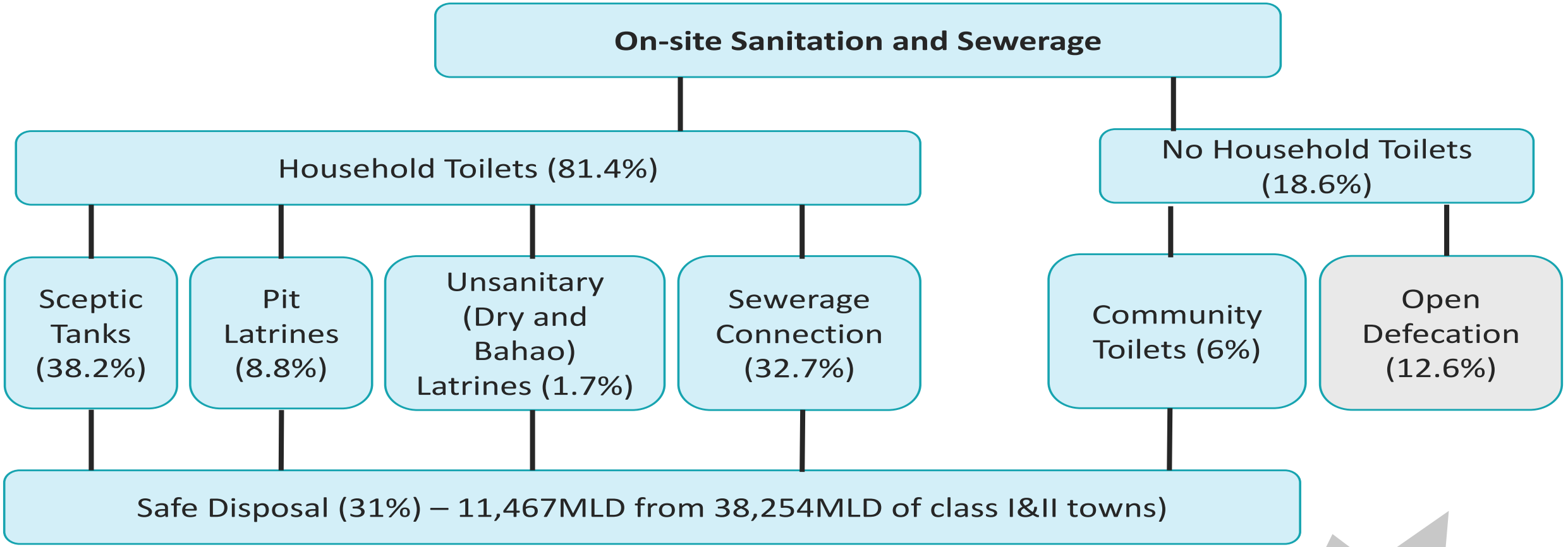
	Type of Toilet Facility within the Premises						No Toilet within Premises	
	Flush/pour flush Toilet Connected to				Pit Toilet	Service Toilet	Alternative Source	
	Piped Sewer	Septic Tank	Other System	Total			Public Toilet	Open
All India	11.9	22.2	2.3	36.4	9.4	1.1	3.2	49.8
Rural India	2.2	14.7	2.5	19.4	10.5	0.8	1.9	67.3
Urban India	32.7	38.2	1.7	72.6	7.1	1.7	6.0	**12.6**
Metropolitan Cities	62.2	20.3	0.9	83.5	2.8	1.5	8.2	4.0
Non-metropolitan Class I Cities	28.1	**46.8**	1.9	76.8	5.3	2.3	4.8	10.7
All Towns	11.2	**43.9**	2.3	57.4	10.2	1.7	4.8	**25.8**
Class I	47.4	**31.8**	1.3	80.6	3.9	1.9	6.8	6.9
Class II	15.8	**49.0**	2.0	66.8	7.2	2.4	5.7	**17.9**
Class III	10.8	**45.4**	2.3	58.5	9.2	1.7	4.8	**26.0**
Class IV	8.2	**40.2**	2.4	50.8	12.7	1.3	4.5	**30.7**
Class V	7.3	**35.2**	2.9	45.3	15.4	1.2	3.9	**34.3**
Class VI	9.2	**36.2**	3.5	48.9	14.8	1.0	3.6	**31.7**

Percentage Distribution of Households by access to drainage: 2011

Class	Drainage			
	Drainage	No Drainage	Waste water outlet connected to	
			Closed Drainage	Open Drainage
All India	51.14	48.86	18.13	33.01
Rural India	36.75	63.25	5.75	31.01
Urban India	81.77	18.23	44.50	37.26
Metropolitan Cities	93.98	6.02	74.3	19.66
Non-metropolitan Class I Cities	85.12	14.88	38.12	47.01
All Towns	70.38	29.62	21.90	48.48
Class I	90.13	9.87	58.59	31.54
Class II	79.27	20.73	27.18	52.08
Class III	73.34	26.66	21.61	51.74
Class IV	64.00	36.00	18.98	45.02
Class V	54.23	**45.77**	16.34	37.88
Class VI	54.49	**45.51**	17.46	37.03

- : Calculations based on Census of India data, 2011: Houses, Household Amenities and Assets
- *Source: URBAN INDIA, HSMI-HUDCO CHAIR-NIUA, 2017*

Census 2011



- **75% of fresh water resource which is being used for drinking purpose is contaminated.**
- **Sewage contributes 60% of the total pollution load.**
- **93% of total domestic wastewater is generated in Class-I cities.**

Ref.: CPCB Report, 2009

Unsafe Disposal 69 %

Onsite sanitation and septage management – emerging questions

MORE THAN 50% URBAN HHs TOILETS HAVE SEPTIC TANKS

Are septic tanks linked to soak pits

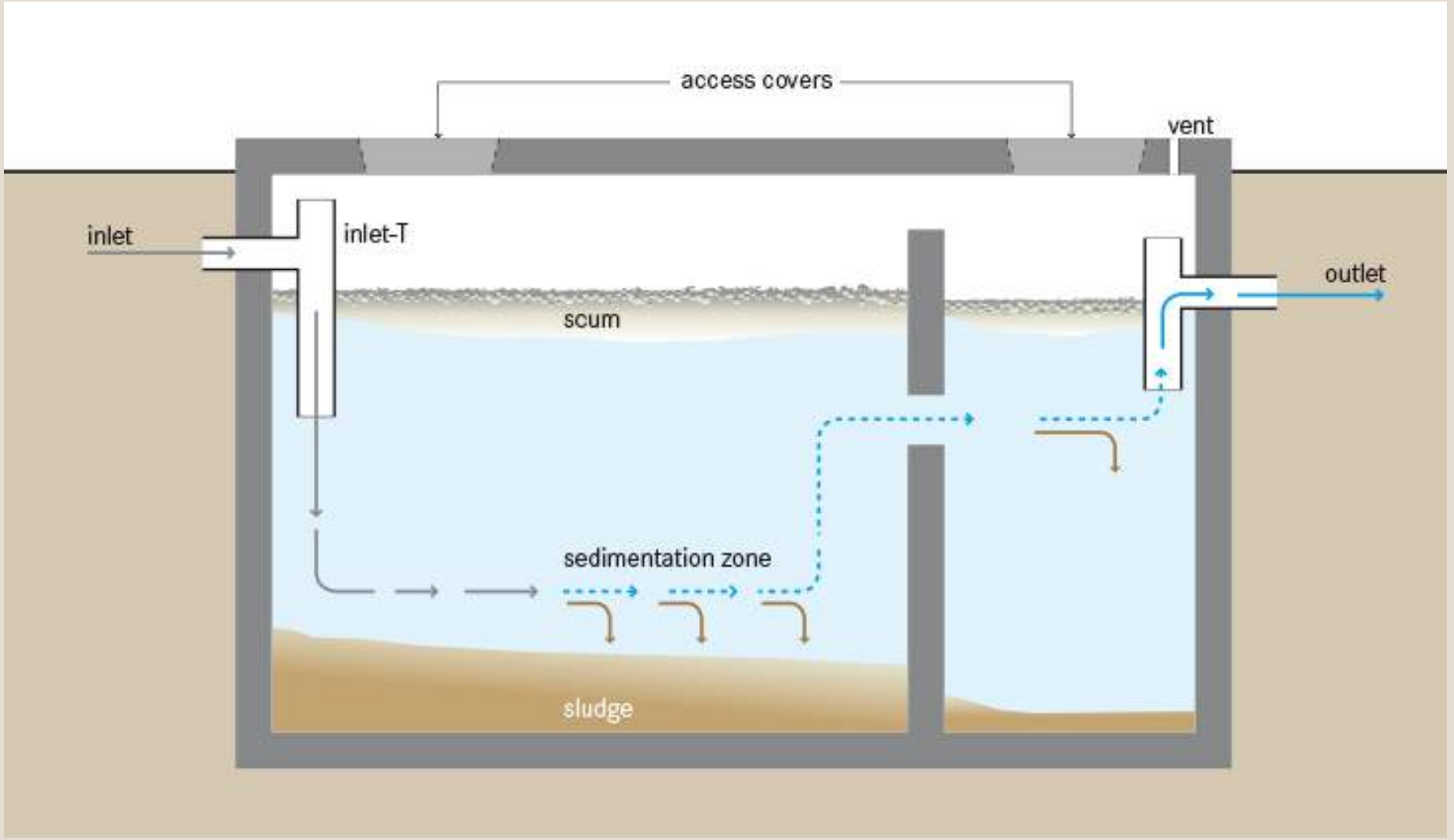
Are they built as per Codes / Specifications ?

How often are they cleaned ?

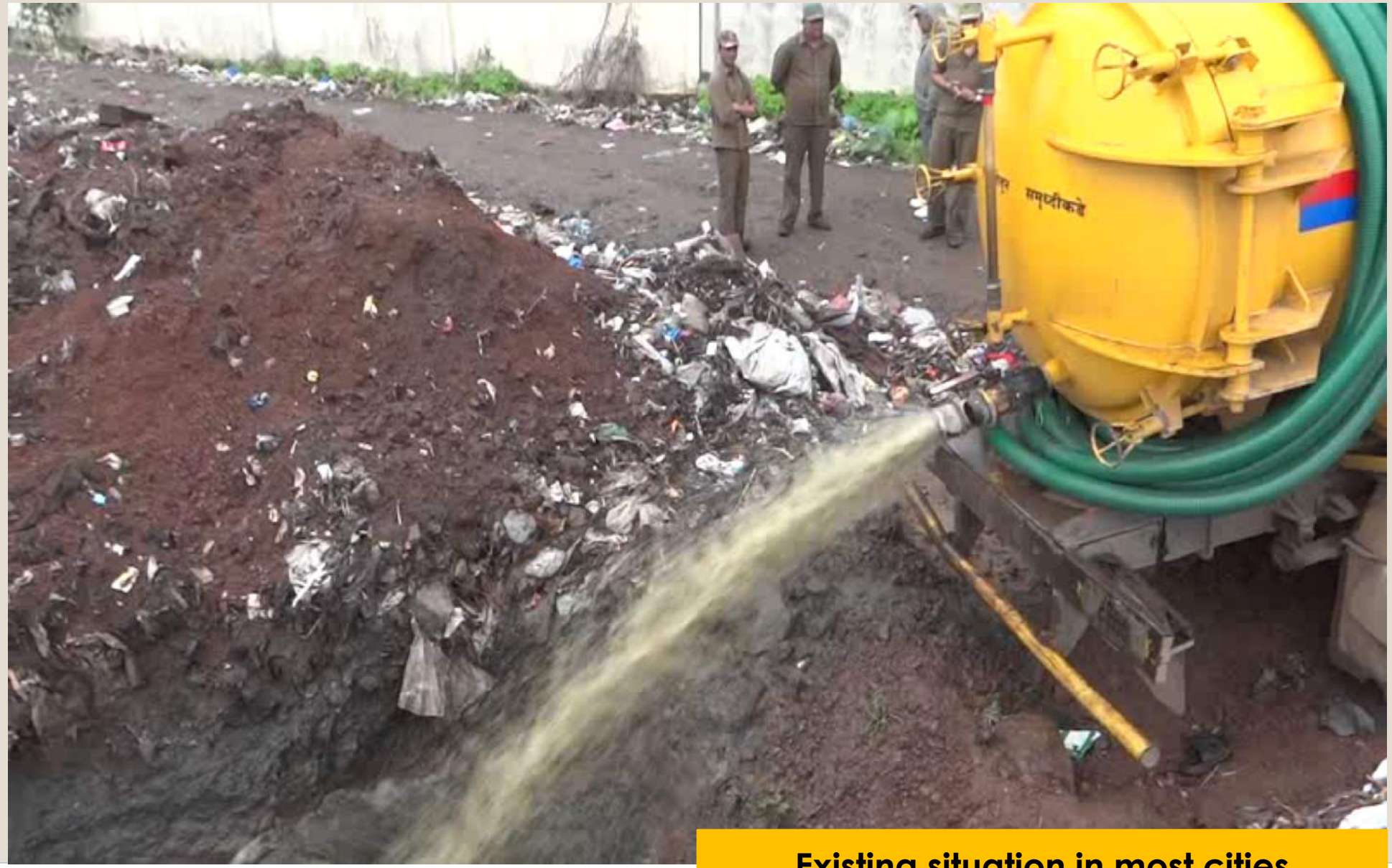
Where does the effluent flow ?

What happens to the SLUDGE?

Septic Tank Diagram



Crude disposal of septage without treatment . . .



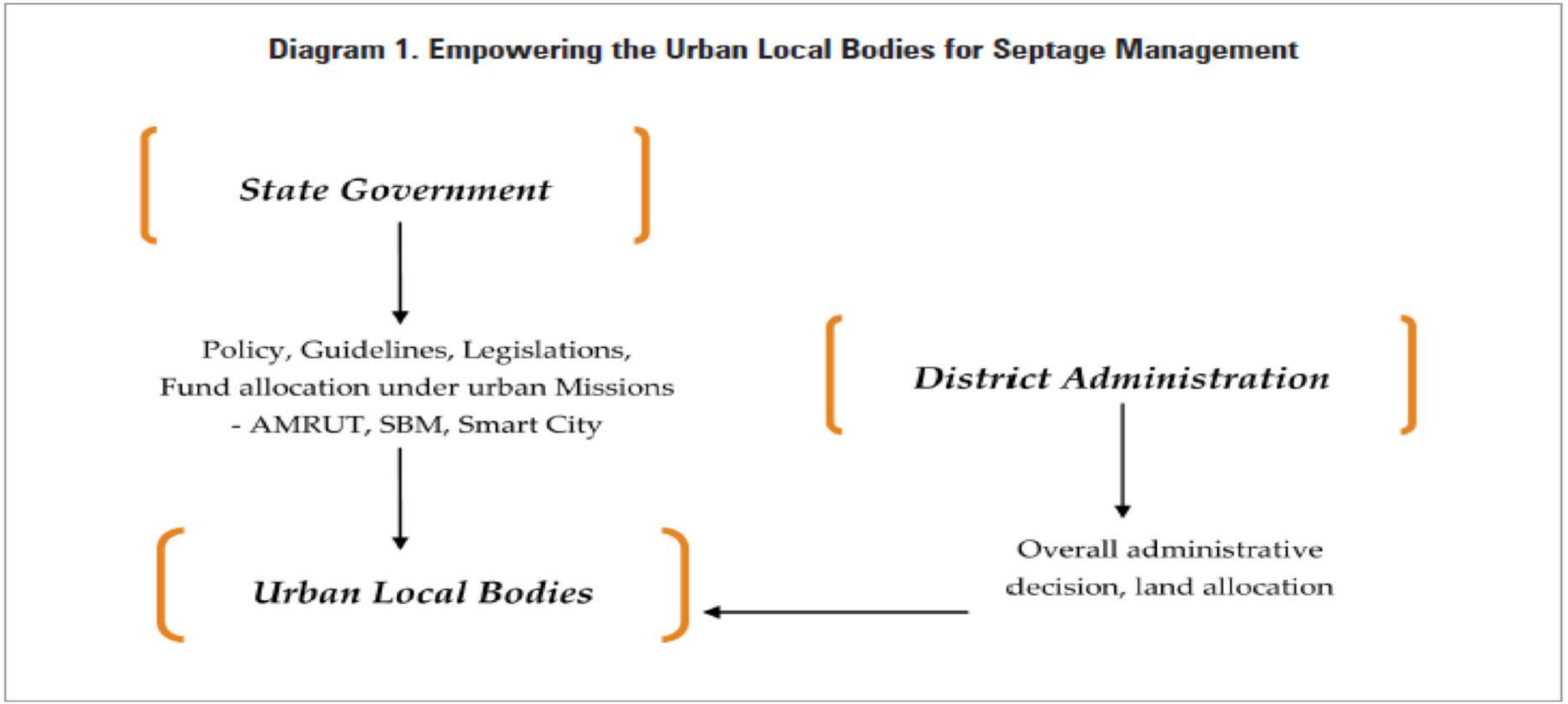
Existing situation in most cities

INSTITUTIONAL SUSTAINABILITY: URBAN SANITATION

Framework of analysis

- What is urban Administrative and Legislative set up ?
  - Central and State Government Administrative set up for sanitation ?
- At State Level, how are functions and roles divided among different institutions/bodies incharge of sanitation decisions?
- How empowered are the Urban Local Bodies in taking decisions and implementing them?

Urban Administration



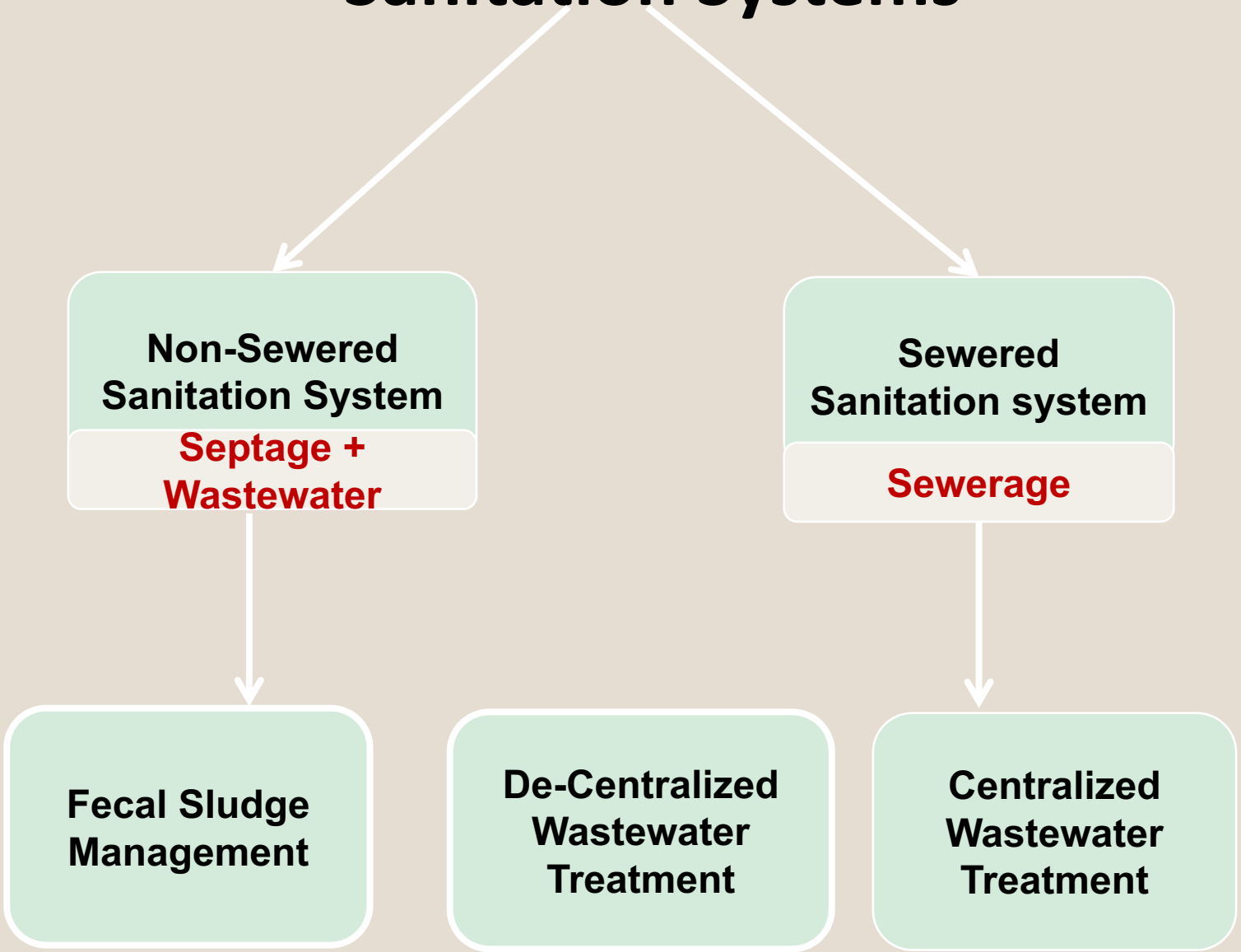
Provision for Sanitation Tax across four states

State	Provisions for other important taxes and charges related to sanitation services	Provision for Sa.nitation Tax
Maharashtra	• Conservancy tax • Imposition of compulsory and voluntary taxes including a general sanitary tax, a special latrine tax, Sewerage benefit tax • Special sanitary tax	Special sanitary tax upon private latrines, premises or compounds cleansed by municipal agency
Tamil Nadu	• Sanitation tax • Sewerage User Charges	• a scavenging tax to provide for expensesconnected with the removal of rubbish, filth or the carcasses of animals from private premises. • a drainage tax to pr ovide for expenses connected with theconstruction, maintenance, repair, extension or improvement of drainageworks.
Andhra Pradesh	• Pipe line service charges • Sewerage Cess as a percentage of the water bill*	• drainage tax to pro vide for expenses connected with the construction, maintenance, repair, extension or improvement, of water or drainage works. • a scavenging tax to provide for expenses connected with the removal of rubbish,filth or thecarcases of animals from private premises
Odisha	• ** Fixed MonthlyWater Charges (per connection) • Monthly Sewerage Connection charges	• a latrine tax on the annual value of holdings • a water tax on the annual value of holdings • a drainage tax on the annual value of holdings

*The above two are applkable for areas served by Hyderabad Metropolitan Water Supptyand Sewerage Board only

CONCEPTUAL UNDERSTANDING OF TREATMENT SYSTEMS

Sanitation Systems



Sanitation Portrait Cities and Towns

Clogged ditch

Abandoned Public Toilet

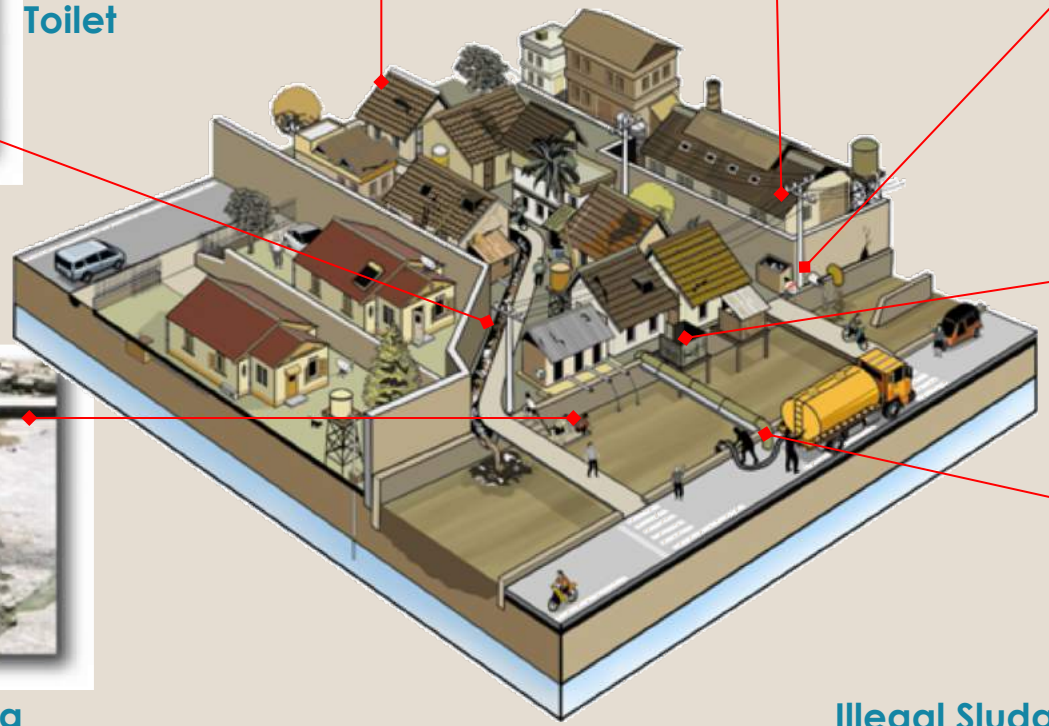
Industrial effluent in settlement area

Open defecation

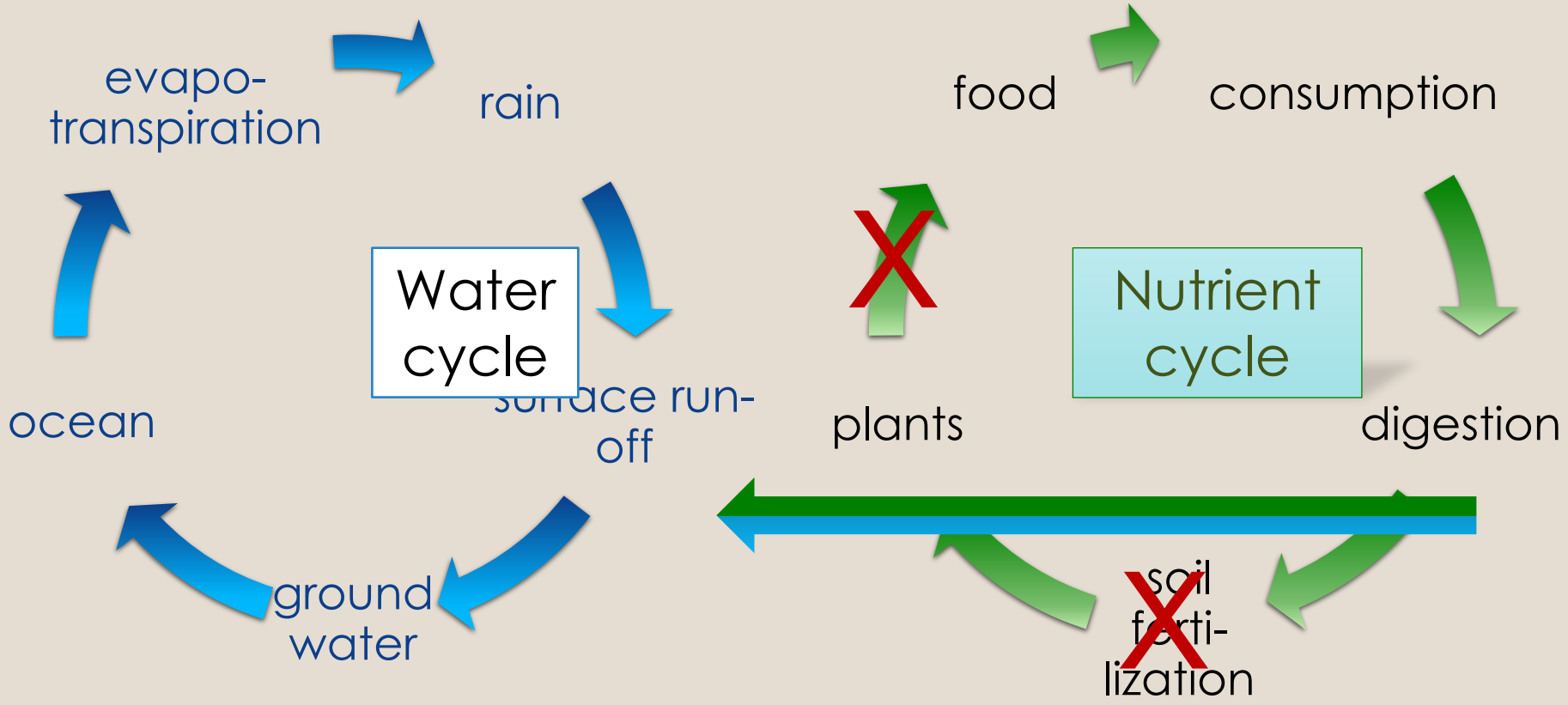
Unhygienic toilet

Bathing and washing in polluted river

Illegal Sludge disposal



Water cycle and nutrient cycle started to get mixed



Concept Source: Kramer, Pedro; (20th Jan 2014). Workshop on 'Establishing Operation & Maintenance Services for Decentralized Urban Sanitation Infrastructure in Karnataka', CDD Society-BORDA, Bangalore, India

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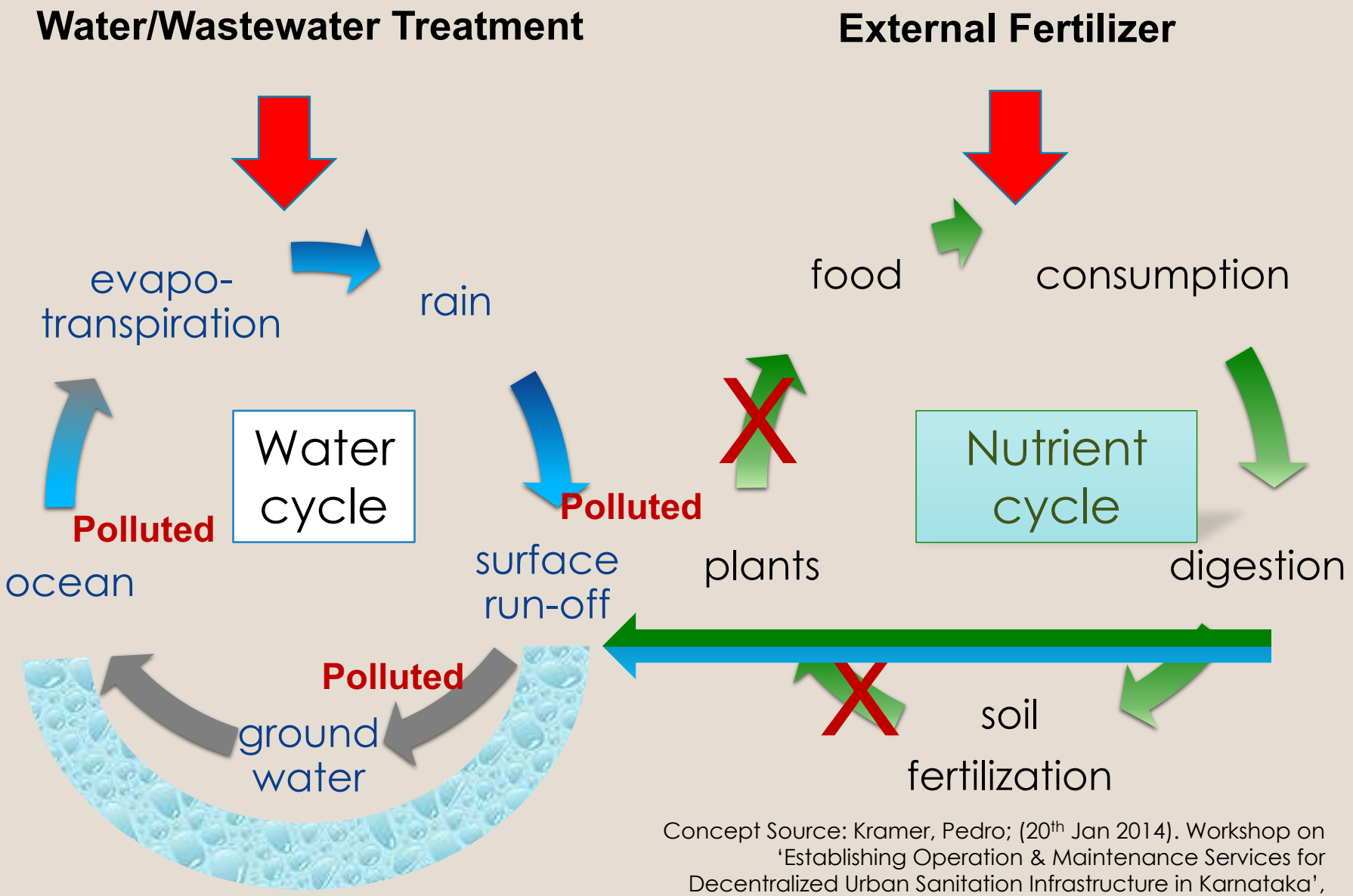

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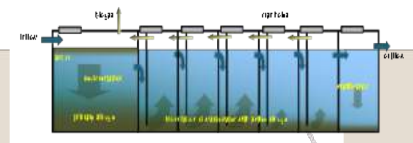
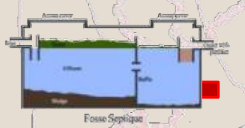
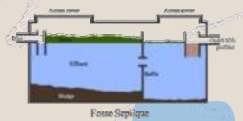
Sanitation System in Practice

- Centralized Sanitation System (Offsite System)
- Decentralized Sanitation System
- Onsite Sanitation System



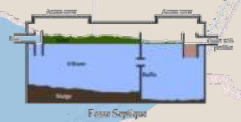
DEWATS Institutional

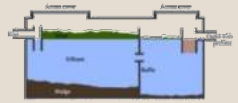




Pit Latrines

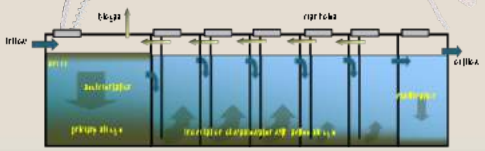
Electromechanical Packaged Unit





Septic Tank

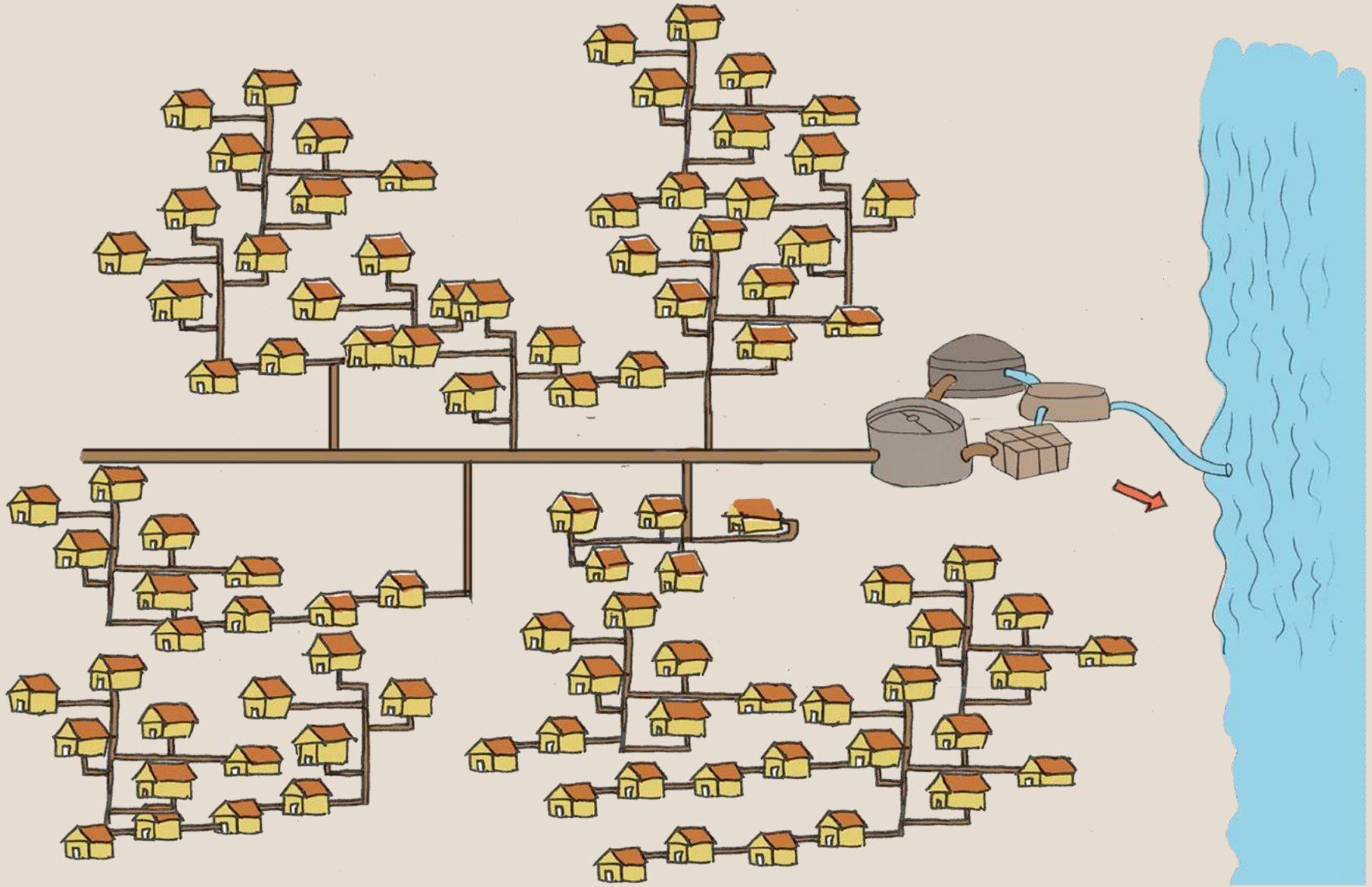
Urban Agriculture



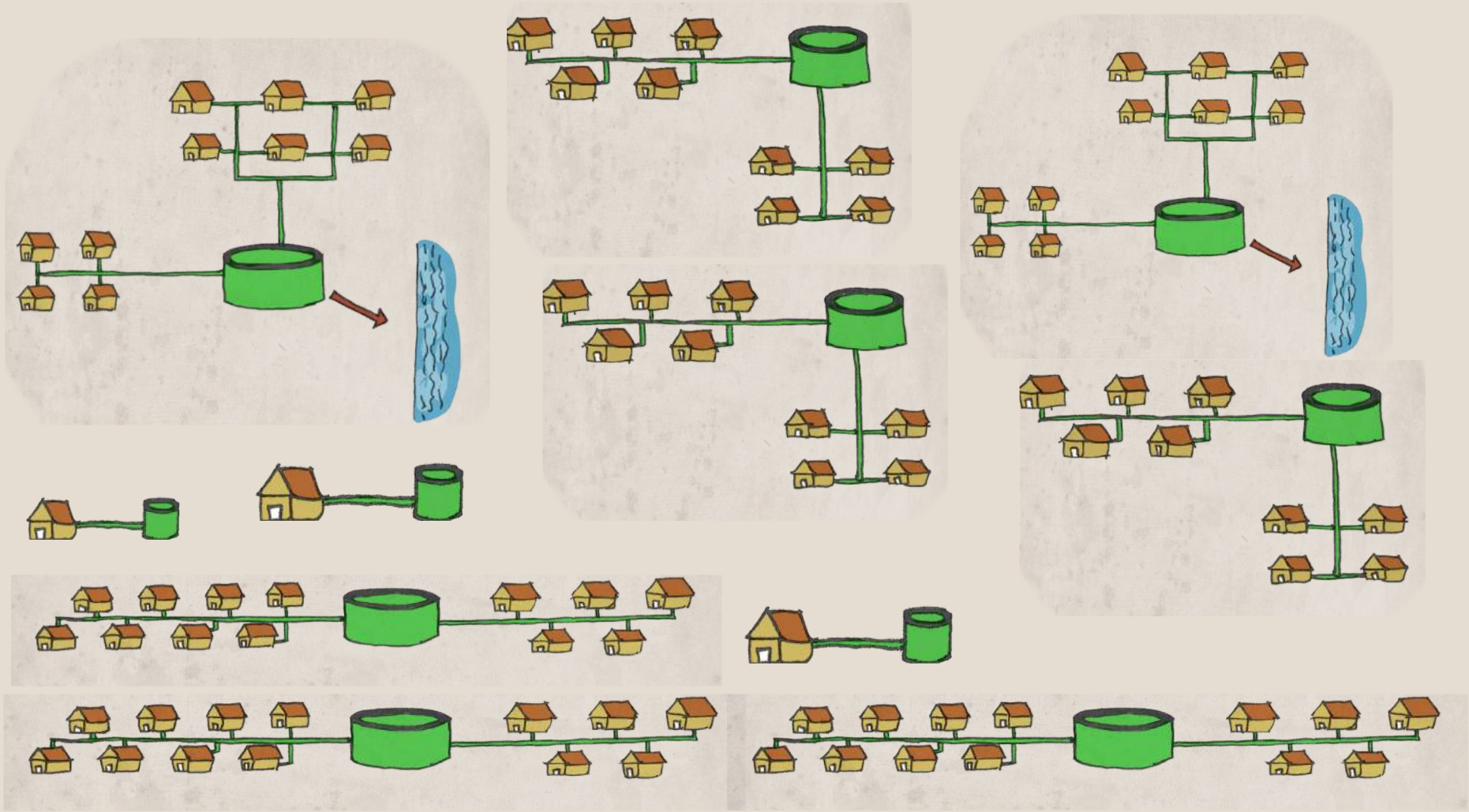
DEWATS SSS

Public Toilets

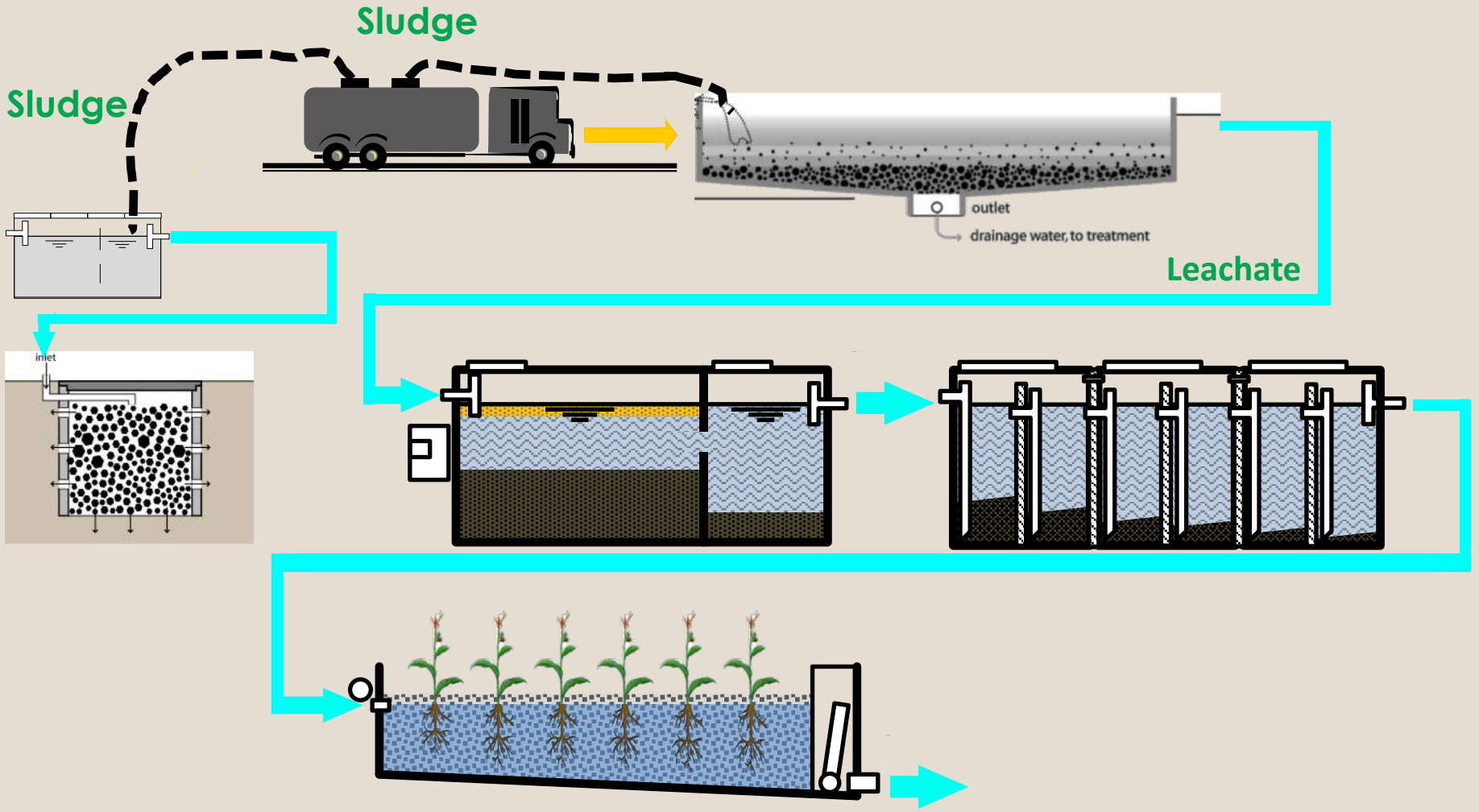
Centralised system



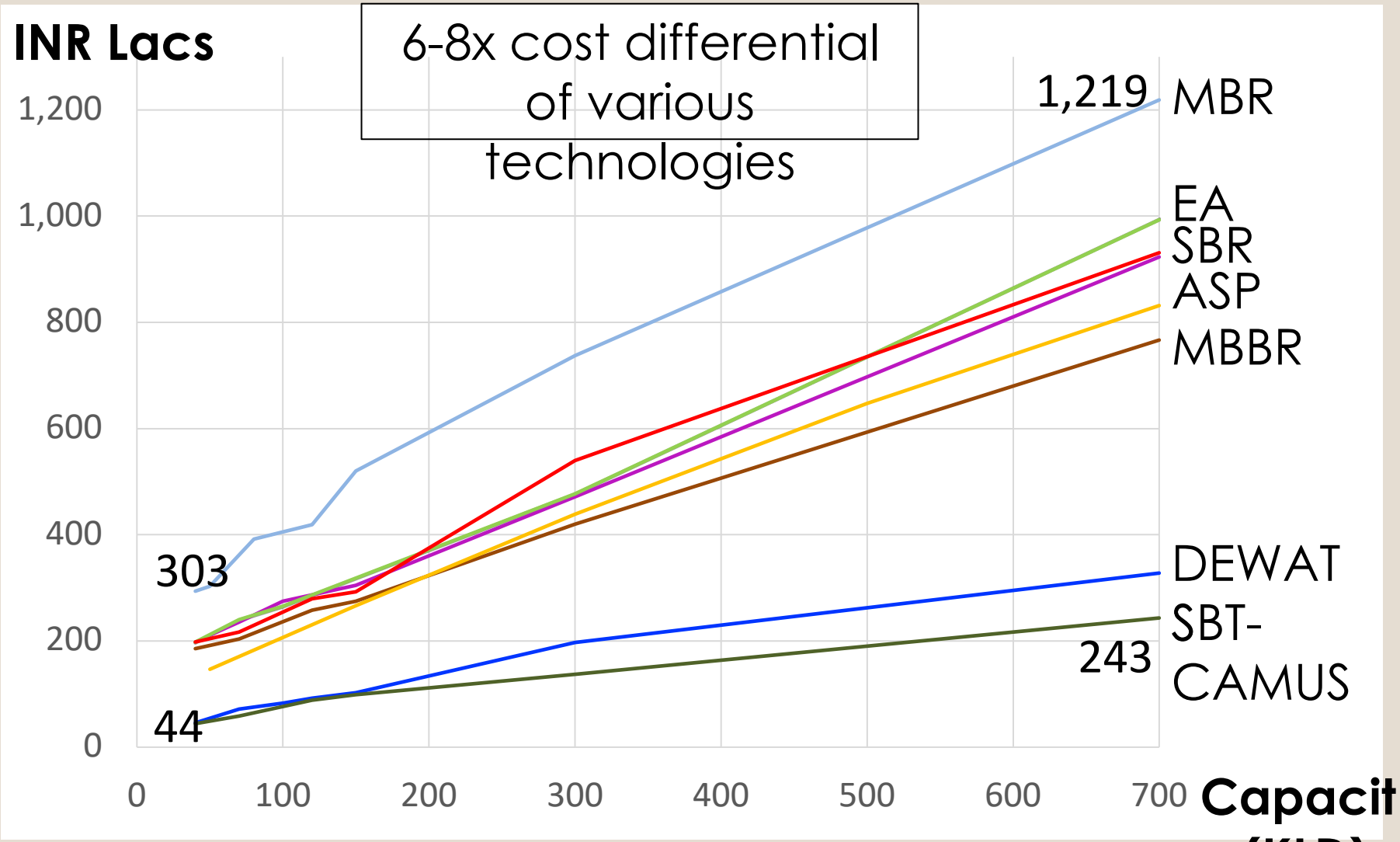
De-centralised system



Hydraulic Profile – Septic Tank + Soak Pit + Septage Management

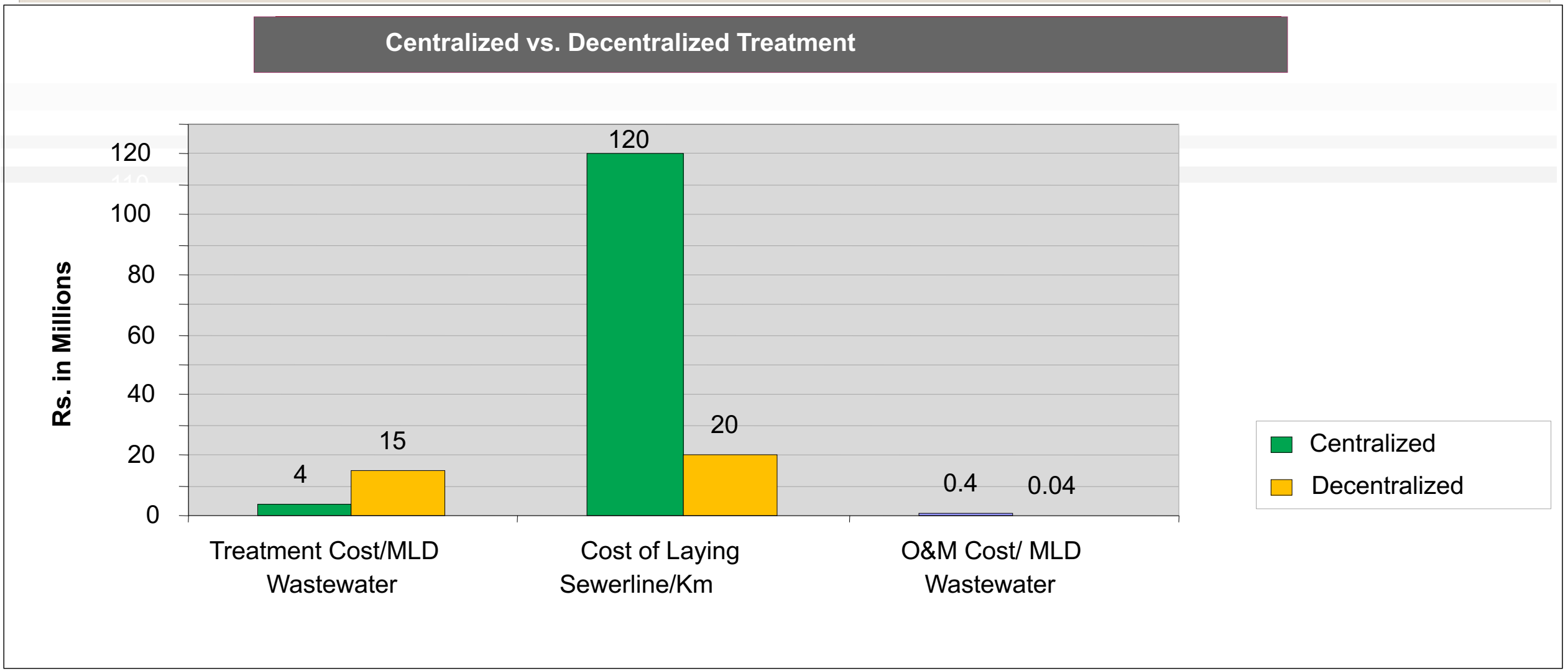


Decentralised treatment system
Life Cycle cost – 10 years

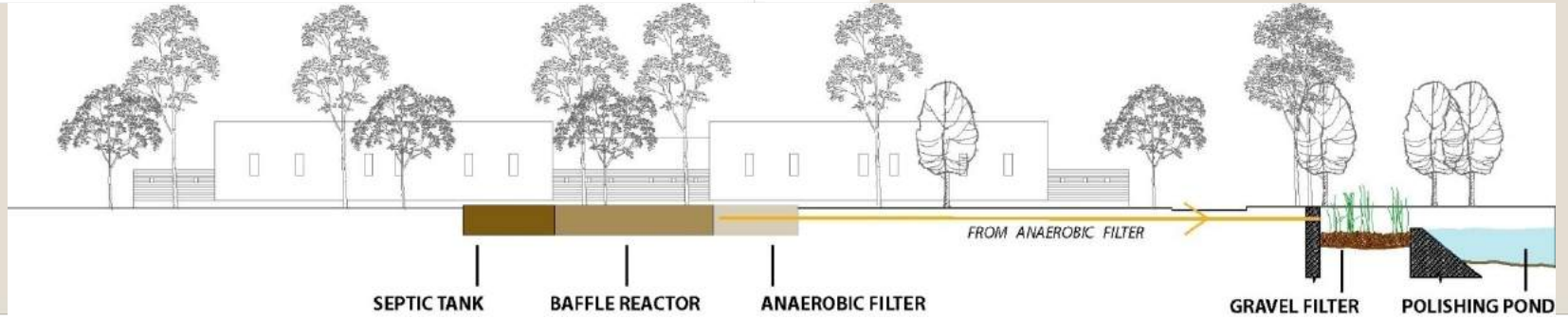


Comparison

Capital, O&M Cost



Housing colonies



Institutions

Purpose:
To be self-sustainable in terms of energy and water

Capacity of the system: 9KLD

Biogas reuse

Total gas consumption/annum – 72 cylinders

Present consumption with biogas supplement/annum – 48 cylinders

Treated water reuse

Freshwater consumption/day for irrigation & gardening

Complete substitution of borewell/dug well water

Small and Medium Scale Industries

Treatment of 54 KLD of wastewater per day

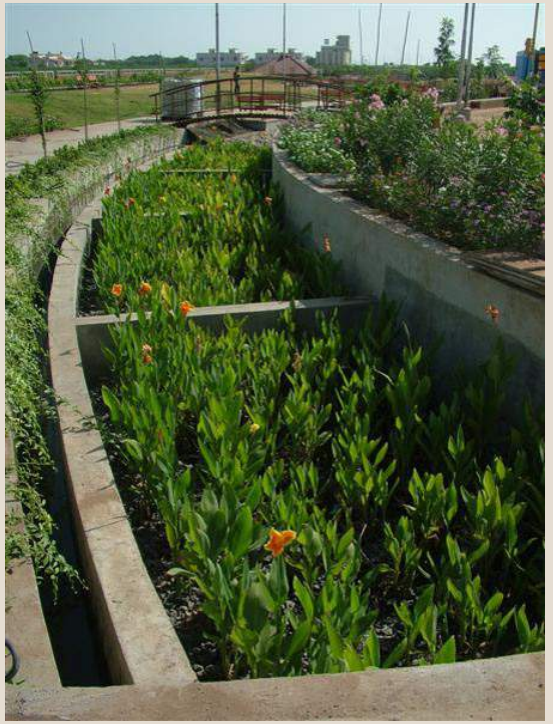
Need:
Water requirement – 30000 lt/day (>60% for landscaping)
Depleting ground water (Dry borewell)
Annual water bill – Rs. 2.7 lakhs (in 2002)

Reuse of water:
Treated water for landscaping, Cooling towers
Firefighting systems

Public and Community Toilets

Hotels and Resorts

Lake Rejuvenation



Treatment of Waterways

Conclusion

- Perspective Building of Urban Development and Decentralised Sanitation Solutions top priority
- Septage Treatment is a Priority
- Solid Waste and Waste Water Treatment is also important since these are often linked with Septage treatment. As an intervention strategy we may focus on Septage Treatment first.
- Why Decentralised Treatment Systems are not prioritized : is a political economy challenge
- Decentralised Treatment Systems require Peoples Awareness, Engagement and Ownership
- Need to learn from Lessons of Malaysia, Indonesia

Financing for Decentralised Sanitation : Recommendations

- **SBM has a separate allocation for SW M .** It should have funds earmarked for FSSM. It can be in the ratio of 25:50:25 (centre : state: local). AMRUT funds are being used for FSSM in some states, MoHUA should provide specific directions on allocation of AMRUT funds for FSSM.
- Advocacy efforts are needed for **SBM- 2 and AMRUT-2 which focus on FSSM and on smaller (non-AMRUT) citie s.** For both SBM and AMRUT,
- Local government can fund their share form 14th FC..(and hopefully 15th FC). It is also essential **to support ULBs to enhance their own incomes by measures such as improving collection efficiency of property taxes**
- While the fund requirement is not very huge, it is possible to get private sector involved in conveyance. This may be done through various means - i.e. scheduled desludging (e.g. Wai), where payments are made to private enterprise by ULB financed through sanitation tax on properties. In case of demand desludging, it is possible to let private desludgers operate on payment of a licence fee.
- **For FSTP, bulk of financing will need to come from public funds. But some innovative financing may be adopted** to leverage public funds. While HAM experience in AP is unfol[C-WAS]m[SaT Sy]e useful to d[FSM Financing Prese ntation]al projects using [June 2018]er in[74]ovative financing frameworks.

Role of Universities in promoting appropriate sanitation solutions

- Narratives, Ideas, Discourse, Experiential learning. Unravelling the political economy of sanitation.
- State and Town level Perspective : Urban Planning Priorities for the state, Investment, Operations and Maintenance, Regulation, Planning, Monitoring.
- Research & Teaching
- Skills Training

THANK YOU

For more information : scbp.niua.org