Online **ADB Sanitation Dialogue 2021**

ACCELERATING INCLUSIVE SANITATION

12–22 April 2021

Holistic CWIS

The role of de-centralized, small-scale STPs

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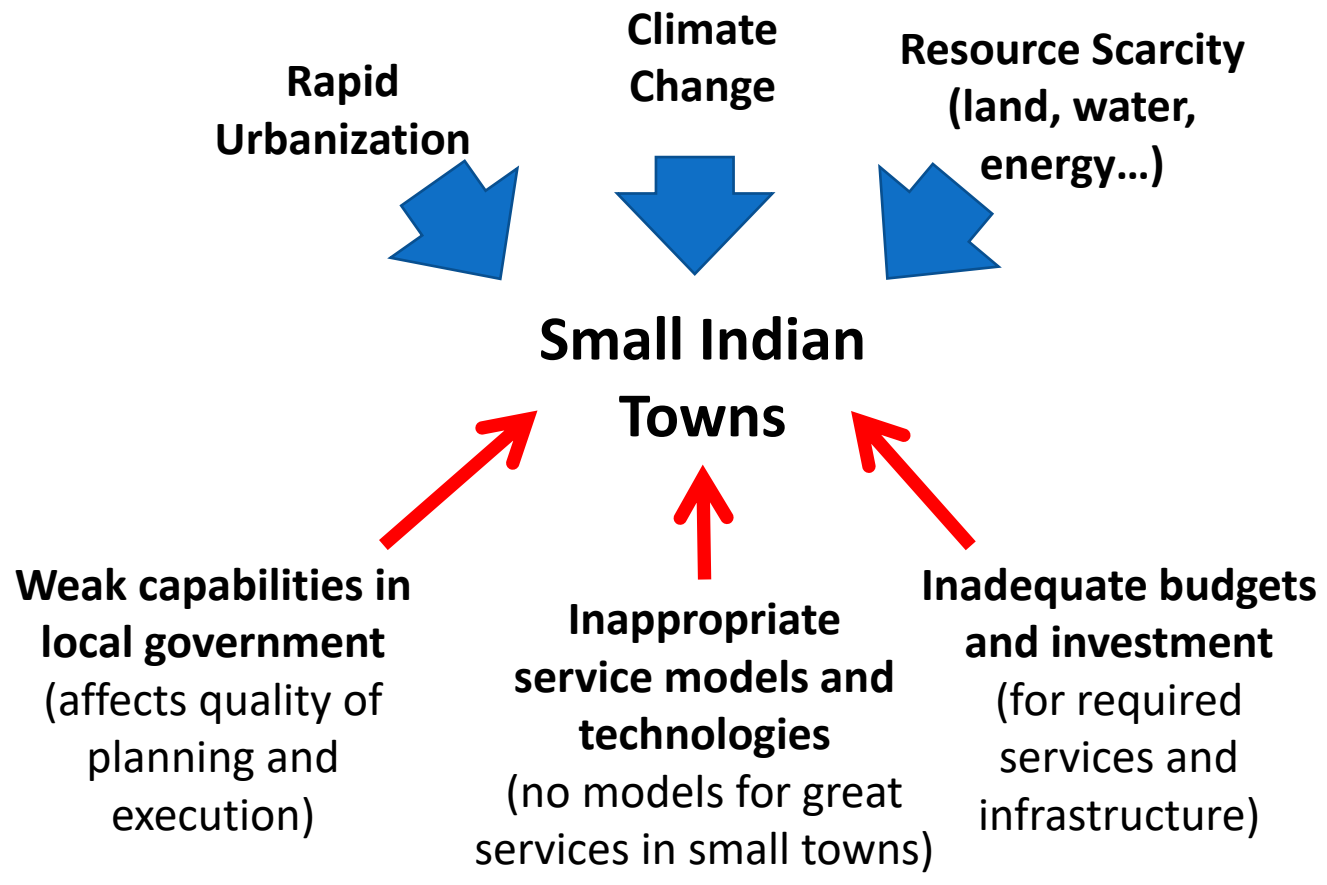
BORDA (South Asia)

BORDA SOUTH ASIA

ADB

Urban India: Towards Livable Cities?

- **Over 500 Million people**
- **3,000+ towns** with population over 20,000 (500+ with 100,000+ pop.)
- **Small towns (<100,000 pop.)** are fast growing, have 120Mn+ people
- Low Livability ranks: **Delhi at 112, Mumbai at 117** (*The Economist* 2018), and getting worse
- Growing investment in urban infrastructure and attention on governance and rankings

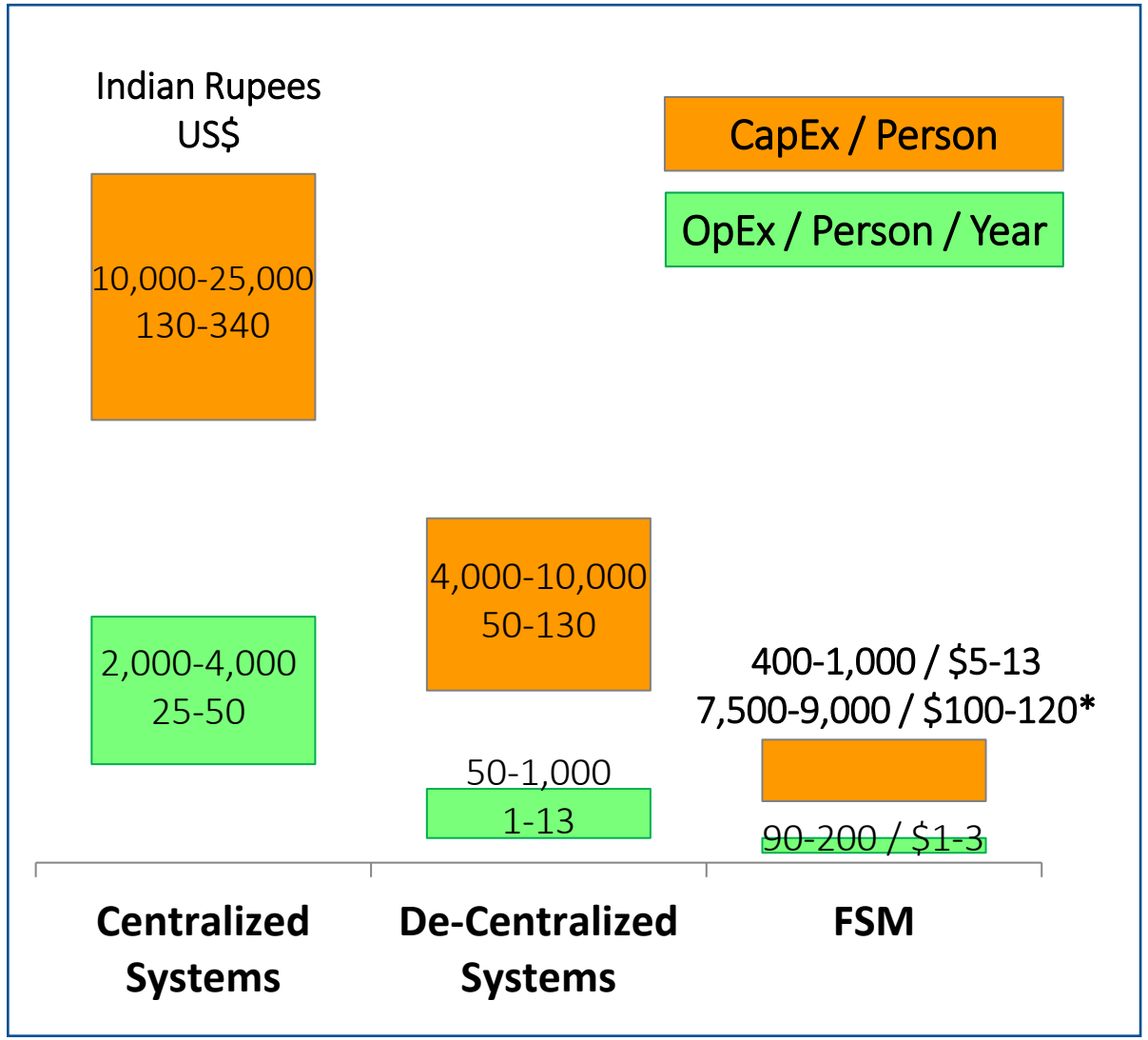


Thinking about CWIS

Sanitation	• What's in, What's out? What are the Goals?
	  • Water, toilets (HH/CT/PT), wastewater, FSM…
	  • Water bodies? SWM? UrbanAg? Green spaces?
	• Circular economy: Reduce, Re-use, Recycle etc.

Inclusive	• Reach everyone—esp. slums • Affordability—Tariffs, CapEx Contributions • Maintainability—"Build-Neglect-Break-Re-build"
City-Wide	• Incremental—but planned in advance • Which are high-priority regions? • Plan for peri-urban areas / future growth • Funds for CapEx and O&M—long-term plan • Integrate with other city services / infrastructure • Who is accountable / responsible?

Multiple Solution, all Together



- Pros and Cons of each solution—use properly
- Consider Govt AND Private spending in each
- A good **City Sanitation Plan** helps make these decisions—what (system), where, when (to build)—integrate with town plan (Masterplan, Vision etc)
- **Who are in charge?**
  - Skills (tech, financial, O&M, policy etc)
  - Tenure / Continuity
  - Accountability
  - Authority (resources, enforcement, funds)

* Incl. septic tank construction

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Multiple Solution, All Together

	Centralized	De-centralized STPs	FSM
Pros	• **Handles all wastewater** • A single authority has full control of the system • Can bundle tariff with water supply	• Private investment **(0.5% of real estate dev cost)**—low cost for Govt. • Small-scale allows technology flexibility (area, re-use, budget) • **100% wastewater treated; can re-use 40-60-85% of water** • Neighbourhood systems—integrate with beautification, parks	• **Quick to implement (6-18mo.)** • **Ultra-low cost** • Easy to maintain and manage • A “good, partial solution” (black water) • Containment cost borne by citizen • Co-composting w/food waste
Cons	• **Difficult to build; 4-10yrs** • Cannot cover all buildings • Difficult to re-use huge quantity of water • Expensive to maintain • **100% Govt. responsibility**	• **Existing buildings?** • ZLD norms are restrictive—need ”local used-water markets” • **Needs new institutional structures** for monitoring / enforcement	• **Less than 1% of wastewater is collected and treated (where does the rest go?)** • Not easy to track offenders—need good monitoring system

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FSM is URGENT…but not Sufficient

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De-centralized / Small STPs : Nature Based Solutions

In front of the Aravind Eye Hospital—treated water for flushing

De-centralized, Small STPs : Nature Based Solutions

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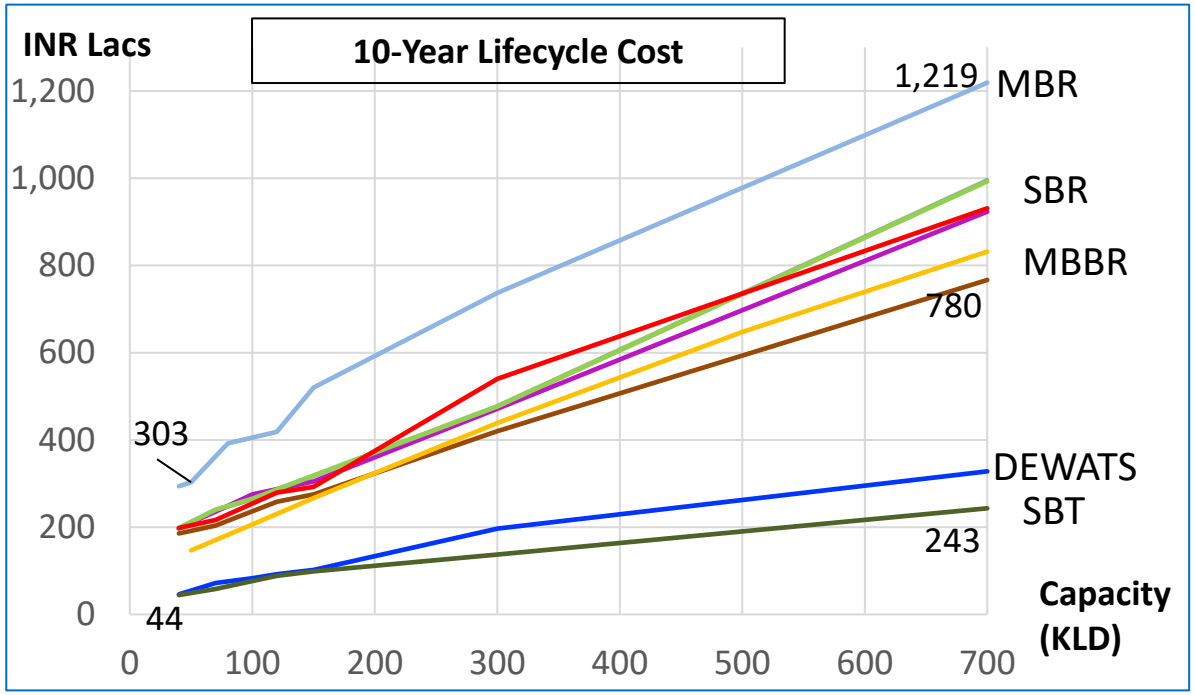
De-centralized / Small STPs

Electro-Mech. Tech. and Nature-Based Systems

- **Lifecycle Cost:** 6-8x cost differential of various technologies
- **Over 10 years (@100LPCD):**
  - **MBR:** Rs 630 and Rs 145 per person / month
    - Small footprint
    - Drinking quality treated water
    - Skilled labour, electricity
  - **DEWATS/SBT:** Rs 92 and 29 per person / month
    - Larger area for biological processes
    - Landscaping / flushing quality water
    - Simple to maintain, minimal energy
- Can fit system in basement, under parking and green areas
- Automation is crashing O&M costs

Snapshot : Small Scale Sanitation Systems (4S) Project

- EAWAG, IIT-Madras, BORDA, CDD, ENPHO
- Technical and Financial Study of 300 systems using 8 different electro-mechanical and nature-based technology
- Scale: 40-700KLD
- Recommendations for effective regulations at city / state level



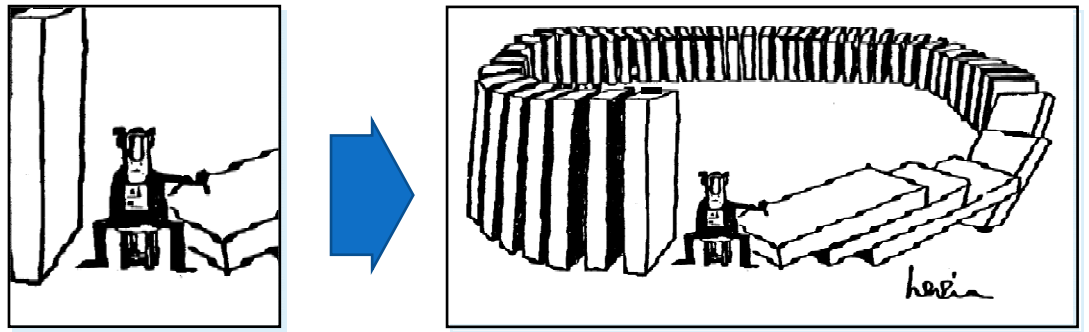
Source: 4S Study

4S: Small-Scale Sanitation Scaling-Up - Eawag

Recommendations and the Way Forward

- Govt. should invest 25% (?to study more carefully?) of sanitation budget on de-centralized STPs and FSM
  - How a budget is spent is more important than ensuring it is spent
  - Basic sanitation for all ASAP

- Holistic, Systems Thinking is necessary—water, sanitation, solid waste, public spaces, housing…
  - Long-term Planning, Financing and Accountability is Key



- Reset Goals and Targets:
  - Pathogens and health
  - Minimize pollution of water bodies
  - Minimize water extraction
  - Beautification and green spaces
  - Affordability and inclusiveness

- Design and O&M of systems by trained, certified and licensed firms and operators only (private or Govt)

- Re-organize / setup Govt. departments to address the de-centralized opportunity—semi-autonomous utilities?

What can we do about this?

Thank You