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FSM4

Workshop 1: The Key Role of FSM in Modern Urban Sanitation Systems

Chennai, India 23 February 2017

~upscaling implementation city wide sanitation projects~

Session C

1330-1500, 23 Feb 2017

Upscaling tools, means & instruments

Cities / Projects

Replication of concepts in full or part

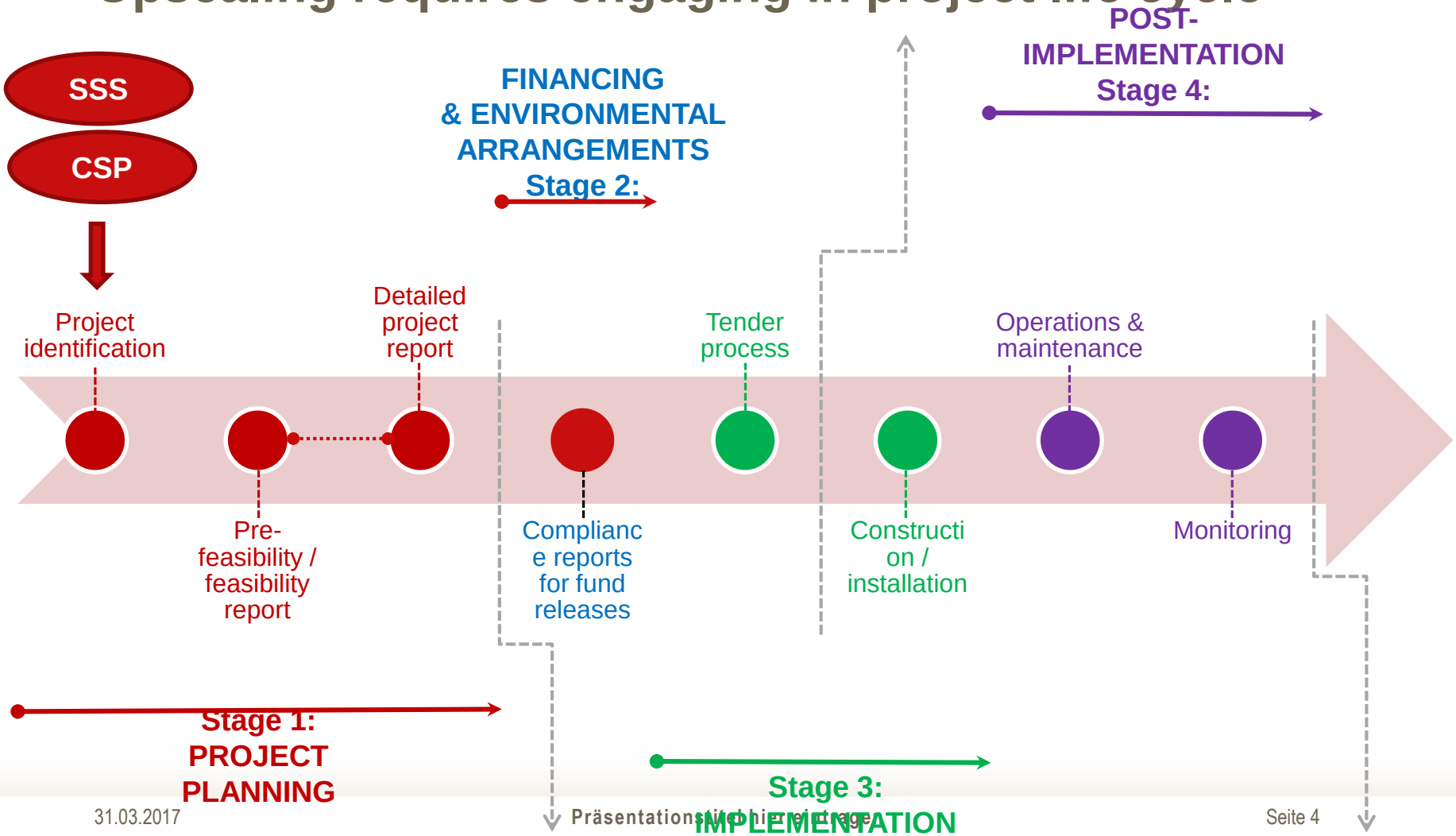
(to achieve critical mass) & (normalize across typologies)

Streamline Processes, Finances, Norms

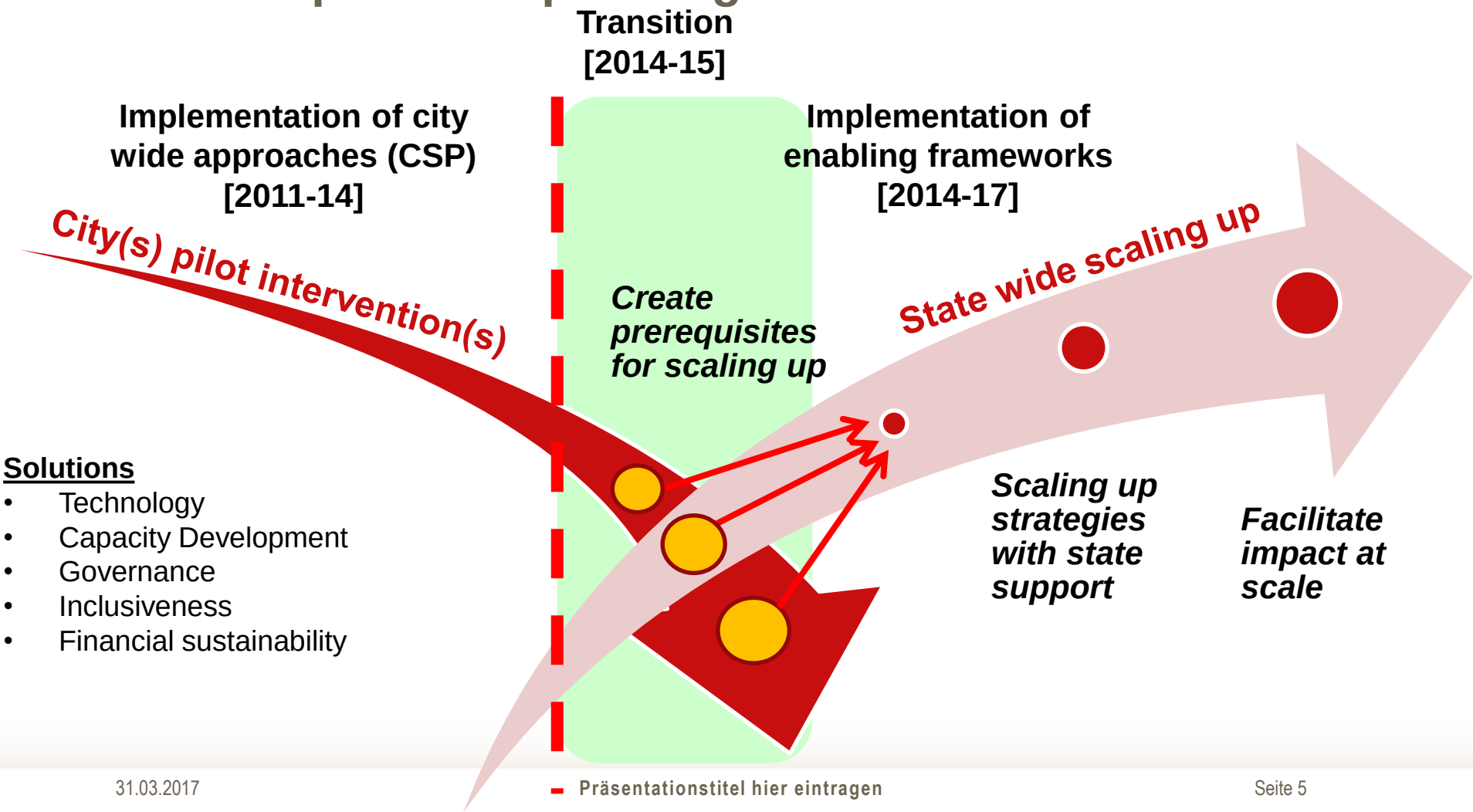
(to facilitate uptake of desired concepts)

Governance / Enabling Environment

Upscaling requires engaging in project life cycle



Roadmap to GIZ upscaling in India



Solutions

- Technology
- Capacity Development
- Governance
- Inclusiveness
- Financial sustainability

How GIZ India is fostering upscaling

- **Projects / concepts / tools in cities**
  - Non-conventional systems at sub-city level
  - Recycling & reuse of wastewater for industrial purposes
  - Septage treatment facilities
  - Waste to energy/compost

- **Processes at the States evolving from State Sanitation Strategy**
  - MSW Manuals
  - SWM, EPR, Compost Policy
  - WW R&R Policy
  - **Guidelines for public toilet management, IWW&SM**
  - Building regulations

5 states
~10 upscaling instruments, ~30 projects implementation
~45 City sanitation plans
KEY WORDS – INTEGRATION, ENTIRE VALUE CHAIN

Integrated Wastewater & Septage Management Guidelines for Kerala State

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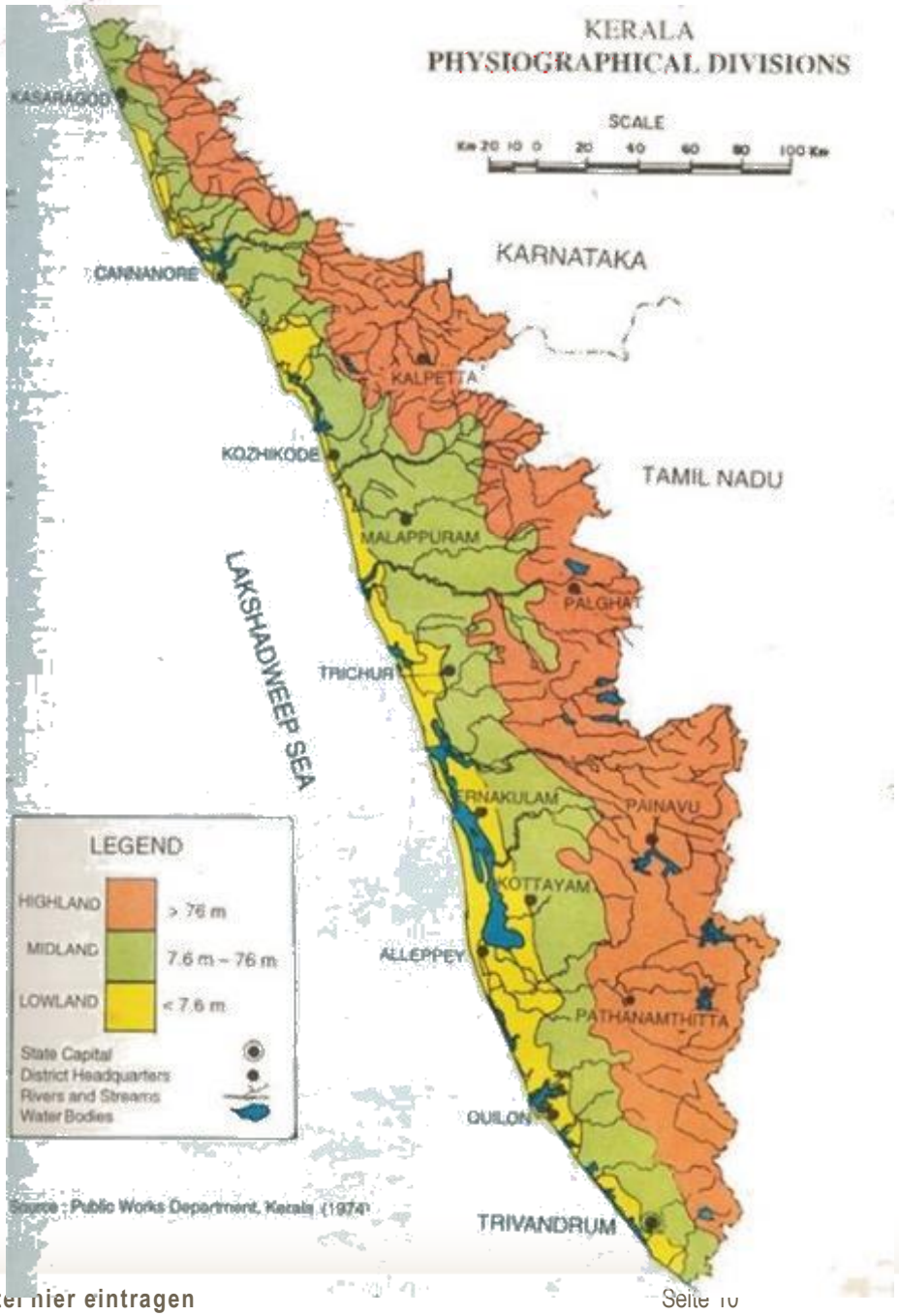
Integrated Wastewater & Septage Management for Kerala

wastewater generation	4274 mld
primary treatment	50.3%
septage treatment	*No record*
Septic tank effluent	*no record*
Secondary treatment	12%

total districts	14
districts in coastal zone	11
major rivers in state	44
districts in coastal zone w/STPs	*2*



Need & Unique Approach

vision, **Kerala State Sanitation Strategy**	***an urban Kerala ensuring environmentally safe disposal of solid and liquid waste*** ***ensuring healthy and clean cities providing access to sanitation infrastructure to all citizens***
one specific goal	***100%*** *hygienically safe and sanitary treatment and disposal'*
objectives	***100%*** *of human excreta and liquid wastes from all sanitation facilities including toilets must be safely treated and disposed*
	promoting / encouraging safe and properly constructed facilities
	promoting proper collection, conveyance, treatment and disposal systems
	promoting recycle and reuse of treated waste water
	demonstrated financial viability for O&M would for ensuring sustainability

IWwSM
closing the loop

holistic & integrated management approach – *conjunctive use of water & wastewater resources*

Conventional & non-conventional systems in conjunction

Incremental development approach

Multi-municipal, regional approach

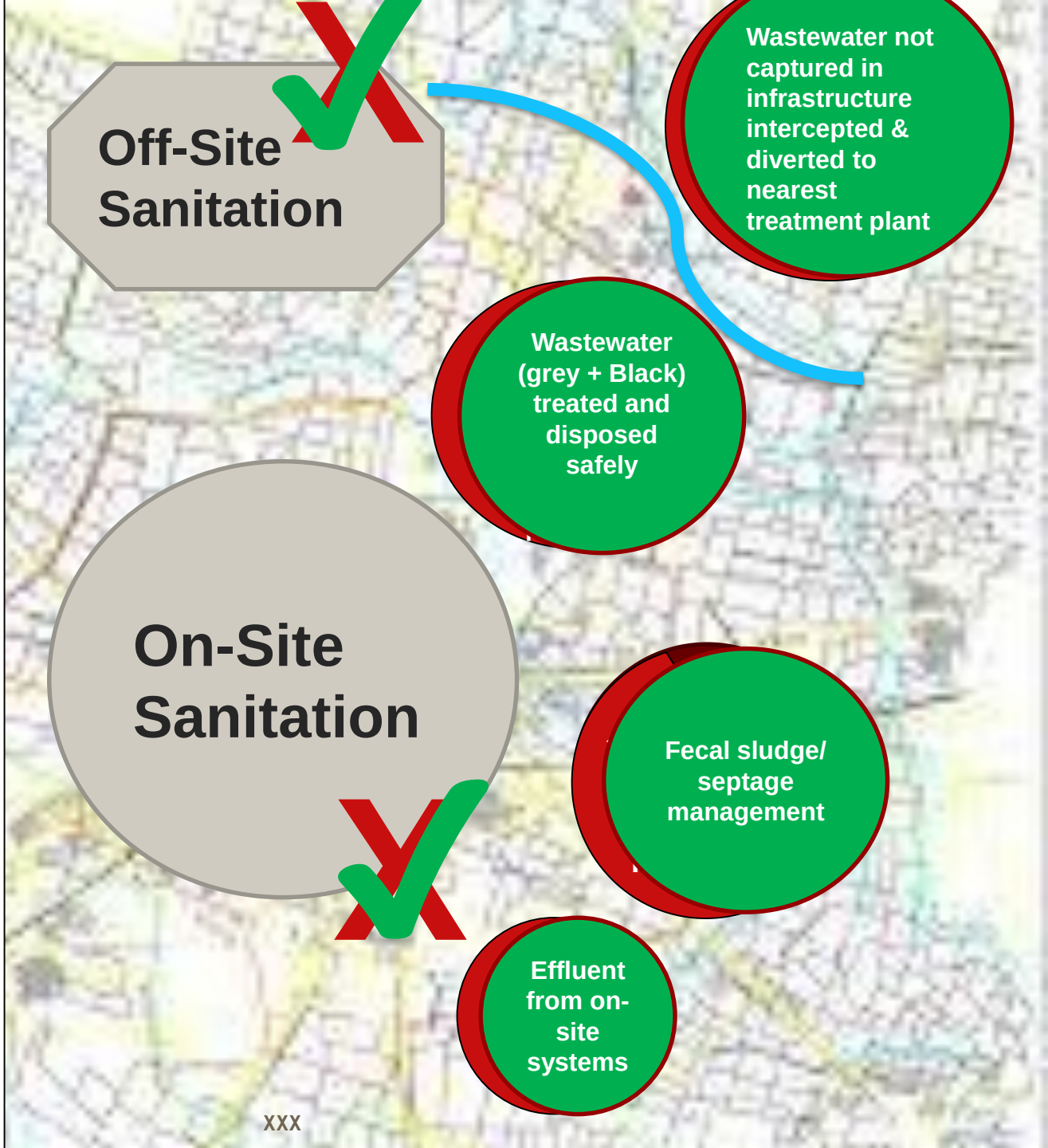
Equity based approach

Robust process oriented approach

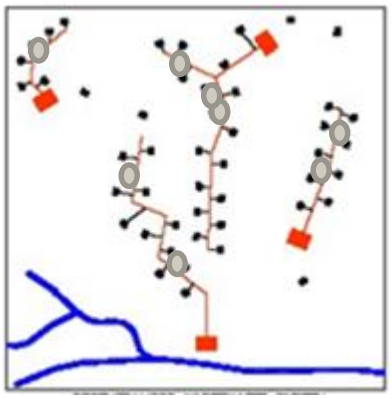
Enabling legal & regulation

Facilitative institution & governance framework

Innovative sustainable financing



IWW&SM, what does it include

Conventional	Non-Conventional
	
Classical design approach – only off-site systems	Non-conventional design approach – on-site and off-site systems
deep sewer based	shallow, small bore sewer based
e.g., centralized STPs	Localized reuse, recycle
	e.g., decentralized STPs,

On-site

STP

Scope of Guidelines – City wide planning & complete value chain

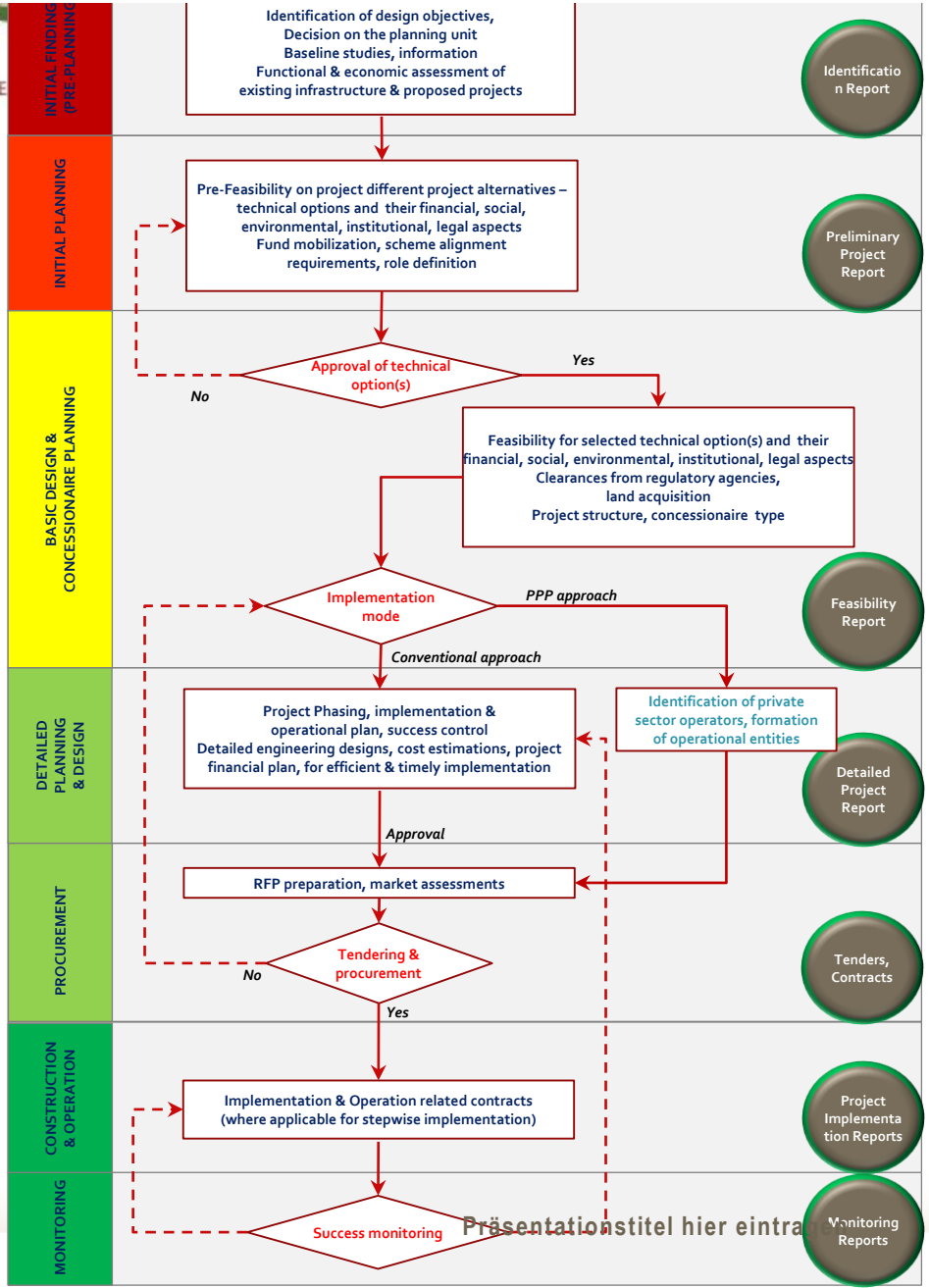
User Interface/ Access	Containment / Collection	Conveyance	Treatment	Disposal, Reuse/ Recycle
• Private Assets (kitchen, individual toilets) • Community Assets (community, shared toilets) • Public Assets (public toilets)	• Private (non-conventional on-site) • Public (Conventional / Non-Conventional Networks)	• Non-Conventional Networks, Mobile-Units • Conventional Networks	• Treatment Systems – Liquid and solids components of wastewater	• STW Reuse for Surface water Groundwater Recharge, Industries, Agriculture, Non-potable uses – contact, non-contact uses • Sludge Disposal, reuse, recycle, recover

- Technology
- Finance
- Institutional & Governance
- Legal & Rugulation
- Inclusion & Public Outreach

Organization of IWW&SM Guidelines

Part A :	City-wide Planning
Part B1:	Design and Implementation
Part B2:	Operation and Maintenance
Part C:	Legal & Regulatory, Institutional & Governance and Financial Framework
Part D:	Tools & Instruments

Planning to Implementation Process



Step by step process

Reduction of risks

Critical factors in city wide planning

- **Key determinants**
  - Settlement based
  - Physiography based
  - Geographical setting
  - Sanitation linked
  - Externalities influence
- **Strategic Planning Approaches for incrementaldevelopment**
  - Spatial integration
  - Process integration
  - Retrofitting
  - Temporal planning (short, medium, long range)

Design & Implementation framework

Decision making for approaches of city-wide IWwSM systems

- Conventional
- Non-Conventional

Decision making for Appropriate Technologies for city-wide IWwSM systems

- Principles & General Criteria
- Technical Criteria
    - *Public Health, Environmental Considerations*
    - *Reuse, Recycle Considerations*
    - *Efficiency, Sustainability*

Design & Implementation of IWwSM Systems across the Value Chain

Decision-making steps

Planning approaches	Facilities at	
	Household level	Public level
Non-Conventional Approaches		
Alternate treatment options - Independent Grey water treatment	Piped infrastructure to collect grey water from the house holds to the trunk infrastructure	Open drains / sma bore sewers laid o on the streets at a cluster level and o level
Alternate treatment options - Independent Black water treatment / faecal sludge treatment	Household toilet and septic tank / soak pit	Public owned / managed collectio and conveyance vehicles and treatment facilities

Potential Technologies	ACTIVATED SLUDGE PROCESS (ASP)	TRICKLING FILTER (TF)
Land Requirement	0.15 to 0.25 hectares	0.25 to 0.65 hectares/MLD
Operation And Maintenance Cost	Rs 0.3 to 0.5 million/year/MLD	Slightly lower than ASP
Energy Requirement	180 to 225 Kwh/ML treated	180 KwH/ML treated
Capital Cost	Rs 2 to 4 million/MLD	Relatively lower than ASP
Effluent Quality	BOD: 10-20 mg/L Suspended solids (SS): 20 to 50 mg/l	Comparable to ASP
Distinct Advantage	Land requirement is very less and performance is not affected by normal variation in waste water characteristic	Rugged system with simple and silent operation

Operation & Maintenance Framework

Outline of Operation & Maintenance	Broad Overview	Budget Estimation	Chapter 5, Part C of CPHEEO Manual presents more detailed information on budget estimation
	Regulatory Considerations		
	Environmental Considerations		
	Management Strategies / Action Plan • Asset Management • Facilities Management	Risk Mitigation	Consolidated Record of O&M related Issues
	Master Schedule for O&M		Disaster Mitigation Measures
			Mitigation Strategy in the overall Context
Organization of Operation & Maintenance	Description of O&M	Community Awareness & Participation	Public Relations
	Deployment of Manpower • Outsourcing • Key Criteria for Selection of Contractors		Grievance Redressal
	Training Master Plan and Schedule		Do's and Don't's for Community
	Database for Effective O&M NUSP, SLB, Swacch Sarvekshan; E.g Sewerage Ledger		
	IT Enabled Monitoring		

Other frameworks covered

Financial

Legal

Data management

Institutional & contracting

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