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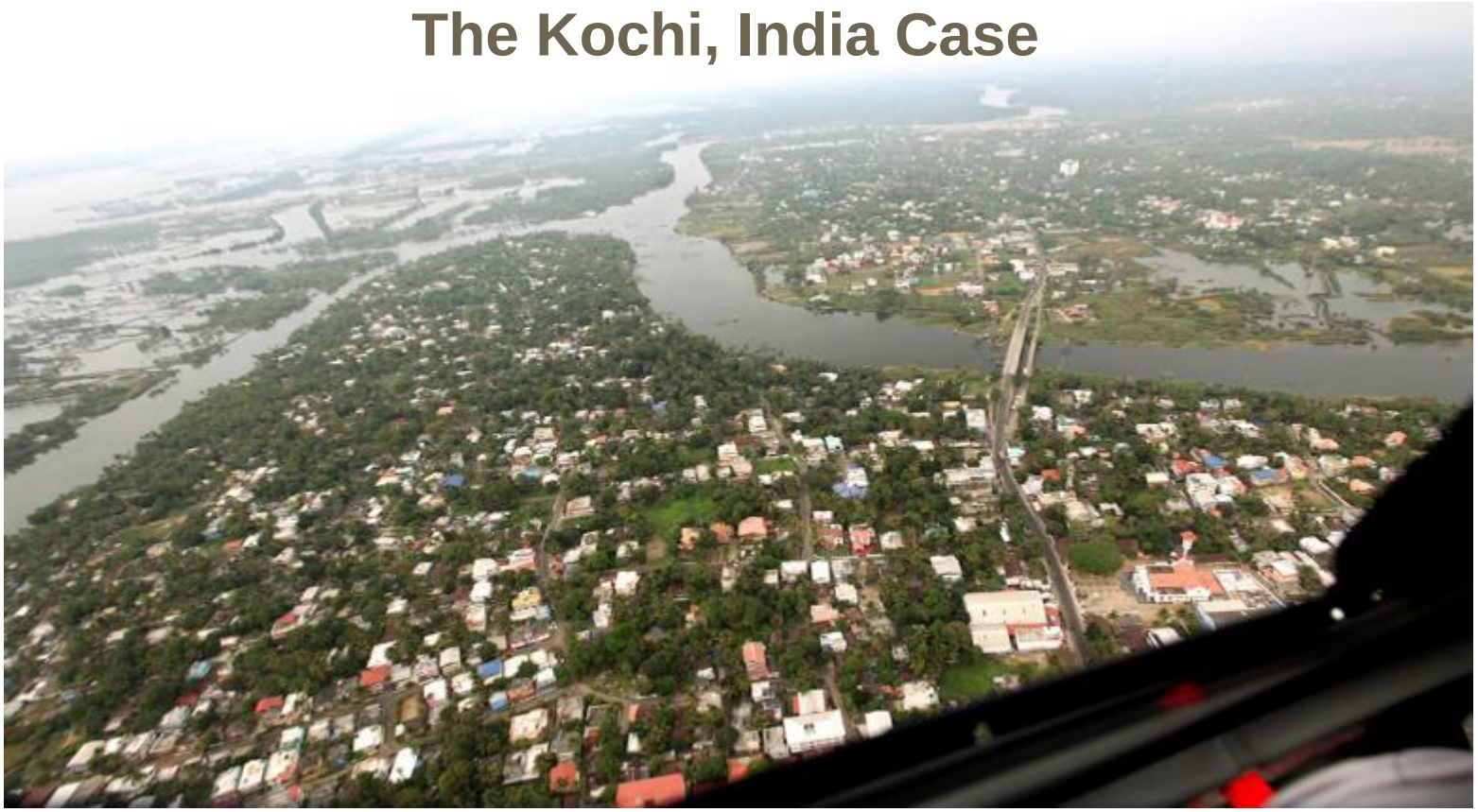
Workshop 1: The Key Role of FSM in Modern Urban Sanitation Systems

Chennai, India 23 February 2017

~planning approaches for sanitation in cities~

The Kochi, India Case



Session A

0930-1100, 23 Feb 2017

Kochi: Challenges for Sanitation System Planning

Uniqueness

- Unique topography (islands, canals & backwaters)
- Coastal city
- High water table
- Generally flat terrain
- Narrow road network
- Monsoon season results in frequent flooding of drains and canals

Kochi Case: A numbers snapshot of what entails

Demographics & WS

- Population ~6.25 lakh (2016),
- HHs ~1.5 lakh,
- Area ~100 sqkm
- City at sea level for most part
- Water supply ~170 MLD
- Connections ~1.1 lakh
- Supply ~90 to 100 lpcd

Wastewater

- 7 sewerage zones
- WW treatment capacity generated ~90 MLD
- Current capacity ~5 MLD
- Sewer ~12 km
- Area covered ~2.5 sqkm
- Treatment capacity augmentation ~35MLD,
- Balance ~50 MLD

Septic tanks

- HHs connected to Septic tanks~1.06 lakh,
- septage generation ~160 cum/day

Sewerage Projects underway, for >10 years and still to result in benefits

KSUDP

Sewerage system to West Kochi for a prospective population of about 165152 (Ultimate population)

Construction of 23 MLD STP at Mundanveli

JNNURM

Sewerage system to Central Kochi for a prospective population of about 190284 (Ultimate population)

Construction of 24 MLD STP

Kochi is not terrain / implementation friendly

Decision on Non Conventional Approach

- ✓ **Implementation of the common technology of conventional gravity sewer not possible due to high groundwater table, plain topography and flooding risk!**

- ✓ **Requirement for an alternative sanitation system which is highly flexible concerning local conditions**

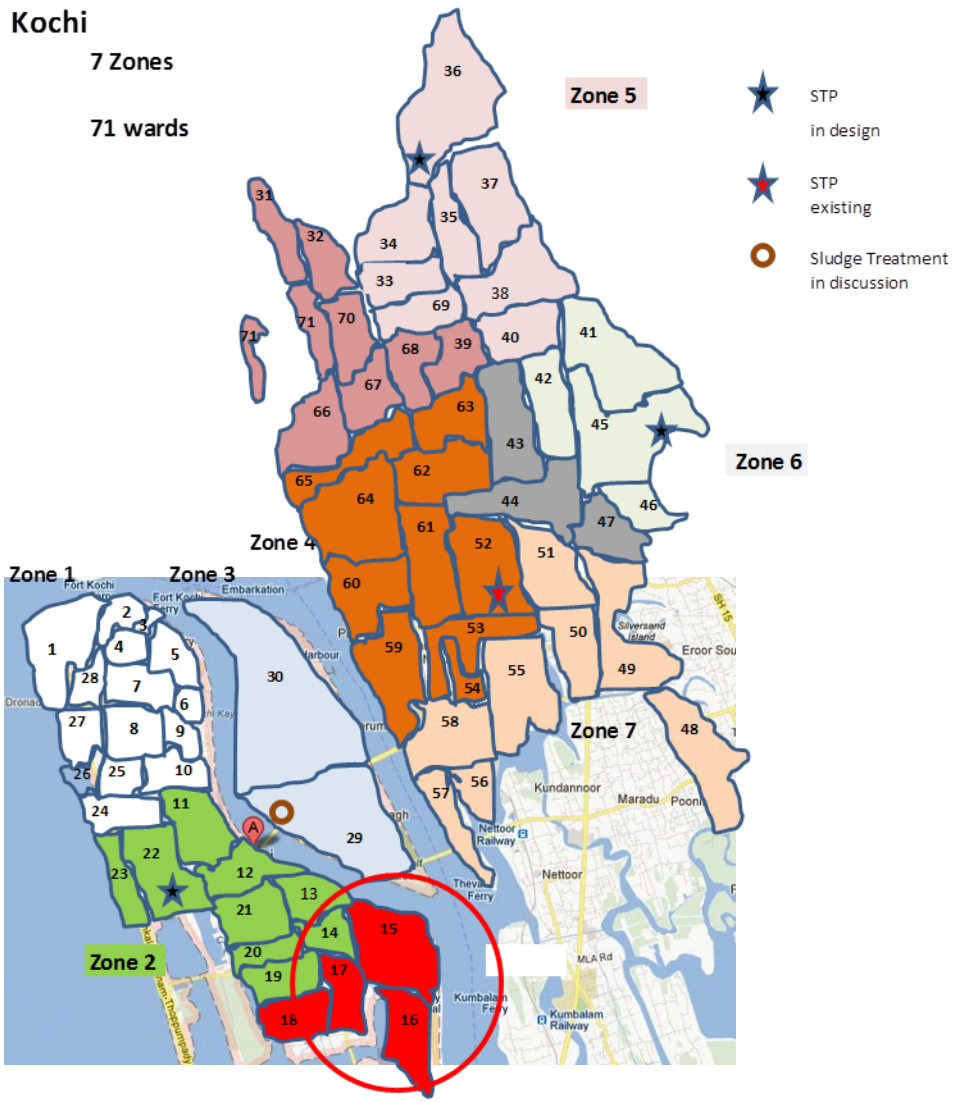
Non Conventional Approach

Project Area

- Ward 15 (Edakochi North),
- Ward 16 (Edakochi South) &
- Ward 17 (Perumpadappu)

Profile:

- Population (2011) = 26.825
- Projected Popl. (2041) = 31.000
- Households (2011) = 7.152
- Area = 324 ha or 3.24 sqkm



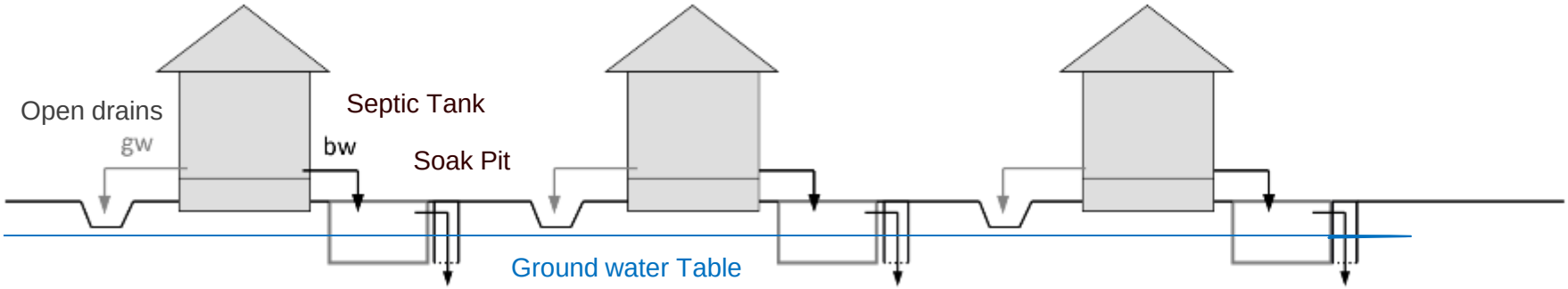
Zones 1, 3, 4, 7 – projects proposed under KSUDP & JNNURM

Source: KSUDP Sewerage Master Plan for Kochi Corporation (2012)

Current Situation

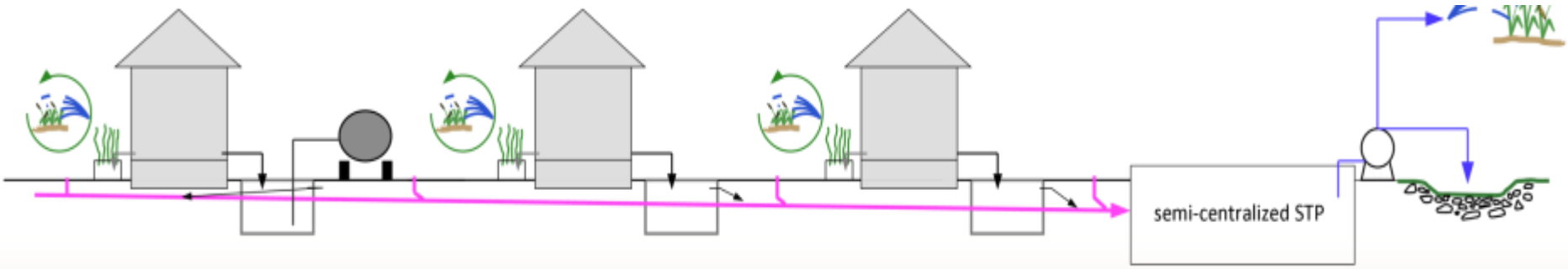
- Project area is not covered by existing sewer system
- Most households have Septic Tanks followed by soak pits

- **Black water** (bw) to Septic Tank
- Effluent from Septic Tank to soak pit
- **Grey water** (gw) is discharged untreated to storm water drains and channels

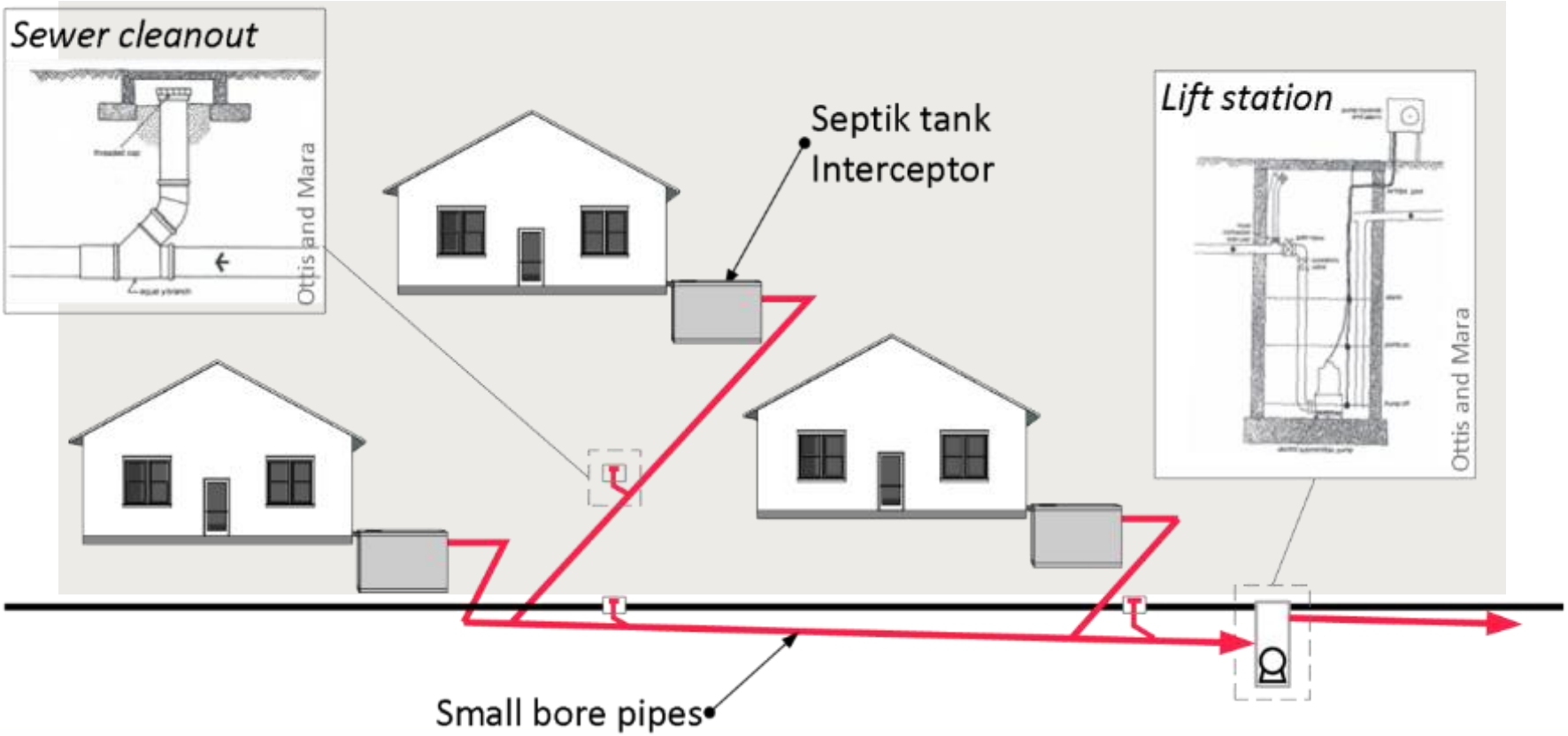


Technical Elements of Proposed System

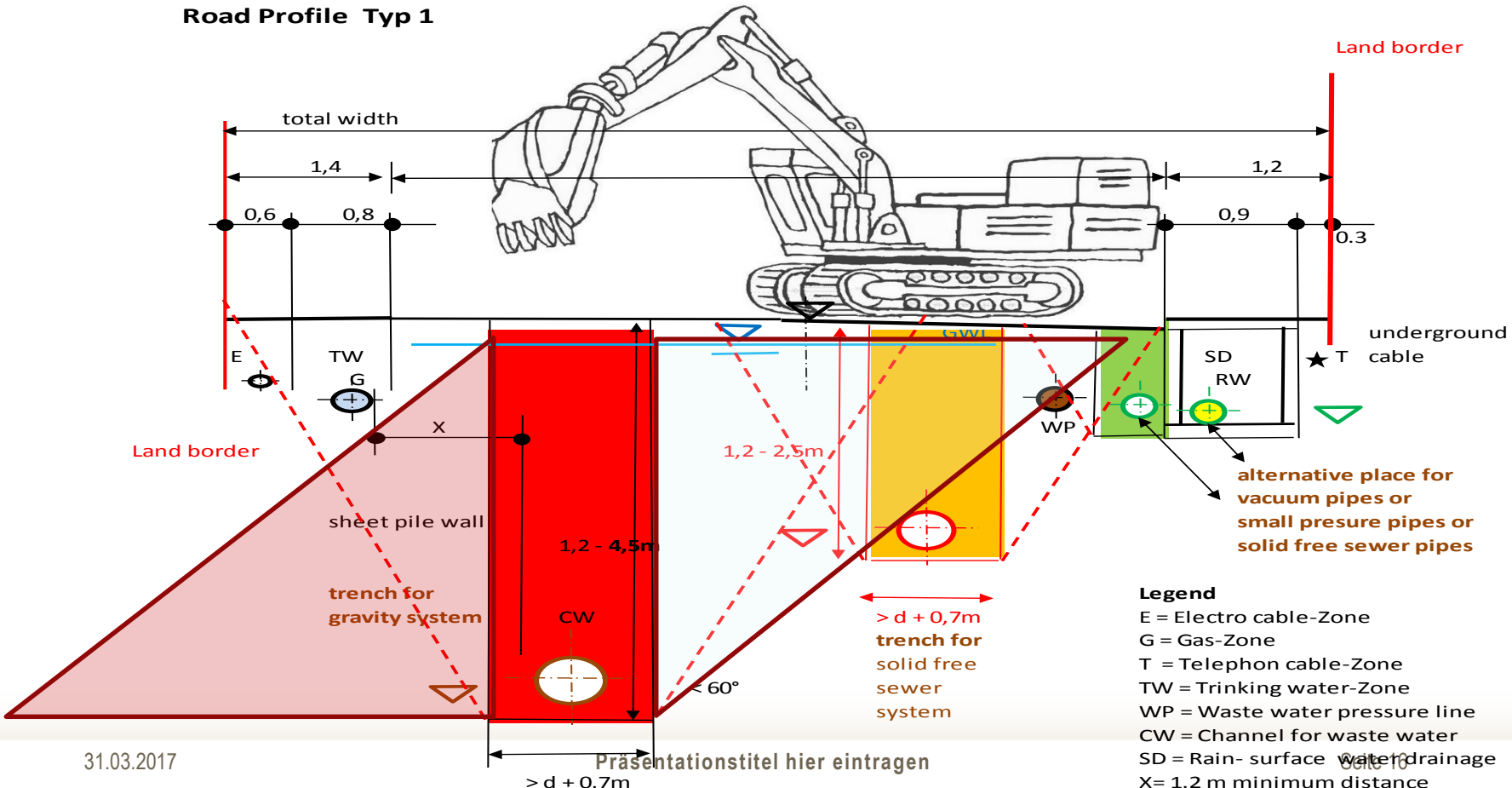
- Upgradation & rehabilitation of existing ST, New & Community ST
- Blackwater and Greywater connected to septic tank (open drains only for storm water)
- Septic Tank as **Interceptor & Sedimentation Tank** for separation of solids and liquids
- Solid free sewer system conveying overflow from sedimentation / septic tanks to decentralized treatment facilities
- Small bore sewers and with shallow gradients
- Establishment of decentralized treatment facilities depending on design of sewer network



Solid Free Sewer Network - System Layout



Trenching of conventional and non-conventional sewers... In a built-up environment & narrow streets



Incapsulated Wastewater Treatment Unit

Project Sneek / Friesland (NL), Noorderhook treatment units

Where are we now?

DPR commissioned by GIZ Partner, Kochi Corporation as per typical Indian planning process

- Consultant on board
- Baselines surveys completed
- Preliminary Planning Report available, in line with Planning process
- **Detailed engineering design is underway**

- Technical Advisory and coordination from GIZ at every stage is on-going
- Consultant capacities being built (GIVEN THIS IS FIRST OF THE PROJECTS IMPLEMENTED AT THIS SCALE)

Criteria for Non-conventional system

- Same comfort for the user like a conventional system
- Appropriate to local conditions
- Any combination of appropriate technologies posible
- Modular implementation and augmentation possible
- Water efficient (no need for flushing using drinking water, saves precious drinking water)
- Energy efficient (construction and operation)
- Feasible in areas with high ground water table
- Beneficial in flat terrains
- Beneficial for places having narrow roads
- Potential for watersaving and reuse of water and nutrients
- New business models for “classic” water utilities

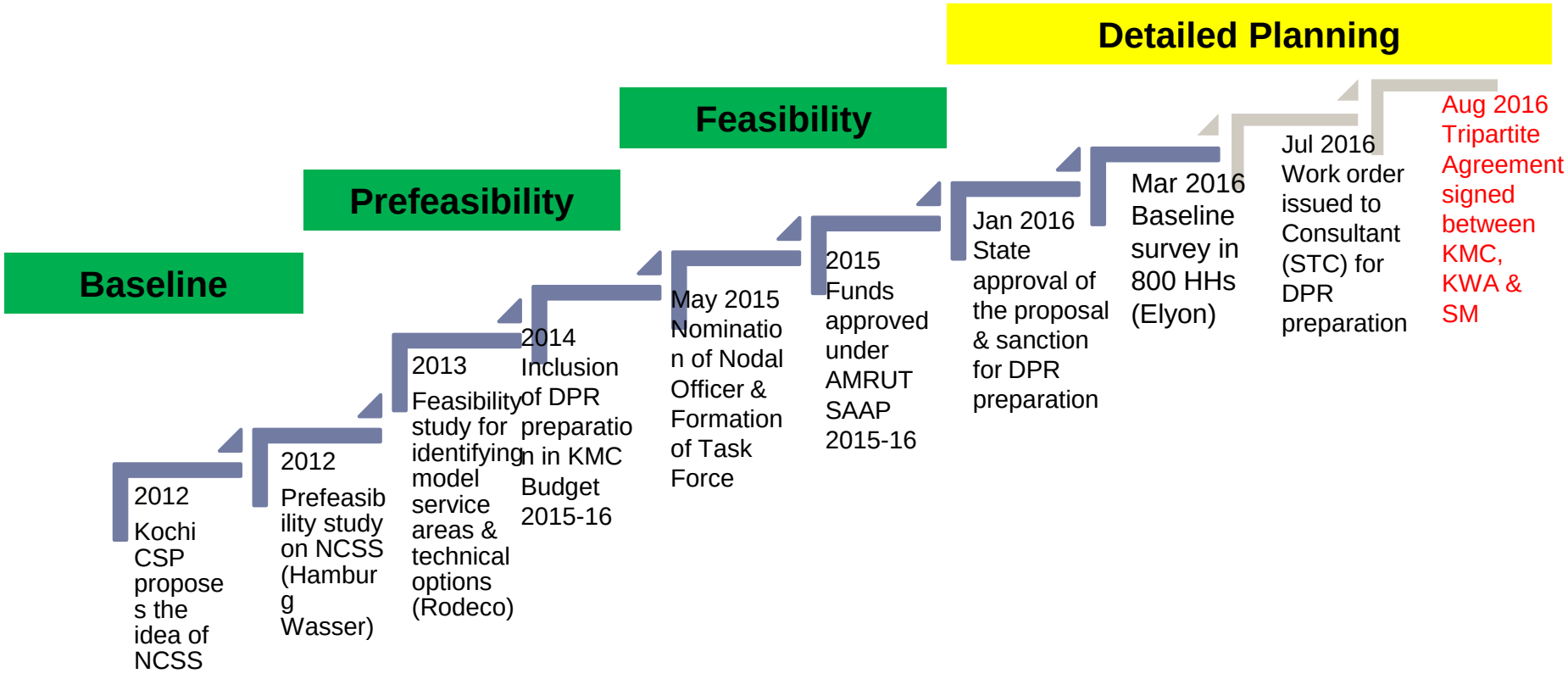
So what is GIZ doing beyond this pilot... To further reaching project objectives

Sustainable city sanitation

Non-conventional approaches to planning... Work in progess

Baseline & Database creation metrics	Facilitating with funding alignment	Technical handholding & institutional strengtheing by way of Wastewater Utility creation	Integrated Wastewater & Septage Management Guidelines for Kerala State (enabling environment creation)

Planning Process and Important Events



Key Questions

1. What are *limitations/boundaries* of Non-conventional approaches to Sanitation ?
2. What are the *recommendations* to overcome this constraint ?
   - Managing multiple approaches suffers from *fragmentation of responsibilities*
   - *Financing* such approaches is generally a problem, because the variability in solutions (over investments in private properties & countless small contracts) and cities still prefer few large contracts ?
3. How to mainstream such approaches ?

As a federal enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

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