# Situation Specific Planning of Sanitation System for Septage Management



Prof. Bakul Rao & Ankita Rathor

Centre for Technology Alternatives for Rural Areas (CTARA)
Indian Institute of Technology, Bombay

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### About CTARA..

- To carry out multi-disciplinary, multi-dimensional and grounded policy studies and research on key T&D sectors
- To put knowledge, expertise and skills for the benefit of the marginalized and disadvantaged sections of the society
- M.Tech and PhD Programs; Supervised Learning Courses for B.Tech.
- Collaboration with Ministries, State Government, ULBs, GPs, NGOs, Consultants,
   Companies
- Technology Evaluation based on Multi-criteria decision making tools AHP, System
   Dynamic Approach

### Content

- Components of Sanitation System
- Situational Analysis for Sustainable Planning
- Scenario Building for a Town and / or a Village
- Ongoing Research
  - Concept of SANIZONEs
  - Septic Tank Redesign

### Sanitation System

- Possible situations in Sanitation System based on
  - Availability of water
  - Availability of space; Accessibility
  - Habits of the users
  - Soil and Groundwater characteristics
  - Compatibility with available Collection, Storage and Conveyance Technology
  - Financial resources; Management Skills and Capacity



### Sanitation System

#### User Interface



#### Dry Toilets

- Urinals
- Pour Flush Toilets
- Cistern Flush Toilets
- Urine Diverting Toilets (Dry / Flush)

### Collection and Storage

- Single Pit/ Twin Pit/ Single VIP/ Double VIP (Ventilated Improved Pit)
- Septic Tanks
- Composting Chamber
- Anaerobic Reactor/ Baffled Reactor

#### Conveyance



• Small Bore Sewers

Sewers

- Conventional Sewers
- Humanpowered Emptying
- Motorized Emptying

#### Treatment



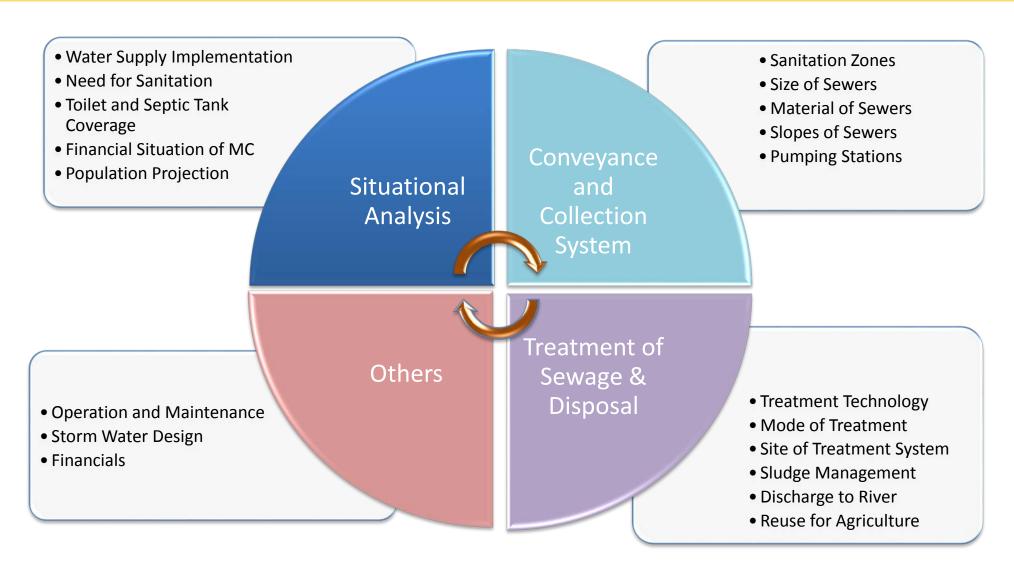
## Use and / or Dispose

- Wastewater
   Treatment –
   Conventional
   Treatment,
   Unconventional
   Treatment
- Septage
   Treatment –
   Composting,
   Drying, Biogas
   Reactor

- Treated waste water – Irrigation, Soak Pit, Water Disposal, Groundwater Recharge
- Treated
   Septage Land
   Application,
   Biogas

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### Situational Analysis



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### Scenario Building

#### Scenarios based on

- Type of Conveyance Simplified, Small Bore & Conventional
- Type of Collection, Storage and Treatment
   Component of Sanitation System

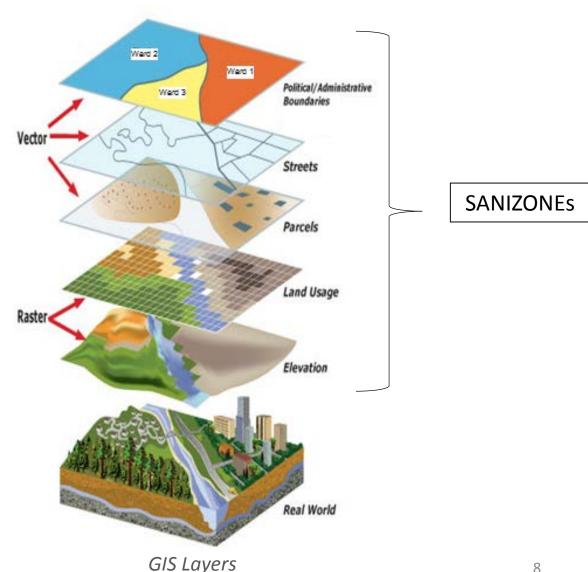


#### Case Study of Sangola

Scenario 1	Scenario 2	Scenario 3
Completely Centralized Conveyance	Partial Centralized Conveyance	Completely Decentralized Conveyance
Convetional Treatment	Partial Convetional Treatment	Unconvetional Treatment

### On-going Research: SANIZONES

- Algorithm for preparing Sanitation Zones for decision making on choice of technology
  - Conveyance
  - Offsite vs Onsite Treatment Choice
  - Centralized vs Decentralized Treatment Choice
- Zones on the basis of Elevation and Streets have been tried out



### On-going Research: Septic Tank Redesign

- Redesign to avoid Human Scavenging
- Assessment different types of Septic Tanks
- Complementary system for On-site
   Treatment of Septage Household level and
   Community level
- Monitoring system for regular cleaning of Septic Tank



Newly installed septic tanks in Sangola MC (on left) and Septic tank emptying by people in Alibaug MC (on right)

# Thank you..!