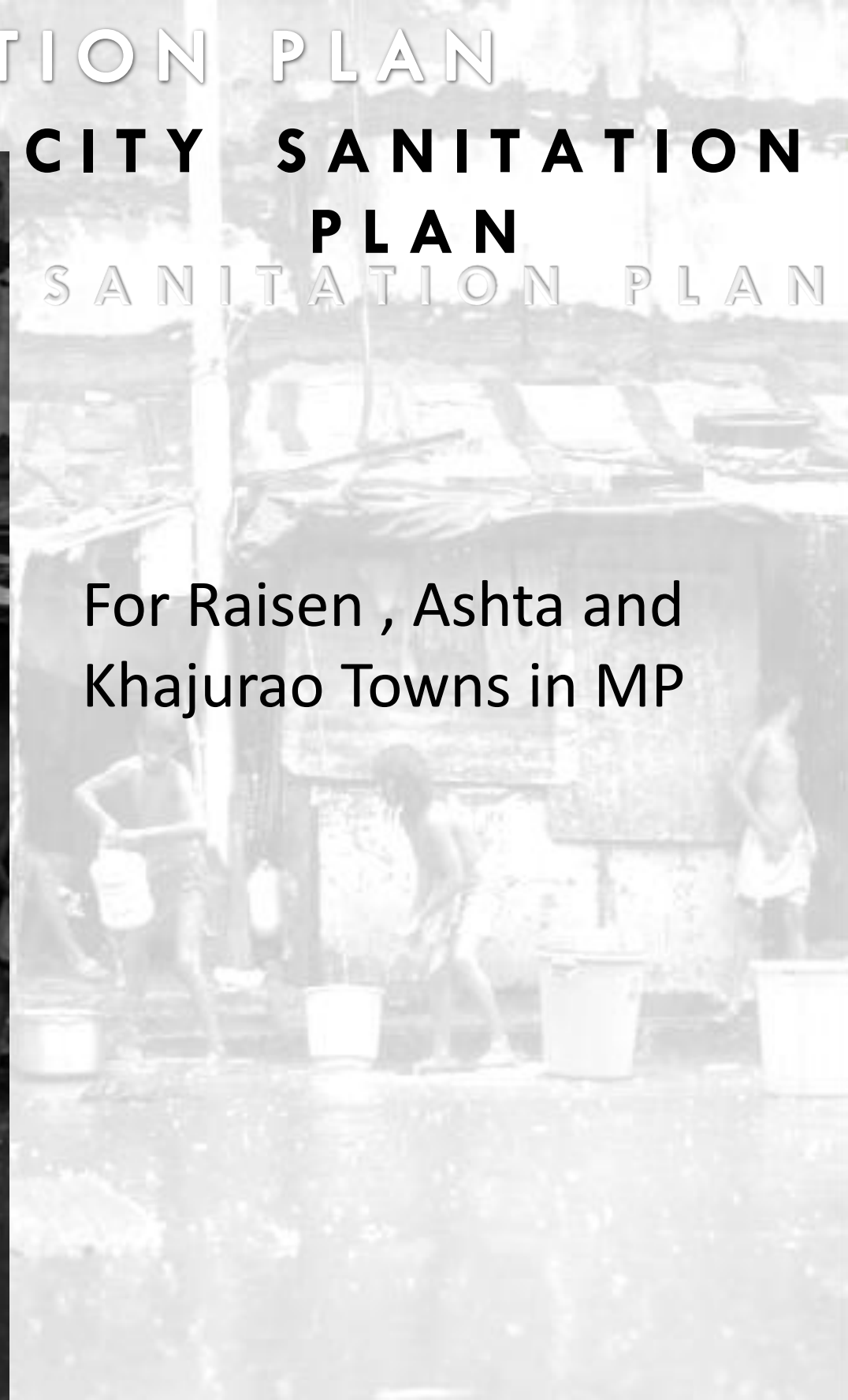


# CITY SANITATION PLAN

## CITY SANITATION PLAN SANITATION PLAN

For Raisen , Ashta and  
Khajurao Towns in MP



ULB's

 WaterAid



 emds

**CENTRE FOR ENVIRONMENTAL MANAGEMENT & DECISION SUPPORT****Head Office:**

Gregor Mendel Strasse  
33,  
1180 Vienna  
AUSTRIA

**India Liaison Office:**

Mumbai / Pune

- Set up as a non-for-profit association under Austrian law in 2004
- Network of National and International Partners and experts.
- Active in India since 2005

# Phasing of C S P

## Phase I

### KEY STAGES

Establishing Baseline

Technical Situation Analysis

Demand Supply Assessment

Future projections

Waste management options

Strategies for sanitation management

Phasing and

**Providing a platform for piloting**

## Phase II

### KEY STAGES

Technical Assistance for developing infrastructure

Developing Strategies for Awareness generation and

Capacity building

**Key Agencies**

Government of  
Madhya Pradesh

Urban Local Bodies

**Supporting Agency**

**Water aid**

**Technical Support**

**CEMDS**

<b>City</b>	<b>Ashta</b>
<b>District</b>	Sehore
<b>Population</b>	35,702 (census 2001)
<b>Area</b>	1538 ha.
<b>Number of Wards</b>	18



<b>City</b>	<b>Khajuraho</b>
<b>District</b>	Chhatarpur
<b>Population</b>	19,285 (census 2001)
<b>Area</b>	59 sq.km.
<b>Number of Wards</b>	15

<b>City</b>	<b>Raisen</b>
<b>District</b>	Raisen
<b>Population</b>	19,285 (census 2001)
<b>Area</b>	19 sq.km.
<b>Number of Wards</b>	18



# Methodology

## Policy Objectives

Eradication of open defecation

Safe disposal of solid and liquid waste

Sustainable Approach towards O&M

## Strategies

100% HOUSEHOLD SANITATION FACILITY

Suitable Technological Options

Resource mobilization and reforms

## Cross sectoral study of-

Affordability and willingness to pay

Cost effective solutions

O & M

Awareness generation

Capacity Building

Financial models

Institutional set up

Human Resource management

Community Participation

# Cluster Approach

## Need for Clustering

Outcome of Reconnaissance survey highlighted similarities in following aspects which formed basis of clustering-

**Availability and status of Infrastructure**

**Socio economic profile**

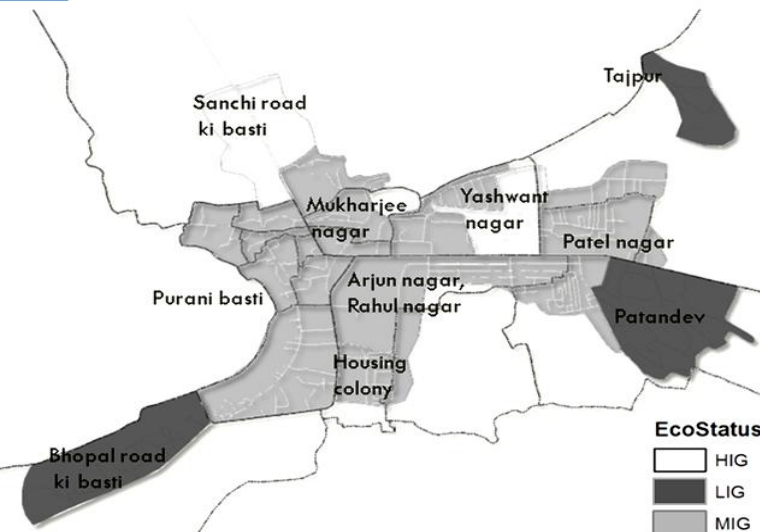
**Urban Sprawl & Density Pattern**

**Housing Typology**

**Topographical features**

- It helped to establish a uniform base for study
- Ease in data assessment and analysis of the issues
- Strategies were more specific and contextual
- Ease in implementation and phasing

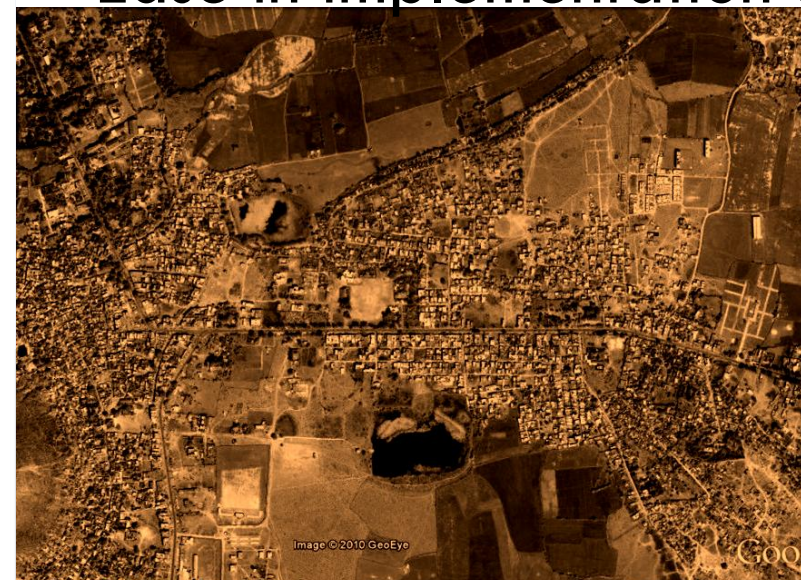
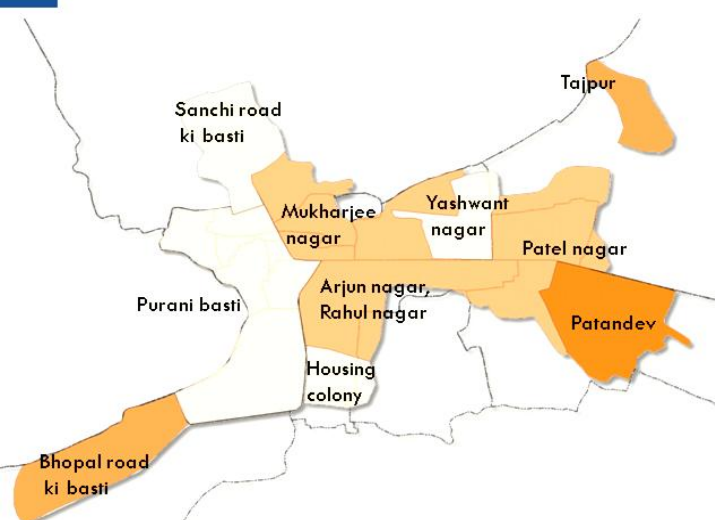
Socio economic classes



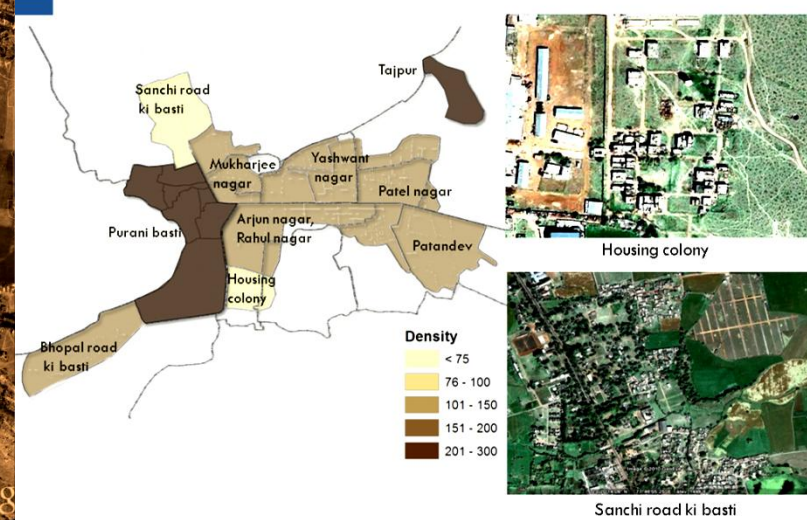
Urban Footprint



Household sanitation facility



Overall Housing Density Pattern





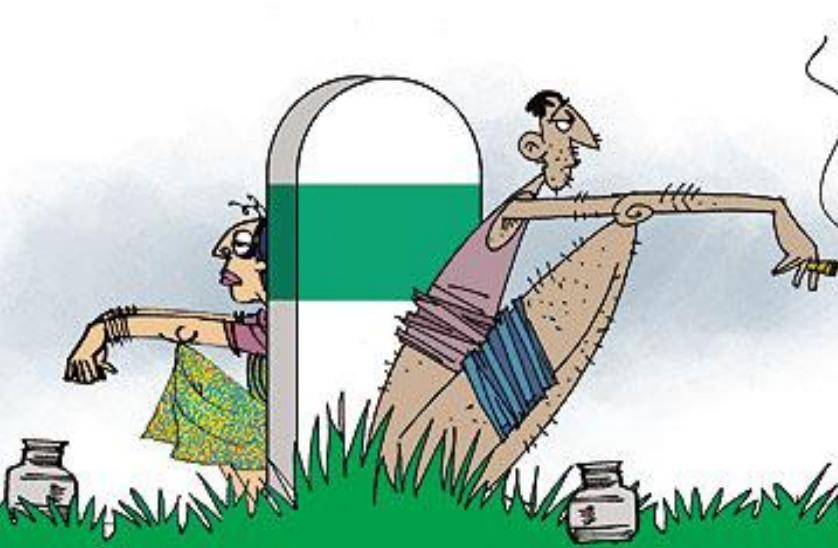
**HOUSEHOLD SANITATION**

**EXISTING SEWERAGE**

**SURFACE DRAINS**

**SWM PRACTICES**

**WATER SUPPLY**



## HOUSEHOLD SANITATION

Access to sanitation infrastructure

Factors responsible for open defecation

Effect of open defecation on health , hygiene and environment

Service level benchmarking

Demand gap and future needs

Technological options

EXISTING SEWERAGE

SWM PRACTICES

SURFACE DRAINS

WATER SUPPLY



# Issues Addressed Through C S P



## HOUSEHOLD SANITATION

### EXISTING SEWERAGE SYSTEM

Coverage and status of system

Efficiency existing of network

Issues in conveyance and treatment

Service level benchmarking

Strategies for future

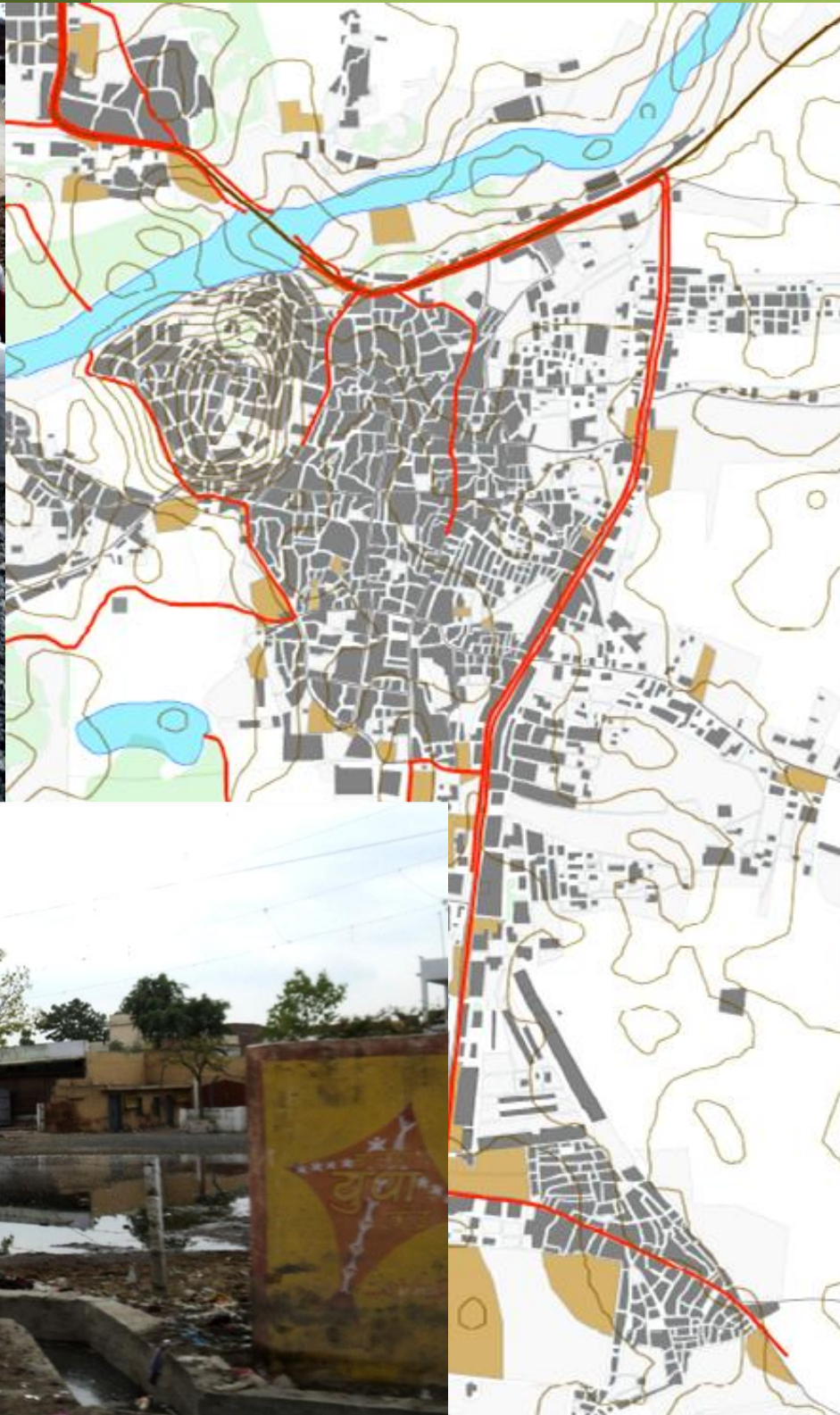
Issues related to Health , Hygiene and Urban environment

### SWM PRACTICES

### SURFACE DRAINS

### WATER SUPPLY

# Issues Addressed Through C S P



HOUSEHOLD SANITATION

EXISTING SEWERAGE SYSTEM

**SURFACE DRAINS**

Coverage and status of system

Efficiency existing of network

Issues in conveyance and treatment

Water logging areas

Strategies for future

SWM PRACTICES

WATER SUPPLY

# Issues Addressed Through C S P



← Developing Country

Developed Country →



HOUSEHOLD SANITATION

EXISTING SEWERAGE SYSTEM

SURFACE DRAINS

**SWM PRACTICES**

Current practices of SWM

Existing infrastructure

Factors affecting Open dumping

Generation of waste in future

Service level benchmarking

Involvement of community

Awareness generation

Technological options

WATER SUPPLY

# Issues Addressed Through C S P



HOUSEHOLD SANITATION

EXISTING SEWERAGE SYSTEM

SURFACE DRAINS

SWM PRACTICES

**WATER SUPPLY**

Access to water supply

Quality and Quantity of supply

Demand supply gap

Future projections

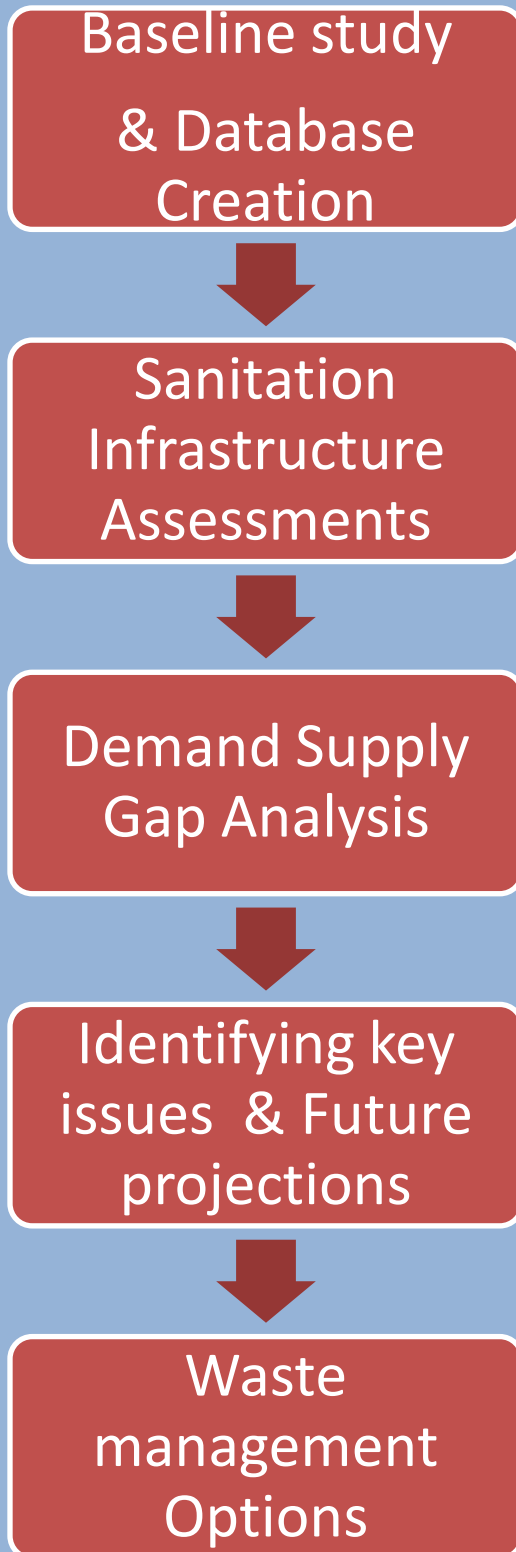
Service level benchmarking

Effect of water quality on health

**After identifying the sectors for detail study and finalizing the indicators and parameters, following activities were enlisted with detail tasks**

# Activity

# Listing for CSP (PHASE I)



Activity 1	General <b>Baseline study</b> and generation of digital maps
Activity 2	<b>Technical Situation analysis</b> and inception report
Activity 3	<b>Stakeholder engagement</b> , awareness raising and communication strategy
Activity 4	<b>Waste management options</b>
Activity 5	<b>Financing plans</b> and Institutional capacity
Activity 6	<b>Draft City Sanitation Plan</b> summarizing all previous results
Activity 7	<b>Participatory Planning</b>
Activity 8	<b>Final city sanitation plan</b>

**Identifying upstream and downstream issues** relevant for with an emphasis on the water resources

**Mapping existing institutional situation** for managing solid and liquid waste, **data for Waste generation, socio-economic conditions of housing and slum areas**

**Mapping important issues for urban planning** (e.g future development plans, Heritage and Tourism especially for Khajuraho as it is a world heritage Site);

**Mapping existing data for environmental status** (hygienic and environmental conditions, water supply, water resources, main polluters, etc.)



Assessment of existing sanitation practices and available infrastructure with focus on –

- # **Access to infrastructure**
- # **Coverage of infrastructure network**
- # **Efficiency**
- # **O&M**
- # **Generation of waste**

**For**

- 8 **Household water and sanitation**
- 8 **Surface drains and existing sewerage**
- 8 **Solid waste management practices**

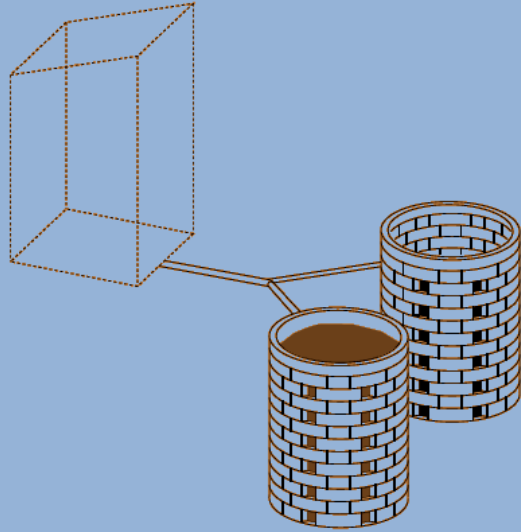
Identifying key issues/ problems/ gaps or loopholes in the service levels







- **Stakeholder survey** (Identifying various target groups and beneficiary groups).
- **Setting up stakeholder groups** for targeted involvement in development of the CSP and interaction strategies.
- Informing stakeholders about the results of the baseline study and situation analysis
- **Selected ULB representatives** from the respective cities participated in an exposure visit to Pune, Mahabaleshwar, Nasik.



- Estimation of Future generation of solid and liquid waste volumes
- Outline design and feasibility study of different options to meet future requirements
- Outline assessment of costs of each option

## Activity 5

# Financing plans and Institutional capacity

- Surveys on affordability, willingness to pay and preferences among future users
- Developing financing mechanisms that allow an extension of the sanitation coverage
- Assessment of realistic institutional capacity for managing the various options

## Activity 6

### Draft City Sanitation Plan

- Summarizing results of technical analysis and Affordability surveys
- Waste management options with indicative costs
- Outlining various strategies and develop Phasing plan

## Activity 7

## Participatory Planning

- Elaborating Advantages and disadvantages of various waste management options to stakeholders in view of existing constraints and opportunities
- Participatory assessment and selection of preferred options

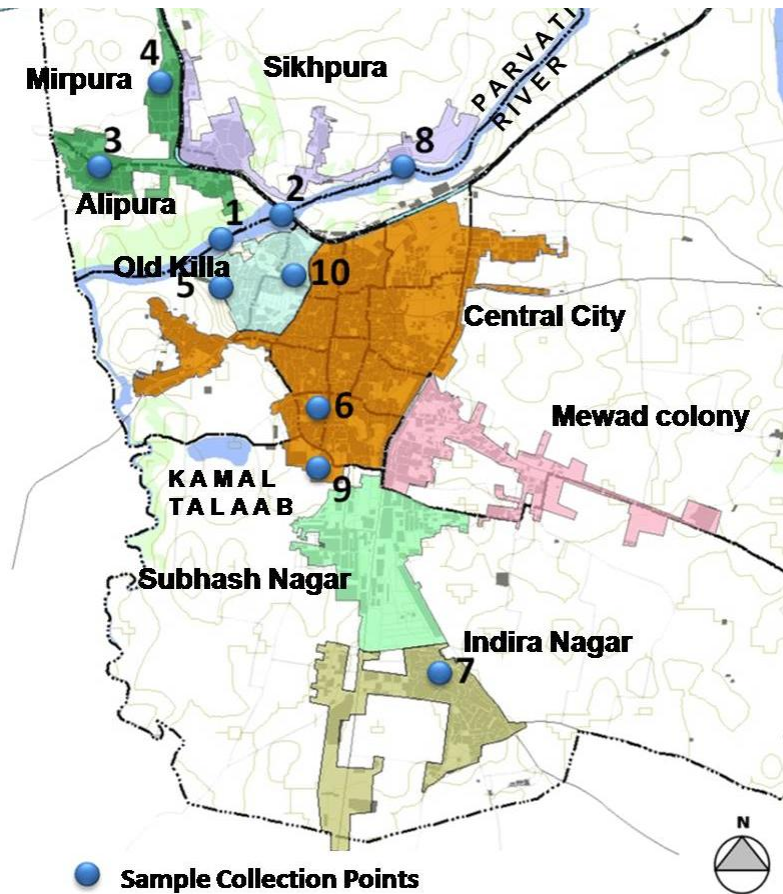
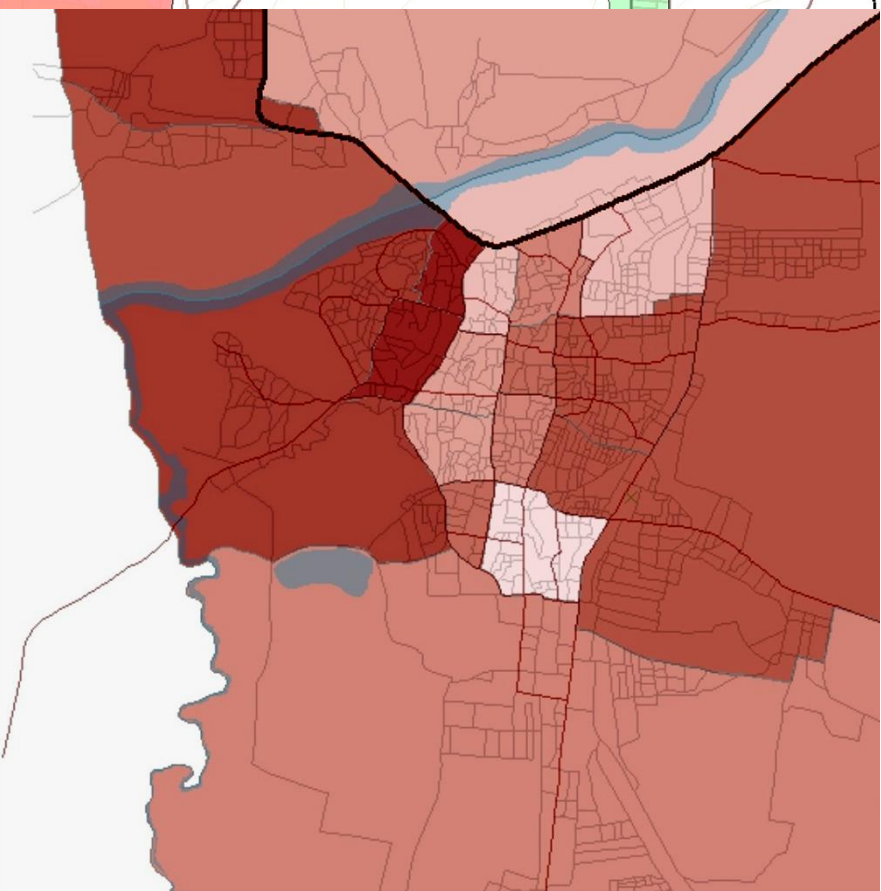
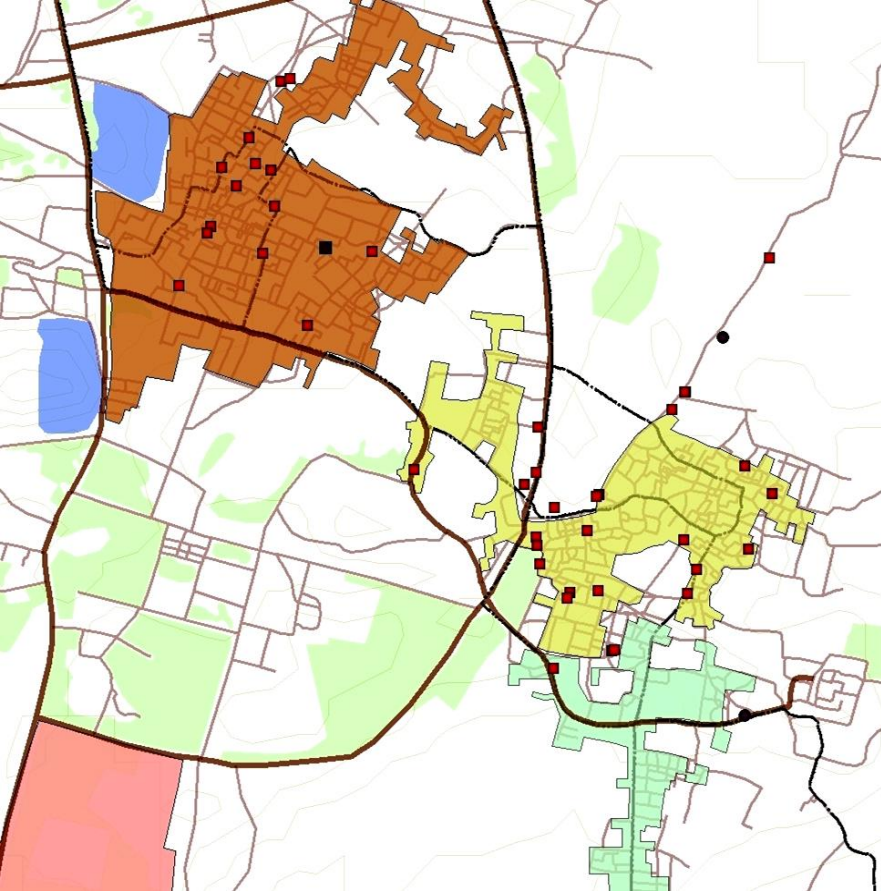
## Activity 8

## Final City Sanitation Plan

- Budget Estimation of Preferred options
- O&M and financial models for sanitation management
- Strategies for IEC , Monitoring and Evaluation
- Way forward and Road Map for Pilot Project

# Role of GIS

- Preparing base map
- Data base generation
- Spatial representation of existing data
- Preparing Thematic and Analytical maps
- Comparative study through spatial data representation
- Developing ICT tools



ICT TOOLS

SAMS

MAPPER

MOBILE APPLICATION

Contribution  
from CEMDS

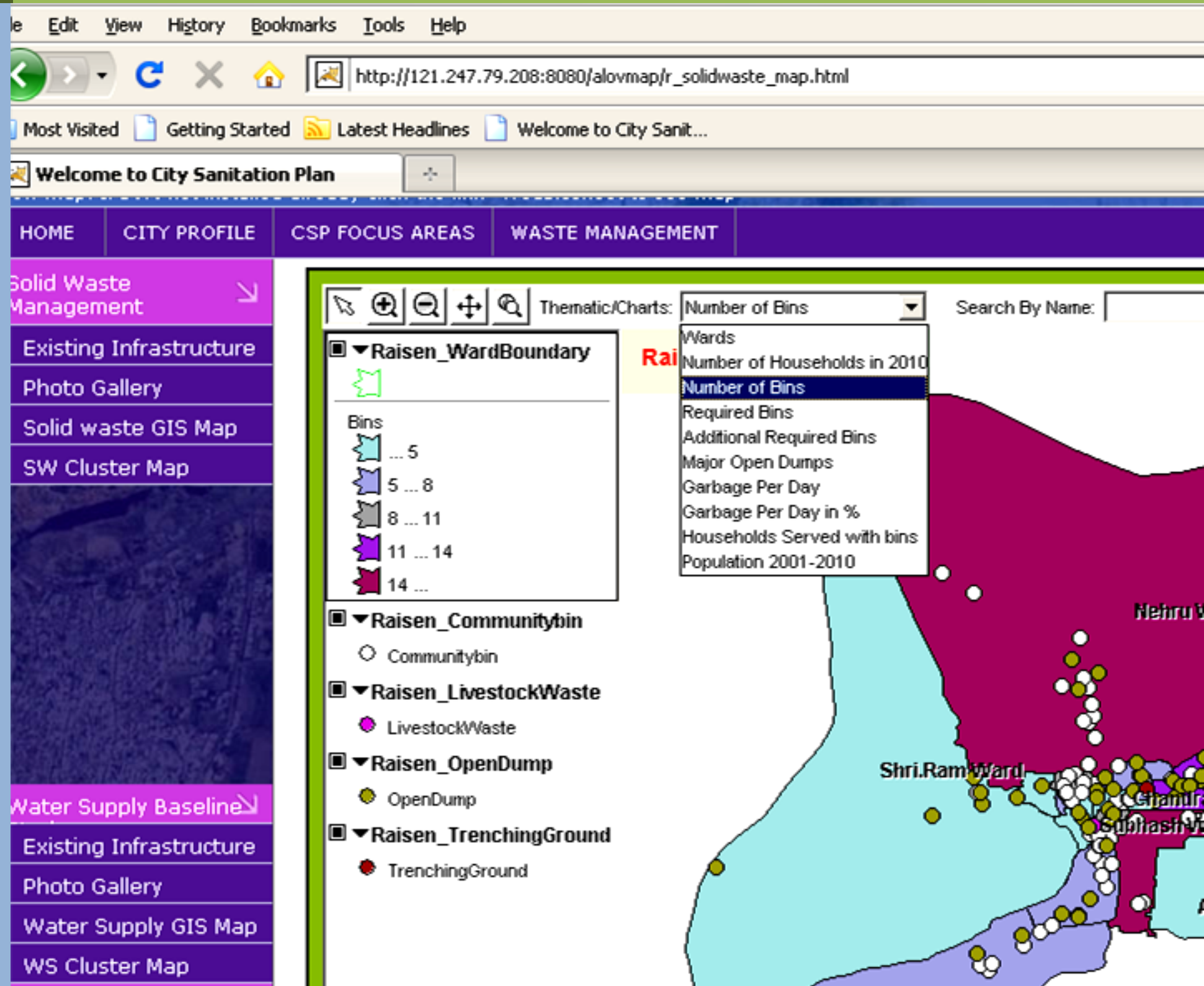
SALIENT FEATURES

- Ease in decision making - SAMS web based Sanitation Amenities Management System with online GIS and CSP data .
- GIS based tool for planning and management purpose : Participatory mapping through mapper in local language.
- Transparency in Monitoring and Evaluation through mobile capturing of key data with photo and lat longs.

□ Easy for analyzing and reviewing the spatial and non-spatial data for each of the sanitation sector

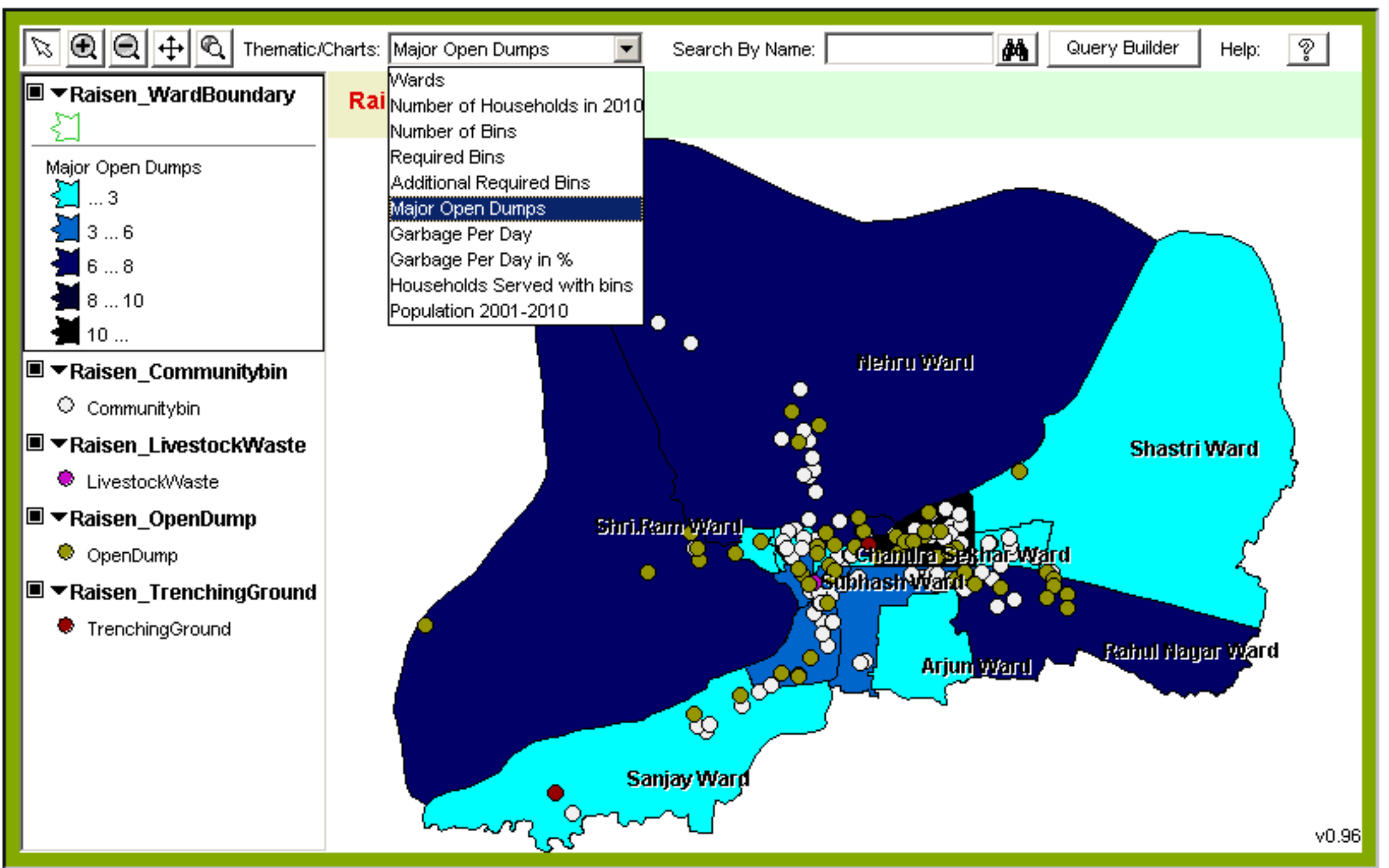
□ Spatial representation of the available data related to sanitation Infrastructure such as locations of –

- Community toilets
- Garbage collection points
- Open dumps
- Hand pumps/ stand posts
- Treatment plant



- Solid Waste Management
- Existing Infrastructure
- Photo Gallery
- Solid waste GIS Map
- SW Cluster Map

- Water Supply Baseline
- Existing Infrastructure
- Photo Gallery
- Water Supply GIS Map
- WS Cluster Map
- Drainage & Sewage Network
- Existing Infrastructure
- Photo Gallery





**International best practices for sanitation:**

**Surveying, studying and documenting various practices related to solid and liquid waste management in context to small cities**

**Support from International experts and from other projects.**

# Strategy Formulation

Short Term

Long Term

Mitigating Demand Gap

Augmenting sanitation coverage

Providing Household toilets

Initiating door to door collection

Providing Community bins

Rehabilitation of drain channels

Initiating awareness generation

Sustainable Approach

Demand based strategy for Sanitation infrastructure

Assimilate Sanitation management plan with development plan

Upgrading sewerage system

Provision of Sanitation infrastructure for solid and liquid waste

Sustainable models of community managed O& M

Upgrading status of infrastructure

Integrated Planning

Efficiency in O & M

Mid Term



# Suggested Technological options for wastewater management

## Consideration of-

- Need in future
- Technical details
- Operational cost
- Management cost
- Required Fund mobilization
- Required Human resource
- Sustainability and environmental impact

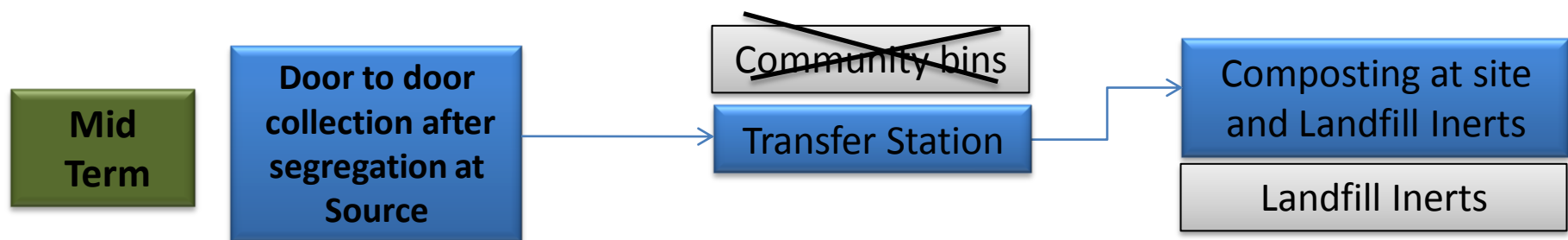
Option		TYPE	Environment Concerns	Capital Cost	O & M Cost
ONSITE	Option 1	Pour Flush Toilets with Septic Tanks			
	Option 2	Water Seal Toilets with Twin Pits			
	Option 3	Ecosan (Dehydrated vaults)			
OFFSITE	Option 4	Anaerobic Baffled Reactor (ABR)			
	Option 5	Activated Sludge Process (ASP)			
	Option 6	Upflow Anaerobic Sludge Blanket (UASB)			
	Option 7	Solid Immobilized Bio Filter (SIBF)			
	Option 8	Waste Stabilization Pond			

Environment	Meaning	Capital Cost	Meaning	O/M Cost	Meaning
	Higher Consideration		Lower capital cost		Lower Cost
	Lower Consideration		Moderate capital Cost		Moderate Cost
	Least Consideration		Higher capital Cost		High Cost

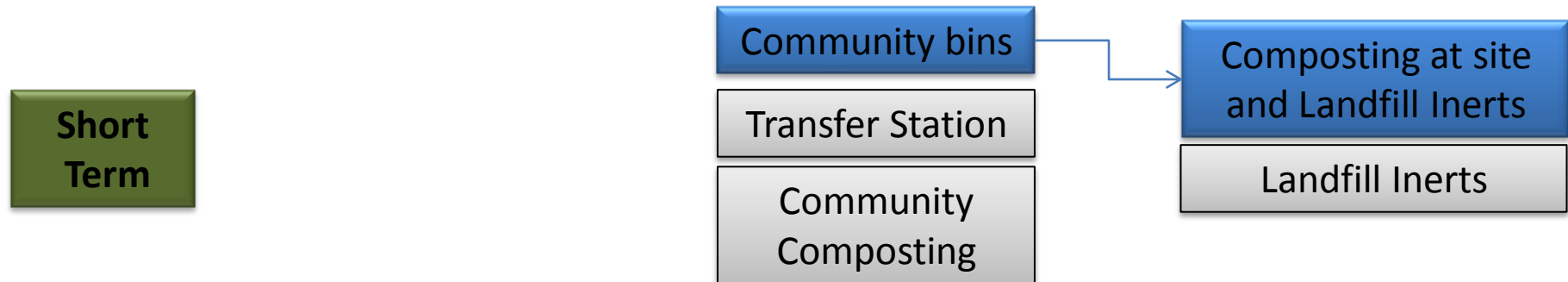
# Suggested Technological options for SWM



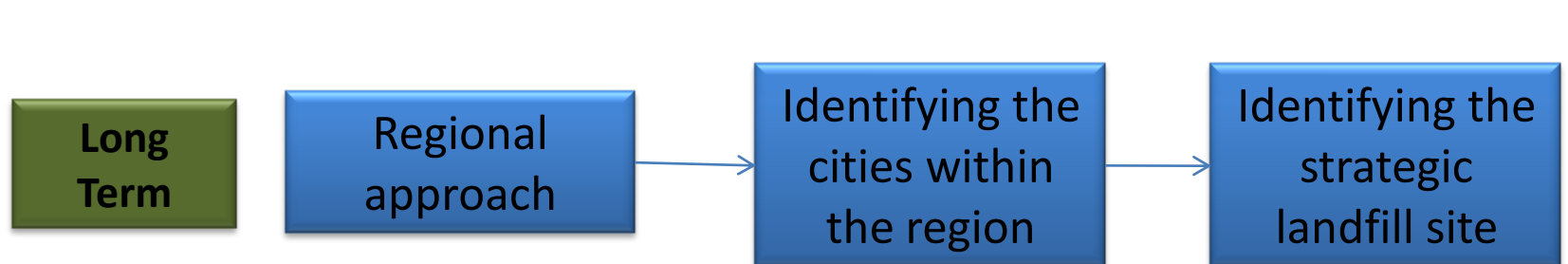
Option 1



Option 2



Option 3



# Strategies for Waste Management Options

**Developing Social Accountability** by direct involvement of citizens in decision making

Introduction of competitive reward schemes at ward/ cluster/ slum level as well as at city level

**Ensuring monitoring and evaluation in designing Implementation and post implementation phase**

Introducing concept of **Participatory Community Monitoring** by providing Community score cards, Citizen Report cards, etc.

Promoting NGOs and SHGs for involvement of capacity building

ROAD AHEAD...



ULB's

 WaterAid



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# WHY PILOT ?

## Need of Pilot Project

### PHASE - II

**Demonstrating and testing practicality of suggested strategies**

**Demonstrating effective implementation of scheme through a pilot project**

**Capacity Building to establish a Sustainable model for Sanitation management**

## Implementation Plan & Pilot Project (PHASE II)

- Identifying and enlisting target areas based on the outcome of existing status analysis
- Prioritizing the crucial areas through participatory assessment with stakeholders
- Developing Short term strategy and draft an implementation plan for the same
- Carrying out detail technical survey and prepare project report elaborating –
  - engineering design for waste management
  - Fund mobilization
  - Resource mobilization and Institutional set up
  - O&M

# Identification of Area for Piloting

