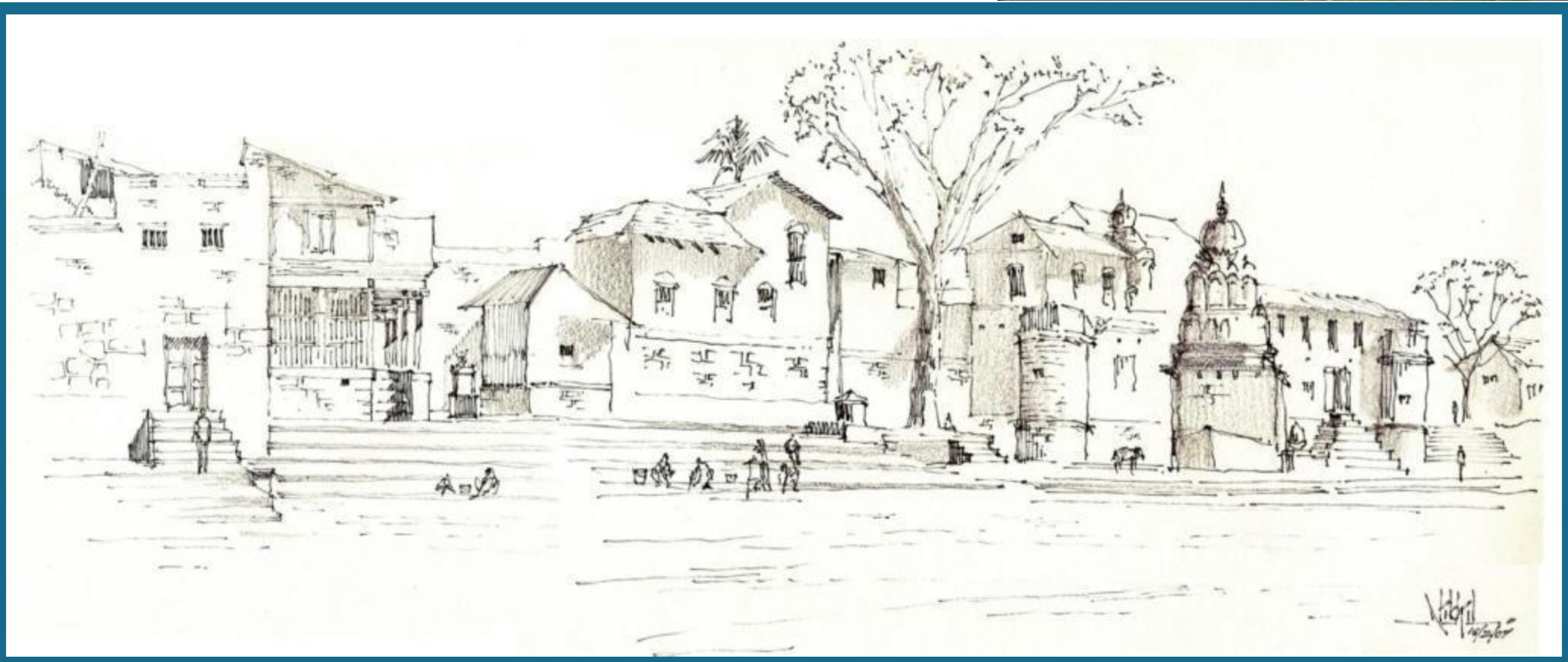
Performance Improvement Planning (PIP) Model

Workshop on Capacity Building for Service Level Benchmarking (SLB)

21ST November, 2013, Shillong (Meghalaya)

Application of PIP Model

for case of a small town in Maharashtra

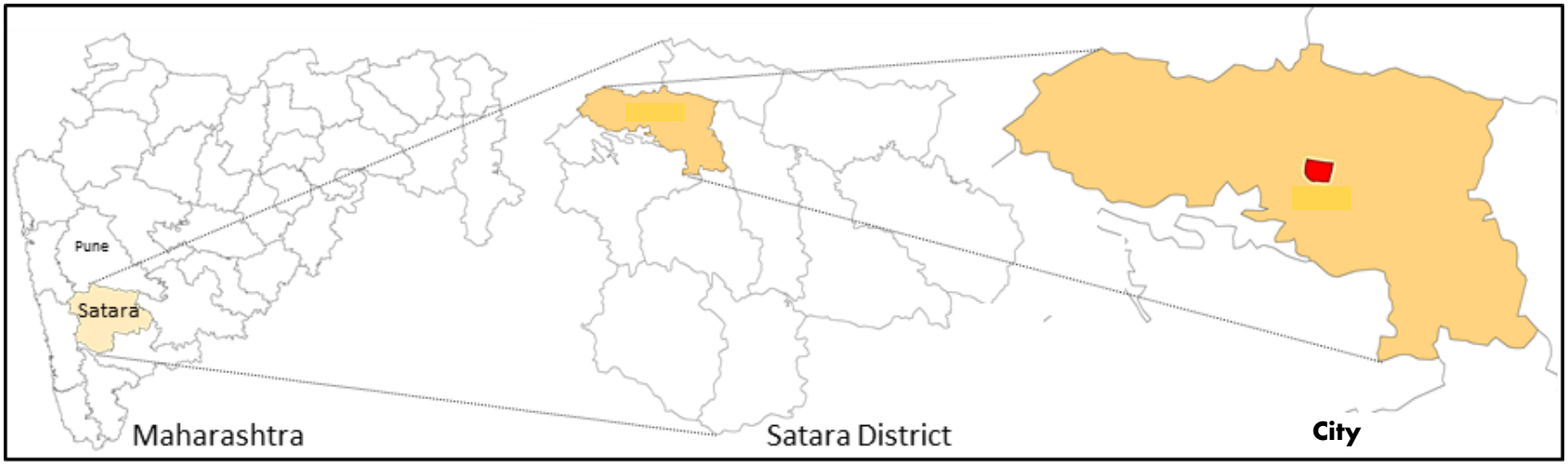


City in Maharashtra

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Civic status	Municipality Class C
Area	3.64 sq. km
Location	90 Kms from Pune
Number of Wards	5 Prabhags / 19 wards

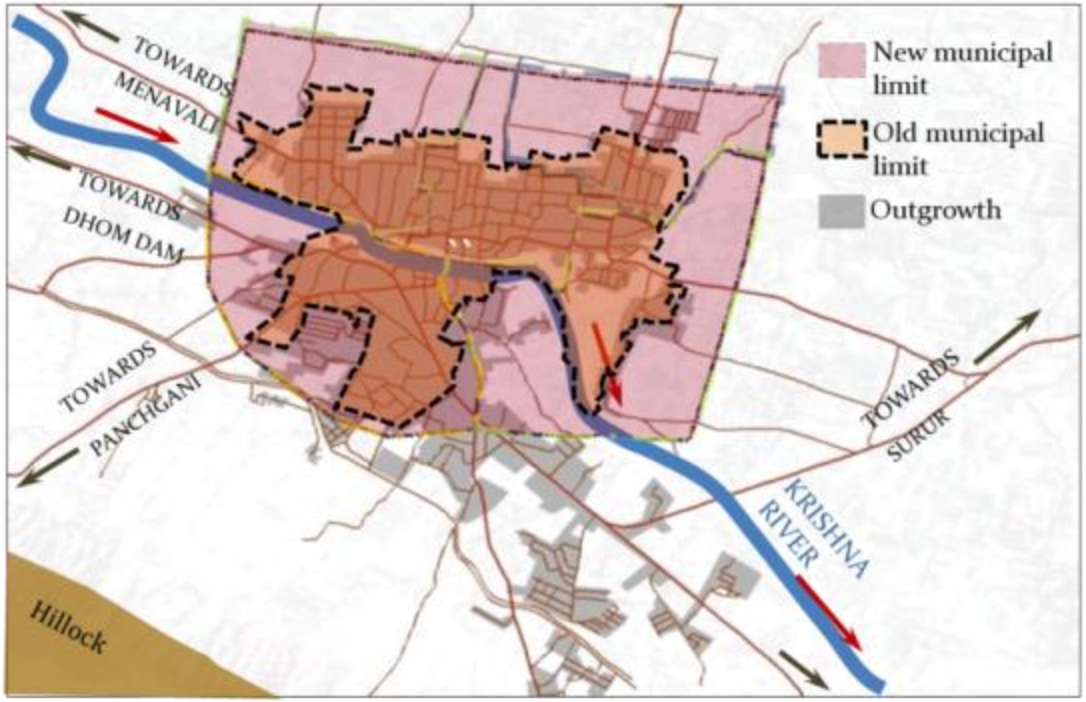
Demography	
Population (No)	36,053
Households (No)	7580
Slum Population	2140
% of slum population	6%
HHs in slums (No)	342



City in Maharashtra

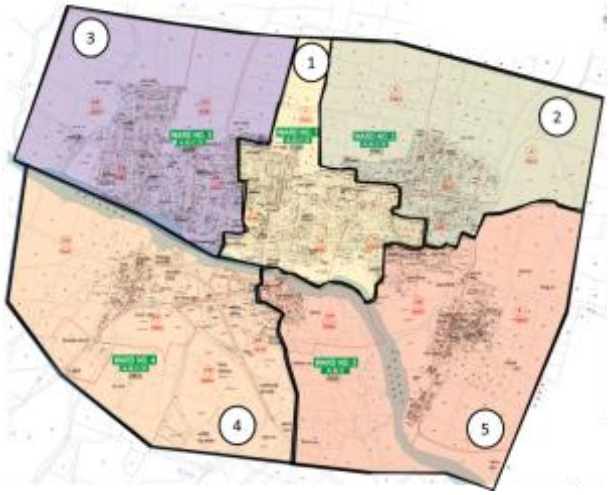
BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Administrative details



Prabhag	Wards	Total HHs	Population
1	1,7,8,9	1524	6607
2	2,3,4,6	1491	6916
3	10,11,12,13	1826	7805
4	14,15,16,19	1438	8023
5	5,17,18	1464	6702
Total		7743	36053

Administrative divisions



Slum Settlements

- Two slum settlements house 342 households and 6% of the city population

NAME	AGE	POPULATION
Gurebazar	30	1328
Kashikapadi	50	812
Total		2140

City in Maharashtra

BASE INFORMATION

↓

ASSESS CITY PRIORITIES

↓

SELECT IMPROVEMENT ACTIONS

↓

DEVELOP IMPROVEMENT PLAN

↓

REVIEW IMPROVEMENT PLAN

↓

MAKE FINANCIAL DECISIONS

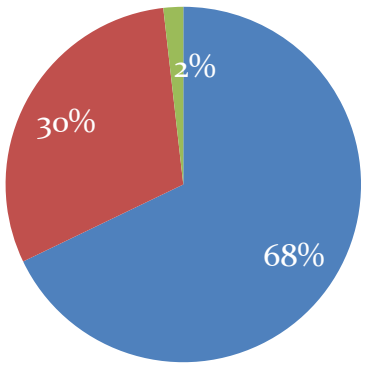
↓

REVIEW FINANCING PLAN

Sanitation

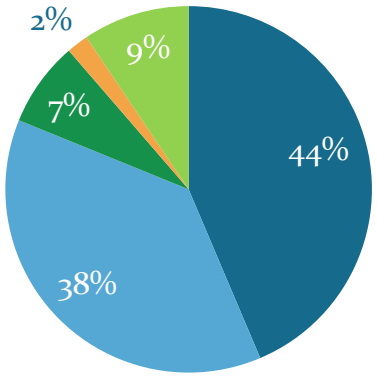
BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Coverage of sanitation facilities



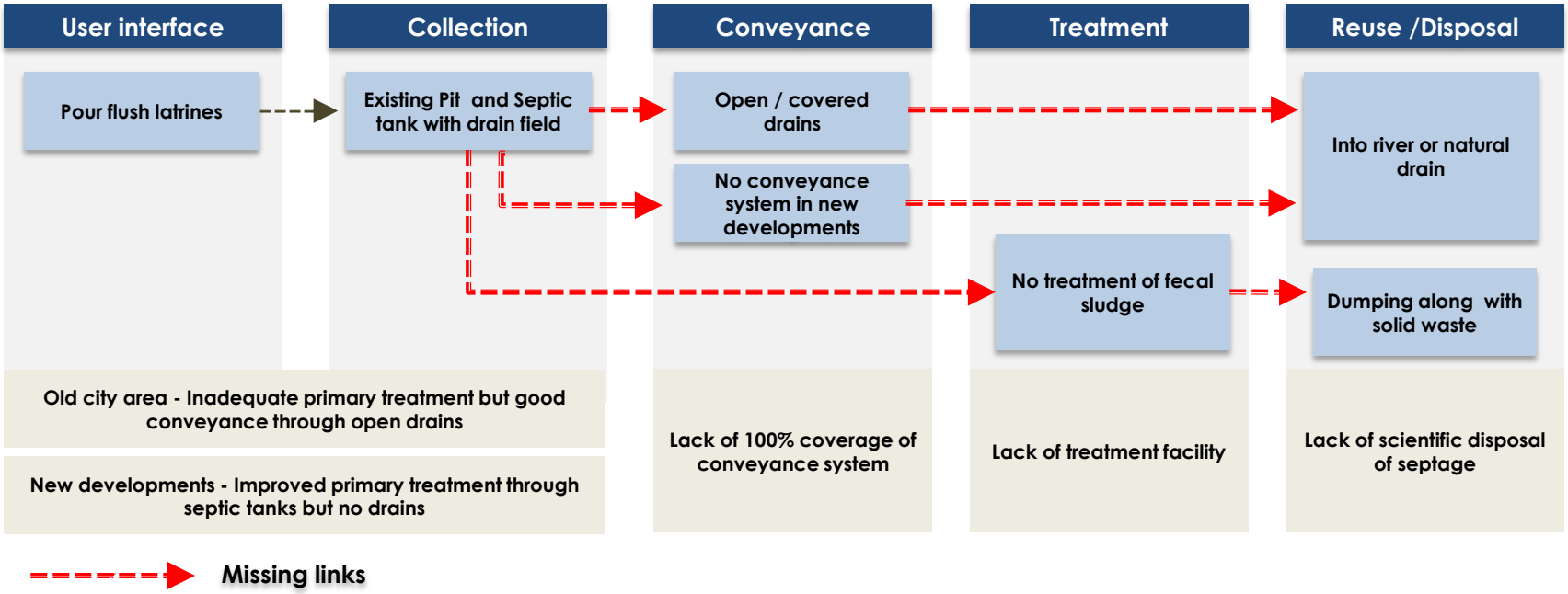
- Households having Individual toilets
- HH depending on Community toilets
- HH practising OD

On-site disposal facility



- HH having individual toilets
- Toilets having Septic tanks
- Toilets having non fuctional septic tanks
- Toilets having Other facility
- Toilets needed for augmenting onsite disposal system to Septic tank

Sanitation value-chain



Sanitation

BASE INFORMATION

↓

ASSESS CITY PRIORITIES

↓

SELECT IMPROVEMENT ACTIONS

↓

DEVELOP IMPROVEMENT PLAN

↓

REVIEW IMPROVEMENT PLAN

↓

MAKE FINANCIAL DECISIONS

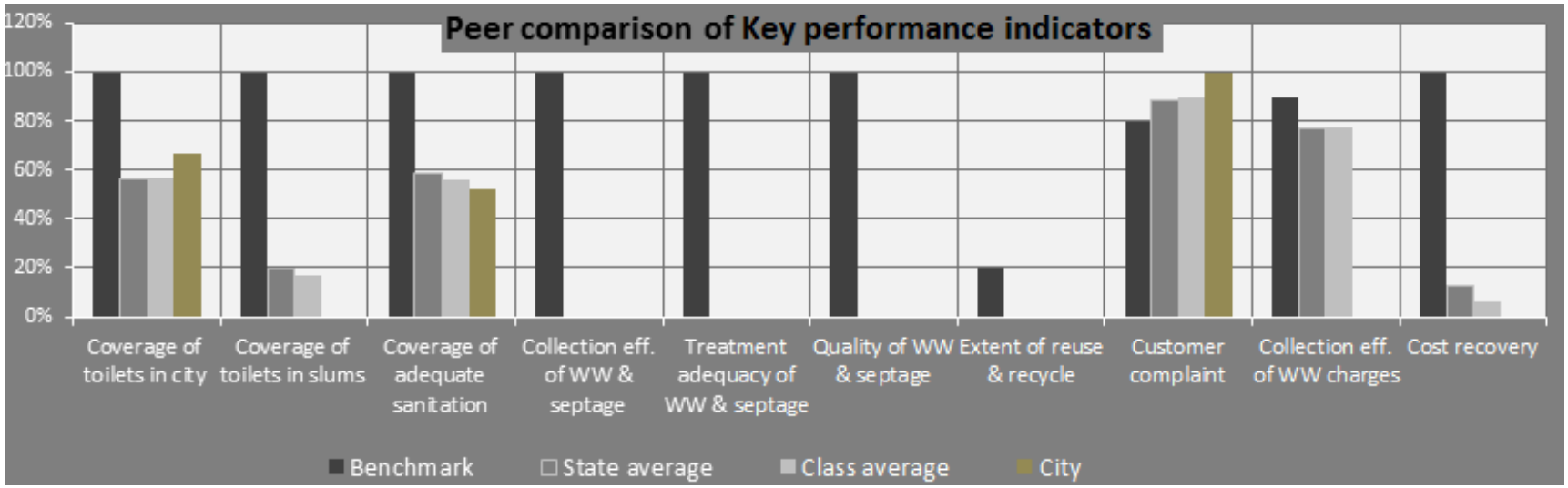
↓

REVIEW FINANCING PLAN

USER INTERFACE	COLLECTION/ STORAGE	CONVEYANCE (through natural drains)	TREATMENT/ DISPOSAL
			
			
			

Sanitation

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN



Access & Coverage

- Lower individual toilet coverage of city is lower than peer group & State
- Slum level individual toilet coverage is 0 % , the slum HHs are dependent on community toilets
- Absence of drainage network in newly developing area

Service level & Quality

- Absence of any kind of treatment facility for both waste water and septage
- Only 3 % of the septic tanks are cleaned annually

Efficiency in service operation

- No quality tests before disposal of waste water flowing through drains
- No quality tests before disposal of septage on dumping grounds

Financial Sustainability

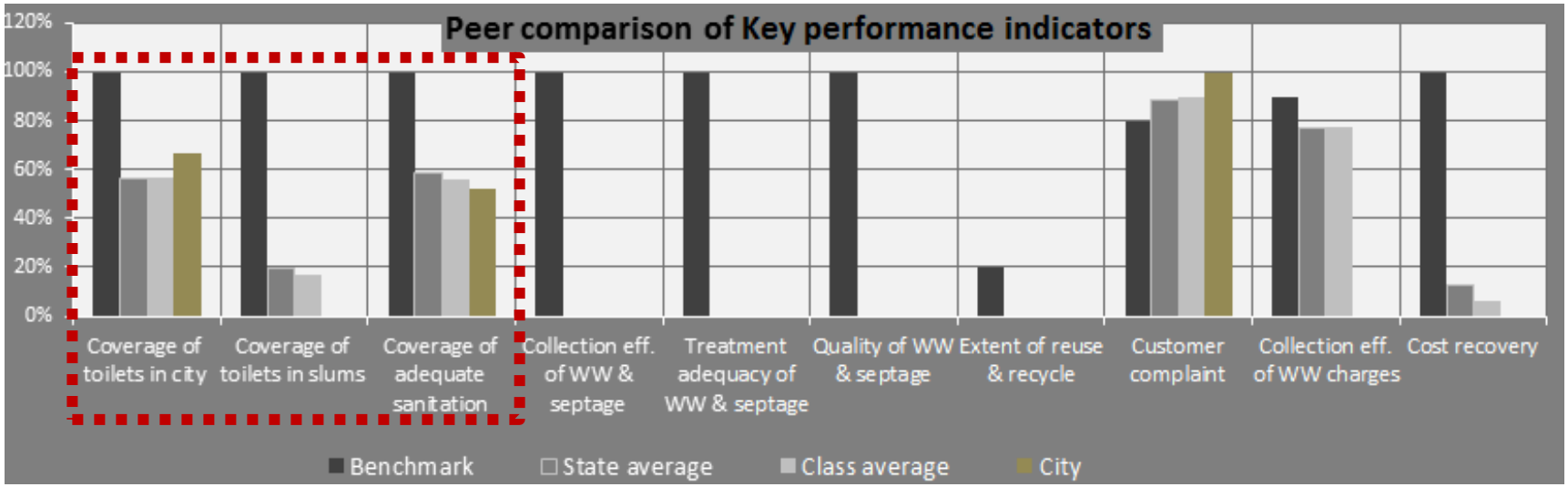
- 15% of No charges for sanitation services provided in the city. Only source is septic tank cleaning charges

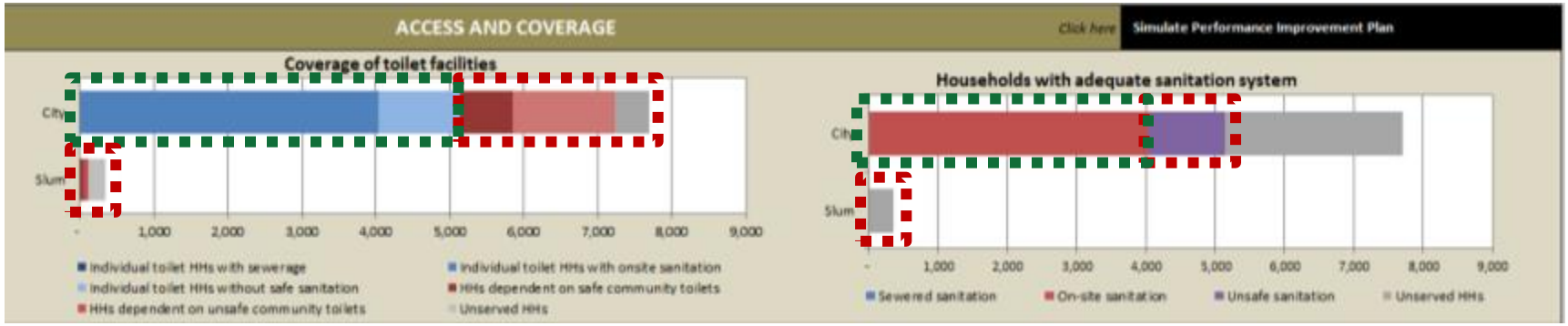
The city is non – sewered, so majority of sewerage indicators are not generated

Sanitation

High dependence on community toilets

Effluent from septic tanks let off in un-scientific ways.





Households having latrines

Households not having latrines

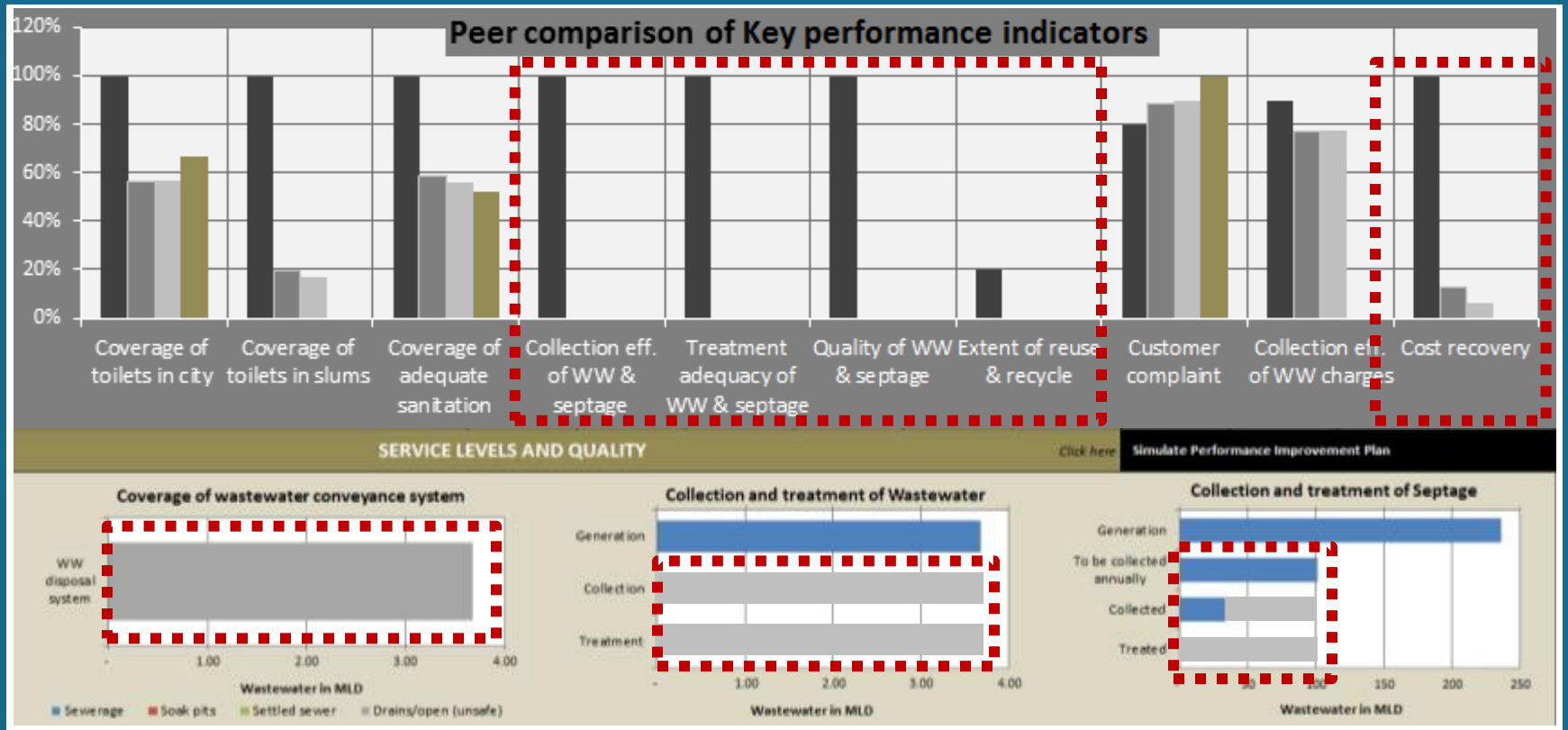
Toilets having sanitary disposal system

Toilets not having sanitary disposal system

Sanitation

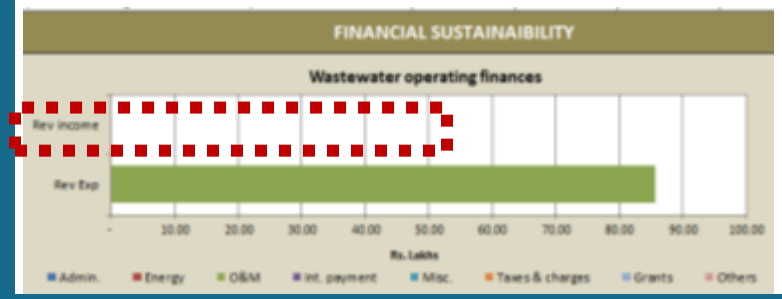
No waste water or septage treatment facility

No tax to recover costs incurred for the service



There is no waste water conveyance system in the city and hence it is not collected.

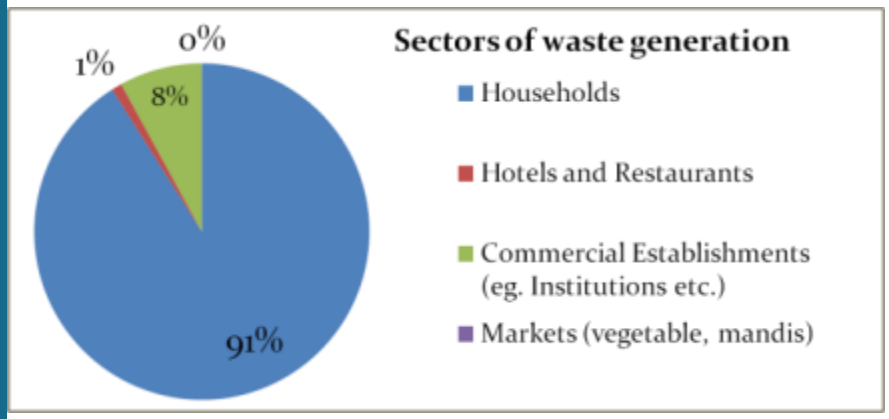
Only part of septage that needs to be collected is collected, and none treated

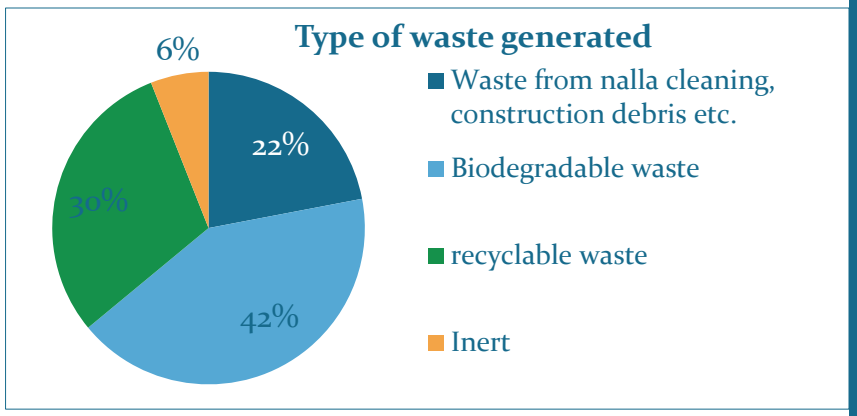


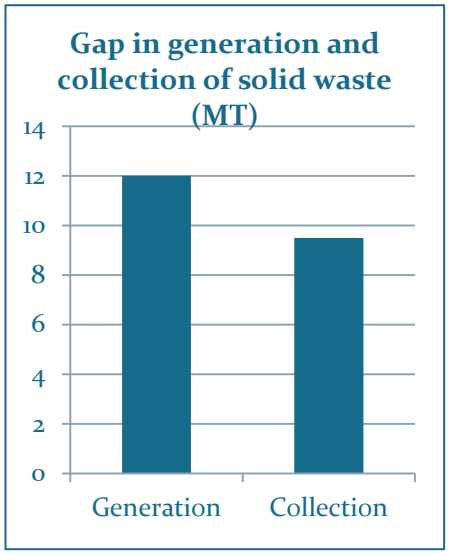
No revenue stream for sanitation

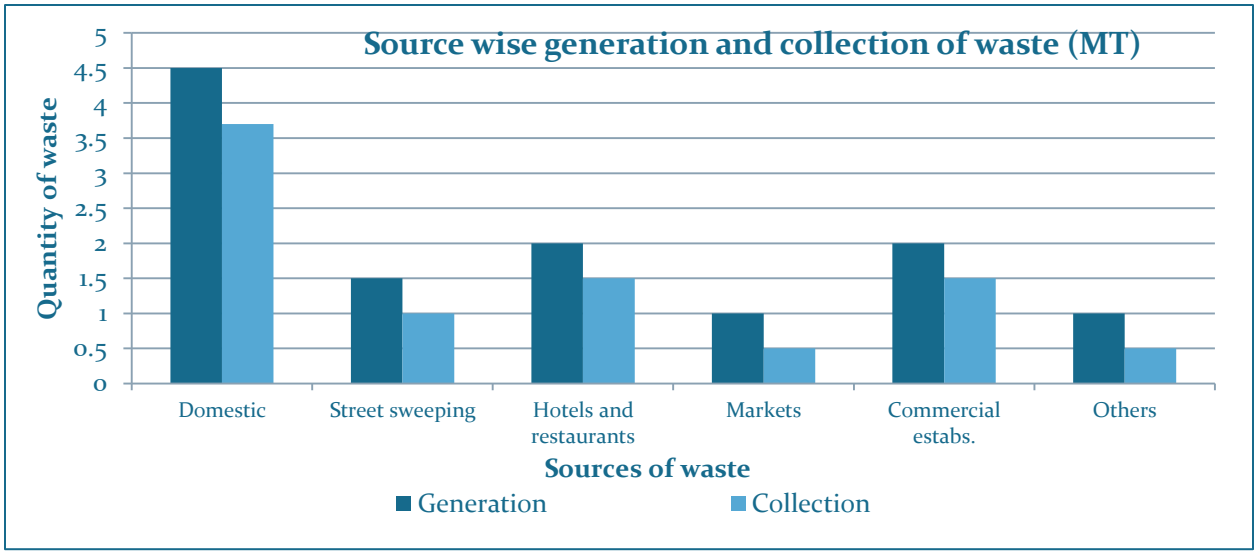
Solid Waste Management

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN



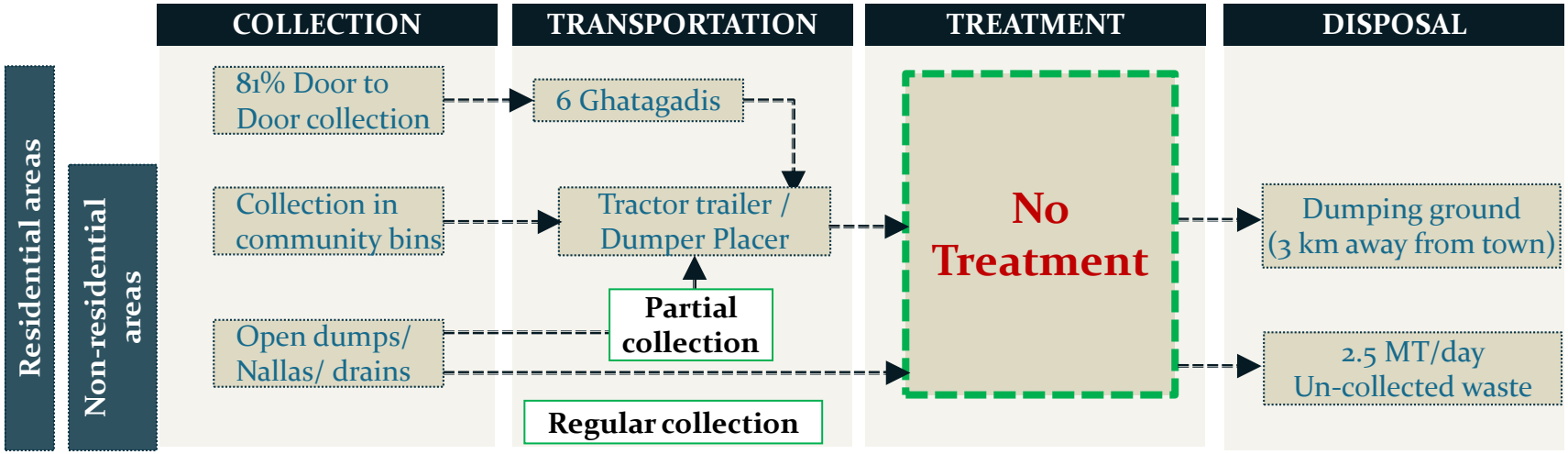






Solid Waste Management

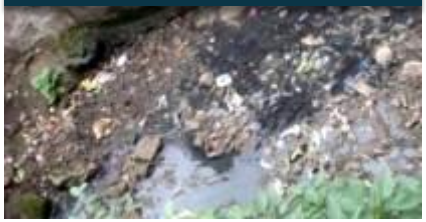
BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN



Door to door Collection

Collection in bins

Dumping along natural drains



Dumping ground

Collection from bins

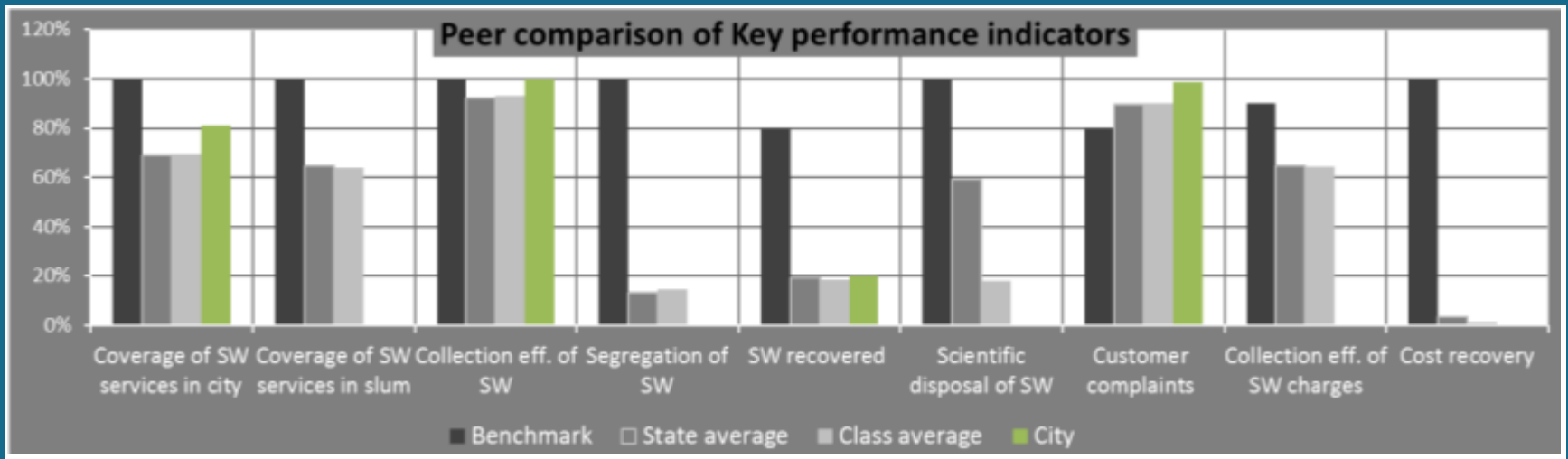
Collection in secondary bins

Dumping in river

Dumping ground

Solid Waste Management

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN



Access & Coverage

- HHs level D-D coverage of city is better than peer group & State, however D-D services have yet not reached the newly developing areas
- D-D collection services are not provided in slums

Service level & Quality

- 100 % collection efficiency of wastes
- No segregation of waste
- Vermi composting non functional due to management issues

Efficiency in service operation

- Dumping of solid waste in the dumping grounds

Financial Sustainability

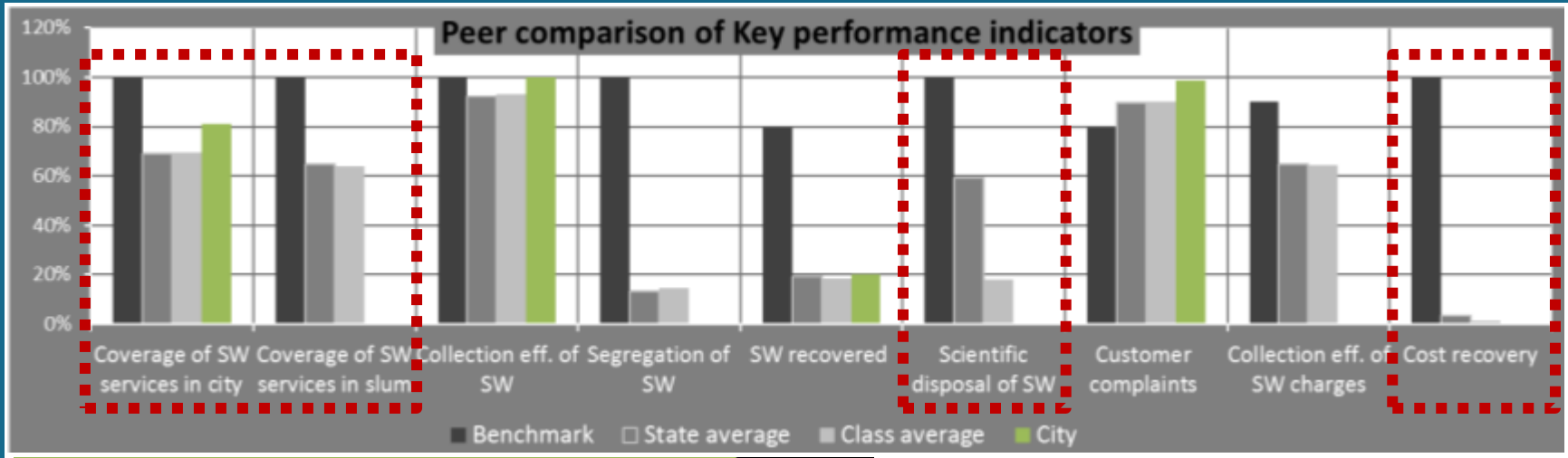
- No dedicated charges for solid waste related services
- 15% of property tax is transferred for O&M of solid waste related services

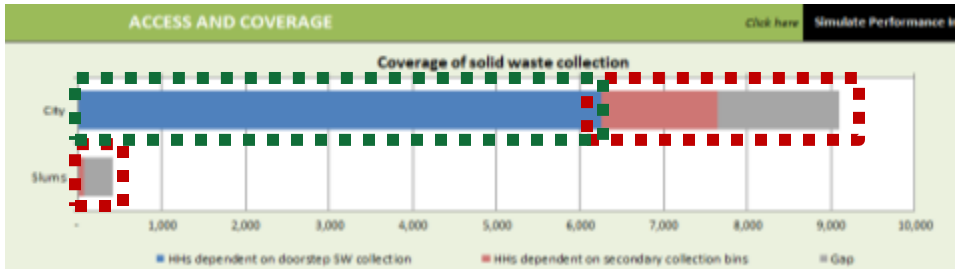
Solid Waste Management

No segregation of waste

Crude dumping of most of the collected waste

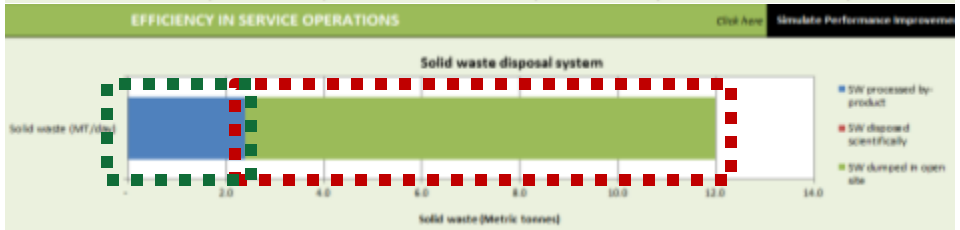
No tax to recover costs incurred for the service





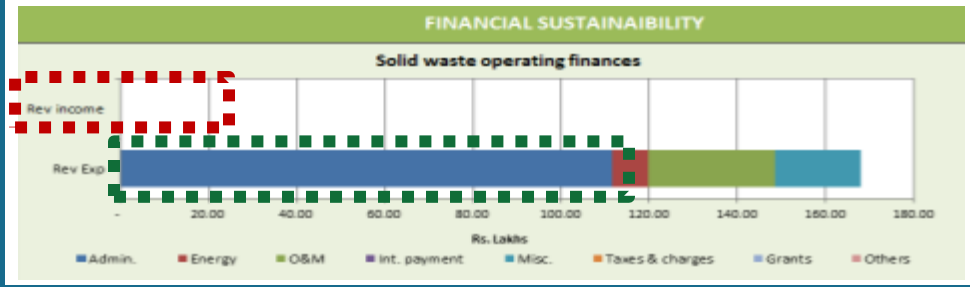
Households served by D2D collection system

Households not served by D2D collection system of the city



Waste treated and converted to manure

Waste dumped without any treatment

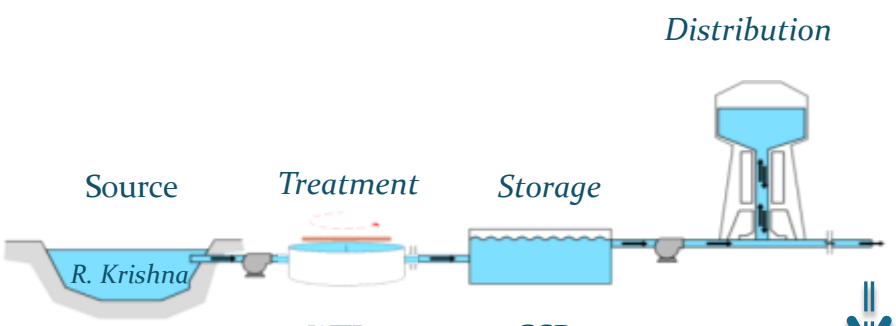


No revenue stream for SWM

Majority of expenses are towards salaries of permanent and temporary employees

Water Supply

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

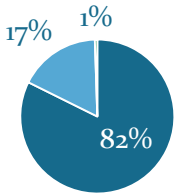


Ground Water
7 Private well
1 Bore well
Total 5.83 MLD

WTP
4.8 MLD

GSR
3.5 LL

ESR
16.6 LL



Authorised consumption

Meter ₹ — Billed metered **0 MLD**

~~Meter~~ ₹ — Billed unmetered **4.57 MLD**

Revenue water 4.57 MLD (78.39%)

Apparent losses

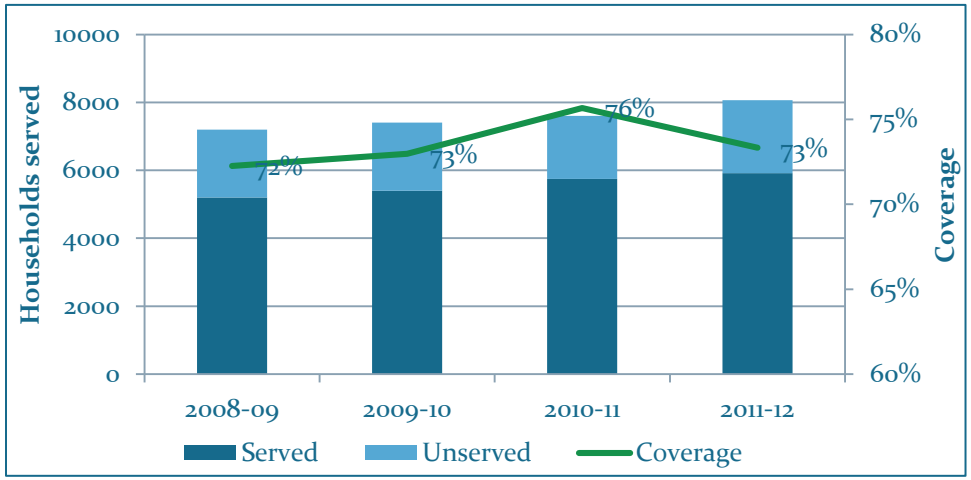
~~₹~~ Unbilled authorized **0.04MLD**

Real losses

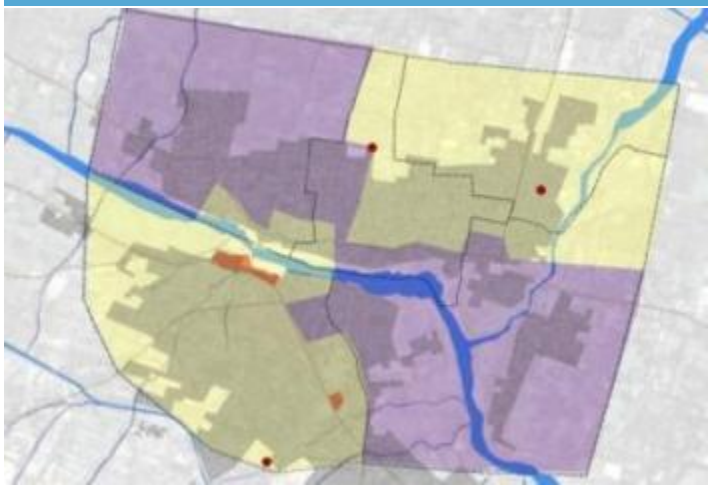
~~₹~~ Unauthorized use and leakages in transmission and distribution **0 .98 MLD**

Non revenue water 1.02 MLD (21.61%)

Coverage of WS connections

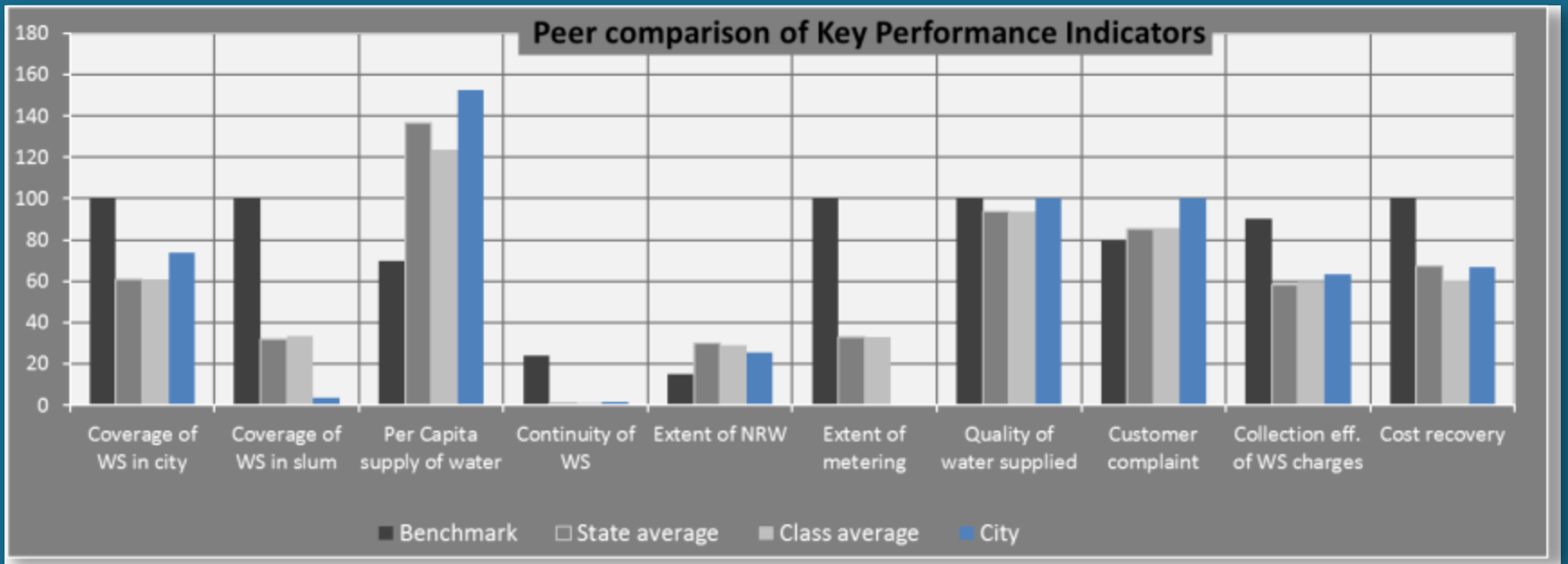


Water Supply Zones



Water Supply

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

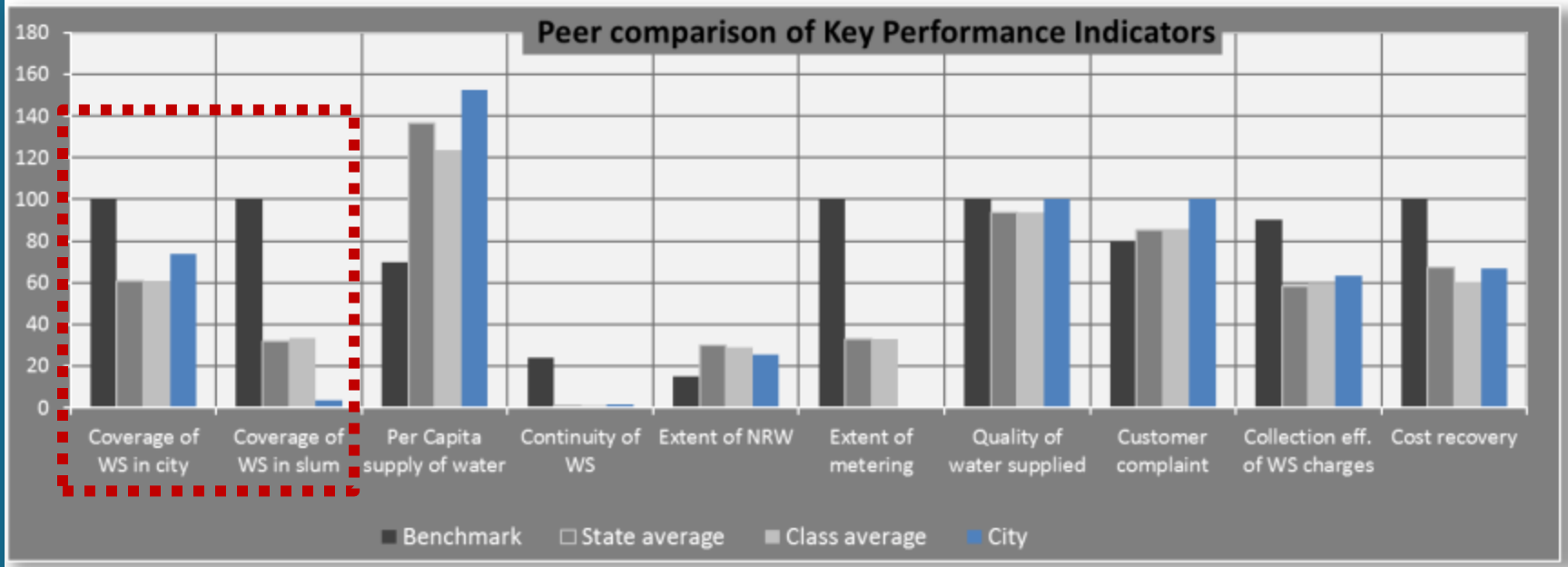


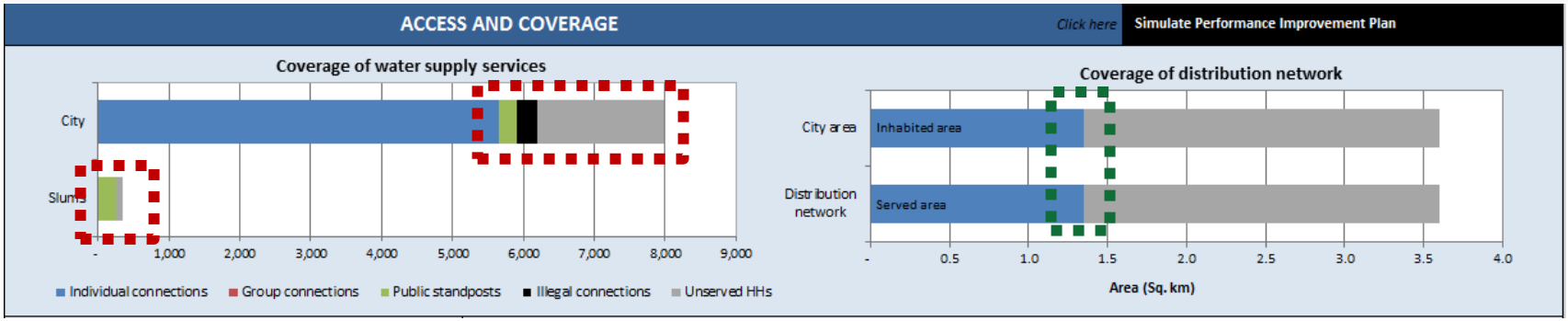
Access & Coverage	▪ Fares better than peer average on individual water supply connections ▪ Slum level individual water supply connection is very low 3%
Service level & Quality	▪ Water is supplied to the residents at the rate of 123 lpcd ▪ Daily 1.5 hours water supply
Efficiency in service operation	▪ No practice of metering water supply connections ▪ Shows 100 % redressal of complaint lodged by residents of the city
Financial Sustainability	▪ Cost recovery and collection efficiency of charges is almost at par with state and class average

Water Supply

Network is available but not all households have a connection

Very few individual connections in slum settlements





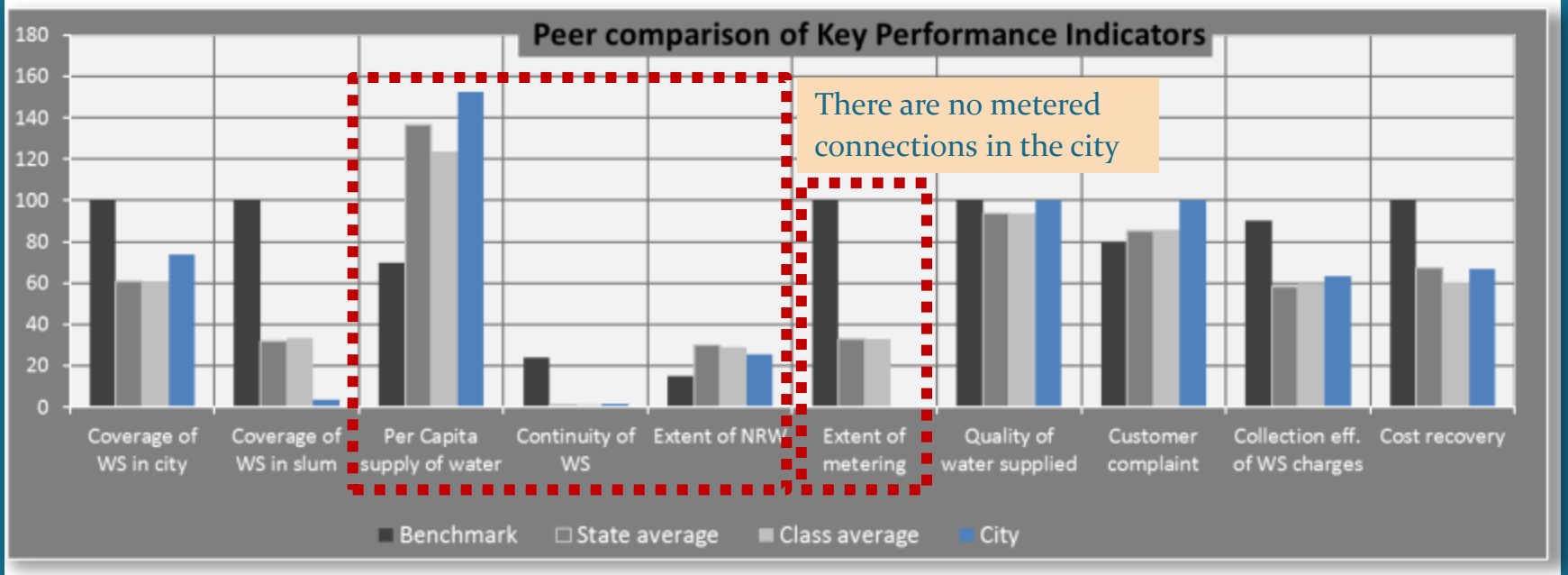
Only 3% HHs in slums have individual connections

Households served by stand-posts, illegal connections and un-served households

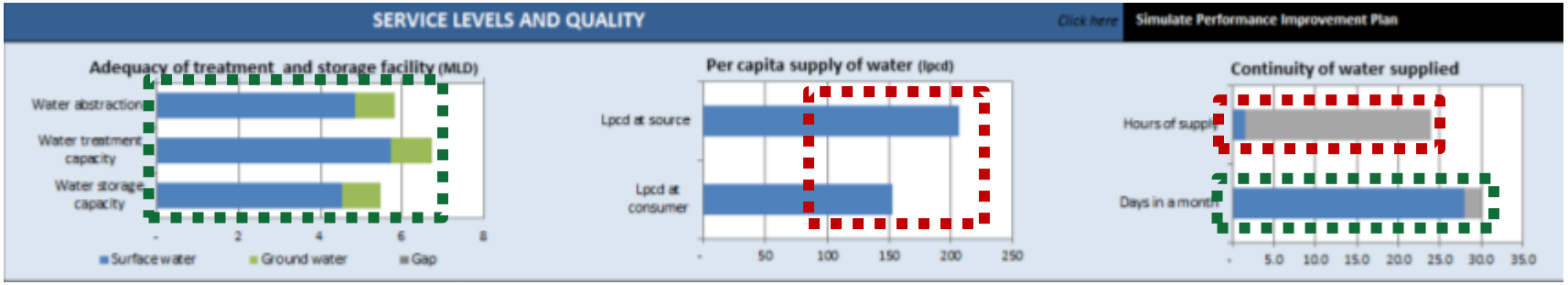
Network is available in all the inhabited area

Water Supply

Water is available but NRW is high



There are no metered connections in the city



Adequate water at source, adequate treatment and storage capacity

Adequate supply at consumer end

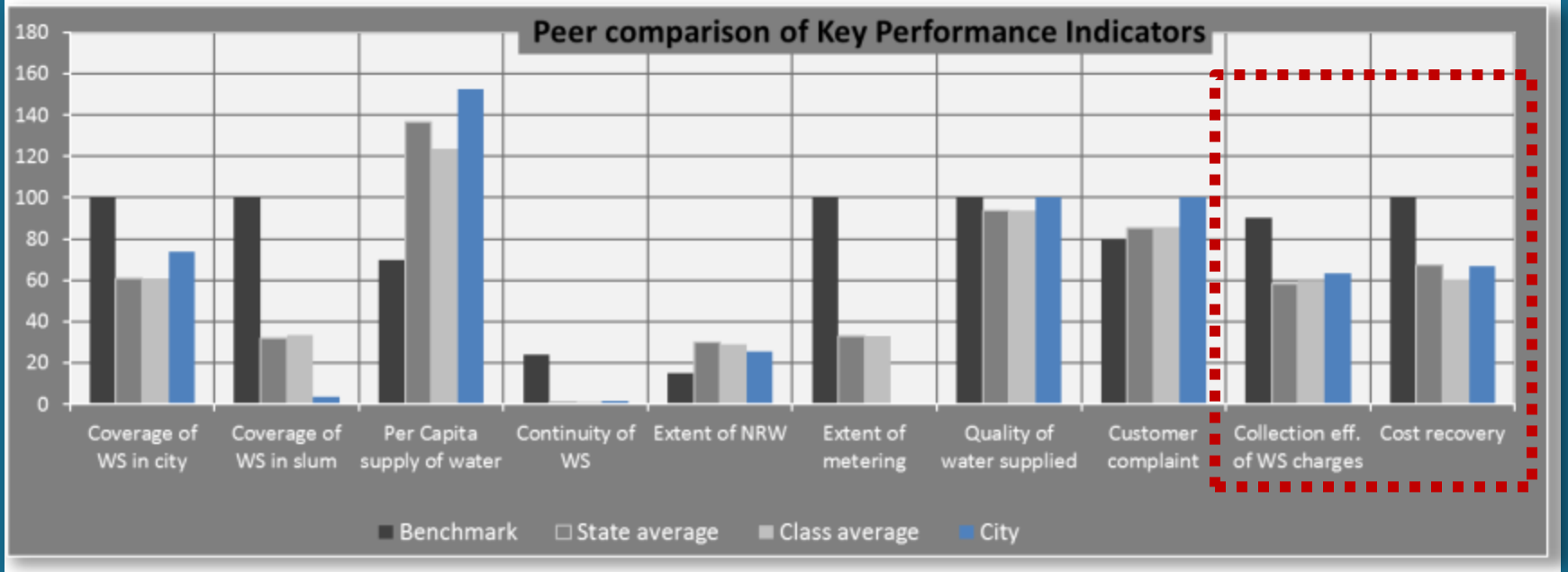
NRW much more than benchmark

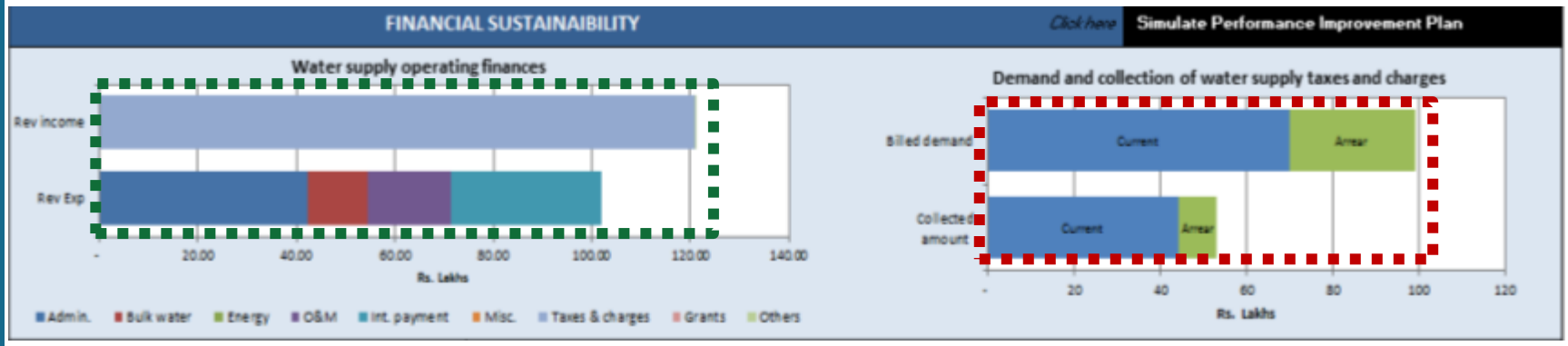
Water is supplied only for 1.5 hrs

Water is supplied almost everyday

Water Supply

Cost recovery is more than 100% but collection efficiency is only 63%





Revenue receipts are more than operating expenses for water supply services.

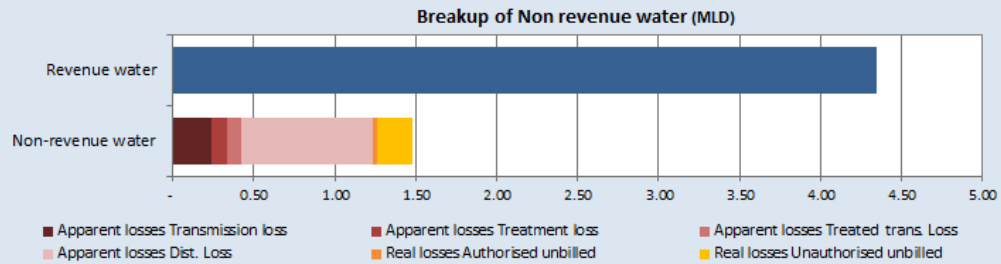
Collection efficiency of water tax is only 63% for current demand and 31% for arrears

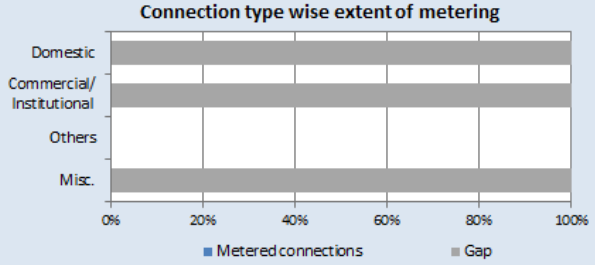
Water Supply

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

LAI – KPI impact matrix

EFFICIENCY IN SERVICE OPERATION — *Click here* **Simulate Performance Improvement Plan**





Actions for performance improvement	Impact of actions on KPIs: Coverage of individual connections in city	Coverage of individual connections in slums	Per capita supply of water	Continuity of water supplied	Extent of non-revenue water	Extent of functional metering	Quality of water supplied	Efficiency in redressal of complaints	Efficiency in collection of water supply charges	Extent of water supply cost recovery
A) Data improvement measures										
☑ Conduct water audit										
☐ Conduct energy audit										
☑ Instal bulk flow meters										
☐ Map water supply and wastewater network										
☐ Conduct Hydraulic modelling										
☐ Conduct Utilities survey (asset mapping)										
B) Process/Policy improvement measures - No cost										
☐ Improve processes for regular checking of water losses										
☐ Policy to introduce universal consumer meters										
☐ Improve processes for management of consumer complaints										
C) Existing system improvement measures - Low-cost										
☐ Reduce losses in trunk main transmission network										
☐ Reduce losses at water treatment plant										
☐ Reduce losses in treated water transmission network										
☐ Refurbishment of water storage reservoirs										
☑ Improvement in water supply distribution network										
☐ Plugging of leakages at valves										
☑ Replacement of service line connections										
☐ Reduce free water supply										
☐ Repair non-functional metered water supply connections										
☐ Improve consumer grievance redressal system										
D) Create new infrastructure - High cost										
☐ Metering of consumer water supply connections										

The matrix displays the KPIs that get affected by each of the LAIs

Summary

BASE INFORMATION

ASSESS CITY PRIORITIES

SELECT IMPROVEMENT ACTIONS

DEVELOP IMPROVEMENT PLAN

REVIEW IMPROVEMENT PLAN

MAKE FINANCIAL DECISIONS

REVIEW FINANCING PLAN

SECTORAL VISION AND PRIORITIES FOR IMPROVEMENT

WATER SUPPLY	WASTEWATER	SOLID WASTE
SECTOR GOALS		
Coverage of individual water supply connection in slum	Coverage of households with individual toilets in slums	Coverage of household level solid waste services in slums
Continuity of water supplied (hours/day)	Coverage of households with adequate sanitation system	Extent of segregation of solid waste
Extent of functional metering of water supply connections	Efficiency of wastewater and septage collection system	Extent of solid waste recovered
Efficiency in collection of water supply charges and taxes	Adequacy of wastewater and septage treatment capacity	Extent of scientific disposal of solid waste
Cost recovery in water supply services	Quality of wastewater and septage treatment	Extent of cost recovery in solid waste services
	Extent of reuse/recycling of treated wastewater and septage	

Each Selected KPI is treated as sector goal

PLANNING OBJECTIVES		
Computerise water supply records	Household survey to assess wastewater services	Procure equipments for door to door solid waste collection (collection bins, ghantagaadis, containerised cycle rickshaw, handcarts etc.)
Policy for providing individual water connections in slums	Policy for providing sanitation services in slums	Engage with private service providers to provide solid waste services
Regularise unauthorised water supply connections	Provision of safe on-site sanitation system for individual toilets in non-sewered areas	Improve processes for maintaining daily logs of solid waste across SWM value chain
Increase connections using existing water supply distribution network	Provision of safe sanitation system for community and public toilet blocks	Improve collection efficiency of solid waste with existing vehicles
Lay internal infrastructure of water supply lines in slums	Provide on-site sanitation system in city and slums	Procure new vehicles for solid waste collection and transportation
	Upgrade open surface drains to closed drains for storm water drainage	Process for allotment of government land for processing and disposal of solid waste
	Procure new suction emptier trucks	Construct sanitary landfill facility for solid waste disposal
	Expand or lay new settled sewer for wastewater conveyance	
	Construct/augment treatment plant for effluent and sullage	
	Construct/augment faecal sludge treatment plant	
	Increase in reuse/recycling of treated wastewater and septage	

Each of the LAIs selected is treated as planning objective. They are formulated as projects in action planning

Sanitation: Action Planning

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

The following Technology options are considered to improve sanitation in the city

Option 1 - On-site Sanitation System

User interface	Collection	Conveyance	Treatment	Disposal
Toilets →	Septic tank	Septage → Vacuum suction emptier trucks →	Fecal sludge treatment facility →	Reuse for agriculture/ energy conversion
	Septic tank	Effluent →	Soak pit →	Earth
		Open/closed drains →	Dedicated storm water drain →	River/ Open plots

Option 2 - Conventional Sewer age system

User interface	Collection	Conveyance	Treatment	Disposal
Toilets →	Conventional Sewer	→	Sewage treatment plant (STP) →	River/ Reuse for agriculture
		Rehabilitate open/closed drains →	Dedicated storm water drain →	River/ Open plots

Sanitation: Action Planning

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Option 1 - On-site Sanitation System

Actions	Type	Start Year	End year	CapEx
Provision of safe on-site sanitation system for individual toilets in non-sewered areas	Existing system	2013	2015	48
Provision of safe sanitation system for community and public toilet blocks	Existing system	2014	2015	28
Improve condition of existing community and public toilets	Existing system	2013	2014	23
Information, education and communication (IEC) campaigns for sanitation awareness	Existing system	2013	2017	12
Provide individual toilet facilities with on-site sanitation system	New infra	2014	2014	43
Construct new community and public toilet blocks	New infra	2013	2014	25
Improve septage collection efficiency of suction emptier trucks	Existing system	2013	2013	0
Upgrade open surface drains to closed drains for storm water drainage	Existing system	2016	2018	217
Procure new suction emptier trucks	New infra	2014	2014	17
Expand or lay new settled sewer for wastewater conveyance	New infra	2014	2016	516
Construct/augment treatment plant for effluent and sullage	New infra	2014	2015	83
Construct/augment faecal sludge treatment plant	New infra	2015	2016	44

Option 2 - Conventional Sewerage System

Actions	Type	Start Year	End year	CapEx
Provision of safe on-site sanitation system for individual toilets in non-sewered areas	Existing system	2013	2015	46
Provision of safe sanitation system for community and public toilet blocks	Existing system	204	2015	28
Improve condition of existing community and public toilets	Existing system	2013	2014	23
Information, education and communication (IEC) campaigns for sanitation awareness	Existing system	2013	2017	12
Provide sewered sanitation system in non-slum areas	New infra	2014	2016	1,433
Provide sewered sanitation system in slums	New infra	2015	2016	140
Construct new community and public toilet blocks	New infra	2013	2014	25
Upgrade open surface drains to closed drains for storm water drainage	Existing system	2016	2018	217
Construct/augment sewage treatment plant	New infra	2016	2017	317

Sanitation: Impact of Improvement Actions

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Business as usual (BAU)

Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Coverage of households with individual toilets in city	67%	67%	66%	66%	66%	66%	66%	65%	65%	65%	65%
Coverage of households with individual toilets in slums	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Coverage of households with adequate sanitation system	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%
Efficiency of wastewater and septage collection system	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adequacy of wastewater and septage treatment capacity	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Extent of reuse/recycling of treated wastewater and septage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Quality of wastewater and septage treatment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency in redressal of customer complaints	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Efficiency in collection of wastewater charges and taxes	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Extent of cost recovery in wastewater services	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Option 1: Onsite System

Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Coverage of households with individual toilets in city	67%	67%	70%	69%	69%	69%	69%	68%	68%	68%	68%
Coverage of households with individual toilets in slums	0%	0%	70%	69%	68%	67%	66%	65%	64%	63%	62%
Coverage of households with adequate sanitation system	52%	52%	63%	69%	69%	69%	69%	68%	68%	68%	68%
Efficiency of wastewater and septage collection system	0%	0%	35%	69%	101%	100%	99%	97%	96%	94%	93%
Adequacy of wastewater and septage treatment capacity	0%	0%	0%	0%	64%	116%	116%	115%	115%	114%	114%
Extent of reuse/recycling of treated wastewater and septage	0%	0%	0%	0%	3%	8%	14%	19%	24%	29%	34%
Quality of wastewater and septage treatment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency in redressal of customer complaints	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Efficiency in collection of wastewater charges and taxes	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Extent of cost recovery in wastewater services	0%	243%	110%	71%	50%	58%	66%	75%	83%	91%	98%

Option 2: Sewerage System

Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Coverage of households with individual toilets in city	67%	67%	62%	65%	91%	90%	90%	89%	89%	88%	88%
Coverage of households with individual toilets in slums	0%	0%	0%	44%	87%	85%	84%	83%	82%	81%	79%
Coverage of households with adequate sanitation system	52%	52%	59%	74%	100%	100%	100%	100%	100%	100%	100%
Efficiency of wastewater and septage collection system	0%	0%	29%	60%	90%	89%	88%	87%	85%	84%	83%
Adequacy of wastewater and septage treatment capacity	0%	0%	0%	0%	0%	0%	63%	63%	63%	63%	64%
Extent of reuse/recycling of treated wastewater and septage	0%	0%	0%	0%	0%	0%	2%	5%	7%	9%	11%
Quality of wastewater and septage treatment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency in redressal of customer complaints	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Efficiency in collection of wastewater charges and taxes	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Extent of cost recovery in wastewater services	0%	387%	240%	242%	119%	14%	14%	14%	14%	16%	16%

Sanitation: Impact of Improvement Actions

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Option 1: Onsite System

Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Access and coverage											
Households resorting to open defecation in city	6%	4%	0%	0%	0%	1%	1%	2%	3%	3%	4%
Households dependent on community toilet facilities	27%	29%	32%	31%	31%	30%	30%	30%	29%	29%	28%
Households with sewerage network services	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Households with adequate on-site sanitation system	52%	52%	63%	69%	69%	69%	69%	68%	68%	68%	68%
Community and public toilets with adequate sanitation system	63%	66%	81%	100%	100%	100%	100%	100%	100%	100%	100%
Service level and quality											
Households with on-site grey water disposal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Households with networked system for grey water disposal	0%	0%	35%	69%	101%	100%	99%	97%	96%	94%	93%
Septic tanks cleaned annually in city	7%	18%	46%	40%	40%	39%	39%	39%	38%	38%	37%
Spatial coverage of closed surface drains	28%	28%	28%	28%	38%	47%	56%	56%	56%	56%	56%
Adequacy of sewage treatment capacity	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adequacy of treatment plant capacity for effluent and sullage	0%	0%	0%	0%	128%	128%	128%	128%	128%	128%	128%
Adequacy of septage treatment capacity	0%	0%	0%	0%	0%	103%	103%	102%	101%	100%	99%
Efficiency in service operation											
Extent of sewage reuse/recycle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Extent of wastewater or sullage reuse/recycle	0%	0%	0%	0%	7%	13%	20%	27%	33%	40%	47%
Extent of septage reuse/recycle	0%	0%	0%	0%	0%	4%	7%	11%	14%	18%	21%

Same Service levels are achieved through both the options.

Option 2: Sewerage System

Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Access and coverage											
Households resorting to open defecation in city	6%	11%	22%	19%	0%	0%	0%	0%	0%	0%	0%
Households dependent on community toilet facilities	27%	22%	16%	16%	15%	15%	15%	15%	15%	14%	14%
Households with sewerage network services	0%	0%	29%	60%	90%	89%	88%	87%	85%	84%	83%
Households with adequate on-site sanitation system	52%	52%	30%	14%	14%	14%	15%	15%	16%	16%	17%
Community and public toilets with adequate sanitation system	63%	66%	81%	100%	100%	100%	100%	100%	100%	100%	100%
Service level and quality											
Households with on-site grey water disposal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Households with networked system for grey water disposal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Septic tanks cleaned annually in city	7%	7%	12%	26%	26%	24%	23%	22%	21%	20%	19%
Spatial coverage of closed surface drains	28%	28%	28%	28%	38%	47%	56%	56%	56%	56%	56%
Adequacy of sewage treatment capacity	0%	0%	0%	0%	0%	0%	146%	148%	150%	152%	155%
Adequacy of treatment plant capacity for effluent and sullage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adequacy of septage treatment capacity	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency in service operation											
Extent of sewage reuse/recycle	0%	0%	0%	0%	0%	0%	5%	11%	16%	22%	27%
Extent of wastewater or sullage reuse/recycle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Extent of septage reuse/recycle	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

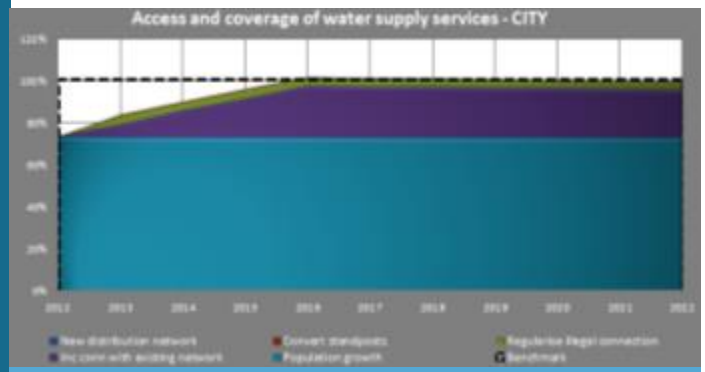
Water Supply: Action Planning

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

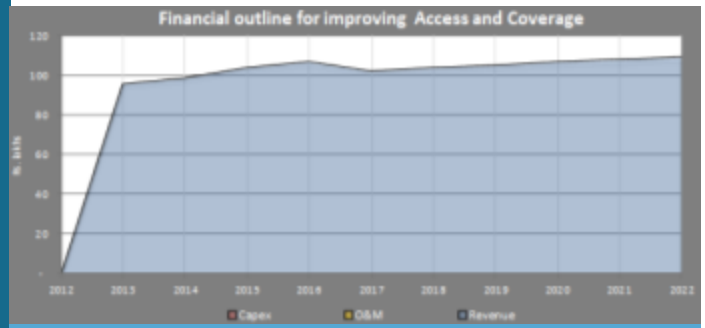
Existing system improvement measures

Activate	Regularise unauthorised water supply connections	2013	2013
Baseline	Estimated percentage of households with unauthorised water supply connections in city	%	5.0%
	Estimated percentage of households with unauthorized water supply connections in slums	%	0.0%
Improvement	Percentage of unauthorised connections to be regularised with improvement measures	%	5.0%
Finance	Penalty charges to be levied for regularisation of connections	Rs/connection	500
Activate	Increase connections using existing water supply distribution network	2013	2016
Baseline	Inhabited area served by distribution network as compared to total inhabited area	total served / total area	1.35 / 1.35
	Households served by individual water supply connections as compared to total households in city	HH served / total HH	5684 / 7700
Improvement	Additional connections that can be given in areas already served with distribution network	Number	2,000
	Possible share of slum households from additional connections to be connected	%	17%
Activate	Convert stand posts/public taps into group connections	2013	2013
Baseline	Present number of public taps and stand posts	Number	40

Inputs for actions



Impact on Service



Impact on finance

Actions	Type	Start Year	End Year	Capital Expenditure
Policy for providing individual water connections in slums	Process/ Policy	2013	2013	0
Regularise unauthorised water supply connections	Existing system	2013	2013	0
Increase connections using existing water supply distribution network	Existing system	2013	2016	0
Convert stand posts/public taps into group connections	Existing system	2013	2013	0
Conduct water audit	Data system	2015	2017	18
Install bulk flow meters	Data system	2014	2015	1
Improve processes for regular checking of water losses	Process/ Policy	2013	2013	0
Improvement in water supply distribution network	Existing system	2013	2016	28
Improve billing and collection of water supply bills	Process/ Policy	2013	2013	0
Improve collection efficiency of water supply charges and taxes	Existing system	2013	2015	2

Water Supply: Impact of Improvement Actions

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Business as usual (BAU)

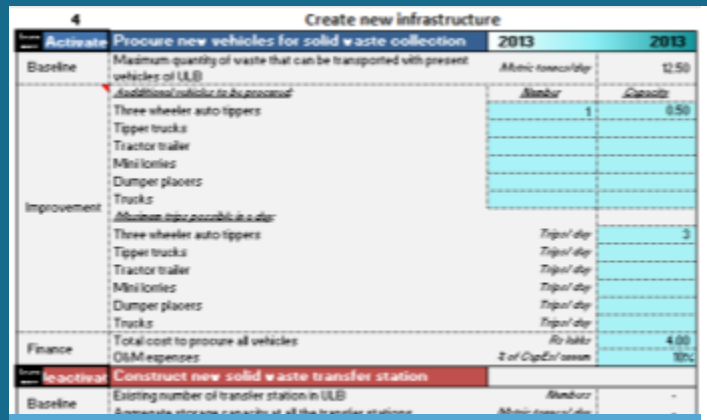
Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Coverage of individual water supply connections in city	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%
Coverage of individual water supply connections in slum	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Per capita supply of water at consumer end (lpcd)	153	150	148	146	144	142	140	138	136	134	132
Continuity of water supply (hours/day)	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Quality of water supplied	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Extent of Non-Revenue Water	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Extent of functional metering of water supply connections	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency in redressal of customer complaints	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Efficiency in collection of water supply charges and taxes	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%	43%
Cost recovery in water supply services	25%	42%	40%	39%	38%	36%	35%	34%	33%	32%	31%

With Improvement Plan

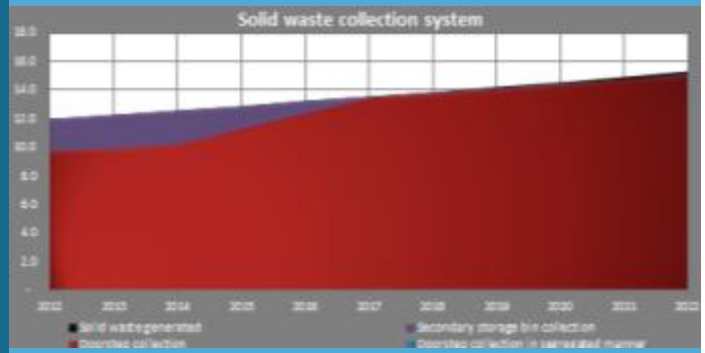
Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Coverage of individual water supply connections in city	74%	84%	90%	96%	100%	100%	100%	100%	100%	100%	99%
Coverage of individual water supply connections in slum	3%	39%	62%	84%	100%	100%	100%	100%	100%	99%	98%
Per capita supply of water at consumer end (lpcd)	153	146	136	128	123	121	119	117	116	114	113
Continuity of water supply (hours/day)	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Quality of water supplied	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Extent of Non-Revenue Water	25%	20%	19%	18%	17%	17%	17%	17%	17%	17%	17%
Extent of functional metering of water supply connections	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency in redressal of customer complaints	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Efficiency in collection of water supply charges and taxes	43%	58%	74%	90%	90%	90%	90%	90%	90%	90%	90%
Cost recovery in water supply services	25%	47%	50%	51%	61%	59%	57%	55%	54%	52%	50%

Solid Waste Management: Action Planning

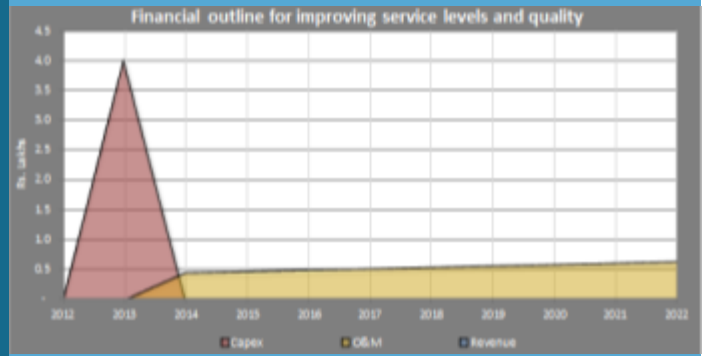
BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN



Inputs for actions



Impact on Service



Impact on finance

Actions	Type	Start Year	End Year	Capital Expenditure
Prepare management plan to efficiently deploy manpower and resources	Process/ Policy	2013	2013	0
Procure equipment for door to door solid waste collection (collection bins, ghantagaadis, containerised cycle rickshaw, handcarts etc.)	Existing system	2015	2018	25
Information, education and communication (IEC) campaign for awareness of solid waste management	Existing system	2013	2016	6
Engage with private service providers to provide solid waste services	New infrastructure	2015	2017	0
Improve processes for maintaining daily logs of solid waste across SWM value chain	Process/ Policy	2013	2013	0
Procure new vehicles for solid waste collection and transportation	New infrastructure	2013	2013	4

SWM: Impact of Improvement Actions

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Business as usual (BAU)

Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Coverage of household level solid waste services in city	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%
Coverage of household level solid waste services in slums	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency of solid waste collection	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Extent of segregation of solid waste	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Extent of solid waste recovered	20%	20%	20%	19%	19%	18%	18%	18%	17%	17%	16%
Extent of scientific disposal of solid waste	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency in redressal of customer complaints	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
Efficiency in collection of solid waste charges and taxes	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Extent of cost recovery in solid waste services	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

With Improvement Plan

Performance levels	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Coverage of household level solid waste services in city	81%	81%	81%	87%	93%	99%	99%	99%	98%	98%	98%
Coverage of household level solid waste services in slums	0%	0%	0%	36%	70%	100%	100%	100%	100%	98%	97%
Efficiency of solid waste collection	100%	100%	100%	100%	100%	100%	100%	100%	99%	99%	99%
Extent of segregation of solid waste	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Extent of solid waste recovered	20%	20%	20%	20%	20%	20%	20%	20%	19%	19%	18%
Extent of scientific disposal of solid waste	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Efficiency in redressal of customer complaints	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
Efficiency in collection of solid waste charges and taxes	85%	168%	172%	175%	175%	175%	175%	175%	175%	175%	175%
Extent of cost recovery in solid waste services	2%	8%	8%	7%	7%	7%	8%	8%	8%	8%	8%

Municipal Finance

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 RE
Opening Balance	177	237	327	238	361	269
Revenue Account						
Revenue Reciepts	411	454	428	462	429	807
Revenue Expenditure	354	411	426	424	631	745
Operating ratio	**0.86**	**0.9**	**0.99**	**0.92**	**1.47**	**0.92**
Capital Account						
Capital Reciepts	111	162	219	62	82	442
Capital Expenditure	236	185	199	197	203	763
Capital Utilisation	**213%**	**114%**	**91%**	**317%**	**246%**	**173%**
Extra-ordinary Account						
Extraordinary Reciepts	102	71	75	50	68	123
Extraordinary Expenditure	94	40	62	37	50	88
Summary						
Total Reciepts	624	687	723	574	580	1372
Total Expenditure	685	636	688	659	883	1596

All figures in Rs Lakhs (100 thousands)

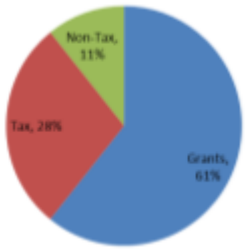
Note: The total may not match due to approximation

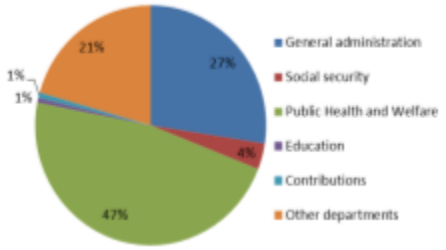
Total expenses have grown registering a CAGR of 6.6% The total receipts have reduced to 580 lakhs in 2010-11 from 624 lakhs in 2006-07 after recording a peak of 723 lakhs in 2008-09.

Operating expenses have grown much faster (22%) than revenue account receipts (9%)

Annual per capita expenses is Rs 1026.
Per capita expense in WSS at Rs 444 for FY 2010-11 is only 48% of the HPEC norm of Rs 936

Revenue Account Receipts & Expenditures





- Very high dependence on grants
- Property tax & water charges majorly contribute to own sources, but collection efficiency is very low
- 42% of total expenses are towards establishments
- Majority of operating expenses are towards public health (47%) and Gen. admin (27%)

WSS Finances

WSS's contribution in operating expenses is much higher than its contribution to revenue receipts

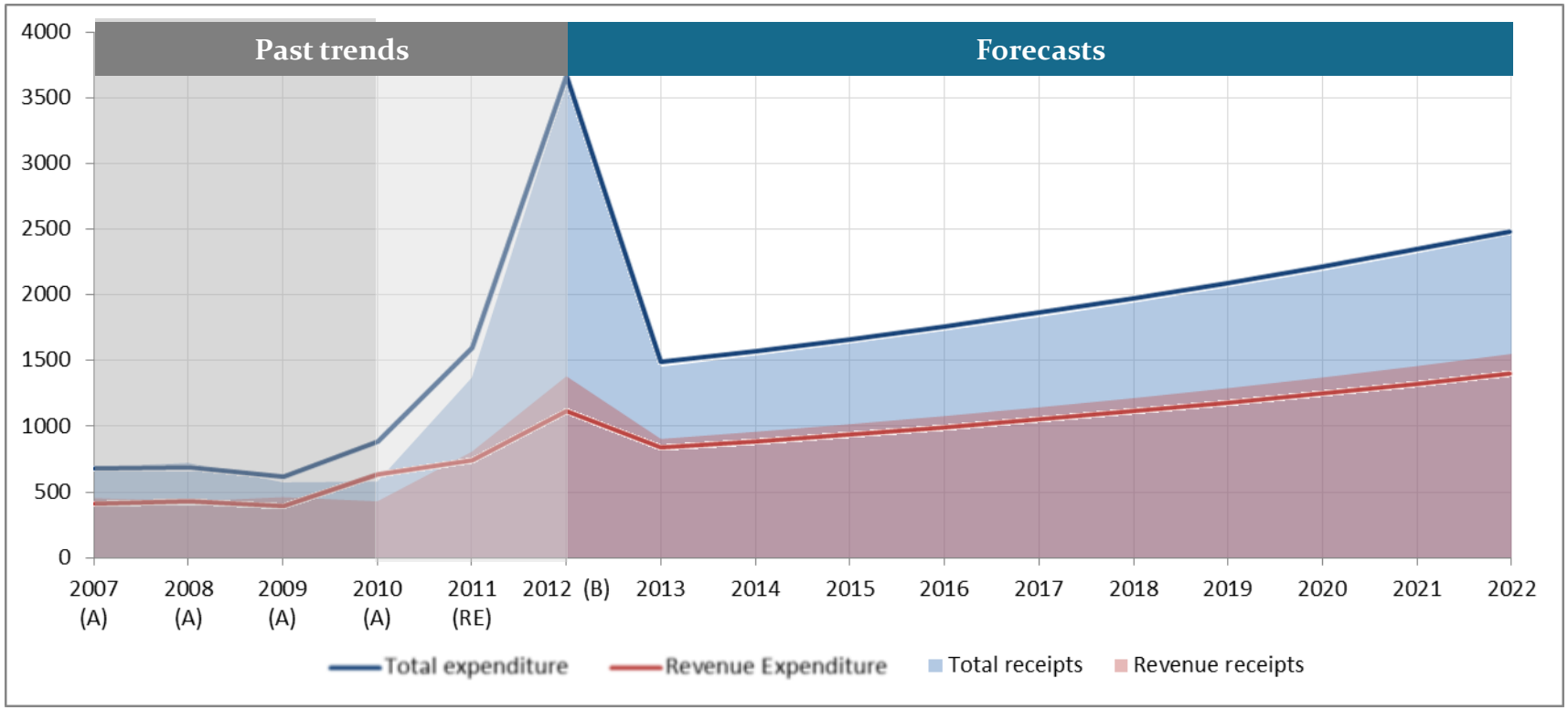
- Water charges is the only major revenue stream; special conservancy tax is levied but does not amount much.
- Collection efficiency of water tax is only 47%

Financial Forecasts

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Total expenses and receipts are estimated to grow at CAGR of 5-6%

- The budget size is estimated to be nearly Rs 2500 Lakhs by 2022
- The revenue receipts are estimated to be around Rs 1550 lakhs against expenses of more than Rs 1400 Lakhs in 2022
- Non-WSS surplus is estimated to cover the WSS deficit in ten years period

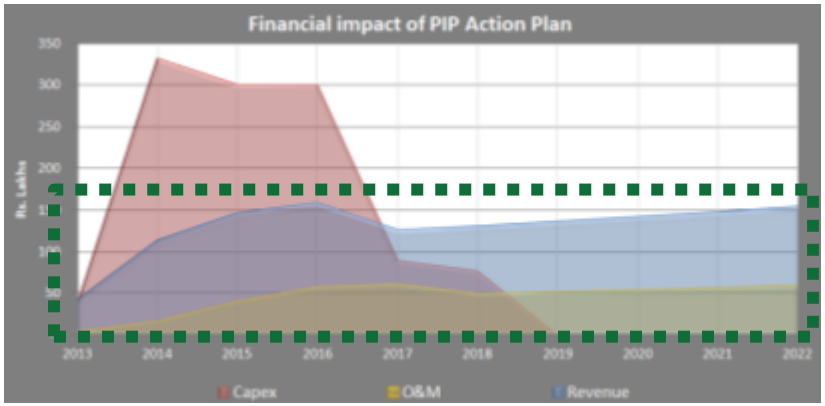


Financial Requirements for PIP

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Option 1 - On-site Sanitation System

Financial Requirements	Rs lakhs
Capital expenditure	1,138
Additional O&M expense	452
Additional revenue	1,292

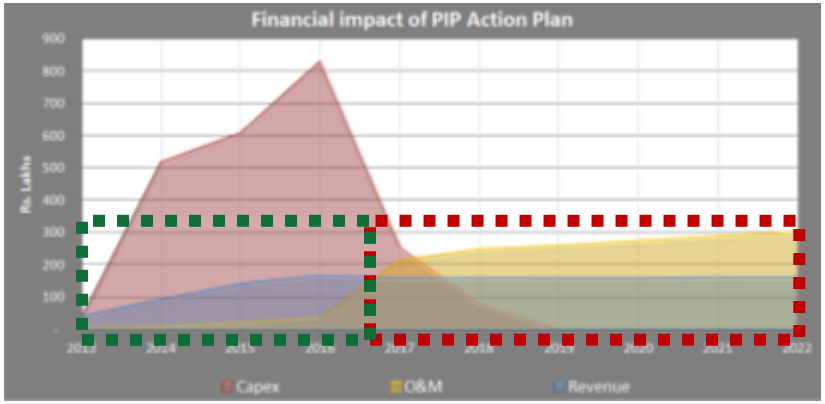


i.e. an investment of more than **Rs 11 Crores** and an additional **revenue of more than 8 Cr** from new assets over 10 year planning period

Option 2 - Conventional Sewerage System

Financial Requirements	Rs lakhs
Capital expenditure	2,323
Additional O&M expense	1,656
Additional revenue	1,406

i.e. an investment of more than **Rs 23 Crores** and an additional **burden of more than 2 Cr** to operate and maintain the assets over 10 year planning period



Financing Plans for both technology option are prepared for two financial iterations each

Capital Expenditure through

1. **Inter-governmental grants**
2. **Own Sources**

Option 1.1 Financial Decisions

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

Grants that the ULB could avail for each of the actions

Actions	Total CapEx required	Central Grants	State Grants	Debt	Private/ PPP	Beneficiary	ULB share (% and Rs. lakhs)	
Conduct water audit	18		100%					
Provision of safe on-site sanitation system for individual toilets in non-sewered areas	48					65%	35%	17
Improve septage collection efficiency of suction emptier trucks	0							
Expand or lay new settled sewer for wastewater conveyance	516	50%	40%				10%	52
Procure equipment for door to door solid waste collection (collection bins,	[illegible]						[illegible]	[illegible]

Transfer of non-WSS surplus for WSS

KEY FINANCING DECISIONS

Financing Plan	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
WATER SUPPLY AND SANITATION OPERATING PLAN										
1. Income generated from PIP actions										
Additional income generated	42	113	146	159	126	130	136	141	147	153
2. Revise WSS charges and tariffs							Link to	Revise WSS tariffs		
Additional income generated	15	18	19	36	41	42	44	45	47	48
3. Revise own income sources like Property tax							Link to	Revise own tax sources		
Additional income generated	25	31	35	28	28	30	31	33	35	36
4. Allocate Non-WSS revenue surplus for WSS services							Link to	Review past trends		
Non-WSS revenue surplus	208	276	323	343	365	387	445	586	738	898
Propose allocation of surplus for WSS CapEx	156	193	226	240	256	233	178	188	200	214
	75%	70%	70%	70%	70%	60%	40%	32%	27%	24%
Operating ratio	**1.0**	**0.8**	**0.8**	**0.8**	**0.8**	**0.9**	**1.0**	**1.0**	**1.0**	**1.0**

IMPACT OF FINANCING PLAN ON MUNICIPAL FINANCES

Budget heads	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
REVENUE ACCOUNT										
Water supply and sanitation services (WSS)										
Opening balance	-	1	-	9	-	7	-	-	-	-
Revenue receipts	289	402	472	516	506	490	444	463	494	507
Revenue expenditure	288	319	364	401	421	425	444	463	494	507
WSS Revenue account status	1	85	108	124	85	72	-	-	-	-
Services other than water supply and sanitation (Non-WSS)										
Opening balance	1	52	83	97	103	109	154	271	400	538
Revenue receipts	858	917	977	1,030	1,096	1,166	1,242	1,324	1,411	1,504
Revenue expenditure	510	543	578	616	656	699	746	795	848	905
Non-WSS Revenue account status	349	426	482	511	543	576	650	800	963	1,137

Revise Tariffs (property tax and WSS taxes/charges)

1. Review number of properties assessed for taxation in ULB					
Improve billing efficiency of property tax by increasing number of properties assessed	%	Current billing efficiency	Proposal for improvement: Targeted efficiency	Year to start improvement	Year for completion
		87%	90%	2013	2015

2. Review collection efficiency of Property Tax					
Improve collection efficiency of property tax		Current collection efficiency	Proposal for improvement: Targeted efficiency	Year to start improvement	Year for completion
Collection efficiency of current demand	%	80%	90%	2013	2015
Collection efficiency of arrear demand	%	87%	90%	2013	2015

3. Review average Property tax demand per property										
Average general property tax demand per property (Rs/property/annum)					386					
Percentage increment in property tax demand/property	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	20%									

4. Review of other taxes and charges of ULB

WSS revenue surplus for Capital Funding

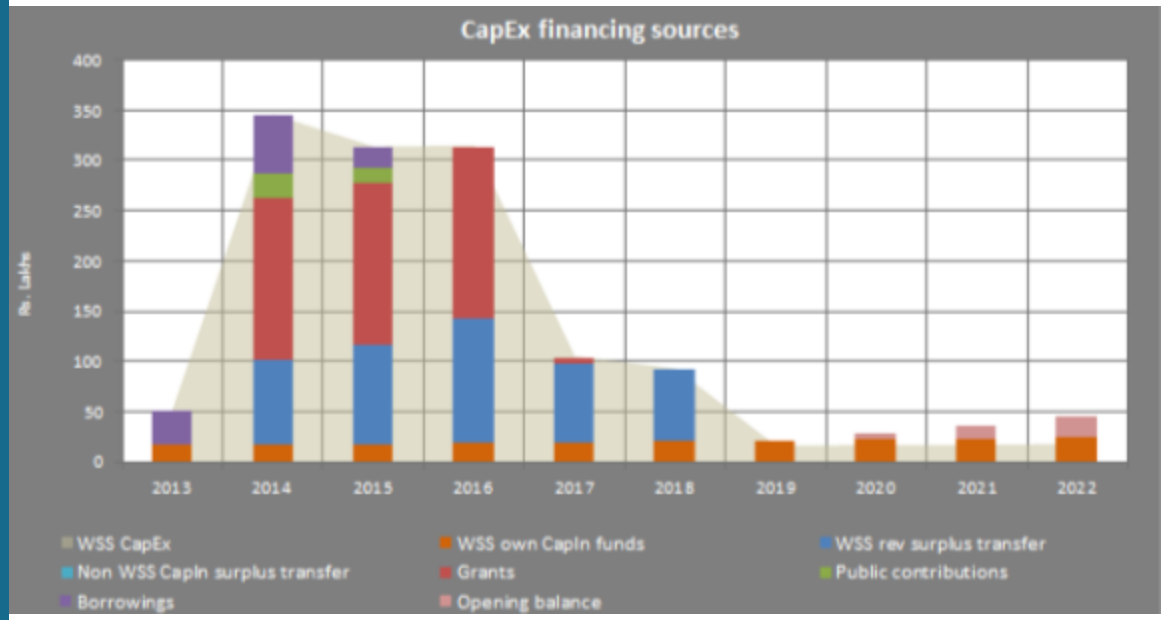
2. Allocate WSS revenue surplus for capital funding										
WSS revenue surplus	1	85	108	124	85	72	-	-	-	-
Propose allocation of surplus for WSS CapEx		85	99	124	78	72				
	0%	100%	92%	100%	92%	100%	-	-	-	-

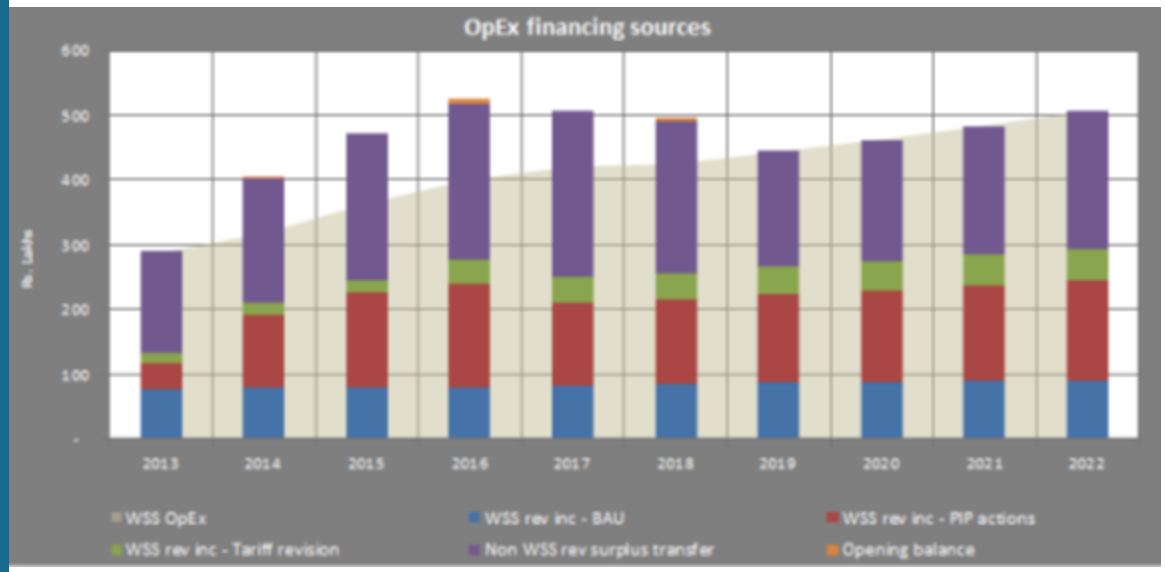
WSS revenue surplus for Capital Funding

4. External borrowings										
Debt from Action Plan finance	-	20	21	-	-	-	-	-	-	-
Additional debt required	34	39								
Terms of conditions	Rate of interest (%)					10%				
	Moratorium period (Number of years)					1				
	Period of Borrowing (Number of years)					15				
Debt servicing requirement	-	3	11	17	17	17	16	15	14	14
Debt service coverage ratio	**NA**	**29.33**	**10.82**	**8.29**	**6.00**	**5.24**	**1.00**	**1.00**	**1.00**	**1.00**

Option 1.1 (Onsite system through grants)

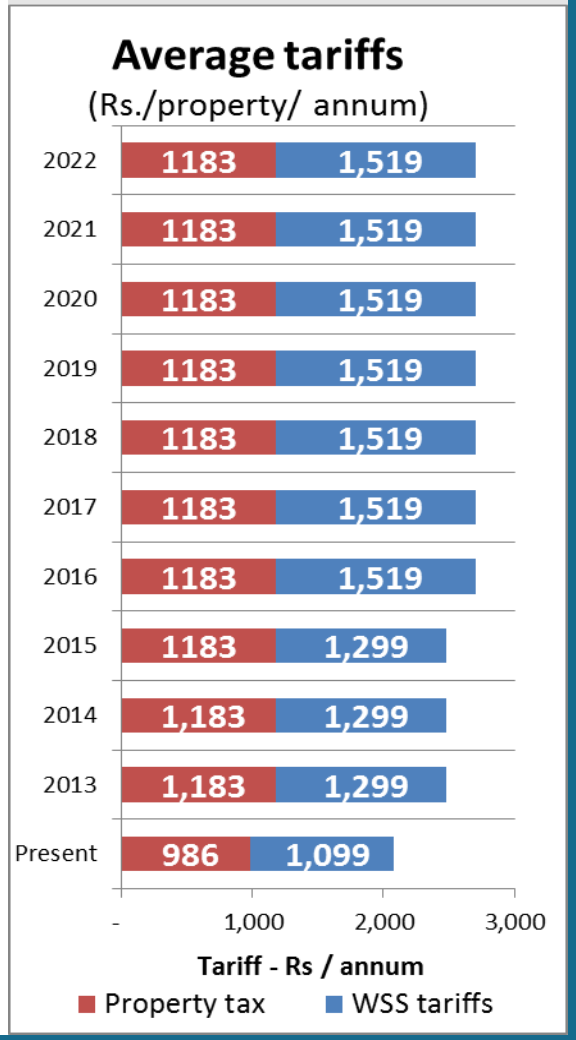
BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN





Increment in tariff required to sustain operating costs

Property tax, water supply tax, waste water tax and solid waste charges



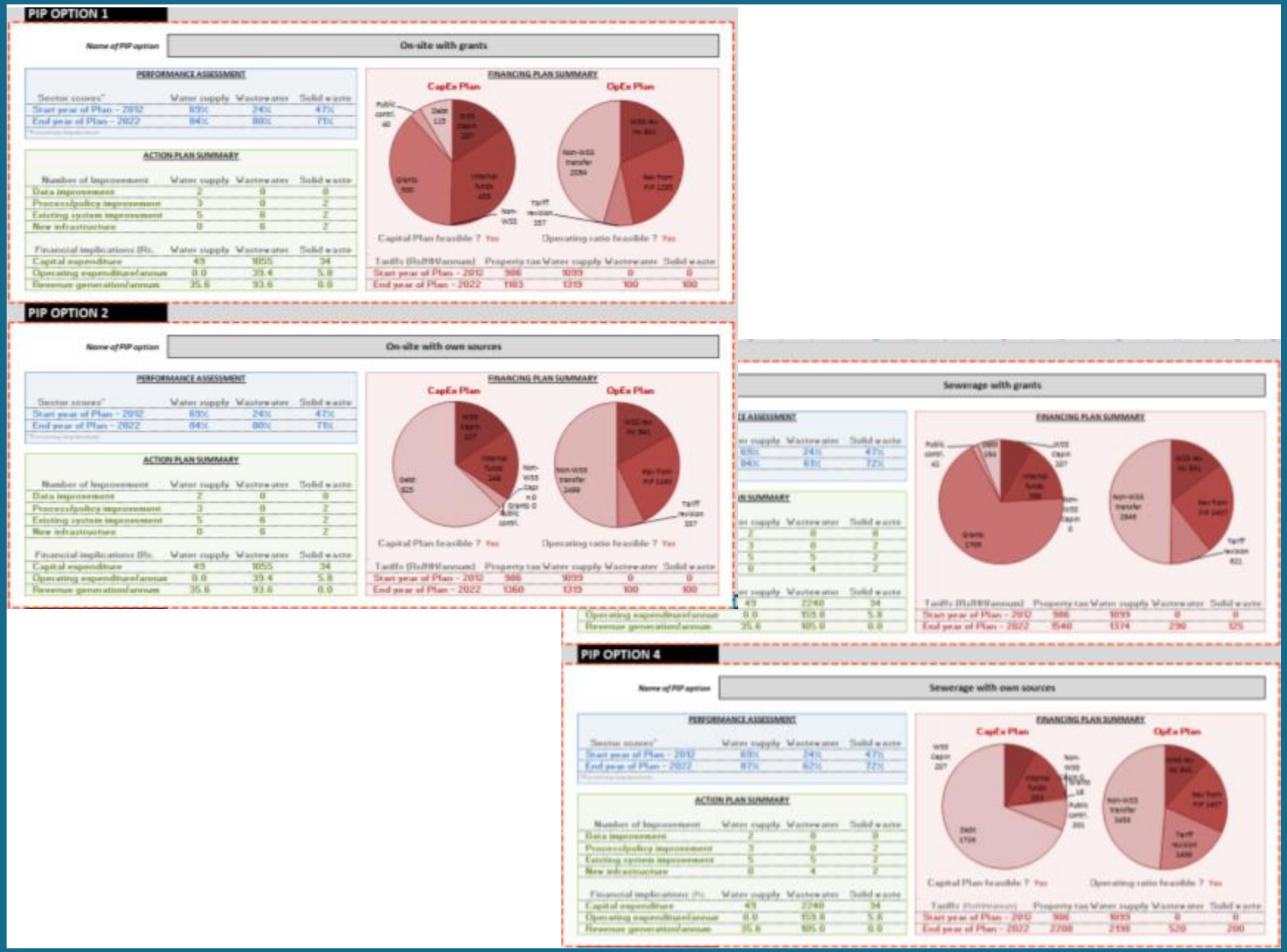
Comparison of the 4 options

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN

PIP Plan options for water supply, solid waste and waste water services	**Sources of funds** (Rs lakhs)					**Tariff required** (Base year tariff = Rs.2085/HH/yr)
	Grants	ULB funds		Private (HHs, PPP, micro - credit)	**Total**	10th year
		Internal funds	Debt			
Option 1.1 On-site with grants	707	458	115	40	**1320**	2702
Option 1.2 On-site through own sources	207	248	825	40	**1320**	2879
Option 2.1 Sewerage with grants	1913	396	154	42	**2505**	3329
Option 2.2 Sewerage with own sources	225	353	1726	201	**2505**	5126

Comparison of the 4 options

BASE INFORMATION
↓
ASSESS CITY PRIORITIES
↓
SELECT IMPROVEMENT ACTIONS
↓
DEVELOP IMPROVEMENT PLAN
↓
REVIEW IMPROVEMENT PLAN
↓
MAKE FINANCIAL DECISIONS
↓
REVIEW FINANCING PLAN



Thank you