



# Performance Improvement Planning (PIP) Model

Workshop on Capacity Building for Service Level Benchmarking (SLB)

22<sup>ND</sup> January, 2014, New Delhi

# Application of PIP Model

for case of a small town in Maharashtra



# City in Maharashtra

## BASE INFORMATION

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

## ASSESS CITY PRIORITIES

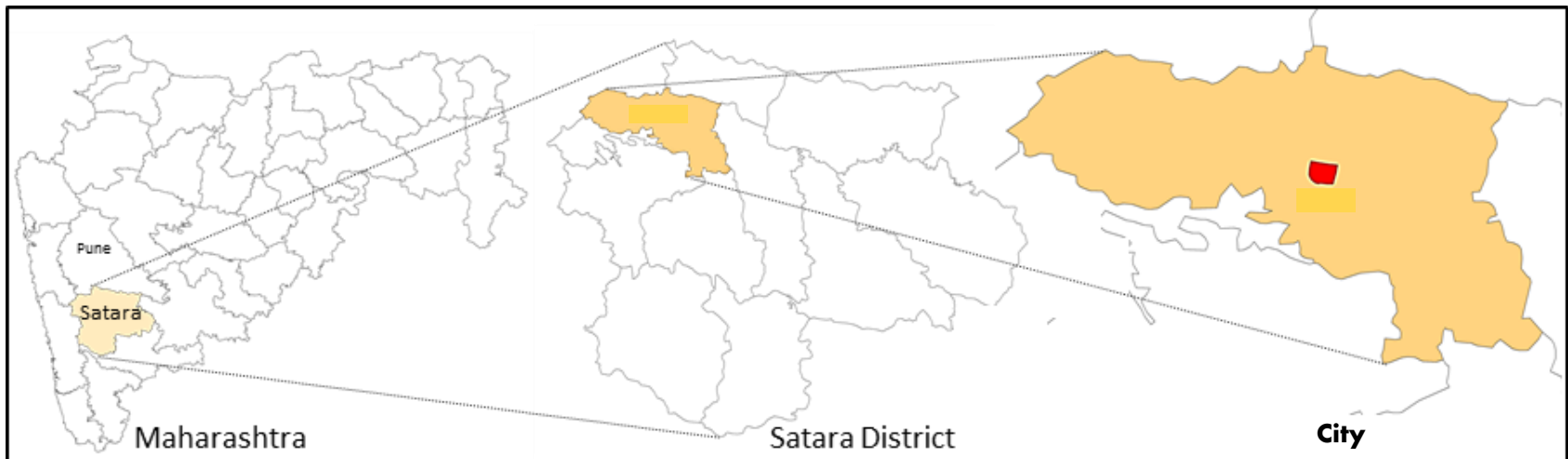
## SELECT IMPROVEMENT ACTIONS

## DEVELOP IMPROVEMENT PLAN

## REVIEW IMPROVEMENT PLAN

## MAKE FINANCIAL DECISIONS

## REVIEW FINANCING PLAN





# City in Maharashtra

BASE  
INFORMATION

ASSESS CITY  
PRIORITIES

SELECT  
IMPROVEMENT  
ACTIONS

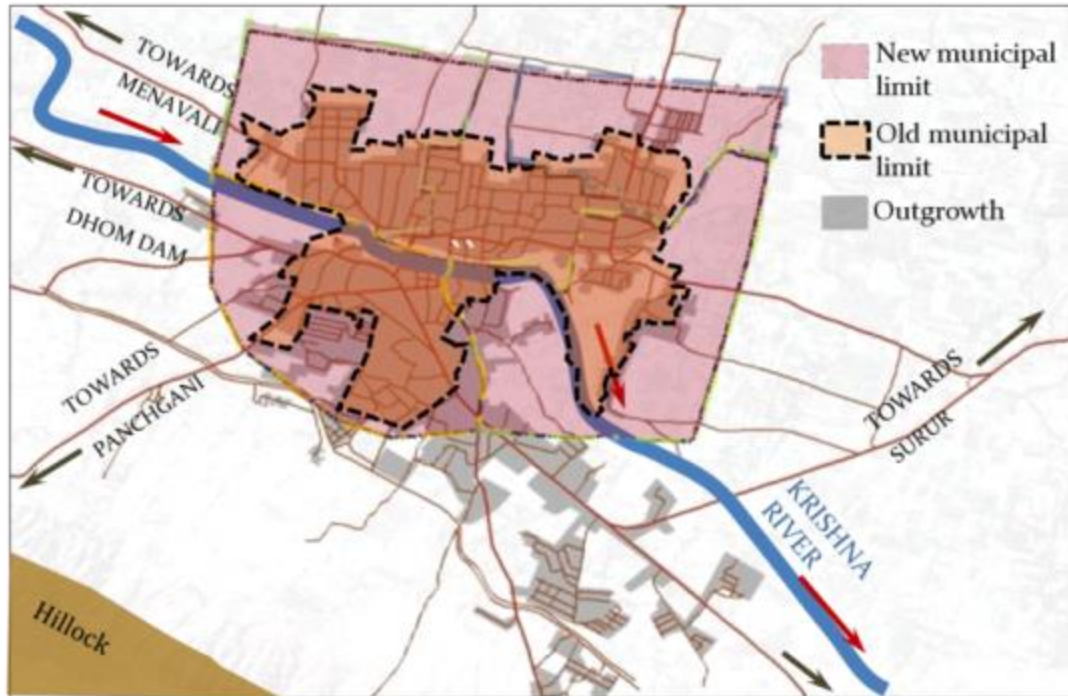
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REVIEW  
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PLAN

MAKE  
FINANCIAL  
DECISIONS

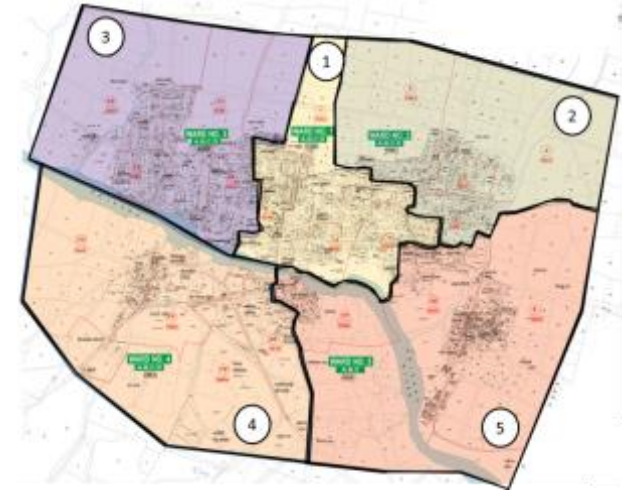
REVIEW  
FINANCING  
PLAN

## 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

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# Sanitation

BASE  
INFORMATION

ASSESS CITY  
PRIORITIES

SELECT  
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ACTIONS

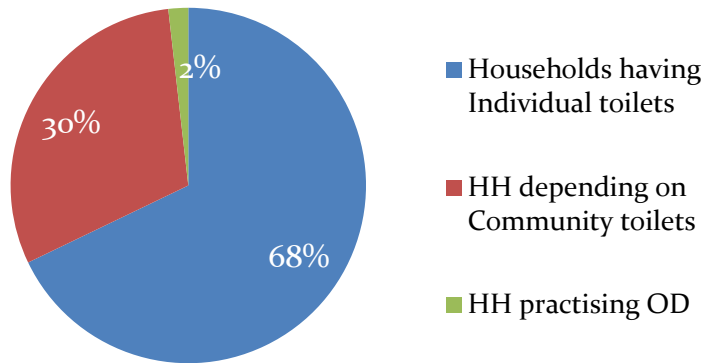
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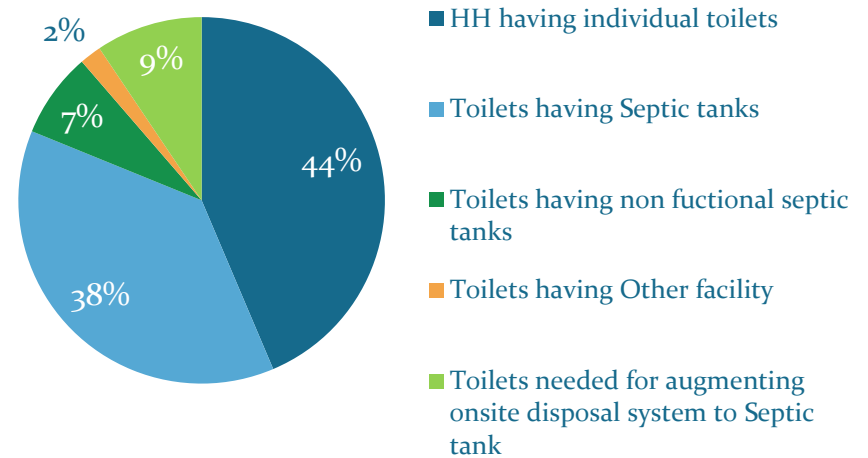
MAKE  
FINANCIAL  
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PLAN

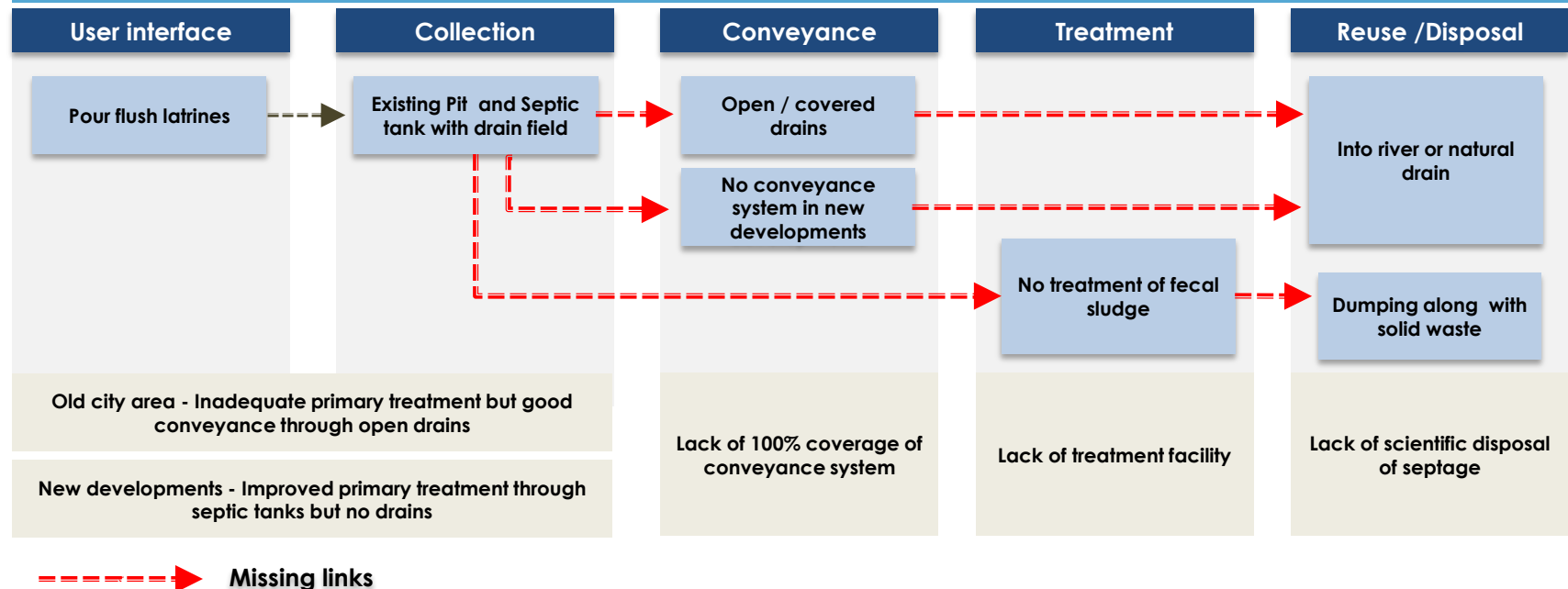
Coverage of sanitation facilities



On-site disposal facility



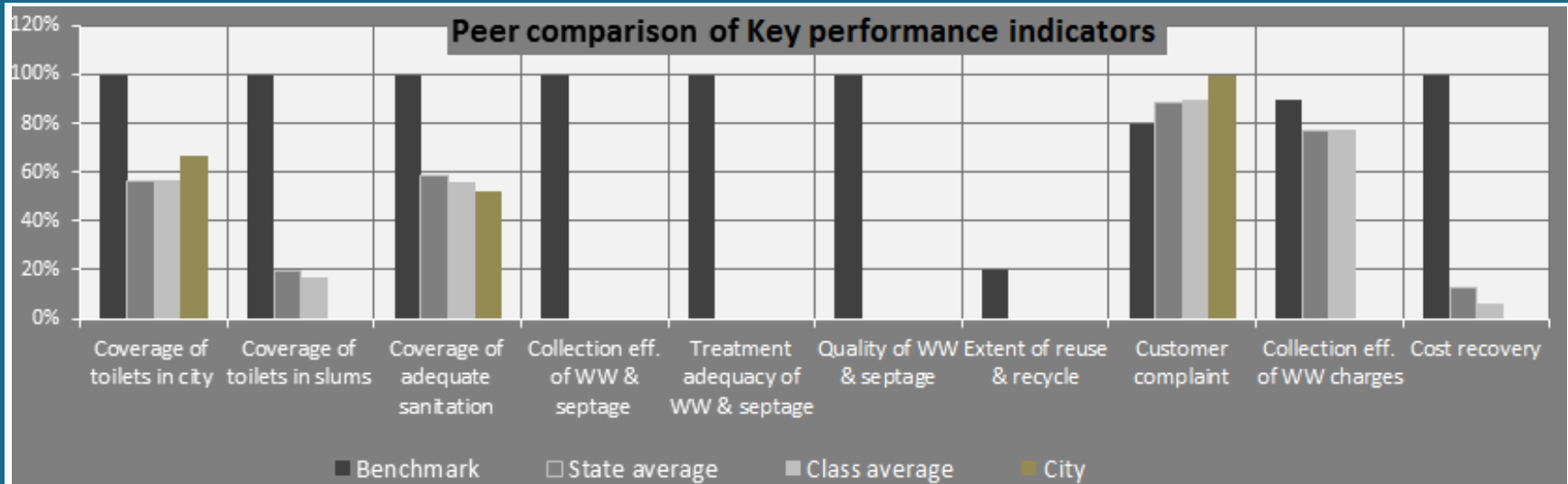
Sanitation value-chain



# Sanitation



# Sanitation



## 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

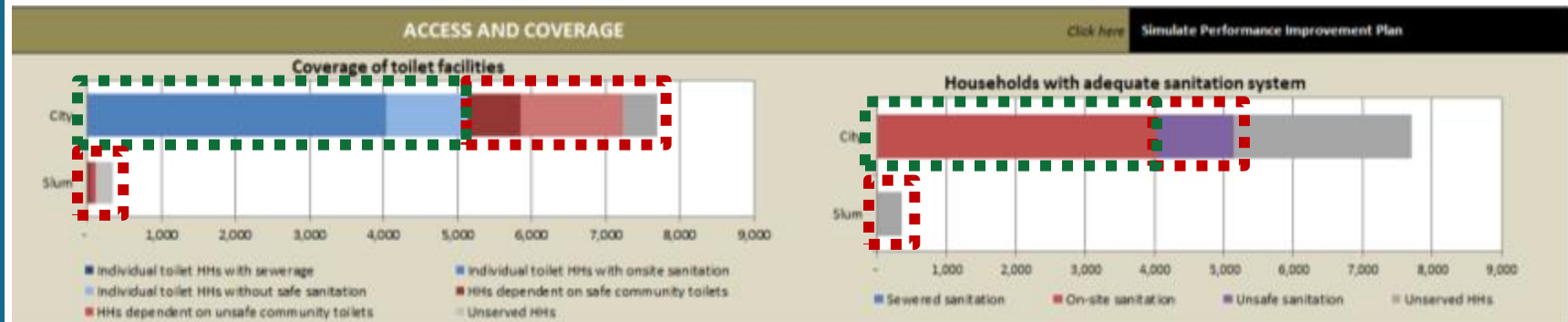
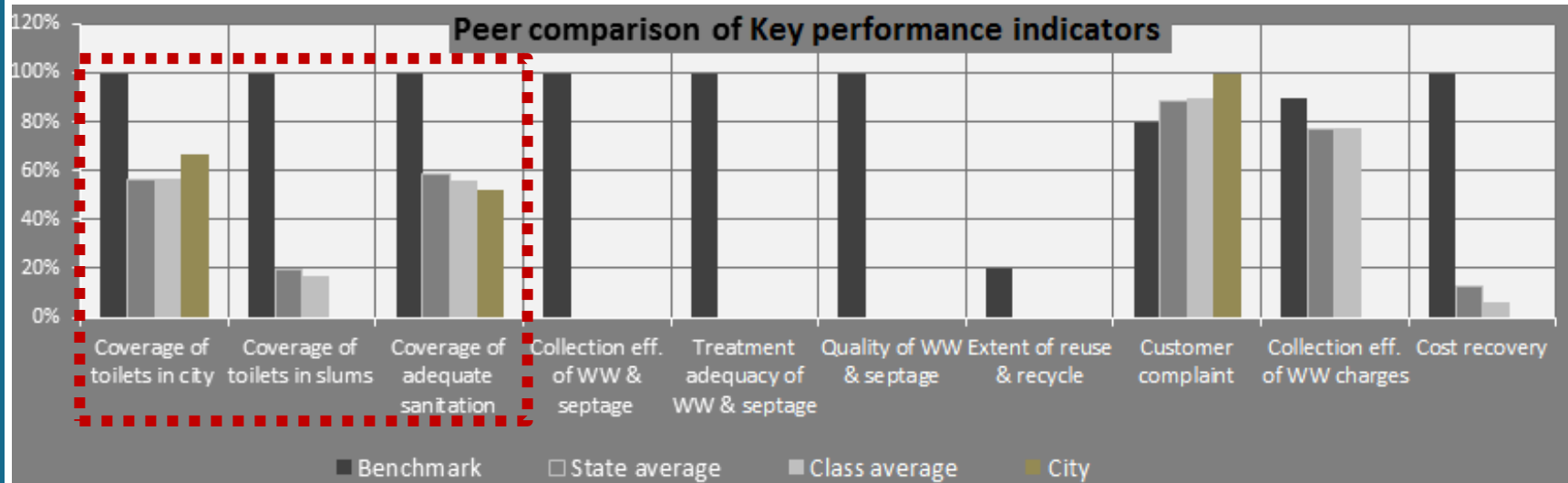
**The city is non – sewerage, so majority of sewerage indicators are not generated**



# Sanitation

High dependence on community toilets

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



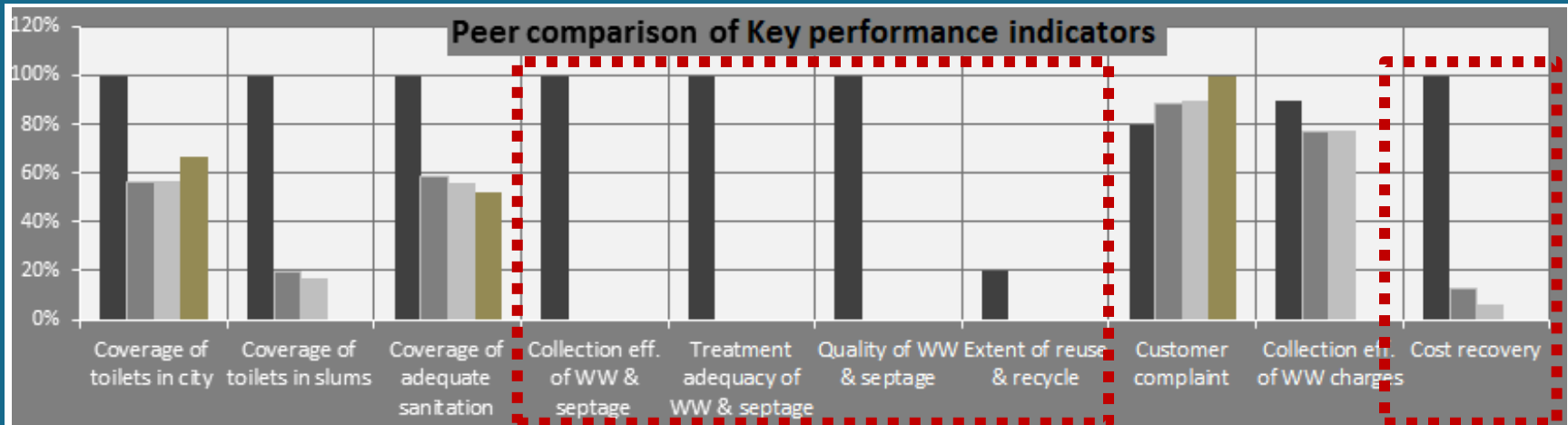
Households having latrines

Households not having latrines

Toilets having sanitary disposal system

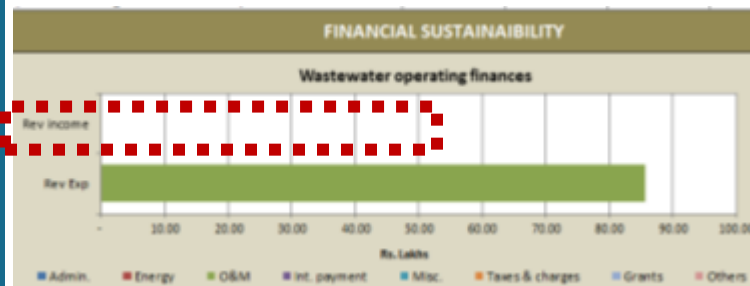
Toilets not having sanitary disposal system

# Sanitation



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  
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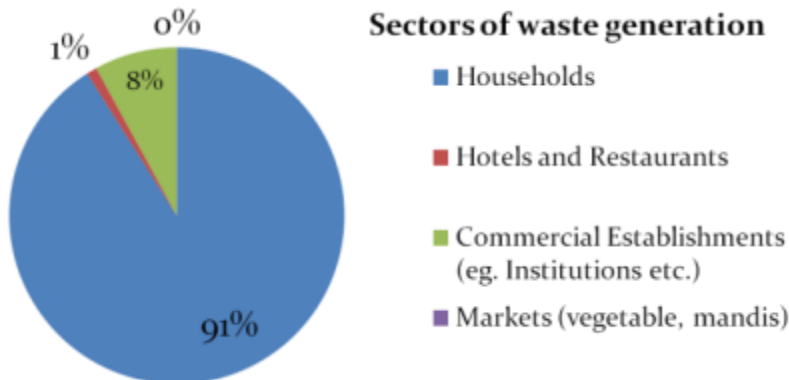
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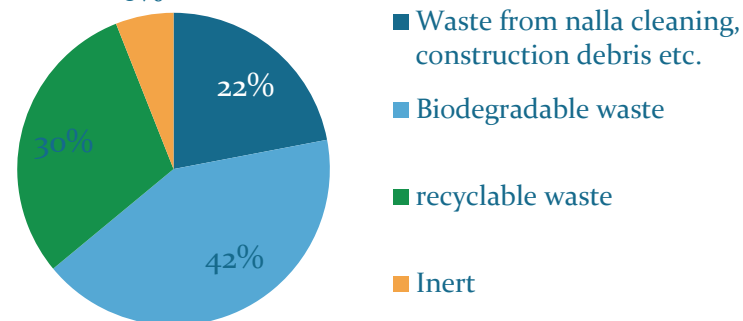
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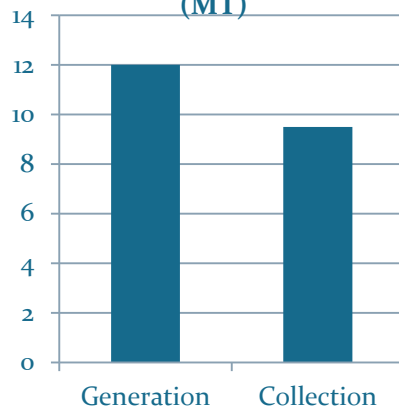
Sectors of waste generation



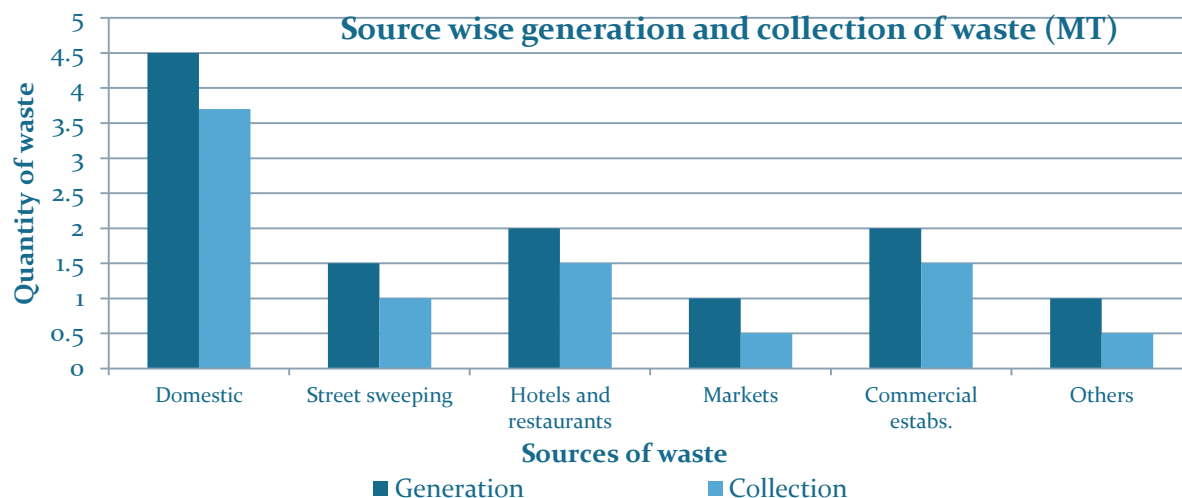
Type of waste generated



Gap in generation and  
collection of solid waste  
(MT)

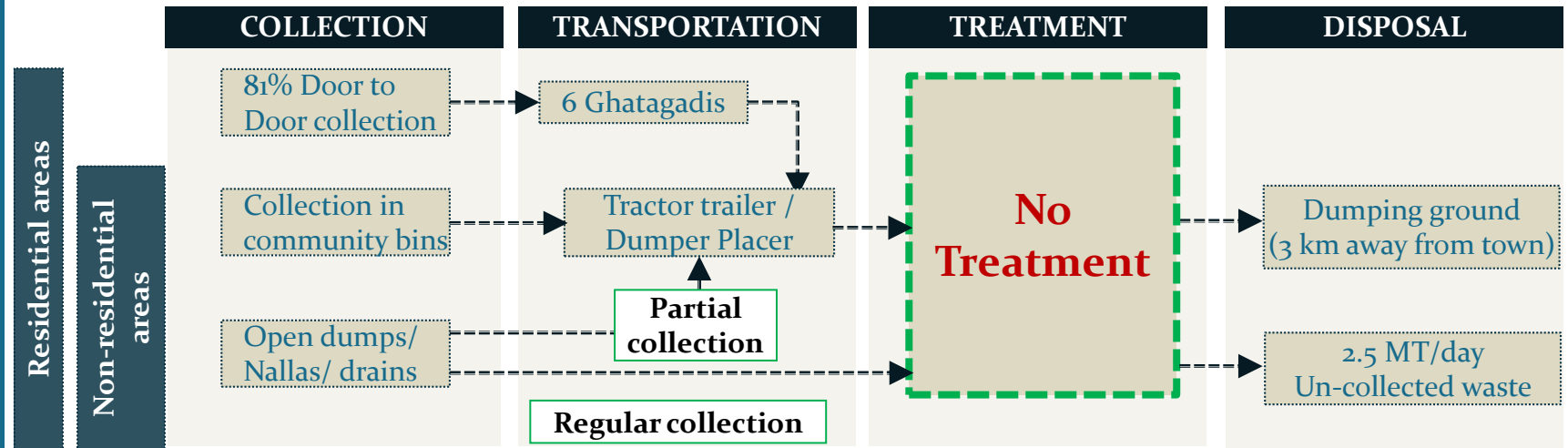


Source wise generation and collection of waste (MT)

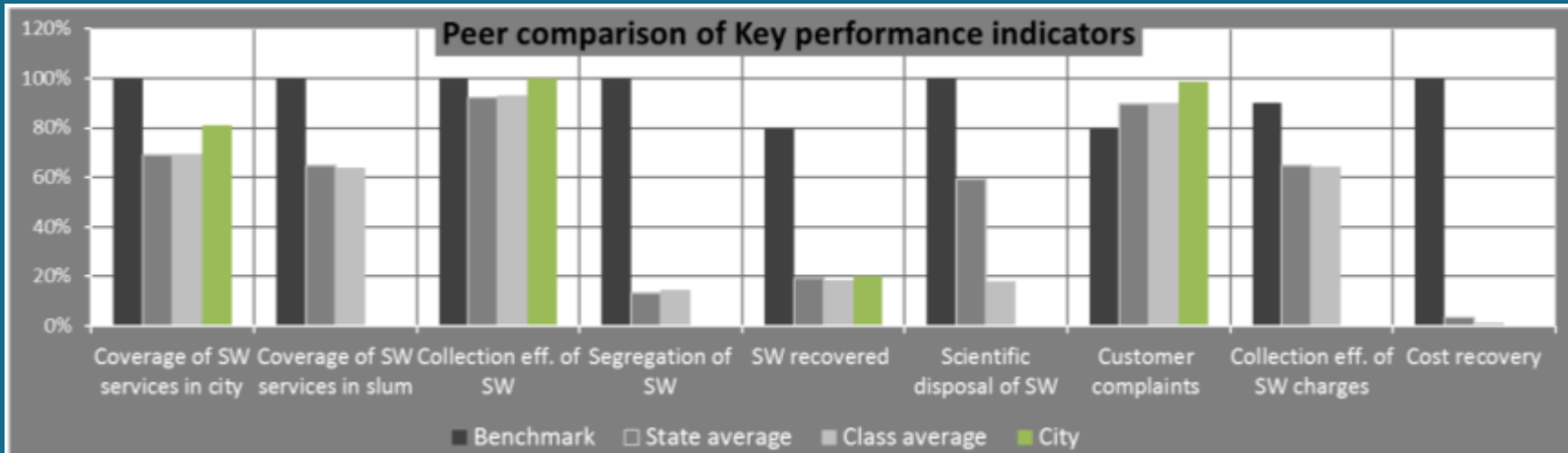




# Solid Waste Management



# Solid Waste Management



## 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

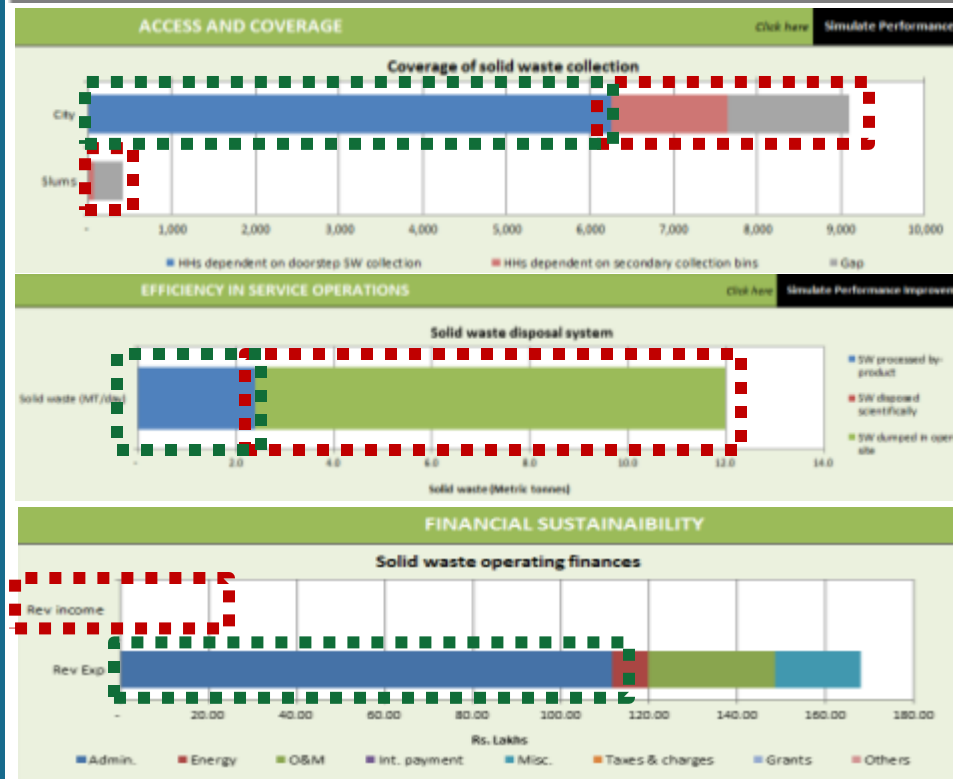
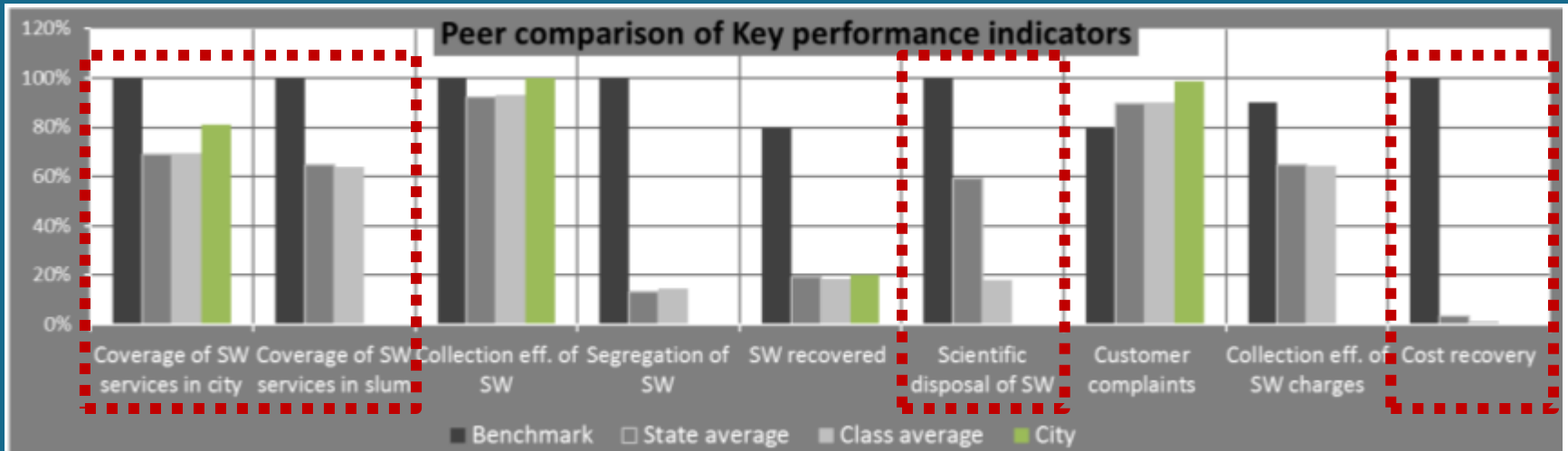
- Dumping of solid waste in the dumping grounds

## 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



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  
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ASSESS CITY  
PRIORITIES

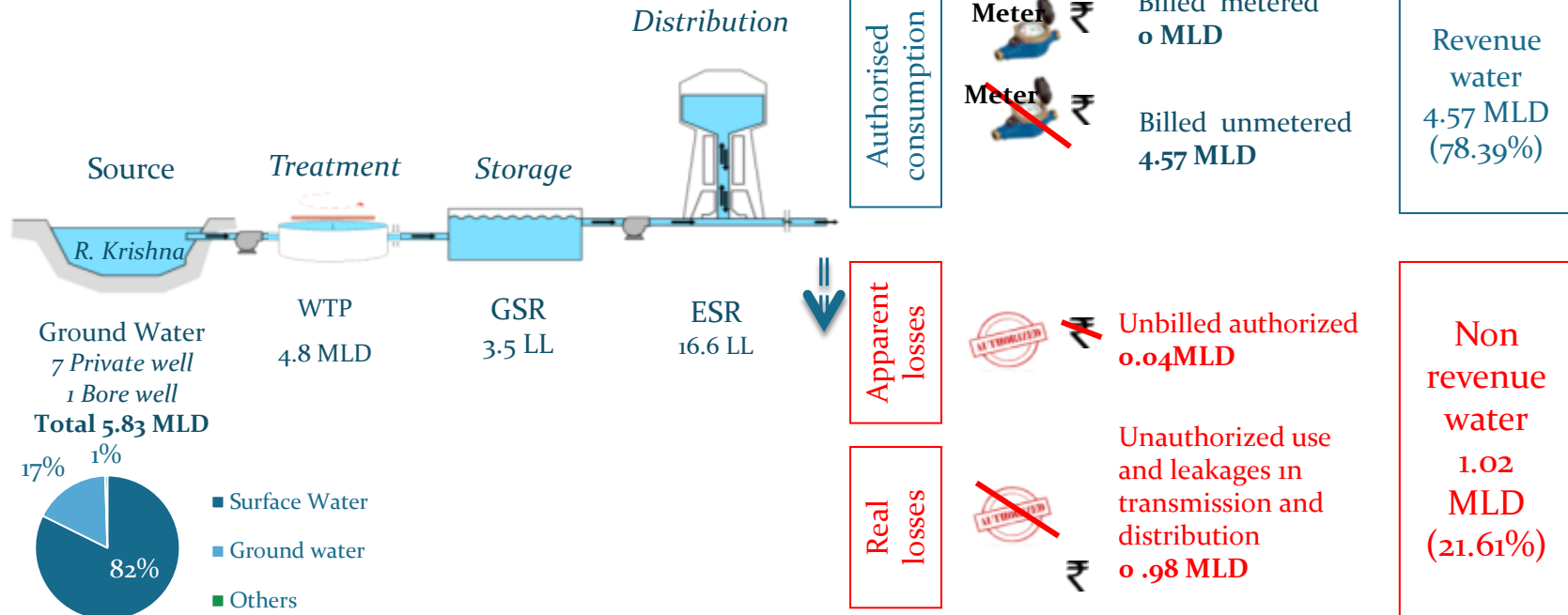
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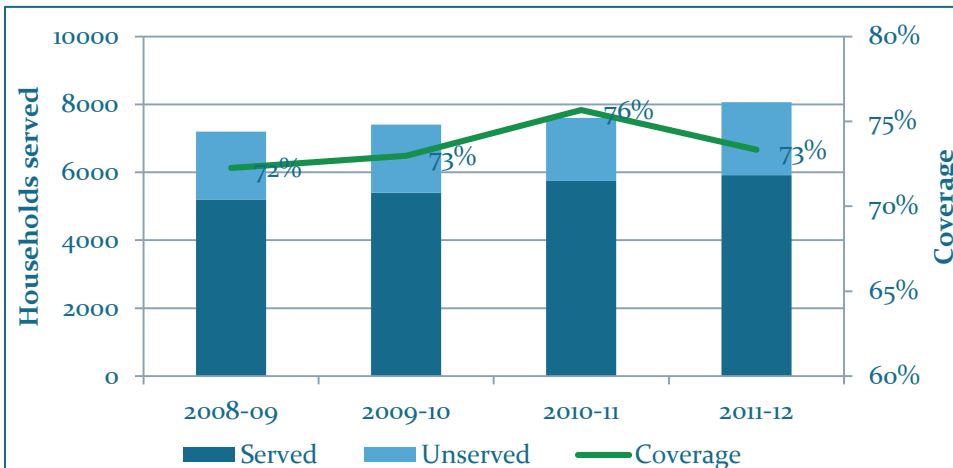
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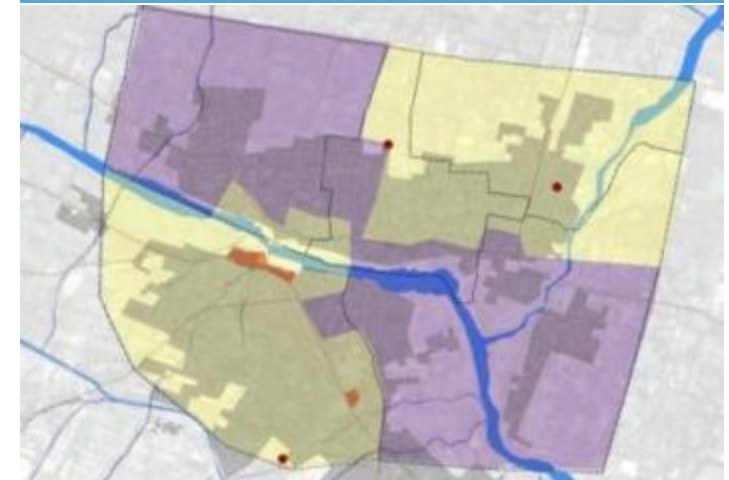
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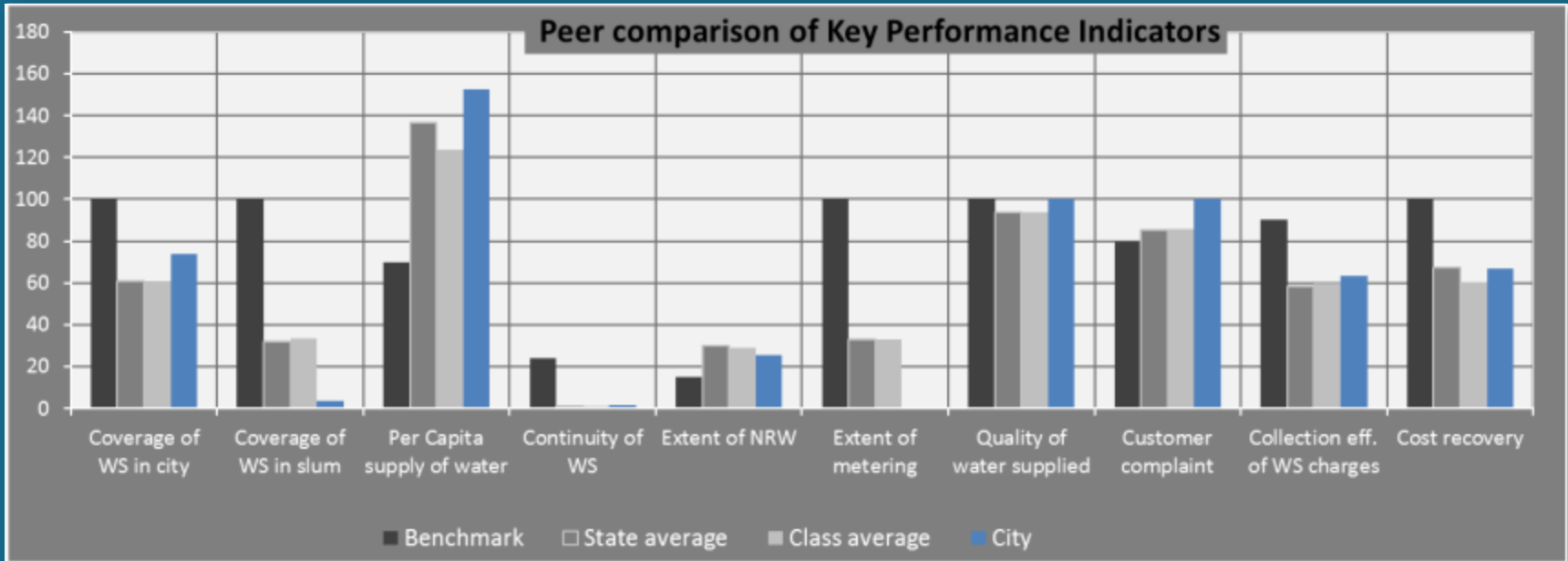
Coverage of WS connections



Water Supply Zones



# Water Supply



## 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

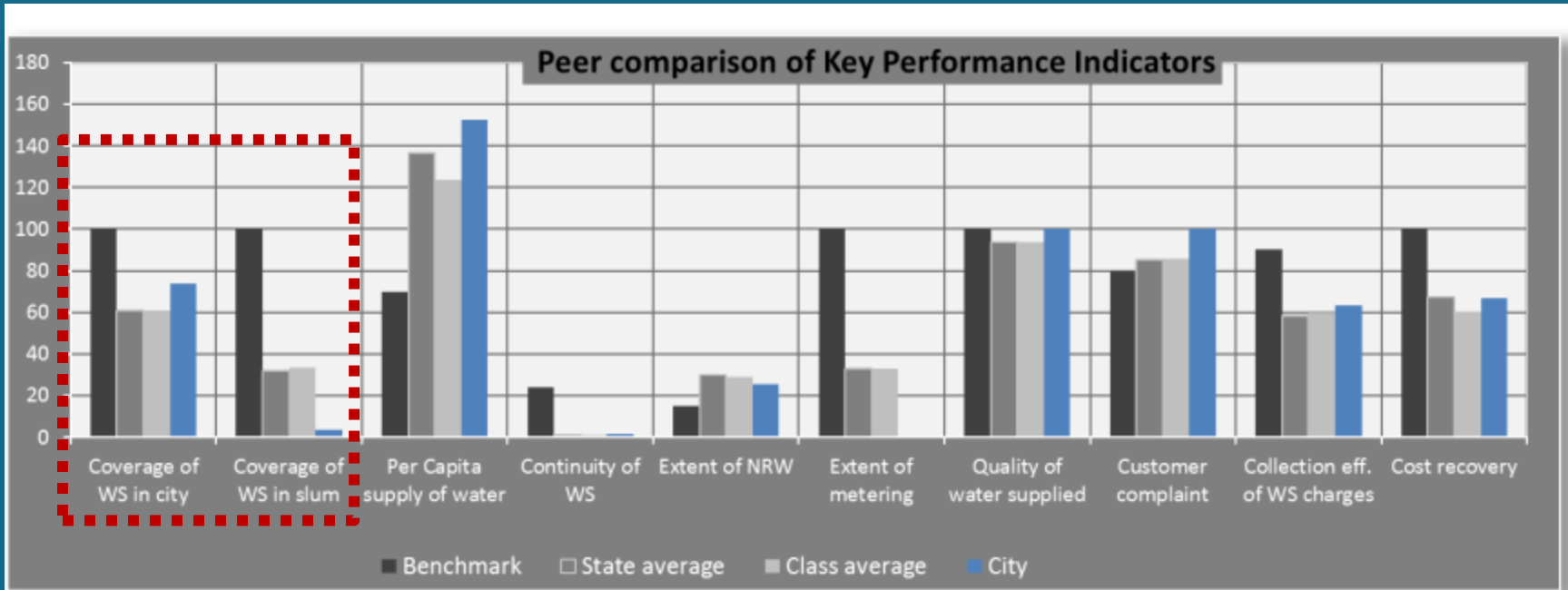
## Financial Sustainability

- Cost recovery and collection efficiency of charges is almost at par with state and class average

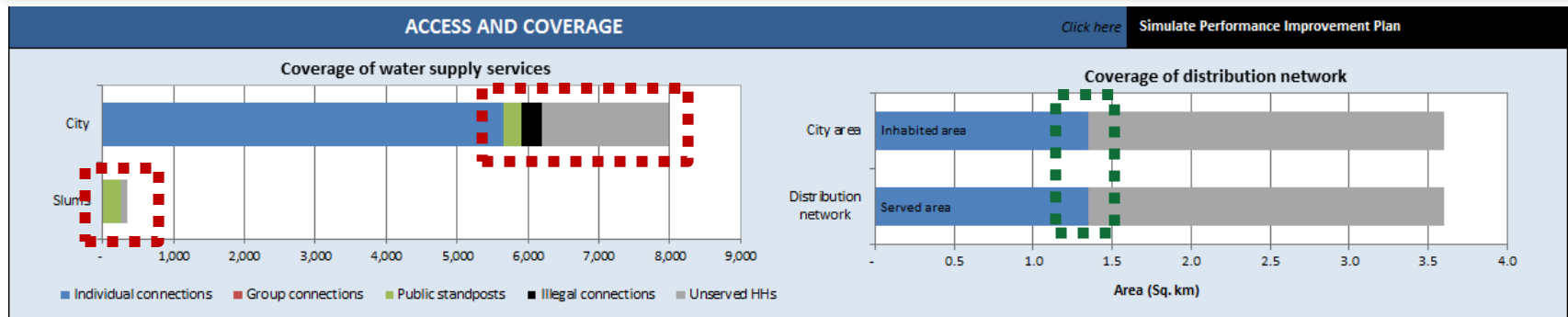


# Water Supply

Network is available but not all households have a connection



Very few individual connections in slum settlements



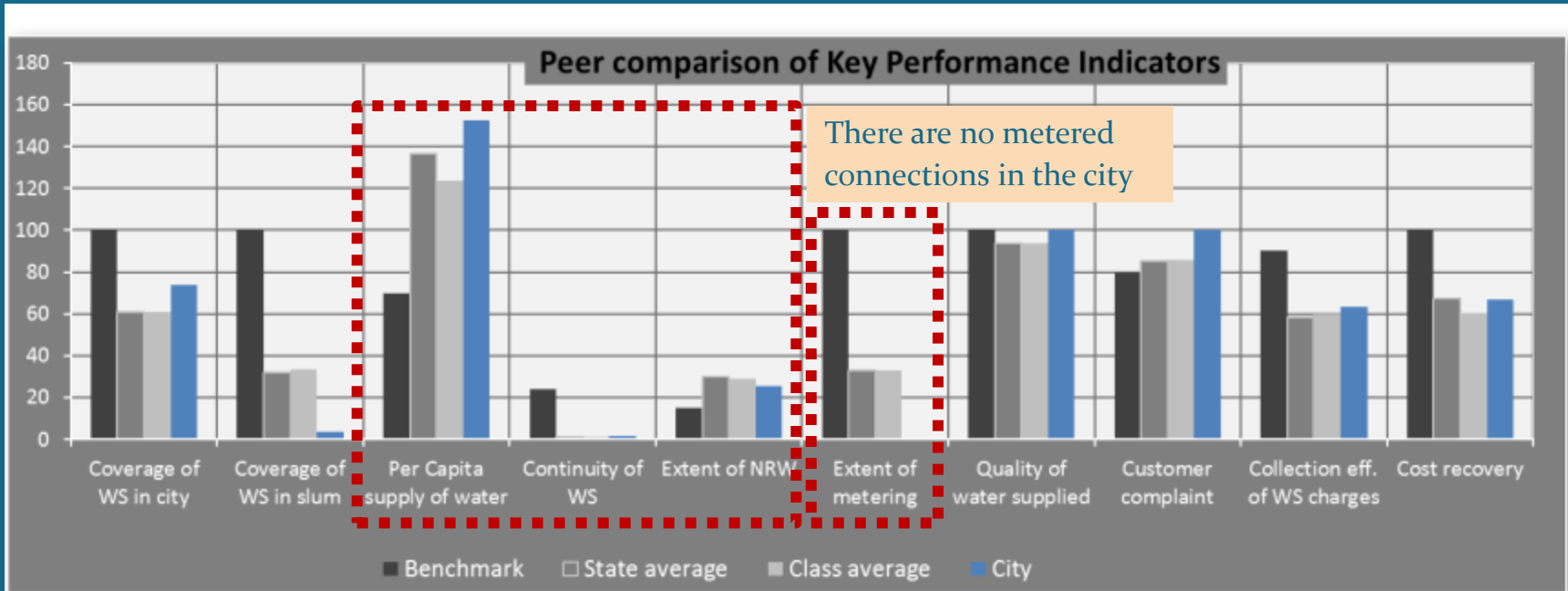
Only 3% HHs in slums have individual connections

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

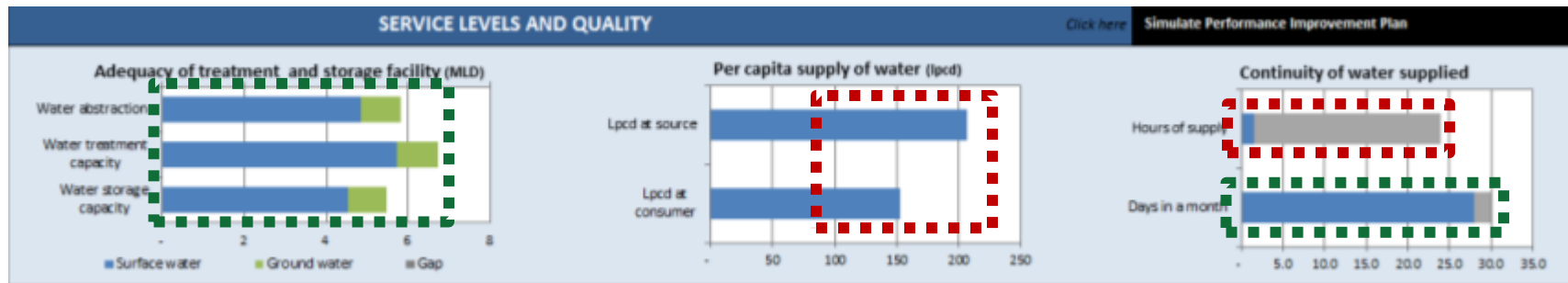
Network is available in all the inhabited area



# Water Supply



Water is available but NRW is high



Adequate water at source, adequate treatment and storage capacity

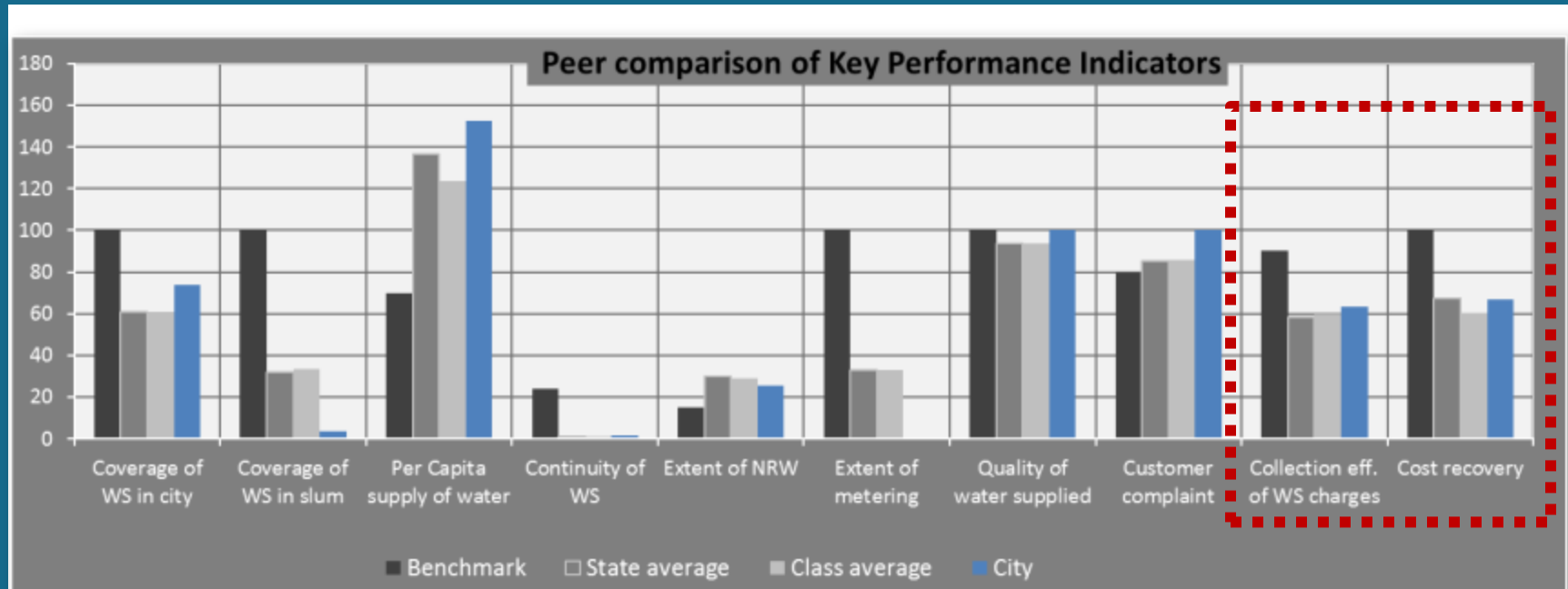
Adequate supply at consumer end

NRW much more than benchmark

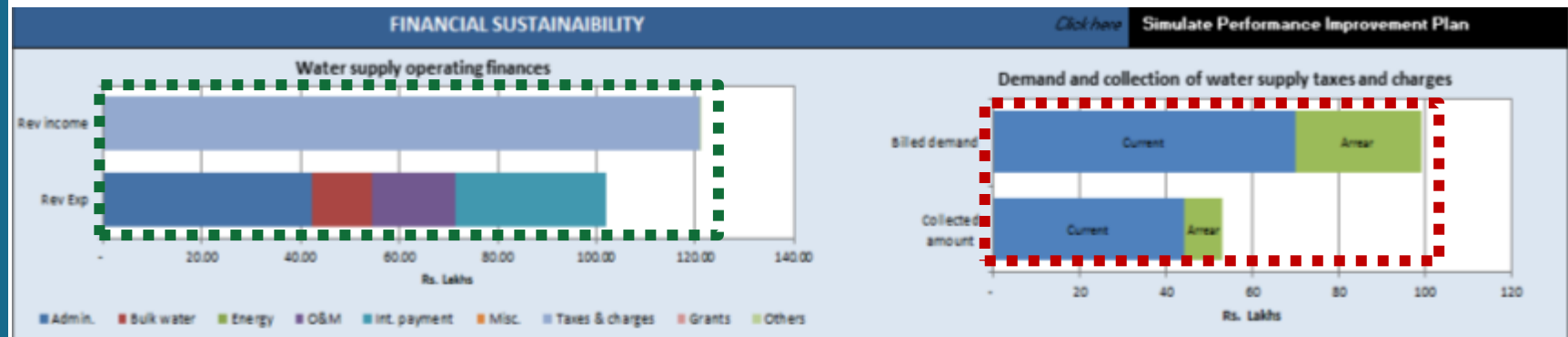
Water is supplied only for 1.5 hrs

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

## LAI – KPI impact matrix

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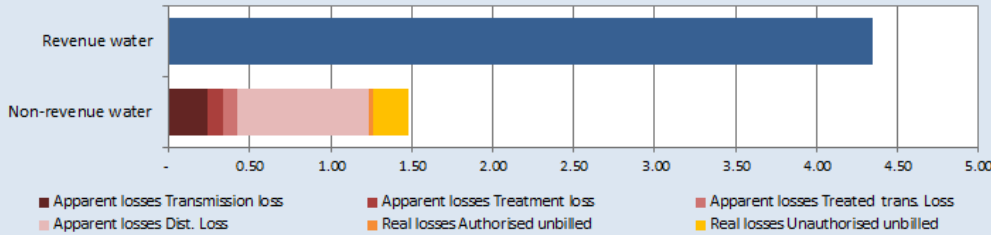
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### EFFICIENCY IN SERVICE OPERATION

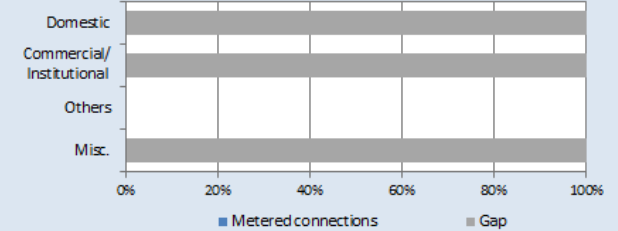
[Click here](#)

Simulate Performance Improvement Plan

#### Breakup of Non revenue water (MLD)



#### Connection type wise extent of metering



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
<b>A) Data improvement measures</b>										
<input checked="" type="checkbox"/> Conduct water audit										
<input type="checkbox"/> Conduct energy audit										
<input checked="" type="checkbox"/> Install bulk flow meters										
<input type="checkbox"/> Map water supply and wastewater network										
<input type="checkbox"/> Conduct Hydraulic modelling										
<input type="checkbox"/> Conduct Utilities survey (asset mapping)										
<b>B) Process/Policy improvement measures - No cost</b>										
<input type="checkbox"/> Improve processes for regular checking of water losses										
<input type="checkbox"/> Policy to introduce universal consumer meters										
<input type="checkbox"/> Improve processes for management of consumer complaints										
<b>C) Existing system improvement measures - Low-cost</b>										
<input type="checkbox"/> Reduce losses in trunk main transmission network										
<input type="checkbox"/> Reduce losses at water treatment plant										
<input type="checkbox"/> Reduce losses in treated water transmission network										
<input type="checkbox"/> Refurbishment of water storage reservoirs										
<input checked="" type="checkbox"/> Improvement in water supply distribution network										
<input type="checkbox"/> Plugging of leakages at valves										
<input checked="" type="checkbox"/> Replacement of service line connections										
<input type="checkbox"/> Reduce free water supply										
<input type="checkbox"/> Repair non-functional metered water supply connections										
<input type="checkbox"/> Improve consumer grievance redressal system										
<b>D) Create new infrastructure - High cost</b>										
<input type="checkbox"/> Metering of consumer water supply connections										

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



# Summary

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## SECTORAL VISION AND PRIORITIES FOR IMPROVEMENT

WATER SUPPLY	WASTEWATER	SOLID WASTE
<b>SECTOR GOALS</b>		
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

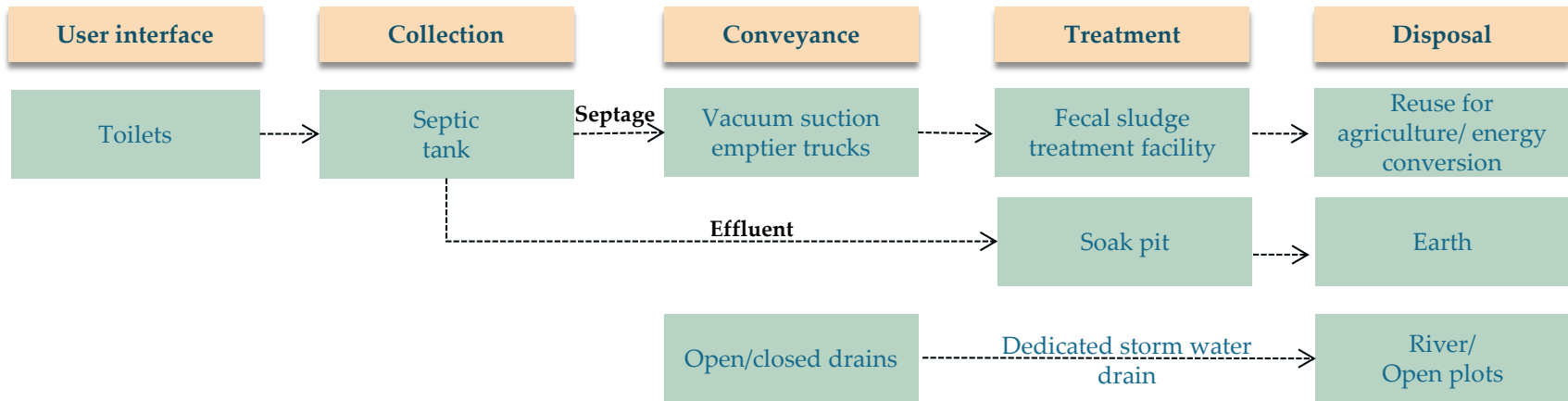
<b>PLANNING OBJECTIVES</b>		
Computerise water supply records	Household survey to assess wastewater services	Procure equipments for door to door solid waste collection (collection bins, ghantagaadis, containerised cycle rickshaw, handcarts etc.)
Policy for providing individual water connections in slums	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

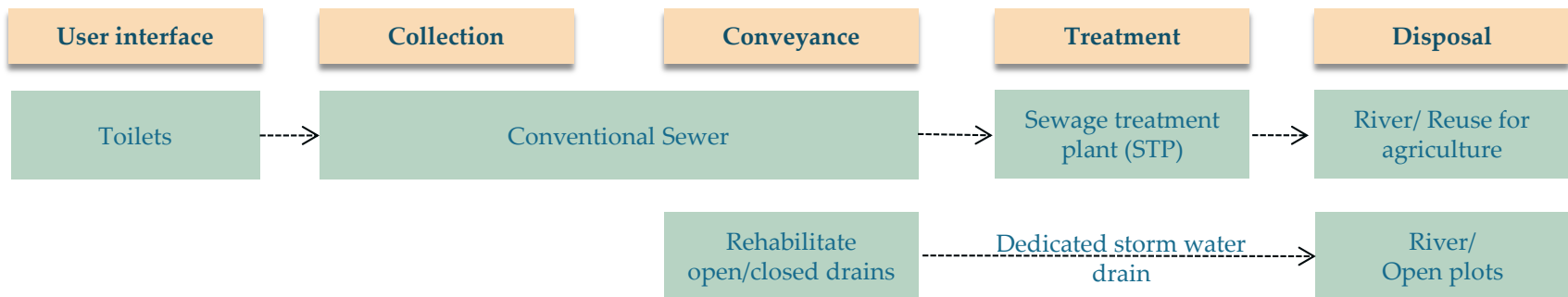
# Sanitation: Action Planning

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

## Option 1 - On-site Sanitation System



## Option 2 - Conventional Sewer age system



# Sanitation: Action Planning

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## 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	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 sewerage sanitation system in non-slum areas	New infra	2014	2016	1,433
Provide sewerage 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



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%

Business as usual (BAU)

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%

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%

Option 2: Sewerage System



# Sanitation: Impact of Improvement Actions



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%	14%	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

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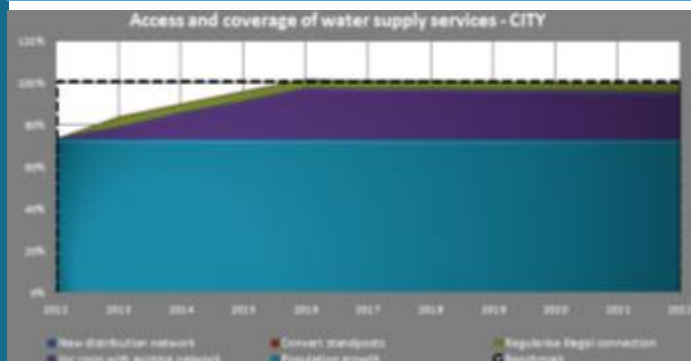
MAKE  
FINANCIAL  
DECISIONS



REVIEW  
FINANCING  
PLAN

Existing system improvement measures				
Item	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 unauthorised 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	Rbi connection	500
Item	Activate	Increase connections using existing water supply distribution network	2013	2016
Baseline		Inhabited area served by distribution network as compared to total inhabited area	Area served / total area in City	1.35 / 1.35
		Households served by individual water supply connections as compared to total households in city	HHs served / total HHs	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%
Item	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



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%

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%	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%

With Improvement  
Plan

# Solid Waste Management: Action Planning

BASE  
INFORMATION



ASSESS CITY  
PRIORITIES



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IMPROVEMENT  
ACTIONS



DEVELOP  
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PLAN



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FINANCIAL  
DECISIONS

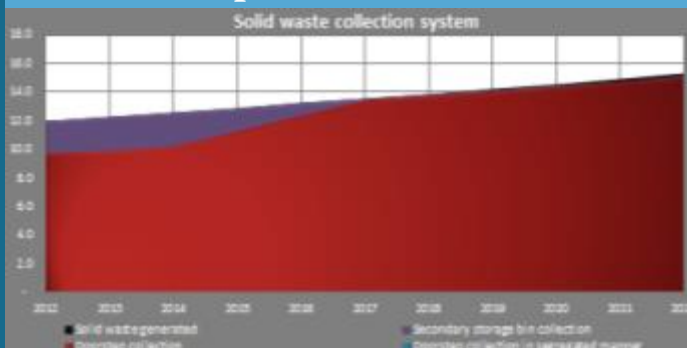


REVIEW  
FINANCING  
PLAN

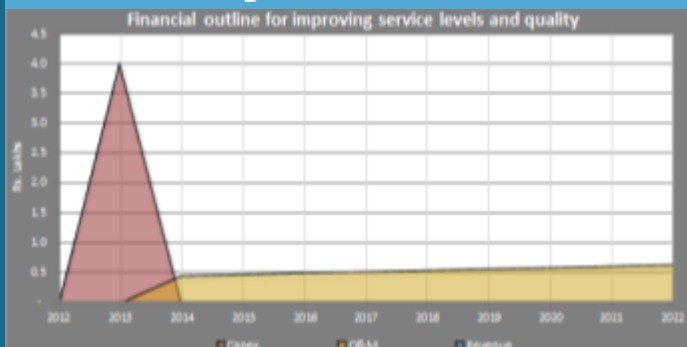
4 Create new infrastructure

Activate	Procure new vehicles for solid waste collection	2013	2013
Baseline	Maximum quantity of waste that can be transported with present vehicles of ULB	Minic transport	12.50
	Additional vehicles to be procured	Number	Capacity
	Three wheeler auto tippers	1	0.50
	Tipper trucks		
	Tractor trailer		
	Mini lorries		
	Dumper loaders		
	Trucks		
Improvement	Attain the possible value	Tipper/tr	3
	Three wheeler auto tippers	Tipper/tr	
	Tipper trucks	Tipper/tr	
	Tractor trailer	Tipper/tr	
	Mini lorries	Tipper/tr	
	Dumper loaders	Tipper/tr	
	Trucks	Tipper/tr	
Finance	Total cost to procure all vehicles	Rs lakhs	4.00
	Capex	Rs lakhs	4.00
Deactivate	Construct new solid waste transfer station		
Baseline	Existing number of transfer station in ULB		
	Additional stations to be constructed		

## 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



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%

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%	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%

With Improvement  
Plan

# 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
<b>Revenue Account</b>						
Revenue Receipts	411	454	428	462	429	807
Revenue Expenditure	354	411	426	424	631	745
<b>Operating ratio</b>	<b>0.86</b>	<b>0.9</b>	<b>0.99</b>	<b>0.92</b>	<b>1.47</b>	<b>0.92</b>
<b>Capital Account</b>						
Capital Receipts	111	162	219	62	82	442
Capital Expenditure	236	185	199	197	203	763
<b>Capital Utilisation</b>	<b>213%</b>	<b>114%</b>	<b>91%</b>	<b>317%</b>	<b>246%</b>	<b>173%</b>
<b>Extra-ordinary Account</b>						
Extraordinary Receipts	102	71	75	50	68	123
Extraordinary Expenditure	94	40	62	37	50	88
<b>Summary</b>						
Total Receipts	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*

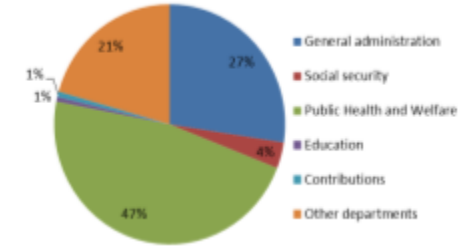
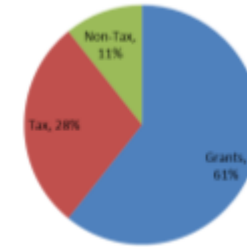
Total expenses have grown registering a CAGR of 6.6% The total receipts have reduced to 580 lakhs in 2010-11 from 624 lakhs in 2006-07 after recording a peak of 723 lakhs in 2008-09.

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

Annual per capita expenses is Rs 1026.

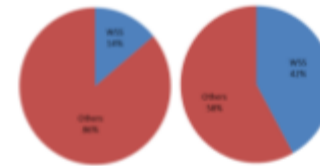
Per capita expense in WSS at Rs 444 for FY 2010-11 is only 48% of the HPEC norm of Rs 936

## 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

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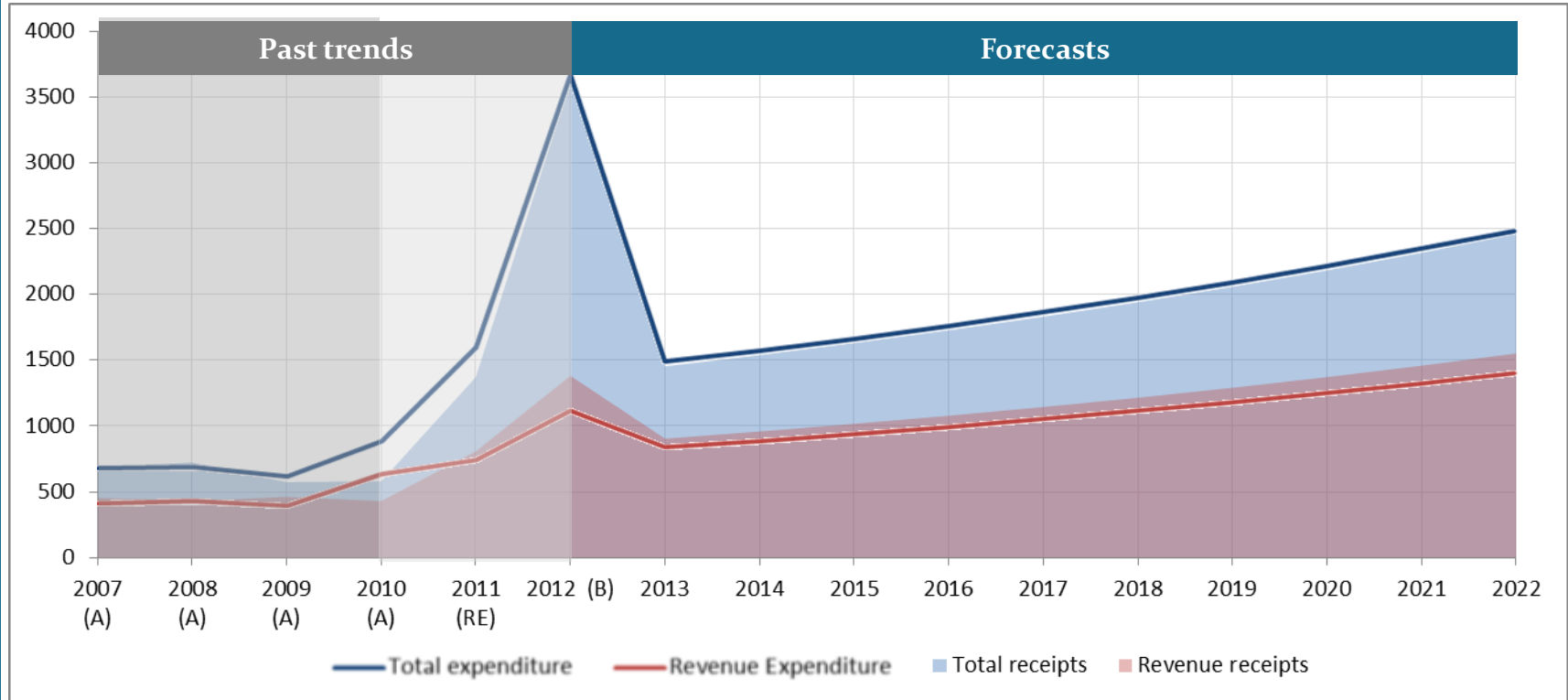
REVIEW  
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Total expenses and receipts are estimated to grow at CAGR of 5-6%

- 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

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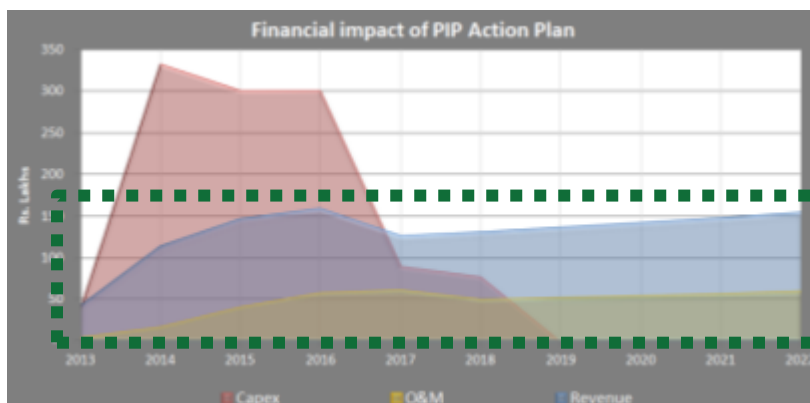
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## Option 1 - On-site Sanitation System

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



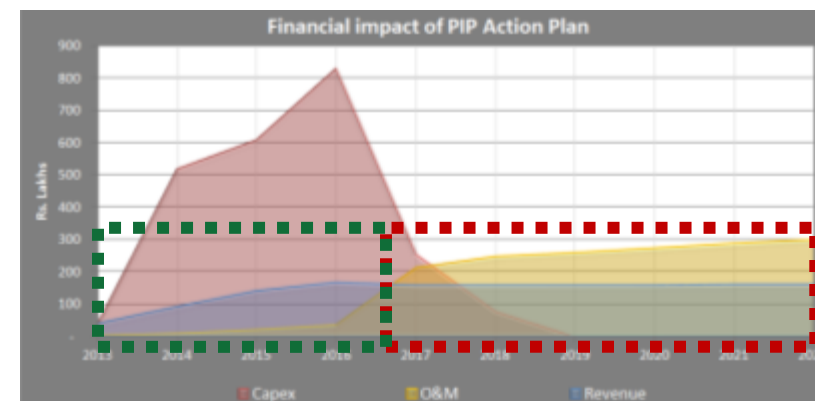
i.e. an investment of more than **Rs 11 Crores** and an additional **revenue of more than 8 Cr** from new assets over 10 year planning period

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

## Option 2 - Conventional Sewerage System

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

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



## Capital Expenditure through

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



# Option 1.1 Financial Decisions

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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,	25						100% 25

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	166	159	126	130	136	141	147	153
2. Revise WSS charges and tariffs										
Additional income generated	15	19	19	56	41	42	44	45	47	49
3. Revise own income sources like Property tax										
Additional income generated	25	31	35	28	20	30	31	33	35	36
4. Allocate Non-WSS revenue surplus for WSS services										
Non-WSS revenue surplus	208	276	323	343	365	367	445	566	736	899
Proposed 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	484	507
Revenue expenditure	288	378	364	401	433	426	444	467	484	507
WSS Revenue account status	1	65	108	124	65	72	-	-	-	-
Services other than water supply and sanitation (Non-WSS)										
Opening balance	1	52	83	97	103	109	154	271	400	538
Revenue receipts	856	917	977	1,030	1,036	1,166	1,242	1,324	1,411	1,504
Revenue expenditure	510	543	578	616	656	699	746	795	846	905
Non-WSS Revenue account status	347	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 arrears demand	%	67%	90%	2013	2015					
3. Review average Property tax demand per property										
Average general property tax demand per property (Platproperty/arsum)			986							
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										
Average demand of other taxes and charges in last year (Rs. lakhs)			879							

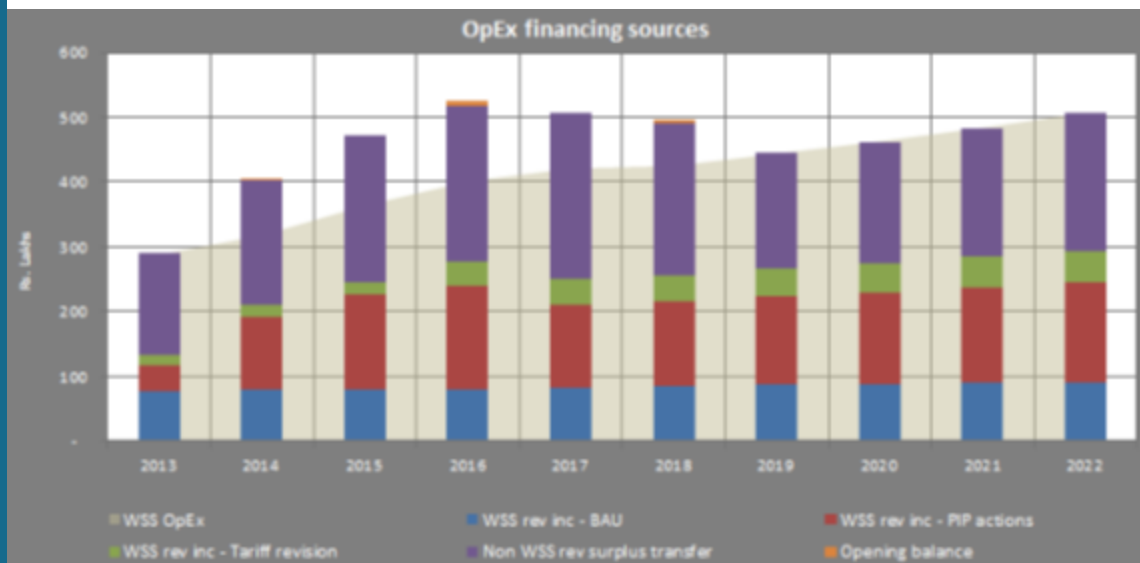
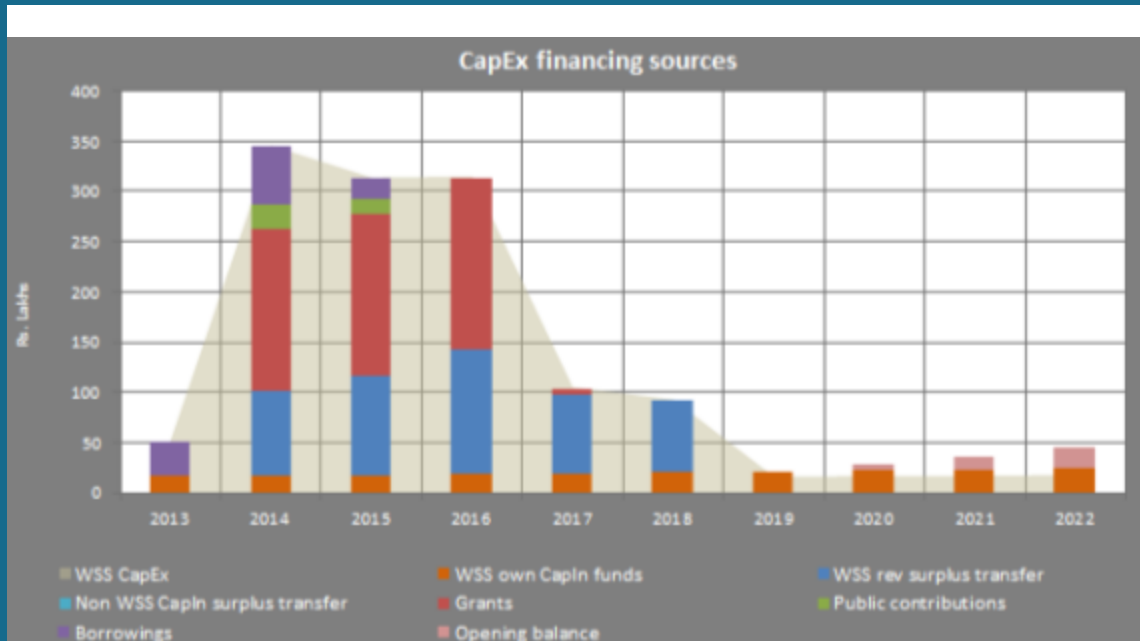
WSS revenue surplus for Capital Funding

2. Allocate WSS revenue surplus for capital funding										
WSS revenue surplus	1	65	108	124	65	72	-	-	-	-
Proposed allocation of surplus for WSS CapEx	0%	100%	92%	100%	92%	100%	-	-	-	-

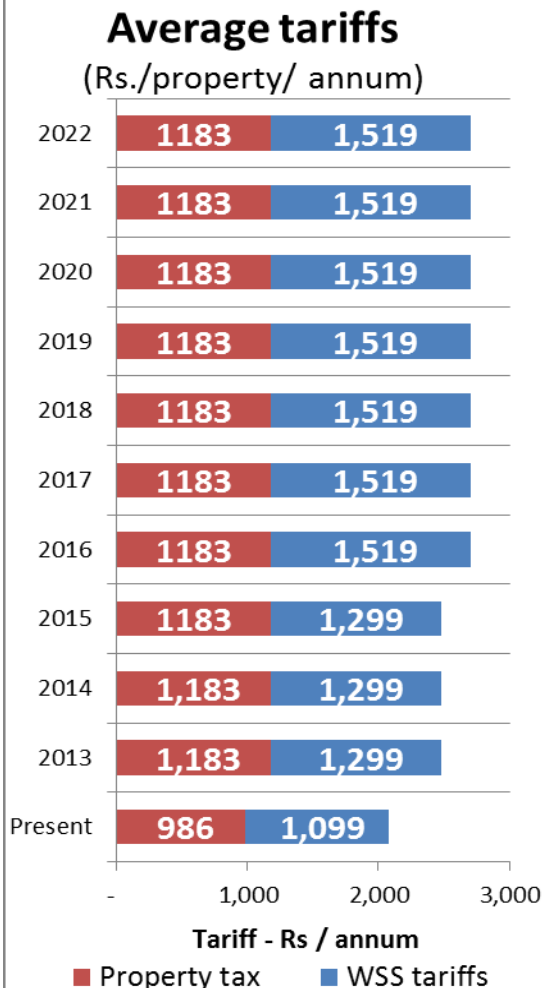
WSS revenue surplus for Capital Funding

4. External borrowings										
Debt from Action Plan finance	-	20	21	-	-	-	-	-	-	-
Additional debt required	34	39								
Rate of interest (%)					10%					
Terms of conditions					Monetorium 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)



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



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			
<b>Option 1.1</b> On-site with grants	707	458	115	40	<b>1320</b>	2702
<b>Option 1.2</b> On-site through own sources	207	248	825	40	<b>1320</b>	2879
<b>Option 2.1</b> Sewerage with grants	1913	396	154	42	<b>2505</b>	3329
<b>Option 2.2</b> Sewerage with own sources	225	353	1726	201	<b>2505</b>	5126

# Comparison of the 4 options

BASE  
INFORMATION

ASSESS CITY  
PRIORITIES

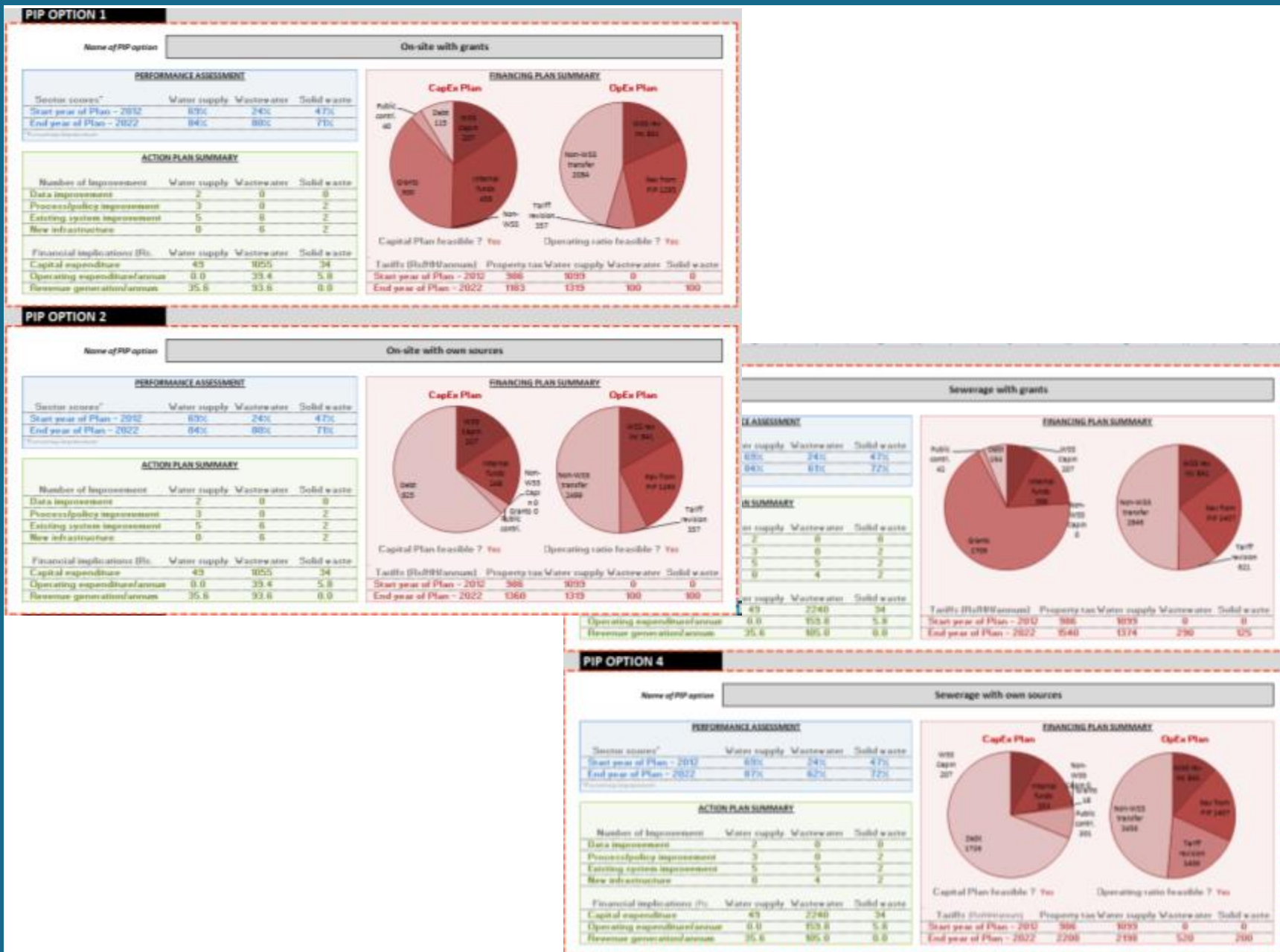
SELECT  
IMPROVEMENT  
ACTIONS

DEVELOP  
IMPROVEMENT  
PLAN

REVIEW  
IMPROVEMENT  
PLAN

MAKE  
FINANCIAL  
DECISIONS

REVIEW  
FINANCING  
PLAN







Thank you