Performance Benchmarking of Urban Water Supply and Sanitation in Maharashtra: Data Book (2008-09)

Part I

CEPT University

April 2011

performance assessment system

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Contents

List of Figures

List of Tables

Abstract

India's rising urbanisation levels entail coping with the challenges of meeting growing demands and aspirations of the people. Sustainable access to water supply and sanitation services in urban India is widespread. The same, however, cannot be said of poor households – reliable and updated information about operational and financial performance of urban water supply and sanitation services, and the quality, level of service delivery and coverage is either inadequate or unavailable.

For improved service outcomes in water and sanitation, it is important to not only assess the performance of the existing system, but to also ensure the sustainability and equity aspects of service delivery. The Performance Assessment System (PAS) Project developed by the Centre for Environmental Planning and Technology (CEPT) University proposes an assessment system with a set of key performance indicators for urban water and sanitation and links the planning and fund allocation process to performance. Initiated in early 2009, the PAS Project includes three major components of performance measurement, performance monitoring and performance improvement. It covers all the 400+ urban local governments in Gujarat and Maharashtra.

The Government of India's Service Level Benchmark (SLB) framework was the basis to further develop this work. The PAS approach also draws on an extensive review of international literature on performance benchmarking in the sector, as well as the practise of benchmarking by different stakeholders such as utility associations, national governments and regulators.

This data book contains the results of the first round of performance measurements of urban local bodies (ULBs) in Maharashtra, carried out in 2009–10. Part 1 presents the performance assessment summary results of the state and compares them with available studies in India and other developing countries. Part 2 provides detailed city profiles, with appropriate context information for each city, to help correlate the information with service levels for all cities in Maharashtra.

Several validation layers have been built into the process for different types of methods. The PAS reliability assessment draws on the reliability principles of the International Benchmarking Network and the International Water Association, and provides reliability estimates through a series of objective questions.

This data book is aimed at initiating discussions among the various stakeholders on the state of water and sanitation in cities. It will be useful for ULBs, city managers, and decision makers to track service delivery in the key sector of urban water and sanitation. By enabling access to other works on performance benchmarking and facilitating appropriate comparisons, it is expected that state governments and cities will build further on the performance assessment framework and institutionalise the culture of performance analysis. This will make it possible to meet the goals of improving the quality of municipal services with increased transparency and accountability.

Preface

The Performance Assessment System (PAS) Project was initiated in early 2009. The development of the Performance Measurement Framework for the Project was a key activity in the initial phase. CEPT University and PAS partners wish to thank the Governments of Gujarat and Maharashtra for their guidance and active participation in discussions and consultations in the framework development and subsequent data collection.

The Government of India's Service Level Benchmark (SLB) framework was the basis to further develop our work. CEPT has been actively working as a member of the group constituted by Ministry of Urban Development, Government of India on the SLB exercise. Our active involvement in pilot study and Steering Committee of SLB has helped significantly to develop a more integrated approach to comprehensive performance assessment system.

The PAS approach has also drawn on an extensive review of international literature on performance benchmarking in the urban water and sanitation sector, as well as the practice of benchmarking by different stakeholders such as utility associations, national governments and regulators. Our interactions with IWA, UNESCO-IHE, IB-Net, WOP-Af have enabled access to other works on performance benchmarking and facilitate appropriate comparisons.

This data book consists of city level results for performance assessment with regards to urban water supply and sanitation indicators in Maharashtra. Detailed city profiles, with appropriate context information are also presented for readers to be able to correlate the information with service levels for all cities in Maharashtra.

We would like to thank all the urban local bodies and their staff for their cooperation in providing the information. The significant contribution and involvement of municipal commissioners, chief officers and elected representatives of the local bodies in the two states has been highly motivating for the PAS team. Our work has benefited from the insights of a large number of resource persons and we particularly acknowledge feedback from members of the PAS Project's Project Advisory Committee. Finally, yet importantly, we would like to acknowledge the support of the entire team of partners, particularly PAS team from the All India Institute of Local Self Government (AIILSG), which collected baseline data. The team at CEPT has also worked hard for completion of this data book.

We hope that this data book will be useful for city managers and decision makers. It is expected that state governments and cities will build further on this performance assessment framework and institutionalise the culture of performance analysis. This will make it possible to meet the goals of improving the quality of municipal services with increased transparency and accountability.

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Abbreviations

ADB	Asian Development Bank
AIILSG	All India Institute of Local Self Government
Avg	Average
BPMC Act	Bombay Provincial Municipal Corporations Act
CDP	City Development Plan
CEPT	Centre for Environmental Planning and Technology
CPHEEO	Central Public Health and Environmental Engineering Organisation
DMA	District Metered Area
DLHS	District Level Health Survey
DPO	District Project Officer
GDP	Gross domestic product
GoI	Government of India
GUDC	Gujarat Urban Development Company
HH	Household
IBNET	International Benchmarking Network for Water and Sanitation Utilities
IWA	International Water Association
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
MC	Municipal Corporation
MoUD	Ministry of Urban Development
MSW	Municipal solid waste
NIUA	National Institute of Urban Affairs
NP	Nagar Panchayat
NRW	Non-revenue Water
O&M	Operation and maintenance
PAS	Performance Assessment System
PMF	Performance Measurement Framework
PPP	Private sector participation
RDF	Refuse-derived Fuel
SJMMSVY	Swarnim Jayanti Mukhya Mantri Shaheri Vikas Yojana
SLB	Service Level Benchmarking
SSLB	Standardised Service Level Benchmarks
STP	Sewerage treatment plant
SWD	Storm water drainage
SWM	Solid waste management
UD	Urban development
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
ULB	Urban local body
UMC	Urban Management Centre
UN Habitat	United Nations Habitat
UNESCO-IHE	United Nations Educational, Scientific and Cultural Organization–IHE Institute of Water Education
UWSS	Urban water supply and sanitation
WDS	Water distribution station

WOP-Af	Water Operators Partnership–Africa
WS	Water supply
WSP	Water and Sanitation Program
WSS	Water supply and sanitation
WW	Waste water
WTP	Water treatment plant

Measurement Units and Symbols

km	kilometre
km²	square kilometre
l/c/d or lpcd	litres per capita per day
m	metre
m³	cubic metre
m³/d	cubic metre per day
m³/d/c	cubic metre per day per capita
mld	million liters per day
mm	millimetre
n.a.	not applicable
no.	number
%	per cent
''	inch
sq mi	square mile
sq km	square kilometre
Rs/kl	Rupees per kilolitre

1. Introduction

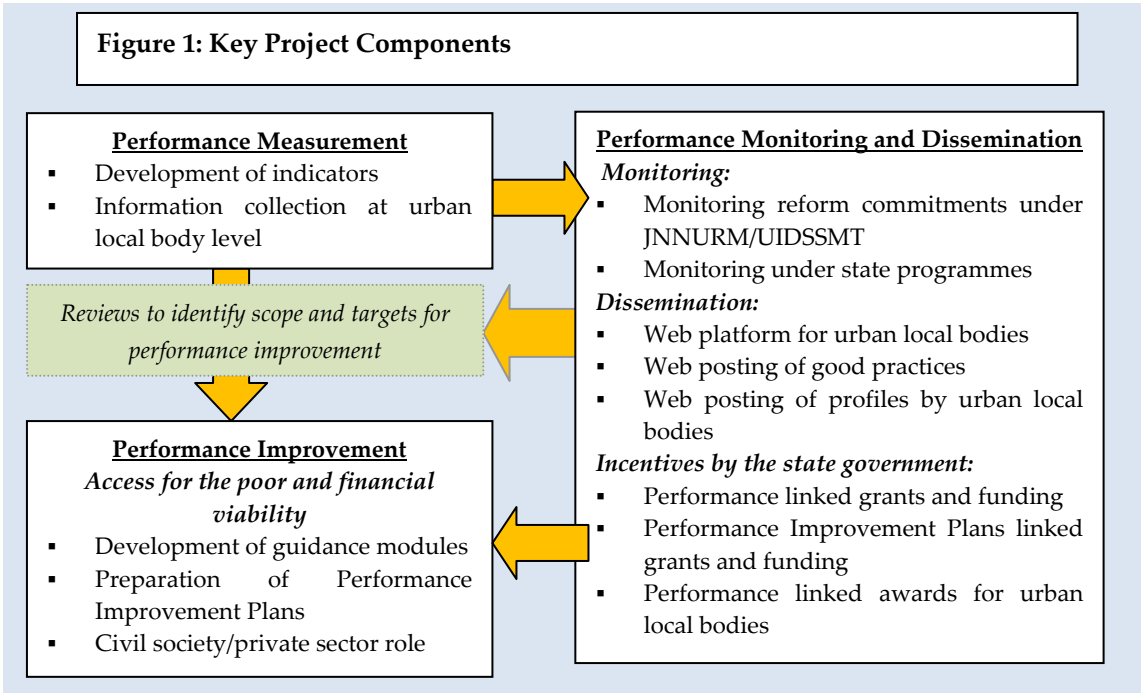
This data book contains results of the first round of performance measurements of urban local bodies (ULBs) in Maharashtra. The survey was carried out in 2009-10 by Performance Assessment System (PAS) through both data workshop and visits to ULBs. Information collected from all 248 cities is for the year 2008-09. This has been scrutinised by experts and verified and validated by the PAS team. This data book consists of two parts. In the first part, the summary results of the state are presented and compared with available studies in India and other developing countries. The second part provides information for each city. It is expected that such a data book will be produced each year. It will enable the ULBs and the state government to keep a track of service delivery in the key sector of urban water and sanitation.

Background

Though access to water and sanitation services in urban India is widespread, availability of accurate information about the quality, level of service, and coverage of poor households remains unavailable. This lack of adequate and reliable information is a key challenge in the sector in India. Very little information is available about the finer aspects of service delivery for example quantity of water made available to people or of non-revenue water (NRW), or about quality of water and coverage of poor households. For new investments in water and sanitation to be effective, it is important to not only assess the performance of the existing system, but to also ensure sustainability and equity aspects of service delivery.

In response to this situation, the Centre for Environmental Planning and Technology (CEPT) University is implementing the PAS Project. The Project aims to develop an assessment system at local and state level that

Figure 1: Key Project Components



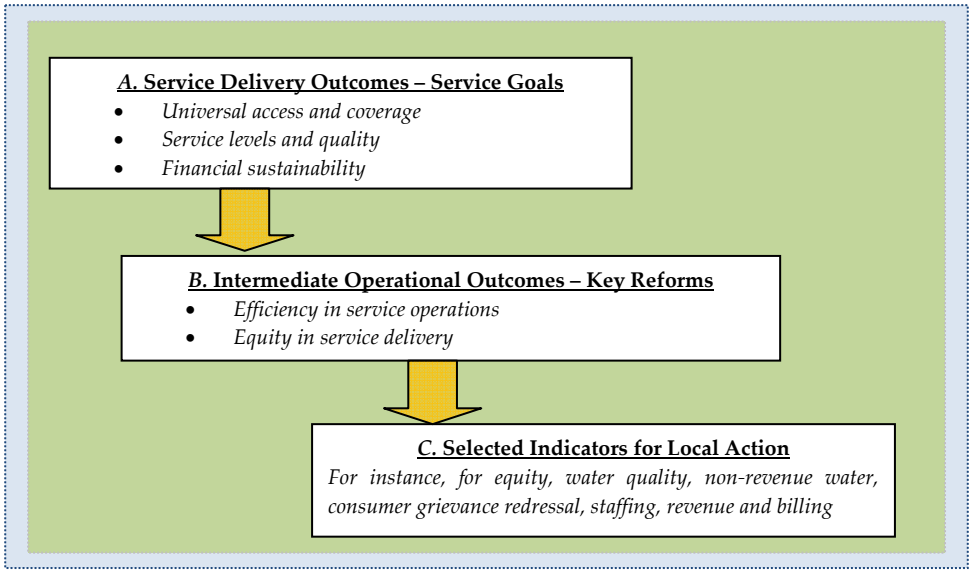
is accompanied with a set of key performance indicators for urban water and sanitation and links the planning and fund allocation process to performance.

Accordingly, the set of three key project components are (a) Performance Measurement; (b) Performance Monitoring; and (c) Performance Improvement.

The Performance Measurement Framework (PMF) developed for state-wide implementation in Gujarat and Maharashtra has been used to prepare a water supply and sanitation performance profile for each of the 414 ULBs for the year 2008-09. A dedicated web platform hosts this information with provisions for access by ULBs and other stakeholders. The portal has been designed with appropriate provisions to assist ULBs for access of information for step wise performance improvement planning. Data collection exercise for 2009-10 and 2010-11 is also under progress for both the states and data books for these years will be available soon.

The key performance indicators under the PAS PMF are distinguished for service delivery outcomes (or main goals of public services) and intermediate operational outcomes that reflect the plans and reforms needed to achieve the service delivery goals.

Figure 2: PAS Performance Measurement Framework



In the PAS framework, additional indicators have also been identified for local government actions to improve performance on equity, NRW, water quality and cost recovery. While goals and reform indicators will be monitored by both higher levels and local governments themselves, indicators for local action are more suitable for local level planning and monitoring.

Alignment with Service Level Benchmarking Pilot Initiative of MoUD, GoI

The PMF of PAS draws on the Ministry of Urban Development, Government of India's (MoUD, GoI) ongoing initiative of standardised Service Level Benchmarks (SLB) for urban water supply and sanitation sectors. The framework includes benchmarks for water supply, wastewater management, storm water drainage and solid waste management (SWM) services. The SLB framework has also been endorsed by the 13th Finance Commission which has included it as one of the conditionalities for allocation of performance based grants to municipalities or municipal corporations. It is expected that, with time, all other municipal bodies would also adopt improved performance monitoring systems as per the SLB framework.

In addition to the key indicators of SLB, the PAS framework generates additional context information and local action indicators. The PAS framework also provides information for equity related aspects. More information for assessing service levels in slum settlements is being facilitated in Round II. It is intended that after proper training, ULBs will use these modules available on the web portal and for self assessment of performance and track their progress. For this data book, information was gathered by the Urban Management Centre (UMC) in Gujarat and the All India Institute of Local Self Government (AIILSG) in Maharashtra.

Methodology

The 2008-09 benchmarking and data book of urban local bodies in Gujarat and Maharashtra in India has measured performance in four sectors of water supply, sanitation, solid waste management and storm water drainage. Data was collected through a checklist (questionnaire) for the year 2008–09. (See PAS 2010 for detailed checklist.)

Before initiating state-wide data collection, the checklist was pilot tested in 30 cities, covering 18 ULBs in Maharashtra and 12 ULBs in Gujarat. The sample was selected carefully to include variations in size, and geographical distribution. In the pilot phase, teams of enumerators visited ULBs in person to collect data for performance assessment. During this period, the PAS Project also supported performance assessment of four ULBs under the GoI's SLB initiative. Learning from pilot experiences, Maharashtra and Gujarat teams adopted different strategies for "State-level Roll-outs" to operationalise the PMF.

In Maharashtra, the team worked closely with the offices of the divisional commissioners to hold a series of "capacity building workshops" in all divisions. These were used as a platform to introduce ULBs to project objectives, benchmarking concepts and the use of indicators for performance measurement and monitoring. A conscious decision was made to adopt both centralised and decentralised methods of data collection to cover 248 ULBs in shortest possible time. In the centralised method, data workshops were conducted in AIILSG, Mumbai, where ULBs brought relevant information. The ULBs were given assistance for data entry and technical clarifications during the workshop to complete the data checklist. This was also verified by experts who were present at the workshop. In the decentralised method, the district project officer (DPO) in charge of municipal administration at the district level facilitated the effort. The ULBs were invited to the district headquarters by the DPO. Data Management Team from PAS was available to support the ULBs. This method offered possibilities to work closely with the district administration to facilitate assessment. A few cities were visited by the team for data collection in the local offices of the ULBs. This method was considered suitable to cover larger cities such as Class "A" and Municipal Corporations, where it required visits to several departments and units within the ULB.

In Gujarat, after exploring several options, the UMC, CEPT's local partner, decided to collect information through personal visits to all ULBs. Background information and ULB profile was generated by the team prior to the visit. Before the visit, copies of the PAS checklist were provided to the ULBs in the local language to enable them to begin collating information from various departments. The team collected data from field offices as well as marked spatial information on maps. Limited visits were undertaken to various water and sanitation facilities in each ULB.

Validation of Data

Several validation layers were built into the process for different types of methods. Besides onsite clarifications, the teams also set up several internal mechanisms to validate data and identify outliers. Several consistency checks were built into the questionnaire. At the end of performance assessment, a hard copy of the final checklist along with indicators results was also shared with ULBs for data validations. For Gujarat, this was accompanied by a short note on how to read/interpret the indicators. In both states, the process of data validation entailed a review by the sector experts, clarifications by consultants on queries raised, followed by modifications or corrections where necessary. Extensive consultations with sector experts and dialogue with city officials provided further opportunities to validate the data.

Data Reliability

Reliability assessment of key performance indicators is important when a comparison is made across cities and different service providers. The PAS reliability assessment draws on reliability principles as those of the International Benchmarking Network (IBNET) and the International Water Association (IWA), and provides reliability estimates through a series of objective questions in the checklist, unlike the SLB reliability scales, which are assigned by the researcher, the. PAS data reliability scales have been computed through a series of responses of ULBs for key variables. Four scales of reliability are used: A being the highest reliability (fully automated systems for data management) and D being the lowest (no records maintained). The questionnaire used for the PAS includes questions on data sources and data management for all key information to derive reliability scale.

With reliability measures associated with each key performance indicator, a more comprehensive comparison across all ULBs becomes possible. It also informs ULBs about the quality of their existing data systems, and encourages them to make improvements in their data management. After the first round of surveys, key actions for improvements in data systems are being explored with selected ULBs. In addition, where appropriate, state-wide information system improvement efforts are also planned.

Comparison with National and International Studies

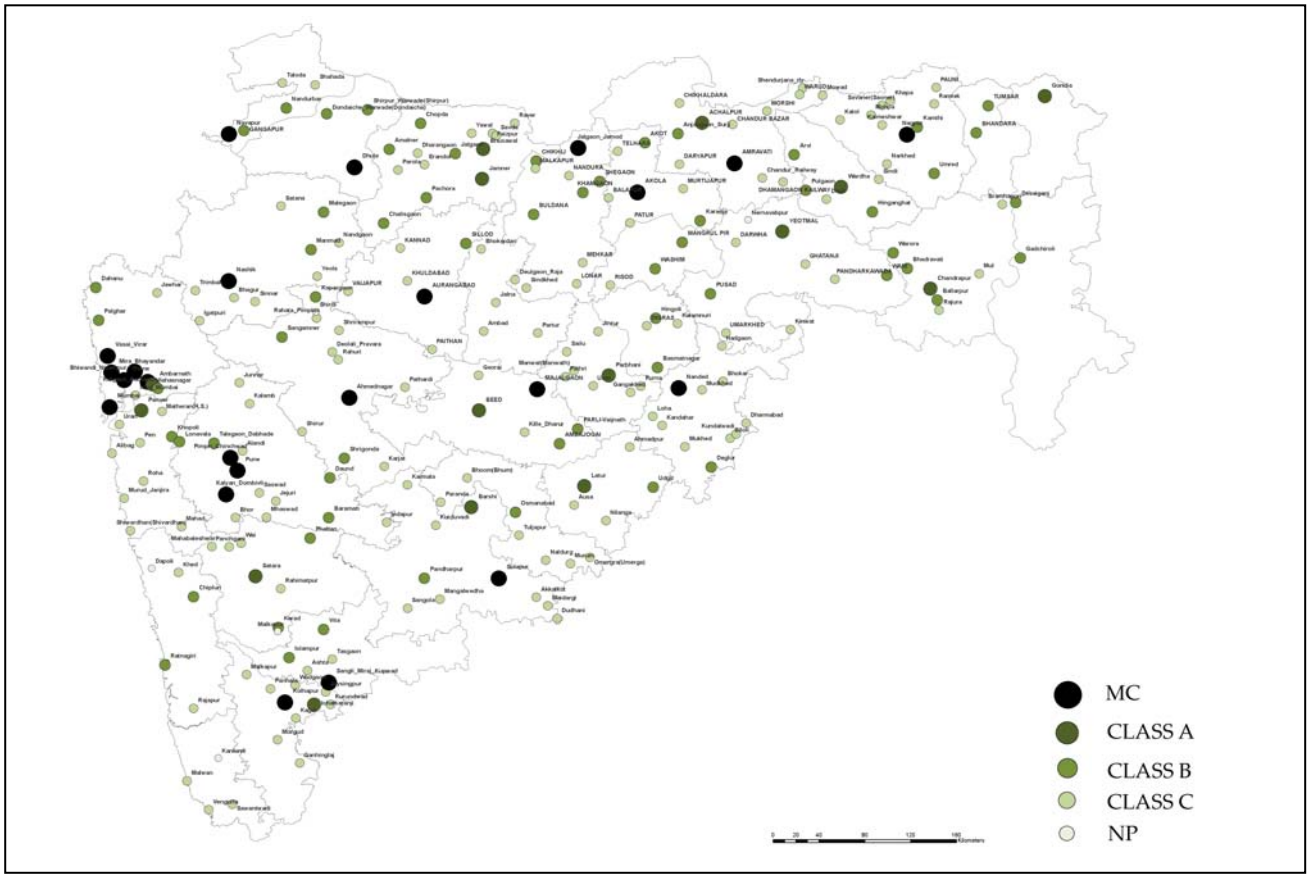
To evaluate the performance of water and sanitation in the two states in relation to national and international studies the results have been compared with various available studies. In most of these studies, a different framework of indicators measurement was used, so only those indicators which are comparable to the PAS are used. It is to be noted that none of these studies are as comprehensive as the PAS and often had a small sample size. Yet, the comparison provides a good reference point for cities in Gujarat and Maharashtra.

Aim of the Data Book

This data book is aimed at initiating discussions among the various stakeholders on the situation of water and sanitation in cities. The data book has city profiles that provide city-level indicators. In the data collection and finalisation process, significant care was taken to validate the information received from ULBs. However, it is possible that there are some inadvertent errors due to use of different variables and formulas. Such problems are common in the initial stages in all benchmarking exercises. It is precisely for this reason that a benchmarking exercise need to be done on a continuous basis and not as a one-off exercise. This is the principal aim of PAS and it is hoped that in the future rounds, both the quality and use of the performance measurement will improve.

PART I- Sector Performance Analysis

Figure 3: Urban Local Bodies in Maharashtra



2. Performance Analysis: Water, Sanitation and Solid Waste

Maharashtra covers an area of 307,731 km² (118,816 sq mi) or 9.84 per cent of the total geographical area of India. It is the second most populous state of India with 9.42 per cent of India's population and the third largest state by area in the country. It is one of the richest states in India, contributing to 15 per cent of the country's industrial output and 13.2 per cent of its GDP in 2005–06. It is also among the most urbanised states with 45 per cent of population living in urban areas. The urban population is concentrated in the large cities, with the 23 municipal corporations accounting for two-thirds of the urban population of the state.

Table 1: Maharashtra: Context Information and Size of ULBs

Class	No. of cities	Population (2009)	Area (sq km)
MC	23	21,874,631	2,226
A	15	3,259,475	418
B	59	4,052,153	1,011
C	145	3,903,407	1,725
NP	6	140,143	69
Total	**248**	**33,229,810**	**5,449**

Maharashtra, in its golden anniversary year, is already implementing a comprehensive urban reform agenda through several programmes for urban water supply and sanitation. Under the Sujal Nirmal Abhiyan (2008–09), the Maharashtra state government gives financial help to ULBs which are ready to improve the water supply schemes and sanitation in accordance with a prescribed approach. The programme essentially includes improvement of accountability mechanisms and promotes the judicious and equal use of water at various levels. Parameters for improvement include information on unauthorised connections, intra-city distribution of services, quality of water, NRW, costs of service provision, service level and functionality of metering etc.

The state has also been a pioneer in treating public-private partnerships as the preferred mode of execution for urban infrastructure projects. It has recently launched an urban renewal mission, the Maharashtra Suvarna Jayanti Nagarotthan Mahaabhiyan, and allocated significant funds for this programme. In addition, Rs 1,840 crore has been assigned for Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) for 2010–11. As of 2010, a total of 86 cities have been covered under the UIDSSMT (with 74 cities for water supply projects and 16 for sewerage projects).

Maharashtra has had a clear focus on urban sanitation. A key programme to ensure success is the Sant Gadge Baba Urban Sanitation Campaign. It encourages cities to prevent open defecation, safely manage wastewater, etc. It forges a spirit of competition among ULBs through performance evaluation and rewards. The state government has undertaken the preparation of City Sanitation Plans for all major municipal corporations. The state has also launched the Swarna Jayanti Sujal and Nirmal Maharashtra Abhiyan 2010. This programme is designed to link funding for infrastructure with specific water sector reforms and actions.

Water Supply

Context

Table 2: Summary of Connections and Production

Class	No. of cities	Total nos. of connections (WS)	Total water production (MLD)	Staff (WS)	Avg staff per ULB
MC	23	1,384,577	3,812	6,583	286
A	15	249,543	388	697	46
B	59	376,249	404	1,737	29
C	145	373,540	360	1,879	13
NP	6	12,711	12	90	15
Total	**248**	**2,396,620**	**4,976**	**10,986**	**44**

Water supply production and number of connections are proportionally more in the MCs, where two-thirds of the state's urban population resides but consumes more than three-fourths of the water. A similar case exists with the number of staff employed in the ULBs for water supply.

Table 3: Summary of Performance Indicators for Maharashtra (as on March 2009)

Water supply							
Key performance indicators	Mean count	State	MC	Class A	Class B	Class C	NP
Coverage of water supply connections (%)	242	52	63	48	49	52	39
Per capita supply of water at consumer end (lpcd)	233	100	135	124	102	91	109
Extent of metering of water connections (%)	58	52	52	52	54	49	100
Extent of non-revenue water (%)	230	31	34	34	31	31	27
Continuity of water supply (hrs)	241	1.7	3.0	1.7	1.5	1.4	5
Efficiency in redressal of customer complaints (%)	219	94	94	95	93	95	96
Quality of water supplied (%)	242	98	97	99	97	98	99
Cost recovery in water supply services (%)	225	68	84	57	64	69	57
Efficiency in collection of water supply related charges (%)	222	68	63	66	67	70	53
Coverage of water supply connections in slums (%)	169	24	35	13	29	22	8

Sector Analysis

- **Access and coverage**

  A water supply and sewerage connection for every family, with doorstep collection of SWM has been considered as the benchmark by the GoI, under its SLB guidelines. As a part of its state-level policy, there has been an increase in provision of group connections for water and increased access to share/community, or pay and use, toilets. Thus there has been a gradual shift from a basic to higher level of services in the state.

Under its Golden Jubilee Programme, Sujal Nirmal Maharashtra Abhiyan (SNMA) 2010, the state government has ensured universal access to water and sanitation.[1]

From the PAS survey, it appears that Maharashtra has a long way to go before it can provide household-level water and sewerage connections. At present, 52 per cent of households have water supply connections, and in slum areas it is abysmally low at 24 per cent. This low coverage in slums is essentially due to the restrictive policies adopted by ULBs in Maharashtra for granting water supply connections in slums. The Government of Maharashtra, through its various Government Resolutions, also specifies cut-off dates for eligibility for basic amenities. This creates a major barrier for ULBs in providing water supply connections in slums.[2]

It is possible to increase coverage in Maharashtra if the state government can make a policy to simplify the process of providing water connection to slum dwellers. It is also essential to have some estimation of illegal connections through periodic surveys by ULBs. This has to be supported with appropriate amnesty schemes for regularising illegal connections. Given the high density of development in larger cities of Maharashtra, a comprehensive information system that links properties, households and water connections database will be essential for developing plans to increase coverage.

In addition, it is important for ULBs to extend water supply network in uncovered areas, particularly in slums or poorly served low-income areas. While increased coverage in such areas will be governed by policies that delink tenure issues with service provisions, it is important also to consider process improvements, for example, simplified paperwork while applying for connections by urban poor. Similarly, procedural changes such as facilities for payment of connection fees and water charges through instalments can also contribute to increased coverage and improved cost recovery.

- **Service levels and quality**

Mere coverage of water supply does not ensure better services. Water supply service has many dimensions: duration of supply; water quality; pressure; and response of ULBs to complaints. On these indicators, Maharashtra's ULBs do not perform well.

The average per capita supply of water at 100 litres per capita per day (lpcd) is below the standard benchmark of 135 lpcd set by the GoI. Similarly, the duration of water supply is on an average 1.7 hours a day and many ULBs do not provide water every day. This is way below the benchmark of 24x7 water supply. The quality of water supply is slated high at 98 per cent; however, almost 93 per cent of cities report this indicator within the lowest reliability band of 'D'. The per capita supply of water in Municipal Corporations of Maharashtra matches the benchmark at 135 lpcd; for smaller municipalities, however, the average supply is 97 lpcd. In Maharashtra, 51 per cent ULBs are completely dependent on surface water sources, and 41 per cent use ground water as well as surface water sources. At the state level, the quantity of

[1] The key objective of SNMA-2010 is to ensure universal access to water supply and sanitation services. The pathbreaking decision of the government seeks to provide technical, managerial and financial assistance to ULBs for improving infrastructure and achieving technical, financial and environmental sustainability of these services.

[2] For example, the GR No. Jho-pu-yo- 1096/Project No. 68/Slum Rehabilitation -2/ Gru-ni-sel, dated 16.5.1996, states that the Government of Maharashtra granted sanction for rehabilitation to those who were residing and whose hutments have been existing and whose name appears in the voter's list dated 1.1.1995 and continued to stay at the same address.

water lifted daily by the ULBs is approximately 4,976 MLD, out of which more than 62 per cent is the bulk purchase of raw water from irrigation projects. The dependence of ULBs on ground water in Maharashtra is very low. Plans for achieving the benchmark of 135 lpcd water supply for municipalities will need to consider developing strategies to reduce NRW. Mere supply-side strategy cannot prove sustainable in the longer run. It has to be backed up by appropriate demand management and conservation measures to harvest rain water or recycle wastewater for non-potable uses.

Clamour for increasing per capita supply can be misleading in an environment where there is no metering at the production, distribution or consumption end. Thus, investment in reliable information systems such as installation of bulk flow meters to record production and distribution quantities along with consumer end recording of water quantities consumed on periodic basis will help measure the indicator more accurately. Currently only 58 ULBs have consumer-level metering. Some ULBS have provided meters only to commercial or industrial connections, as the tariffs for water supply to these consumers are calculated at a higher rate than residential. Meter management, especially maintenance/repairs of meters, is observed to be an important issue. Only one ULB in the state, the Malkapur Nagar Panchayat with a population of 30,000, has successfully implemented 24x7 water supply in its municipal limit. It is seen as a model for other ULBs to plan a pilot project by identifying a District Metered Area (DMA) for 24x7 water supply.

- **Financial sustainability**

A comparison of cost recoveries across all three sectors in Maharashtra shows interesting results. Water has the highest cost recovery, followed by sewerage and SWM. Average cost recovery for water in Maharashtra is 68 per cent. A majority of the ULBs do not have separate accounts for water supply (WS), waste water (WW) SWM and storm water drainage (SWD) services, except for a few municipal corporations that have separate budgets for water supply and sanitation services. For this indicator, more than 75 per cent ULBs in Maharashtra have a reliability grade of 'C'. The Government of Maharashtra adopted National Municipal Accounts Manual (NMAM) for implementation from 2005–06. However, only five ULBs have reported that they have implemented double entry accounting system.

For cost recovery of sewerage, Municipal Corporations fare better with 84 per cent of the operational costs recovered. Under the SNMA, ULBs are required to commit to 80 per cent recovery of operation and maintenance cost of water supply and sanitation. Plans for improving cost recovery have to appropriately include reduction of expenditure and increase in revenue, and consider new sources of taxes or user charges.

- **Efficiency in service operations**

The indicators considered under efficiency in service operations show mixed results. The only area that seems close to the benchmark values is redressal of consumer complaints, with 94 per cent of the complaints handled in time. The average NRW in the state is 31 per cent; the reliability of this indicator, however, is low throughout the state. This low reliability is due to lack of information on quantity of water at various points in the system. At the consumer end, meters are important to measure the quantity of water. However, there are only 58 ULBs that have some level of metering. While most municipal corporations have adopted the practise of having metered water connections, in other ULBs only the commercial connections are being metered.

Under the SNMA, various actions are required to be undertaken by ULBs. They include consumer surveys, detection and regularisation of illegal connections, water and energy audits, a programme for leak detection and repairs, computerised water bills and streamlined consumer redressal systems, and water quality testing. The SNMA funding for water and sanitation is available only if a ULB agrees to carry out these reforms.

With regard to collection efficiency, the ULBs in Maharashtra collect 68 per cent of the bills. There is a need for ULBs to develop targets for increasing collection. They will have to devise schemes and programmes for recovering arrears as well as the current year's bills. The main improvement areas relate to computerised billing systems, customer-friendly collection systems and incentives to staff for improved collections. There is also a need to introduce periodic updating of property and connection registers and link them to billing and collection systems.

- **Equity**

The coverage of water supply connections in slums is low at 24 per cent, while the overall coverage figures are 52 per cent. There is thus a dire need for policies and programmes to increase coverage of water in slum areas. For this to happen, it is necessary for cities to extend the network to slums. Water and sewerage connections in slum areas are governed by policies related to granting tenure. For example, in Maharashtra all slums established before 1995 are granted *de facto* tenure and provided water and sanitation. However, in Gujarat, the provision of services is delinked from tenure and all slum dwellers are eligible for water and sewerage connections, if they are in the service area. Maharashtra needs to consider similar policies. Second, it is also important to consider simplifying the process of getting new connections and reducing the 'upfront' amount to be paid with applications. There is a strong need for a comprehensive database and information system on service availability at household level in slums. More emphasis needs to be given on regular updation and computerisation of slum information. The database thus developed will provide a premise for creating a shelf of projects for slum improvement and formulating Performance Improvement Plans for the poor to improve access to basic services. It will also be a crucial input for pro-poor decision making, allocation of budgets for the poor and leveraging grants from centrally sponsored schemes.

Reliability for Key Performance Indicators

Table 4: Reliability Results for Key Performance Indicators

Performance indicators	(% of ULBs)						
	Reliability				No data	Not applicable	Total
	A	B	C	D			
Water supply							
Coverage of water supply connections	8	54	32	3	3	0	100
Per capita supply	7	17	61	14	1	0	100
Continuity of water supply	2	15	61	21	2	0	100
Quality of water supplied	2	2	4	89	3	0	100
Cost recovery: O&M	1	9	79	1	10	0	100
Coverage of WS connections in slums	2	12	6	46	15	19	100
Extent of NRW to total water supplied	1	1	6	90	2	0	100
Efficiency in redressal of customer complaints	3	66	10	9	12	0	100
Functional metering of water connections	4	19	0	0	2	75	100
Collection efficiency for water charges	5	77	6	0	10	0	100

Table 4 presents the reliability levels of the various key performance indicators for Maharashtra. In general, the reliability level 'A' indicates proper information system in ULB, that is, computerised records which are periodically updated; the reliability level 'B' depicts good information system but with manual records that are updated frequently; reliability level 'C' denotes manual records that are not updated regularly; and reliability level 'D' represents data that are estimates made by the ULB without any records.

In Maharashtra, most indicators have reliability levels 'B' and 'C'. For some indicators, like water quality and NRW, the reliability levels are extremely low. Very few cities have reliability level 'A'. This suggests an urgent need in Maharashtra ULBs for information system improvements. It is important that some crucial variables that measure NRW or cost recovery should have high reliability. This will require some actions, that is, identifying illegal connections, updating records for connections through consumer surveys, computerising the billing and collection information, etc. In addition, the ULBs will also need to make small capital investments in flow meters and ensure that consumer meters are functional.

Sewerage and Sanitation

Context

Table 5: Context Information and size of ULBs

Class	No. of ULBs	No. of ULBs with underground system	No. of ULBs with STPs	No. of sewer connections	Staff (WW)	Avg staff per ULB
MC	23	15	13	1,378,851	5,325	232
A	15	4	2	27,295	1,475	98
B	59	5	3	22,701	2,881	49
C	145	5	2	1,757	2,030	14
NP	6	0	0	-	27	5
Total	**248**	**29**	**20**	**1,430,604**	**11,738**	**47**

In Maharashtra, only 29 ULBs have underground sewerage system and only 20 of these ULBs have sewage treatment plants. In a majority of the ULBs, open drains are used to carry greywater and overflows from soak pits. The GoI SLBs are designed for ULBs with sewerage and sewage treatment plants. However, even in the 29 ULBs that have a sewerage network, only a part of the ULB is covered. For a majority of ULBs in Maharashtra, these indicators are not applicable.

The PAS team is working on developing appropriate indicators for non-sewered cities. The second round of surveys has included information on these aspects and it will be possible to report on these indicators. The summary of indicators for the state is given in Table 6.

Table 6: Summary of Performance Indicators for Maharashtra (as on March 2009)

Key performance indicators	Mean count	State	MC	Class A	Class B	Class C	NP
Wastewater (sanitation and sewerage)							
Coverage of toilets (individual + community) (%)	231	74	71	77	75	73	92
Coverage of wastewater network services (residential + non-residential) (%)	24	41	46	19	68	24	n.a.
Collection efficiency of wastewater network (%)	22	40	40	44	18	92	n.a.
Adequacy of wastewater treatment capacity (%)	19	36	37	48	26	n.a.	n.a.
Quality of wastewater treatment (%)	16	93	91	91	100	100	n.a.
Extent of reuse and recycling of wastewater (%)	17	41	24	87	62	67	n.a.
Extent of cost recovery in wastewater management (%)	130	13	32	29	15	7	9
Efficiency in redressal of customer complaints (%)	200	96	90	95	96	97	81
Efficiency in collection of sewerage related charges (%)	43	74	61	75	79	81	n.a.
Coverage of toilets in slums	168	11	13	20	9	9	21
Coverage of sewerage connections in slums (%)	21	2	5	1	0.2	0	n.a.
Storm water drainage							
Coverage of storm water drainage network (%)	81	68	28	80	71	77	29
Incidence of water logging/flooding (no.)	63	5	11	2	3	4	2

Sector Analysis: Wastewater

- **Access and coverage**

In the state, 74 per cent of the households have access to safe sanitation, either through a toilet on-site or a community toilet. In cities where there is sewerage network, it is partial covering only 41 per cent of households in those cities. In Maharashtra, sanitation has been a focus of many programmes. The Sant Gadge Baba Abhiyan, an urban sanitation campaign, is being implemented by the Government of Maharashtra since 2002–03. The objective of the Sant Gadge Baba Abhiyan is to incentivise ULBs for improvements in sanitation and making cities open defecation free.[3] Each year, awards are given to ULBs that have made significant progress in improving sanitation in their area.

[3] Every year participating ULBs need to do a baseline survey in October. On the basis of the survey urban local bodies are graded. The Sant Gadge Baba Abhiyan campaign has been designed to encourage ULBs to become clean. The programme envisages that while it is not immediately feasible for all ULBs to go for underground sewerage system, they should adopt a range of on-site sanitation systems to achieve total sanitation.

Coverage of sewerage can be increased by extending sewerage network to slum areas and other unserved areas. In many ULBs, there is no separate levy or charge for toilets and, hence, proper information on toilets is not available. Often the only recourse is to conduct household surveys. As a consequence, the information related to toilet coverage is of poor reliability. In the larger cities of Maharashtra, it is important to develop an information system that links the Property Tax database with water connections, sewerage connections and types of disposal (septic tank, soak pit, etc)

Only 11 per cent of the households in slums have individual toilets and only 2 per cent of the households have sewerage connection. The extent of open defecation is very high, with an estimated 16 per cent of urban poor households forced to defecate in the open. Elimination of open defecation in the state is sought to be achieved through community toilets, and a large number of community toilets have been constructed in the Mumbai Metropolitan Region in recent years. However, this is still not sufficient and there is widespread open defecation in larger cities. Just as in Gujarat, the ULBs in Maharashtra will need to take up household level toilet construction programmes in a big way.

It may be necessary to examine options of decentralised wastewater treatments, and small-bore or shallow sewer options. ULBs also have to provide adequate facilities for septage management.

- **Service levels and quality**

With only 12 per cent of cities relying on underground sewerage and sewage treatment, the indicators on service level and service quality for wastewater in Maharashtra have less relevance. In cities with sewerage, the network covers a part of the area and hence, the average collection efficiency of sewerage network is 40 per cent. Likewise, with only 15 cities having functional sewerage treatment plants (STPs), the average sewage treatment capacity of ULBs in Maharashtra is 35 per cent.

- **Financial sustainability**

In Maharashtra, the average cost recovery for wastewater services is 13 per cent. A majority of the ULBs do not have separate accounts for wastewater services. . It is expected that reliability of financial data will improve as the Government of Maharashtra has adopted National Municipal Accounts code and ULBs are required to shift to double entry accounting system soon.

Actions for improving cost recovery have to appropriately include reducing expenditure and increasing revenue. For sewerage, reduction of expenditure would require replacing pumps at sewage pumping stations, cleaning and maintaining sewerage system on a regular basis. Increasing revenue would require levying sewerage benefit tax and charges in proportion to the water consumption.

Reliability for Key Performance Indicators

Table 7: Class-wise Reliability for Key Performance Indicators

Performance indicators	(% cities)						
	Reliability				No data	Not applicable	Total
	A	B	C	D			
Sanitation and sewerage							
Coverage of toilets	4	49	13	25	8	0	100
Coverage of sewerage connections at HH level	1	5	0	3	4	87	100
Collection efficiency of wastewater network	1	1	0	6	1	90	100
Adequacy of wastewater treatment capacity	1	2	2	3	2	90	100
Cost recovery: O&M	0	5	16	0	46	33	100
Coverage of toilets in slums	2	7	4	56	13	19	100
Coverage of sewerage connections in slums	1	0	0	7	5	86	100
Quality of wastewater treatment	1	0	0	6	3	90	100
Extent of reuse and recycling of wastewater	1	0	0	5	3	90	100
Efficiency in redressal of customer complaints	2	53	19	12	12	2	100
Collection efficiency for wastewater charges	2	3	13	7	13	62	100

The reliability of most indicators on wastewater is under the category of 'C' and 'D'. This suggests that most variables used for deriving the indicators are based on poor records. It is important that the state government develops clear policies and guidelines to help ULBs improve and systematise their information.

Solid Waste Management

Context

Table 8: Solid Waste Management in Maharashtra

Class	No. of cities	Solid waste generated (tonnes per month)	Solid waste collected (tonnes per month)	Solid waste staff	Avg staff per ULB
MC	23	570,825	392,372	13,079	817
A	15	27,870	25,800	860	222
B	59	33,758	31,514	1,050	83
C	145	27,095	25,509	850	25
NP	6	1,145	710	24	27
Total	**248**	**660,692**	**475,904**	**15,863**	**124**

The situation in Maharashtra for SWM is relatively better with door-to-door collection from 63 per cent of the households. Table 8 presents waste generated and collected, as well as number of staff at the state level and in each size class. Table 9 presents a summary of indicators.

Table 9: Summary of SLB Indicators for Maharashtra (as on March 2009)

Solid waste management							
Key performance indicators	Mean count	State	MC	Class A	Class B	Class C	NP
Door-to-door collection of solid waste (%)	245	63	63	65	60	65	44
Efficiency of collection of municipal solid waste (%)	242	95	91	90	96	95	100
Extent of segregation of municipal solid waste (%)	246	13	10	17	19	11	32
Extent of municipal solid waste recovered (%)	55	53	35	70	53	60	n.a.
Extent of scientific disposal of municipal solid waste (%)	11	61	67	n.a.	11	65	n.a.
Extent of cost recovery in SWM services (%)	156	5	21	6	2	3	0
Efficiency in redressal of customer complaints (%)	222	96	95	99	95	95	100
Efficiency in collection of SWM related charges (%)	13	72	67	70	n.a./n.d.	85	n.a.
HH level coverage of SWM services in 'slum settlements' (%)	170	51	60	50	48	50	0

Sector Analysis: Solid Waste Management

- **Access and coverage**

For SWM, the door-to-door coverage is 63 per cent. It is possibly due to efforts made by the state government to have a common approach to municipal solid waste (MSW) management across the state. The state government has also evolved a model contract framework to engage both private society and civil

society. Efforts have been made by the Maharashtra Pollution Control Board to persuade all the local bodies to obtain mandatory authorisation, prepare action plans for management of MSW and identify suitable land for setting up of facilities for treatment and disposal of waste generated in the cities.

For increasing door-to-door collection of solid waste, ULBs have to extend services in slum areas and involve non-governmental organisations (NGOs) and community organisations in waste collection. Most cities will need to procure waste collection vehicles, construct transfer stations and identify proper sites for sanitary disposal of wastes.

- **Service levels and quality**

Service level and quality aspects of SWM relate to three indicators: efficiency of collection of MSW; extent of segregation; and extent of waste recovered.

Collection efficiency: The ratio of solid waste collected to solid waste generated, as reported by the ULBs in the state, is 95 per cent. All ULBs report high collection efficiency. In estimating this indicator, it was seen that while the ULBs can measure the quantum of waste collected adequately, the estimates of waste generated are made on some assumption of per capita waste generated. For a more correct estimate of waste generation, ULBs will need to conduct surveys in households and enterprises to arrive at more appropriate estimate of waste generation. ULBs also need to invest in infrastructure such as weighbridges to measure the collected wastes properly, instead of relying on calculations based on vehicle capacity.

The MSW Rules, 2000 of the GoI require that all municipal waste should be segregated. However, the extent of segregation of wastes in the state is only 13 per cent and only 84 ULBs practise some segregation of solid waste at door-to-door level. In the state there are 20 ULBs which report that they are able to achieve 100 per cent segregation of municipal wastes. Given the poor segregation rate in a large number of ULBs, it will be important for ULBs to launch awareness campaigns and provide incentives for segregation of wet and dry waste to households and establishments. This also has to be linked with raising awareness among ULB workers and contractors to ensure segregation of waste throughout the transportation chain (from source till disposal). Procurement of separate containers for segregating waste at source (household level) can also help in bringing in the necessary discipline.

It is reported that 92 ULBs in Maharashtra have some facilities for recovery from municipal waste. Most of these facilities are for composting the waste and include composting yards, and vermi-composting. However, a few ULBs have begun to explore waste-to-energy generation with private sector participation.

- **Financial sustainability**

Realistic policies, operational strategies and plans for cost recovery and financing are essential for sustainable UWSS services. On an average, the cost recovery from solid waste operations is only 5 per cent. A majority of the ULBs do not practise separate accounting for SWM and SWD services, except for a few municipal corporations. The cost recovery for solid waste in municipal corporations is 21 per cent; in municipalities it is 3 per cent.

- **Efficiency in service operations**

Scientific landfills are required under the GoI's MSW Rules, 2000, but in Maharashtra only 4 per cent of ULBs have scientific landfills. These ULBs dispose 61 per cent of their waste scientifically. ULBs in Maharashtra are more efficient in dealing with citizen complaints – 42 per cent cities report more than 90 per cent complaint redressal on time for SWM-related complaints. However, appropriate monitoring of complaint needs to be done at the ULB level and a proper analysis of complaints is required. This will help improve efficiency of SWM.

- **Equity**

In Maharashtra, the door-to-door coverage of solid waste collection covers 51 per cent of the slum households. It will be important to involve NGOs, civil society organisations and other local groups to increase coverage in slum areas. Appropriate incentives or rewards should be considered for ULB staff to provide better SWM services in slum settlements.

Reliability for Key Performance Indicators

Table 10: Reliability for Key Performance Indicators

Performance indicators	(% cities)						
	Reliability				No data	Not applicable	Total
	A	B	C	D			
Solid waste management							
Coverage of HH collection of SWM	1	24	15	59	1	0	100
Collection efficiency of MSW	0	1	19	77	3	0	100
Extent of segregation of MSW	1	3	2	95	0	0	100
Extent of MSW recovered	2	4	10	7	1	77	100
Cost recovery: O&M	0	6	8	44	42	0	100
Coverage of HH collection of SWM in slums	2	8	5	52	13	19	100
Extent of scientific disposal of MSW	1	1	1	1	2	94	100
Efficiency in redressal of customer complaints	2	69	8	10	8	2	100
Collection efficiency for SWM charges	1	1	3	1	55	40	100

The reliability of most indicators on solid waste is in category 'D'. This suggests that despite the MSW Rules, 2000, many ULBs in the state do not have appropriate records and systems to estimate waste generation, waste collection and waste recovery. Most variables used for deriving the SWM indicators are estimates by ULB staff rather than based on records. It is important that the state government develops clear policies and guidelines to help ULBs improve and systematise information on solid waste.

3. Comparative Analysis of Key Performance Indicators: Gujarat and Maharashtra

Introduction

In this section, results from PAS are compared with various national and international studies, to see the relative performance of the cities of Gujarat and Maharashtra with others. The comparison of PAS/SLB indicators are made with similar indicators used in other studies. One has to bear in mind that the other studies were conducted in large cities, mainly municipal corporations, so ideally one would need to compare the results from other Indian studies with the indicators of Gujarat and Maharashtra. However, given the fact that there are very few studies on performance measurement of urban water utilities in India, in this data book, we have used the available studies as references for comparing Gujarat and Maharashtra's results. The Annex provides details of the studies used for this comparison. In the tables that follow in this section, the studies are referred to by the agency or the programme.

Water Supply

Table 11 gives a snapshot of the key performance indicators estimated by various studies conducted in the past:

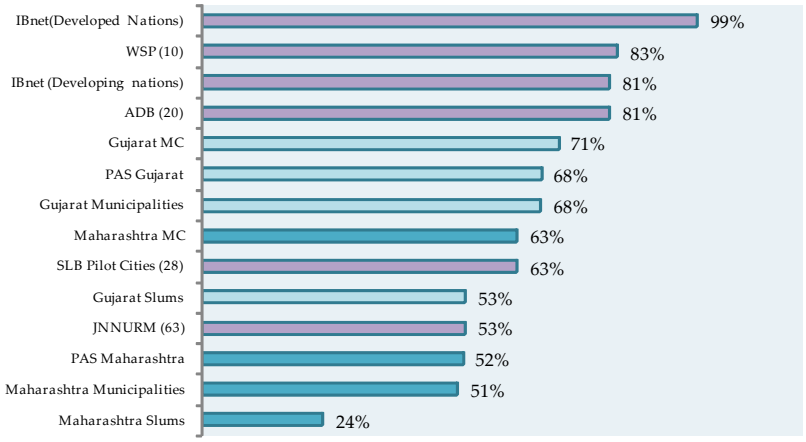
Table 11: Key Performance Indicators Estimated by Different Studies

WATER SUPPLY INDICATORS	NIUA (Metro, Class I&II)	JNNURM Mission Cities	WSP	ADB	SLB Pilot Cites	Ibnet (Developing nations)	Ibnet (Developed)	PAS Gujarat	PAS Maharashtra
YEAR	1999	2005-06	2005-06	2007	2009	2008	2008	2008-09	2008-09
AVG POPULATION SIZE of ULB	465,226	1,518,277		2,678,289	2,082,912	239,528	129,665	148,612	195,268
AVG NO.OF CONNECTIONS in ULB		148,506		179,108	204,937			17,951	11,098
NO.OF ULBs in Sample	301	63	10	20	28	1948	631	166	248
Coverage of Water supply connections (%)		53	83	81	63	81	98.85	68	52
Per capita supply of water (lpcd)	150	132	226					77	88
Per capita supply of water (lpcd) at consumer end				119	130			88	100
Continuity of water supply (hrs per day)			4.0	4.4	4.6			1.6	1.7
Quality of water supplied (%)					95			96	98
Cost recovery (OandM) in water supply services (%)	65	72		95	71			60	68
Coverage of water supply connections in 'slum settlements' (%)		56						53	24
Extent of non-revenue water (%)	21	37	34	32	41	31	54	30	31
Efficiency in redressal of customer complaints (%)					87			98	94
Extent of functional metering of water connections (%)	55	28	32	25	46			0.7	52
Efficiency in collection of water supply related charges (%)					68			50	68

Coverage of Water Supply Connections
(Average: Gujarat: 68 per cent; Maharashtra: 52 per cent)

The indicator reflects the number of households in the service area of the ULB that are connected to the water supply network with direct service connections. It does not include households supplied water through public standposts, group connections, tankers or those completely dependent on other water sources such as bore wells, open wells, etc.

Average household level coverage of water supply connections in Gujarat is 68 per cent. Maharashtra is much lower than Gujarat at 52 per cent. Within Gujarat, the coverage of water supply in municipal corporations (MC) is 71 per cent and for municipalities is 68 per cent. Similarly, for Maharashtra, the coverage of water supply in MCs is 63 per cent and in municipalities it is 51 per cent.



Comparing this performance indicator with other studies, it is seen that Gujarat and Maharashtra ULBs are not very different from the other cities. But they are far behind the coverage prevailing in other developing countries and the sample of cities used in the ADB/WSP studies. In the IBNET data from the developing country cities, Dhaka Water Supply and Sewerage Authority has highest coverage at 87 per cent, while Nashik, in Maharashtra, reports 99.5 per cent coverage of water connections at household level.

Coverage of Water Supply Connections in Slums
(Average: Gujarat: 53 per cent; Maharashtra: 24 per cent)

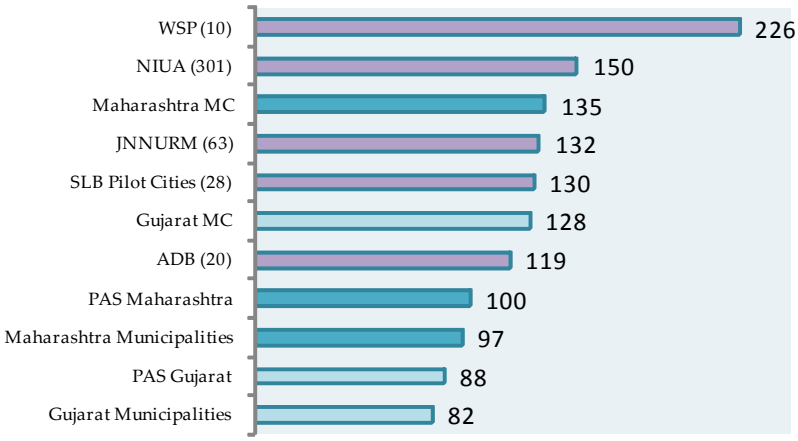
A PAS review of international and Indian benchmark studies demonstrated that there were no indicators that measured performance of utilities/ULBs for the poor. In the PAS study, additional equity indicators have been derived to help assess the level of service delivery to the urban poor. The coverage indicator for slums is defined as presence of a water tap on the premises. Shared service connections are not included in calculating this indicator.

Gujarat fares much better in terms of coverage of individual water supply connection in slums. The coverage of individual water supply connections in slums of Gujarat is 53 per cent. This is twice the coverage of water connections in slums of Maharashtra (24 per cent). In 16 per cent of the ULBs in Gujarat, coverage of water connection in slums is 80 per cent or more. This slum coverage indicator has been compared with JNNURM dataset (2005–06) that is derived from compiling City Development Plan (CDP) data for 63 mission cities. The average coverage of water in slums in these cities is 56 per cent. It appears that many CDPs have included standposts and group connections as well, because the District Level Health Survey (DLHS) 2008, reported house connections in 48 per cent of urban households in India.

Per Capita Supply of Water
(Average: Gujarat; 88 lpcd; Maharashtra: 100 lpcd)

The WHO norm for per capita supply is 135 litres per capita per day (lpcd). This norm is also adopted in India by the CPHEEO and by the SLBs of the MoUD, GoI. Against this benchmark, Gujarat has an average supply of 88 lpcd whereas in Maharashtra it is slightly better at 100 lpcd.

In context of intrastate variations, in Gujarat MCs provide 128 lpcd whereas municipalities provide 82 lpcd. There are only 9 per cent of ULBs in Gujarat (15 ULBs including three MCs) that supply more than 135 lpcd. In Maharashtra, the MCs provide 135 lpcd water, but the municipalities provide 97 lpcd. In Maharashtra 16 per cent of ULBs (39 ULBs including six MCs) supply more than 135 lpcd.

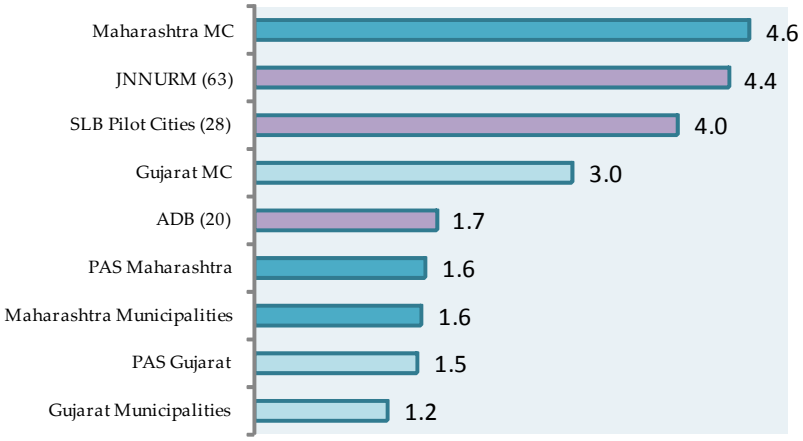


The quantum of water supplied in Gujarat and Maharashtra is much lower than in other Indian and international cities. A study conducted by the National Institute of Urban Affairs (NIUA) in the 1990s (301 cities) shows average lpcd value at 150. The JNNURM CDPs of 63 cities suggest lpcd value of 132. Similarly, the ADB (20 cities) and Standardised Service Level Benchmarks (SSLB) (28 cities) studies record average lpcd value of 119 and 130 lpcd, respectively.

Continuity of Water Supply
(Average: Gujarat: 1.6 hours; Maharashtra: 1.7 hours)

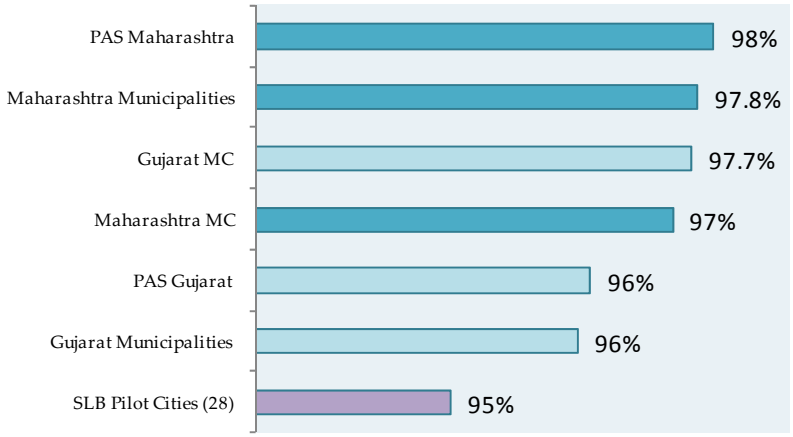
A very few cities in India have been able to successfully demonstrate/implement 24x7 water supply. In Maharashtra, Malkapur Nagar Panchayat has successfully implemented a 24x7 water supply scheme within its entire municipal limit. In a few other cities in Maharashtra, there are a few ULBs where some part of the ULB is provided 24x7 water.

On an average in both Gujarat and Maharashtra, ULBs supply water for 1.6 to 1.7 hours a day. These are again very low as compared with the average water supply hours in the JNNURM, SSLB and ADB studies. In Gujarat, MCs supply water for 1.6 hours per day, whereas municipalities supply water for a shorter duration of 1.2 hours per day. There are just 10 per cent of ULBs in Gujarat (16 ULBs) that provide water for 3 hours or more. In Maharashtra, MCs provide water for 3 hours while the municipalities provide water for 1.5 hours. What these averages do not reveal is the fact that many ULBs in Gujarat and Maharashtra supply water on alternate days, with some supplying water once a week.



Quality of Water Supplied
(Average: Gujarat: 96 per cent; Maharashtra: 98 per cent)

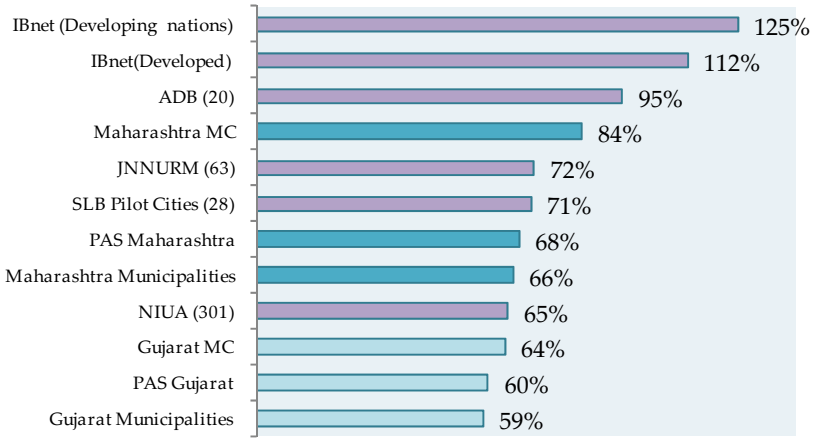
The indicator defines the percentage of water samples that meet or exceed the specified potable water standards, as defined by the CPHEEO. The percentage of water samples that passed CPHEEO standards (for residual chlorine, bacteriological, physical and chemical parameters) is high in Gujarat and Maharashtra, with ULBs reporting 95 per cent or more samples passing the water quality tests.



Cost recovery (O&M) in Water Supply Services
(Average: Gujarat: 60 per cent; Maharashtra: 68 per cent)

A cost recovery of less than 100 per cent means revenues from tariffs and taxes do not cover the operation and maintenance (O&M) costs of water supply. Gujarat's ULBs demonstrate average cost recovery of 60 per cent for its water supply operations. Maharashtra's ULBs are a little better off with an average cost recovery of 68 per cent.

In both states, MCs have a better cost recovery than municipalities. About 16 per cent cities in Gujarat have managed to reach the benchmark value of 100 per cent cost recovery. Similarly, in Maharashtra, about 16 per cent of cities in Maharashtra report cost recovery of 100 per cent and more.

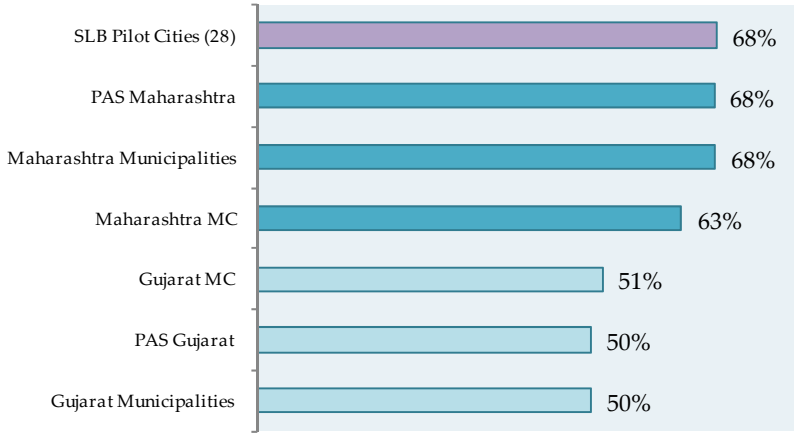


The O&M cost recovery of international utilities is much higher. The IBNET results for both developing and developed countries depict average cost recovery of over 100 per cent, suggesting an operating surplus. Several utilities in IBNET's developing country database report cost recovery of more than 100 per cent. Gujarat and Maharashtra ULBs need to look at these developing country water utilities and understand how they manage to recover the full cost of O&M. With the Government of Maharashtra's guidance note on setting tariffs for water and sewerage, it is possible for many ULBs in Maharashtra to reach full cost recovery.

On an average, the cost recovery of water services in Indian cities is below the 100 per cent benchmark. Within the SSLB datasets, only five Indian ULBs – Trivandrum (222.8 per cent), Tiruchirapalli (197.4 per cent), Guntur (144.9 per cent), Kozhikode (105.8 per cent) and Kolhapur (105.6 per cent) – are able to cover their O&M costs.

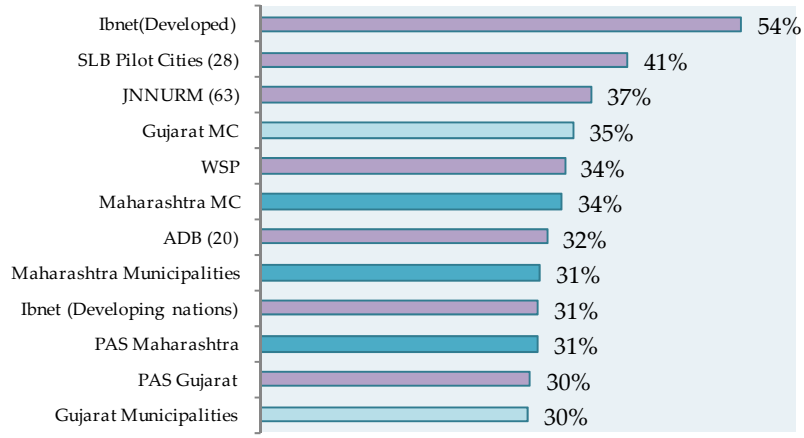
Efficiency in Collection of Water Supply-related Charges
(Average: Gujarat: 50 per cent; Maharashtra: 68 per cent)

This indicator measures the ULB's effectiveness in collecting water bills issued for the current year. The arrears are generally accounted separately and are not included in calculating collection efficiency. For Gujarat, the collection efficiency of water supply-related charges is 50 per cent, which implies that ULBs in the state manage to collect only half of the amount billed for water. For Gujarat ULBs, given the absence of metering of water connections, water-related charges are collected as a part of the annual Property Tax bills. The low collection efficiency of water charges is thus a reflection of low collection of property taxes, which are the mainstay of ULB finances. Maharashtra ULBs are comparatively better with 68 per cent collection efficiency; 17 per cent of ULBs (41 ULBs) in Maharashtra report collection efficiency of more than 90 per cent. The SSLB pilot cities have, on an average, collection efficiency of 68 per cent which is very similar to Maharashtra.



Extent of Non-revenue Water
(Average: Gujarat: 30 per cent; Maharashtra: 31 per cent)

NRW is the difference between the volume of bulk water that leaves the city's treatment plants and wells (or the total system input) and the volume of water billed to the consumers. Thus it is a crucial indicator depicting the losses – both physical losses such as leakages, and apparent losses such as thefts and meter inaccuracies. In Gujarat, 17 per cent of ULBs report NRW less than 20 per cent; in Maharashtra about 19 per cent of ULBs (48 ULBs) have NRW below 20 per cent. It is important to mention here that accurate measurement of volume of water at production, distribution and consumer level is essential for estimation of NRW. At present, 23 per cent cities in Maharashtra have partial metering at the consumer's end, while in Gujarat no consumer level metering is practised. It is important to reduce NRW through metering, repairing visible leaks and taking action against illegal connections.

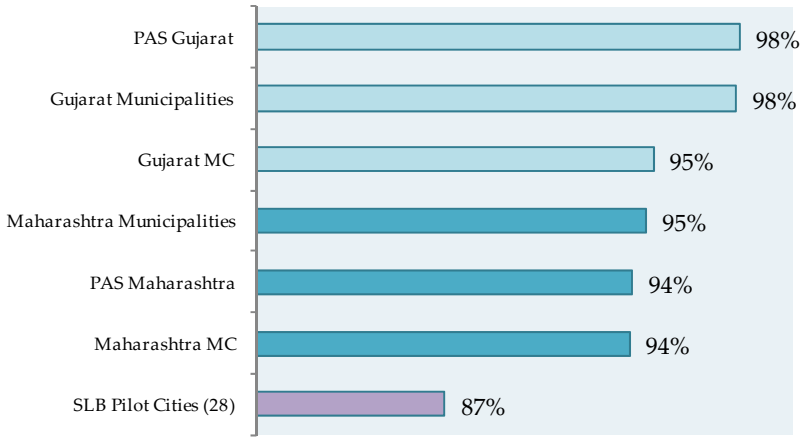


In both Gujarat and Maharashtra ULBs, the NRW estimates are based on very poor data. ULBs in both states will have to conduct water audits and identify key areas of action for reducing NRW. Interestingly, the IBNET averages for the NRW indicator are high at 54 per cent for utilities in developed countries. This is more likely due to better measurement of variables. When proper measurements of water supplied and

consumed are not available, there is a tendency to guess the NRW at around 30 per cent. As can be seen from the chart, most NRW values in India hover round this figure. With rising demand for water in the two states due to rapid urbanisation, it is imperative that ULBs adopt measures such as water audits to estimate the true NRW and take necessary actions to reduce NRW.

Efficiency in Redressal of Consumer Complaints
(Average: Gujarat: 98 per cent; Maharashtra: 94 per cent)

This indicator captures the effectiveness of the system in addressing complaints from customers in a timely manner as per service charter standards. Though the indicator value is very high, its reliability is low in both Gujarat and Maharashtra.



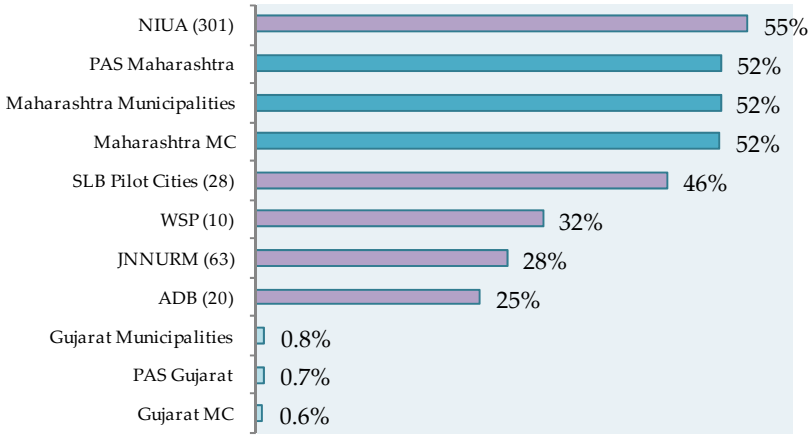
In Gujarat, 98 per cent of the complaints registered with ULBs are resolved as per specified service charter standards, that is, within 24 hours. In Maharashtra, on an average, 94 per cent of the complaints registered for water supply are redressed in stipulated timeframes. In both states, record keeping of the complaints is very poor. Complaints are received through various means – personal visits of consumers to the municipal office, telephone calls to a 'help line' number, calls to the municipal staff and elected councillors, through media and the Internet, if available. Often only a few complaints are registered, and hence a high rate of redressal of complaints.

Extent of Functional Metering of Water Connections
(Average: Gujarat: 0.7 per cent; Maharashtra: 52 per cent)

Metering of water connections is essential to implement volumetric charges for water. A telescopic tariff structure (referred to as rising block tariffs) is more equitable than a flat charge based on pipe diameters or those linked with Property Tax assessments. Meters at the consumer end also help proper estimation of water balance and NRW.

Despite these benefits of water meters, Gujarat ULBs do not have any metering of water connections. A few industrial connections are metered in six ULBs of Gujarat. Maharashtra, on the other hand, has encouraged ULBs to move to full metering. At present, 58 cities have some level of metering. There are five ULBs which have 100 per cent metering and 20 ULBs that have more than 80 per cent metered connections.

The other studies of Indian cities also show that in bigger Indian cities, there is widespread use of water meters. A NIUA study of Class 1 cities in India reports average metering of 55 per cent. The more recent MoUD study of SSLB cities reports an average metering level of 46 per cent. The earlier studies by WSP and ADB in cities had average

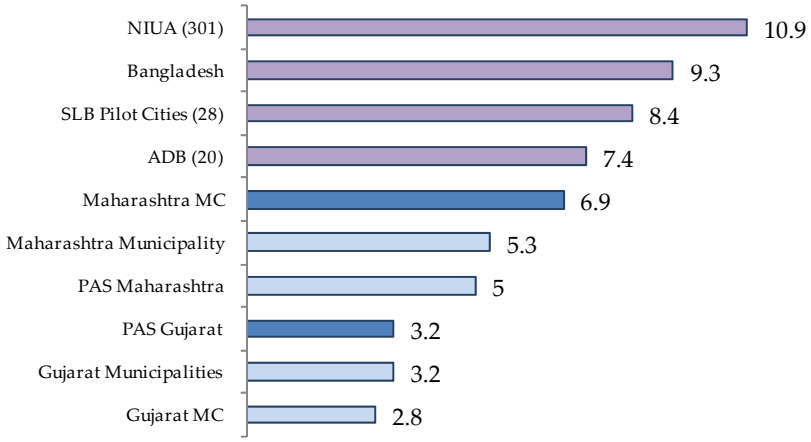


metering of 32 per cent and 25 per cent, respectively. In the JNNURM mission cities, 28 per cent of water connections are reported as metered. Gujarat ULBs are way behind the national trend of metering water connections and the state government needs to take some urgent action.

Additional Indicators: Water Supply

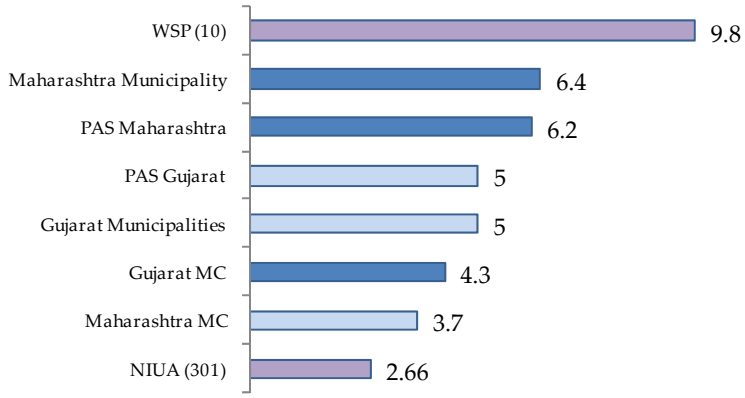
In addition to the SLB indicators, the PAS PMF also identified a range of local action indicators for some of the key performance indicators. These indicators are often referred to as 'drill-down' indicators as they serve two important purposes. First, they provide more details on the key performance indicators and help explain the indicator better to the utility managers. Second, and more importantly, these indicators help in identifying local actions required to achieve improved performance. In this section, these local action indicators are compared with other similar national and international studies.

Staff Per 1,000 Connections (Average: Gujarat: 3.2; Maharashtra: 5)



This local action indicator is a ratio of the total staff, including regular and contracted, employed in water supply for 1,000 water supply connections. This ratio needs to be interpreted carefully as excess staff may not translate into efficient management. Both national and international averages depict a high staffing ratio, which ranges between 7 to 11 staff/1,000 connections. In comparison, the staff ratio in Gujarat is very low at 3 staff per 1,000 connections, and in Maharashtra it is 5 staff per 1,000 connections.

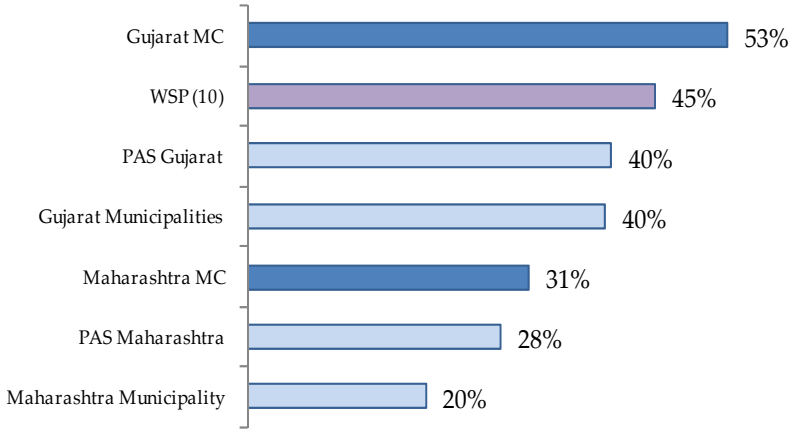
Unit Cost of Production of Water Supply (Average: Gujarat: 5; Maharashtra: 6.2)



This indicator captures the cost of putting a kilolitre (kl) of water in the system. This indicator is highly relevant when seen together with electricity cost per unit of production of water. The production cost may differ widely among cities owing to type of source (underground or surface) and topography, leading to significant variations in costs of energy. However, on an average, the water production cost for Gujarat and Maharashtra is 5 and 6.2 Rs/kl, respectively. This is comparable to SLB pilot city average production cost of 5.7 Rs/kl. In the SLB pilot cities, the highest production cost was that of Indore (Rs 13.60/kl) and Bengaluru (Rs 11.39/kl).

Electricity Cost as % of Total Cost of Production

(Average: Gujarat: 40 per cent; Maharashtra: 28 per cent)



Electricity costs often account for a major part of water production costs. This is mainly due to pumping of water from source or during transmission. In Maharashtra, ULBs' electricity expenditure for water is 28 per cent of total cost of production, while in Gujarat it is 40 per cent of the total cost of water production. Despite surface water available from Narmada Canal, ULBs in Gujarat have to supplement water from underground wells, leading to high energy costs.

Sewerage and Sanitation Services

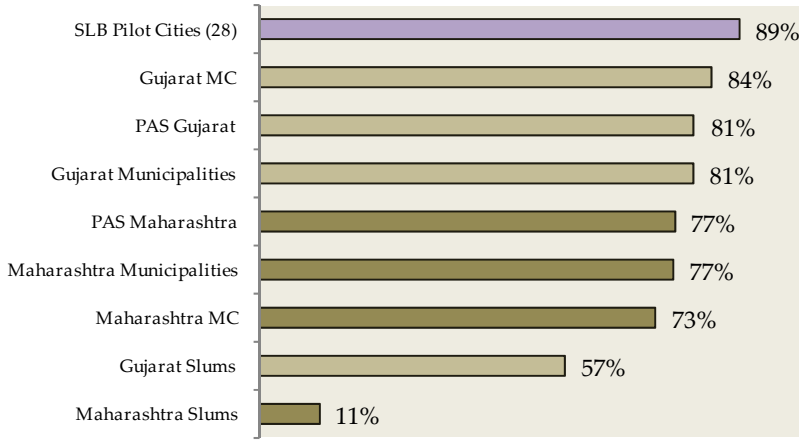
Table 12: Key Performance Indicators for Sewerage and Sanitation

Sewerage indicators	NIUA (Metro, Class I & II)	JNNURM mission cities	SLB pilot cities	PAS Gujarat	PAS Maharashtra
Year	**1999**	**2005–06**	**2009**	**2008–09**	**2008–09**
Avg population size	**465,226**	**1,518,277**	**2,082,912**	**148,612**	**195,268**
Avg no. of connections		**148,506**	**204,937**	**17,951**	**11,098**
No. of utilities	**301**	**63**	**28**	**166**	**248**
Coverage of toilets (%)		56%	89%	81%	77%
Coverage of sewerage connections at HH level (%) (residential + non-residential)	58%	32%	56%	33%	41%
Collection efficiency of wastewater network		54%	55%	77%	39%
Sewage treatment capacity		73%	82%	101%	37%
Cost recovery (O&M) in wastewater management (%)	127%	88%	58%	51%	13%
Coverage of toilets in 'slum settlements' (%)		20%		57%	11%
Coverage of sewerage connections in 'slum settlements' (%)				20%	2%
Quality of wastewater treatment (%)			93%	90%	93%
Extent of reuse and recycling of wastewater (%)			10%	0.1%	41%
Efficiency in redressal of customer complaints			93%	98%	96%
Efficiency in collection of sewerage related charges			65%	55%	74%
Storm water drainage					
Coverage of storm water drainage network			33%	31%	68%
Incidence of water logging/flooding			73	9	5

Coverage of Toilets

(Average: Gujarat: 81 per cent; Maharashtra: 77 per cent)

The Joint Monitoring Programme of UNICEF/WHO defines "improved sanitation" as one where hygienic separation of human excreta from human contact is ensured. Access to toilets on the premises is generally considered as the 'benchmark' for sanitation.

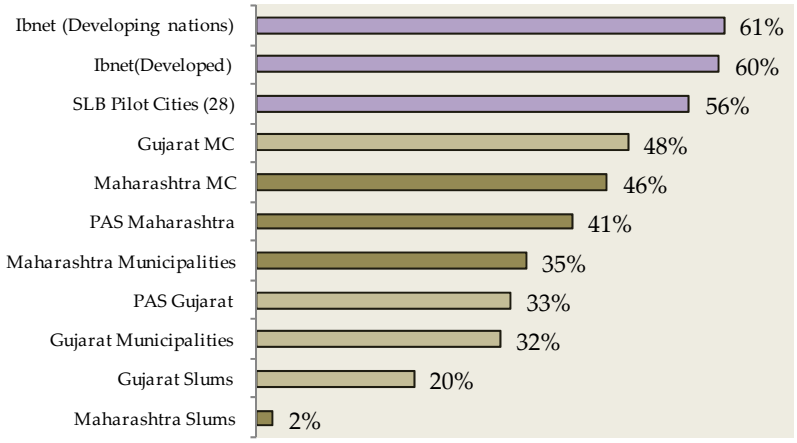


However, in India, the SLB of the GoI has included access to community toilets also as an acceptable level of service. The GoI has made substantial investment in improving sanitation through the 'Basic Services to the Urban Poor' component of the JNNURM as well as the 'Integrated Low Cost Sanitation' scheme. In addition, state governments such as Gujarat have launched toilet construction programmes that provide subsidies for construction of toilets. Many ULBs have also taken up 'open defecation free' city campaigns and constructed public toilets.

Gujarat has relatively high toilet coverage than Maharashtra. The higher coverage in Gujarat can be attributed to the state government programme of toilet construction. This has resulted in high coverage of toilets in slums at 57 per cent in Gujarat, while in Maharashtra only 11 per cent slum households have a toilet on the premises.

Coverage of Sewerage Network Services
(Average: Gujarat: 33 per cent; Maharashtra: 41 per cent)

Though access to individual toilets has been increasing in India, the coverage of underground sewerage network remains persistently low. With substantial investments in this area being taken up through central and state programmes, it is necessary to monitor this indicator to observe improvements. Often, it is likely that despite laying a sewerage network, people are unwilling to connect their toilets as they may have alternate arrangements such as septic tanks, soak pits, etc.

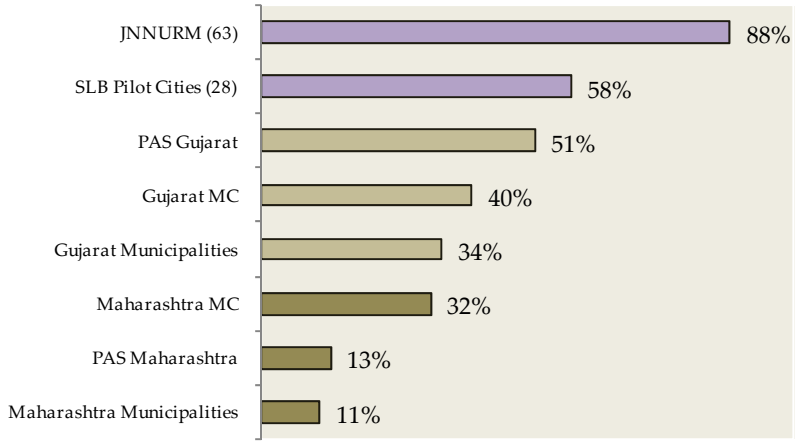


In Gujarat, 40 per cent of ULBs (67 ULBs) have some underground network, yet only 33 per cent of households are connected to the sewerage network. It is likely that the sewerage systems cover only a part of the ULB and households are reluctant to connect to it and pay high charges when they have alternate arrangements. The sewerage connection coverage in slums is at 20 per cent. In Maharashtra, only 13 per cent of ULBs (33 ULBs) have underground sewerage networks, but the coverage is high at 41 per cent. Surprisingly, just 2 per cent of slum households in Maharashtra are connected to sewerage networks.

In the SLB pilot cities, the coverage of sewerage networks is 59 per cent, which is similar to the IBNET averages of 60 per cent.

Extent of Cost Recovery in Sewerage Management
(Average: Gujarat: 51 per cent; Maharashtra: 13 per cent)

In the Indian context, sewerage charges are typically linked to water charges or they form a part of the Property Tax structure. This can have a significant bearing on cost recovery levels. The extent of cost recovery is expressed as wastewater revenues as a percentage of wastewater expenses, for the corresponding time period.

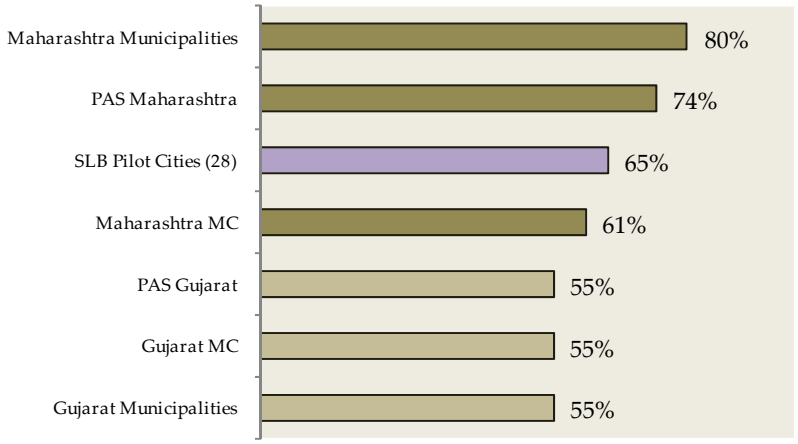


In Gujarat, wastewater charges are levied as part of Property Tax. For

Gujarat, the average cost recovery of wastewater service is 51 per cent. This is better in comparison with Maharashtra, where average cost recovery is only 13 per cent. In both Gujarat and Maharashtra, the municipal corporations perform better. However, it is still lower in comparison with the SLB pilot city average (58 per cent) and the JNNURM mission cities average (88 per cent).

Efficiency in Collection of Sewerage Charges
(Average: Gujarat: 55 per cent;
Maharashtra: 74 per cent)

This indicator measures the revenues collected as sewerage charge as against the billed amount.



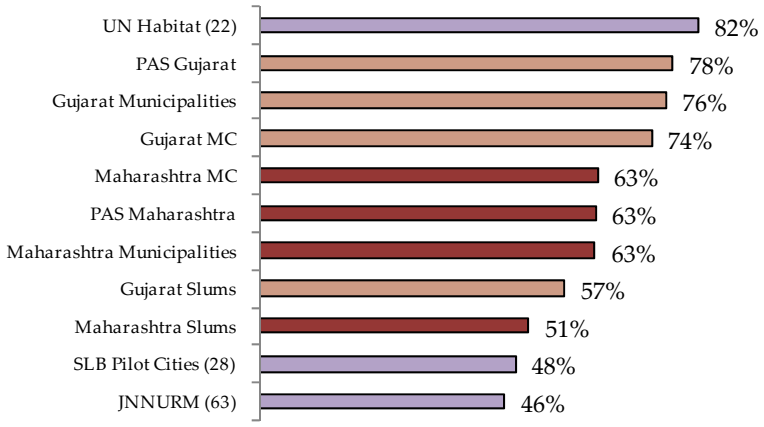
In Gujarat average collection efficiency for wastewater-related charges is 55 per cent while in Maharashtra it is 74 per cent. The average for SLB pilot cities was 65 per cent. In Gujarat, only 2 per cent of ULBs have collection efficiency of more than 90 per cent, while in Maharashtra, 5 per cent of ULBs have a collection efficiency of more than 90 per cent.

Solid Waste Management

Table 13: Key Performance Indicators for SWM

SWM indicators	NIUA (Metro, Class I & II)	JNNURM mission cities	SLB pilot cities	UN-Habitat	PAS Gujarat	PAS Maharashtra
Year	**1999**	**2005–06**	**2009**	**2010**	**2008–09**	**2008–09**
Avg population size	**465,226**	**1,518,277**	**2,082,912**	**2,398,019**	**148,612**	**195,268**
Avg no. of connections		**148,506**	**204,937**		**17,951**	**11,098**
No. of utilities	**301**	**63**	**28**	**22**	**166**	**248**
Household level coverage of SWM services (%)	92	46%	48%	82%	78%	63%
Efficiency in collection of municipal solid waste (%)	88	68%	78%	89%	87%	95%
Extent of segregation of municipal solid waste (at treatment plant) (%)		13%	23%		7%	13%
Extent of municipal solid waste processed and recycled (%)			43%	30%	33%	53%
Cost recovery (O&M) in SWM (%)	7%		22%		23%	5%
Extent of scientific disposal of municipal solid waste (%)			19%	90%	18%	61%
Efficiency in redressal of customer complaints			93%		98%	96%
Efficiency in collection of SWM related charges			68%		43%	72%
HH level coverage of SWM services in 'slum settlements'					57%	51%

Household Level Coverage of SWM Services
(Average: Gujarat: 78 per cent; Maharashtra: 63 per cent)



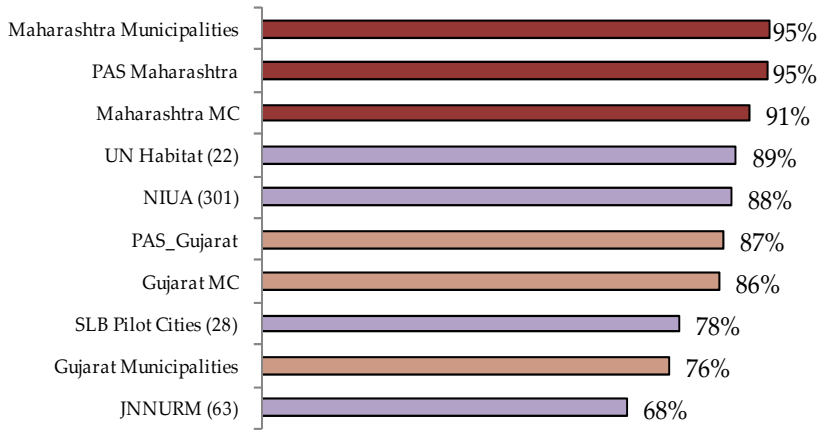
The coverage of SWM services is assessed by taking into account the proportion of households and establishments that are served by daily door-to-door collection of solid waste. Doorstep level collection is an essential and critical starting point in the entire chain of SWM services. In most ULBs in India, door-to-door-collection is generally provided through resident welfare associations, private agencies or non-governmental organisations under contract with ULBs. Some ULBs have an integrated SWM contract with one agency that is responsible for collection, transportation, processing and disposal of MSW.

The coverage of door-to-door solid waste collection in Gujarat is high at 78 per cent, while in Maharashtra it is 63 per cent. In Gujarat, 31 per cent of ULBs report greater than 90 per cent coverage for SWM collection. However, in slums the coverage for door-to-door collection of solid waste is 57 per cent. In Maharashtra, 29 per cent of ULBs report coverage of more than 90 per cent, while in the same ULBs the coverage in slum

areas is just 50 per cent. A UN-Habitat study in 22 cities has estimated access to waste collection services. This access is considered for both garbage collections as well as sweeping services. The study records that, on an average, 82 per cent of the population has access to waste collection services. However, it should be noted that UN-Habitat access does not include exclusively door-to-door collection.

Efficiency of Collection of MSW
(Average: Gujarat: 87 per cent; Maharashtra: 95 per cent)

This indicator denotes the ratio of waste that is actually collected by the ULB and authorised service providers to the estimated waste generation. This excludes recycling or processing at the generation point.

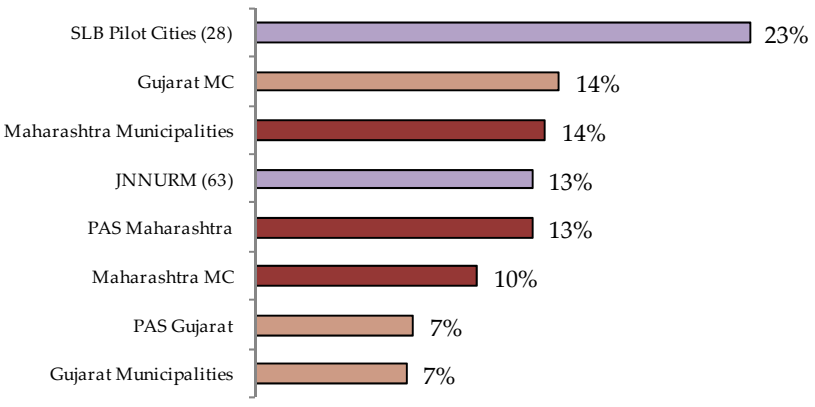


Maharashtra's ULBs collect 95 per cent of its MSW generated, while in Gujarat, the average collection efficiency of MSW is at 87 per cent. Interestingly, 77 per cent of ULBs in Maharashtra report collection efficiency of over 95 per cent. In Gujarat, only 14 per cent of ULBs have collection efficiency of more than 95 per cent.

One of the major problems in Indian cities is estimating the municipal waste generation. Such estimates should ideally be based on sample surveys (providing also for seasonal variation patterns). Likewise, the waste collection figures should be based on measurements done using a weighbridge at the treatment or disposal site. Very few ULBs in India carry out surveys to estimate municipal waste generation. Hence, the reliability of this indicator is quite low. The average values for collection efficiency of MSW in a UN-Habitat study of 22 cities from around the world is 89 per cent. The indicator is defined to include the percentage of waste collected by the formal sector or deposited by households in containers or depots. Comparing with Indian studies, the NIUA study records an average collection efficiency of 88 per cent. This is higher than the average collection efficiencies reported for the SSLB pilot cities (78 per cent) and the JNNURM pilot cities (68 per cent).

Extent of Segregation of MSW (at Treatment Plant/Disposal Site)
(Average: Gujarat: 7 per cent;
Maharashtra: 13 per cent)

Segregation of waste is considered a critical requirement in the MSW Rules, 2000 of India. It is the basic building block to enable recycling, reuse, treatment and scientific disposal of the different components of waste. This indicator is defined as segregated waste received at the treatment

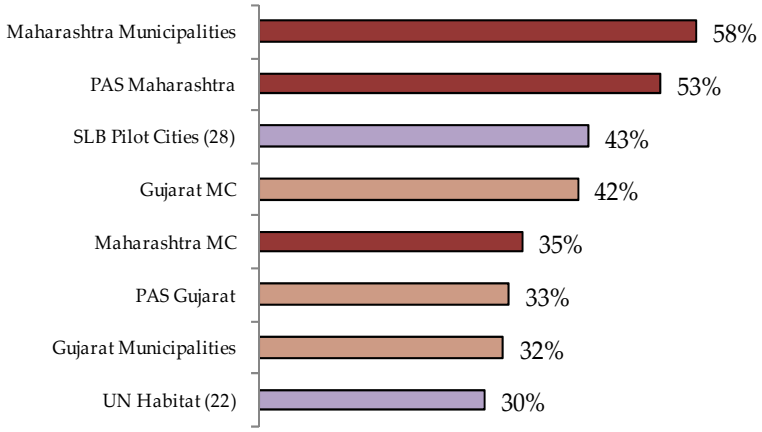


plant to the total waste received.

In Gujarat, 70 per cent of ULBs have no segregation of waste and another 17 per cent report less than 10 per cent segregation. Only 7 per cent of ULBs in Gujarat report segregation levels of more than 50 per cent. In Maharashtra, around 65 per cent of ULBs report no segregation at all. Only 11 per cent of ULBs report segregation of more than 50 per cent in Maharashtra. The SSLB pilot cities report higher segregation rate of 23 per cent while the JNNURM mission cities report segregation at 13 per cent.

Extent of MSW Recovered
(Average: Gujarat: 33 per cent; Maharashtra: 53 per cent)

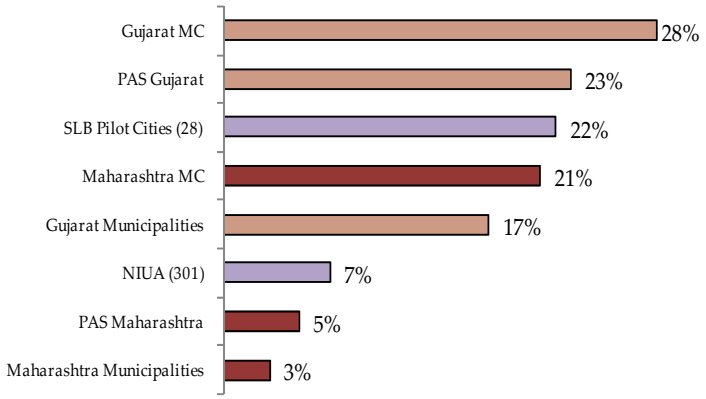
MSW recovery is an indication of the quantum of waste either recycled or processed. This is expressed in terms of percentage of total waste collected. In Gujarat, 44 per cent of ULBs do not have any solid waste recycling or processing facilities. For the ULBs that report some kind of waste processing, 33 per cent of the waste is recycled. In Maharashtra, 77 per cent of ULBs do not have any kind of solid waste processing facility. In both Gujarat and Maharashtra, vermi-composting is the most common waste processing method. In Gujarat four MCs and one municipality have plans for RDF and vermi-composting is practised by 30 per cent of ULBs in Gujarat. In Maharashtra, only 10 per cent of ULBs practise vermi-composting, while five ULBs have RDF technology and four are pursuing waste-to-energy projects.



Many small ULBs have an informal system for recovery of the waste by waste-collectors/rag-pickers. While in some cities, the share of recycling by rag-pickers is high, this is not captured by this indicator, as it only accounts for 'formal' recycling. The UN-Habitat study estimates that 30 per cent of waste in cities is recovered.

Extent of Cost Recovery in SWM Services
(Average: Gujarat: 23 per cent; Maharashtra: 5 per cent)

The indicator signifies the extent to which the ULB is able to recover all operating expenses relating to SWM services. In case of SWM, there is a potential to recover costs through user charges as well as with revenues that can be gained from recycling, reuse and conversion of waste to compost or fuel.

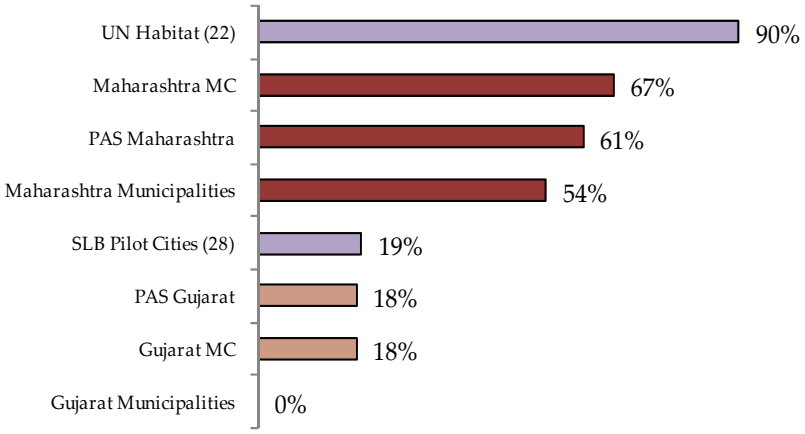


Cost recovery in SWM is consistently low throughout the country. Gujarat has an average cost recovery of 23 per cent which is comparable with the SLB pilot city average of 22 per cent. Maharashtra's ULBs recover

only 5 per cent of the cost of SWM services. The NIUA study estimated cost recovery of 7 per cent for solid wastes.

Extent of Scientific Disposal of MSW (Average: Gujarat: 18 per cent; Maharashtra: 61 per cent)

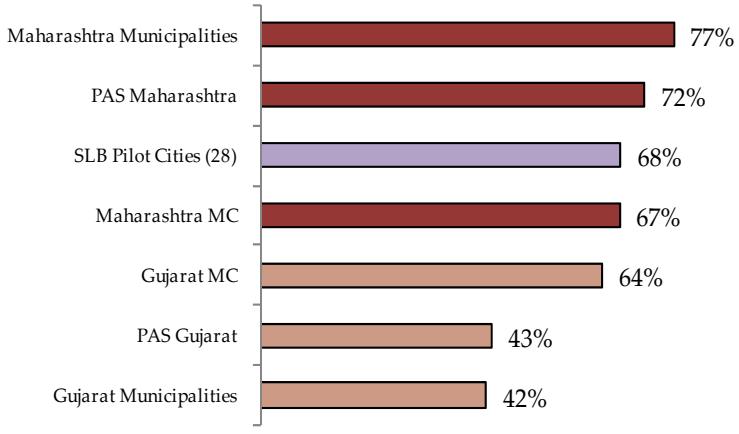
The indicator defines the amount of waste that is disposed in landfills that have been designed, built, operated and maintained as per standards laid down by central agencies. This extent of compliance is expressed as percentage of total quantum of waste disposed at landfill sites, including open dump sites.



In Gujarat only three cities have landfill sites that are operated as per central government rules. In Maharashtra, 10 cities have scientific landfill sites, where 60 per cent of their waste is disposed. The UN-Habitat's indicator measures the proportion of waste that is deposited in an environmental landfill or controlled disposal site, or any other formal treatment system, including incineration. The average value of scientific disposal for the UN-Habitat study is as high as 90 per cent. Indian cities have a long way to go, as the SLB pilot cities also reported that only two of the 28 cities had scientific landfills.

Efficiency in Collection of SWM Charges (Average: Gujarat: 43 per cent; Maharashtra: 72 per cent)

Efficiency in collection is defined as the current year revenues collected, expressed as a percentage of the total operating revenues billed for the current year. For a ULB, it is not just enough to have an appropriate tariff structure that enables cost recovery objectives, but also efficient collection system. Lower collection efficiency implies accumulation of arrears. The SLB pilot cities reported an average collection efficiency for SWM charges at 68 per cent. In Maharashtra the collection efficiency is 72 per cent, while in Gujarat it is only 43 per cent. In Gujarat, the MCs have a collection efficiency of 64 per cent as compared with municipalities which collect only 42 per cent of SWM bills. In Maharashtra the municipalities perform better at 77 per cent, compared with the MCs, where average collection efficiency of MSW is 67 per cent.

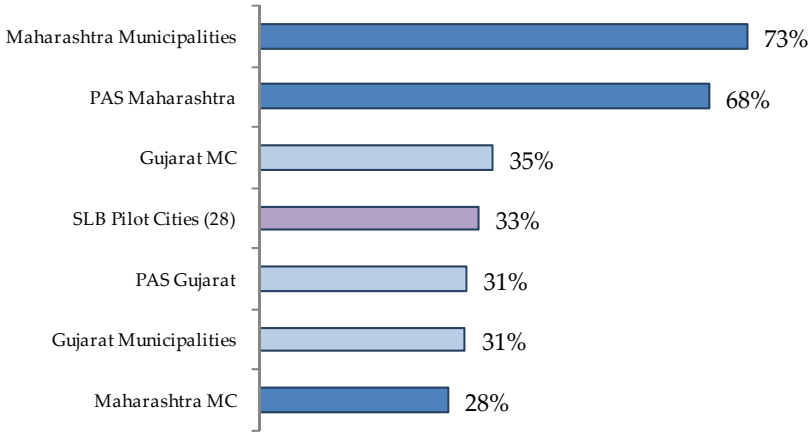


Storm Water Drainage

Coverage of Storm Water Drainage Network (Average: Gujarat: 31 per cent; Maharashtra: 68 per cent)

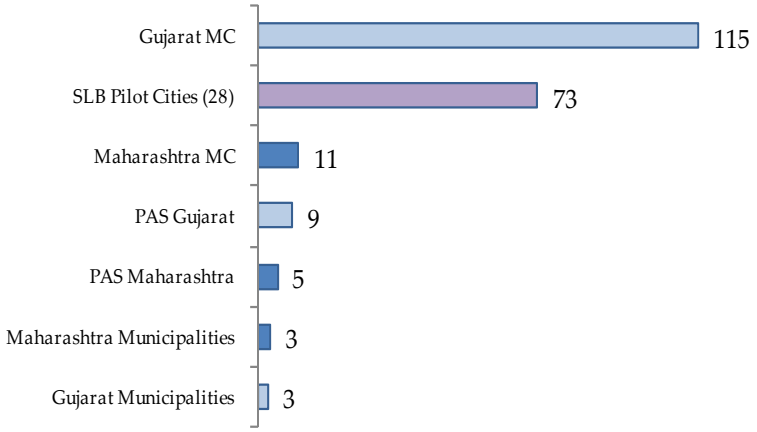
This indicator measures extent of road length covered by storm water network.

While the average for the SLB pilot cities was 33 per cent, in Gujarat ULBs it is 31 per cent. Maharashtra ULBs have 73 per cent coverage of storm water drains.



Incidence of Water Logging/Flooding (Average: Gujarat: 9; Maharashtra: 63)

The incidence of water logging shows the extent and effectiveness of a city's storm drainage system. The data for this indicator has not been reported in a very reliable manner. In Gujarat, two MCs have reported data (more than 200 incidents of water logging/flooding in a year). Forty-one per cent of ULBs in Gujarat report water logging incidents ranging from one to 12 incidents per year.



In Maharashtra, 25 per cent of ULBs reported on this indicator. In these ULBs, on an average, there are five incidents of water logging.

Annex

Brief Description of Studies Referred in the Data Book

1. National Institute of Urban Affairs (NIUA)

The NIUA conducted a study titled 'Status of Water Supply, Sanitation and Solid Waste Management in Urban Areas' in 1999. The study assesses the status of three basic services – water supply, sanitation and municipal solid waste management (SWM) – in 300 cities of India. The study was carried out in all towns in the country including all metropolitan cities and selected Class I and Class II urban centres. The sample covered all the states and union territories. The study was commissioned in 1999 and the data collection work took more than a year. A detailed survey of the agencies responsible for the provision, operations and management of these services in the selected cities and towns including all the metropolitan cities in the country was carried out. After government clearances and follow-ups with utilities for data gaps, the report was finalised in May 2005.

Name of the study	**Status of Water Supply, Sanitation and Solid Waste Management in Urban Areas**
Conducting agency	NIUA
Year of study and year for publishing of final report	Data for the year 1999, Published in June 2005
No. of utilities covered	Total: 301 Metropolitan cities: 22; Class I: 164; Class II: 115
Sector of study	Water, wastewater and solid waste management
Methodology adopted	Primary data collection through filled questionnaire from respective authorities. City selection based on purposive sampling basis with Class I and Class II towns in a 2:1 ratio, as these cities form a very large proportion of the total urban centres in the country
Data validation techniques used	Validation done by asking for clarifications from the utility on doubtful data elements

2. Jawaharlal Nehru National Urban Renewal Mission (JNNURM) Mission Cities

The reference for the data used is the City Development Plans (CDP) of 63 mission cities of JNNURM. These CDPs were made by different consultants commissioned by the mission cities and reviewed by agencies appointed by the Ministry of Urban Development (MoUD), Government of India (GoI). All the CDPs were prepared during 2005–06. In preparation of these CDPs, information available with the ULB was used. The CEPT team compiled the information available in these CDP reports to compute the averages.

Name of the study	**JNNURM – Mission Cities City Development Plan Review**
Conducting agency	CEPT compilation of data from various CDP reports
Year of study and year for publishing of final report	CDP prepared in 2005–06, CEPT compilation in 2009–10
No. of utilities covered	Total: 63 Metropolitan Cities: 35; Class I: 24; Class II: 2; Class III: 2
Sector of study	Water, wastewater and solid waste management
Methodology adopted	Indicators/data were selected from CDP reports
Data validation techniques used	Nil

3. Water and Sanitation Program–South Asia (WSP-SA)

Recognising the potential of benchmarking as a tool to improve the performance of Indian utilities, the WSP-SA piloted a benchmarking exercise covering 13 water supply and sanitation (WSS) utilities in India in 2003–04. This exercise involved creating awareness about benchmarking, developing the methodology and collecting and analysing data on an initial sample of WSS utilities in India. Phase II of the benchmarking exercise intended to cover a maximum of 16 utilities. From the original list of 16 utilities, only 10 utilities were able to provide adequate data.

Name of the study	**Benchmarking Urban Water and Sanitation Utilities – Phase II**
Conducting agency	CRISIL for Water and Sanitation Program
Year of study and year for publishing of final report	Data for the year 2005–06, published in May 2007
No. of utilities covered	Total: 10 Metropolitan Cities: 7; Class I: 3
Sector of study	Water
Methodology adopted	Data collected from the water utility by the use of a detailed questionnaire
Data validation techniques used	Validations done by asking for clarifications from the utility on data elements

4. Asian Development Bank (ADB)

The ADB and the GoI agreed that information on selected JNNURM cities would be useful for their work in identifying projects in support of the JNNURM programme. It was in this context that the MoUD, with support from the ADB, took up the study for benchmarking and recording of water utilities data. The '2007 Benchmarking and Data Book of Water Utilities in India' provides data for 20 selected water utilities in India. Data was collected through a questionnaire for 2005–06. Performance indicators were derived using basic data provided by the utilities.

Name of the study	**2007 Benchmarking and Data Book of Water Utilities in India**
Conducting agency	ADB
Year of study and year for publishing of final report	Data for 2005–06, published in 2007
No. of utilities covered	Total: 20 Metropolitan Cities: 13; Class I: 7
Sector of study	Water
Methodology adopted	Data collected from the concerned water utility by the use of a detailed questionnaire
Data validation techniques used	Validations done by asking for clarifications from the utility

5. Service Level Benchmark (SLB)

While the GoI has been assisting the states and urban local bodies (ULBs) towards urban infrastructure improvements and asset-creation through the JNNURM, what finally matters is the outcome in the delivery of services to urban residents. It is with this vision that the MoUD initiated an exercise to develop standardised SLBs with respect to basic municipal services. The Ministry aimed at adopting national benchmarks in four key sectors – water supply, sewerage, SWM and storm water drainage. Measurements were carried out against these benchmarks in 28 cities across the country.

Name of the study	Service Level Benchmarks
Conducting agency	MoUD and various partners
Year of study and year for publishing of final report	2008–09, published in June 2010
No. of utilities covered	Total: 28 Metropolitan Cities: 13; Class I: 11 ; Class II: 2; Class IV: 1; Class V: 1
Sector of study	Water, wastewater, solid waste management and storm water drainage
Methodology adopted	Data collected by visiting the concerned ULB and using a standardised questionnaire
Data validation techniques used	Validations done by asking for clarifications from the utility on suspected data elements

6. International Benchmarking Network for Water and Sanitation Utilities (IBNET)

The IBNET provides a large database for water and sanitation utilities performance data. It supports and promotes good benchmarking practises among water and sanitation services by providing guidance on indicators, definitions and methods of data collection; by facilitating the establishment of national or regional benchmarking schemes; by undertaking peer group performance comparisons and by establishing links between utilities, utilities associations and regulators. IBNET considers the requirement of comparative information and its use in benchmarking. It is an important management tool for managers and professionals in water and sanitation utilities. Benchmarking and knowledge of best practise is important for all water and sanitation utilities. It is in this light that IBNET collects and provides data on over 2,000 water and sanitation utilities.

For the ease of analysis these utilities were categorised into utilities from developing and developed nations. The average population size for these is 239,528 and 129,665, respectively. The data set from IBNET is used here to compare the performance of Indian utilities with international averages.

Name of the study	IBNET
Conducting agency	IBNET
Year of study and year for publishing of final report	2009
No. of utilities covered	Total: 2,579 Metropolitan Cities:181; Class I: 652 ; Class II: 302; Class III: 718; Class V: 726
Sector of study	Water, wastewater, solid waste management
Methodology adopted	Data collected from the concerned water utility by the use of a detailed questionnaire
Data validation techniques used	Validations done by asking for clarifications from the utility

7. UN-Habitat

The source of the global data on SWM is from *Solid Waste Management in the World's Cities*, which is the third edition in the UN-Habitat's *State of Water and Sanitation in the World's Cities* series. The report (that is, *Solid Waste Management in the World's Cities*) focuses on the state of SWM in 20 cities across the world and provides certain key indicators for 2010.

Name of the study	**Solid Waste Management in the World's Cities**
Conducting agency	UN-Habitat
Year of study and year for publishing of final report	Data for 2009, published in 2010
No. of utilities covered	Total: 22 Metropolitan Cities: 13; Class I: 9
Sector of study	Solid waste management
Methodology adopted	Data collected from the concerned utility by the use of a detailed 'profile' or data form
Data validation techniques used	No

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The Performance Assessment System (PAS) Project

The PAS Project aims to develop appropriate methods and tools to measure, monitor and improve delivery of water and sanitation in cities and towns in India. The PAS Project includes three major components of performance measurement, performance monitoring and performance improvement. It covers all the 400+ urban local governments in Gujarat and Maharashtra.

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PAS Project

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