

# A Review of Performance Benchmarking Urban Water Supply and Sanitation

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# Acknowledgments

The Performance Assessment System (PAS) Project has developed systems for measurement, monitoring and improvement of urban water supply and sanitation (UWSS) performance in Gujarat and Maharashtra.

Benchmarking of water and sanitation services in emerging countries pose serious challenges. This is because the conventional approach of benchmarking used in more developed countries does not work when water supply is intermittent, often unmetered and a large number of consumers who are poor depend on shared connections. For sanitation, cities often do not have sewerage infrastructure and the population also lacks access to basic sanitary facilities for capture and storage.

The experience in development of benchmarking varies greatly across the world with involvement of a variety of lead institutions. This experience provides a rich basis for drawing lessons for new systems being set up in developing countries. This paper presents a review of benchmarking of water and sanitation around the world. The lessons drawn on the basis of this review have been used in setting out the PAS performance measurement and assessment system in India.

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# Summary

Benchmarking as a concept was introduced by Xerox in the early 1980s to identify the best in the sector and adopt practices used by them to improve performance. The initial efforts in benchmarking in the water and sanitation sector were in Europe and North America.

## International efforts in water and sanitation benchmarking:

Some notable efforts have been made by the American Water Works Association (AWWA), the International Water Association (IWA) and the International Benchmarking Network for Water and Sanitation Utilities (IBNET) of the World Bank.<sup>1</sup> The IWA provides a framework within a utility perspective and a comprehensive set of indicators for water supply and waste water. Both the IBNET and AWWA provide ready-to-use frameworks and platforms for data collection, analysis, quality checks and dissemination of results. Both the IBNET and IWA highlight the importance of reliability of information and suggest methods for assessing the reliability of indicators and related level of confidence. However, the reported results do not always show the reliability assessments. For example, the utility results, as reported on the IBNET website, do not provide reliability bands for any of the results posted.

In 2007, three International Organisation for Standardisation (ISO) series were developed for services related to drinking water supply and waste water for both public and private utilities. The ISO 24510 series relates to service delivery to consumers or end users. It specifies three activities related to water and wastewater services to meet user expectations: provision of service; contract management and billing; and fostering user relationships. The ISO 24511 and 24512 series deal with infrastructural and management components of water and wastewater utilities. These series are intended as guidelines to manage the utilities. It is also applicable for cities with intermittent supply (less than 24 hours supply per day) as well as where supply is through non-piped means (for example, trucks, bottles, etc). Wastewater systems specified in the standard includes both sanitary and industrial wastewater that is drained into sewers, and sanitary waste in undiluted form.

<sup>1</sup>IWA: Alegre et al. (2000), Alegre et al. (2006) and Matos et al. (2002); AWWA: Cabrera et al. (2011); and IBNET: (Berg & Danilenko, 2011).

Over the past two decades benchmarking in the water sector has been facilitated by different actors including: (a) utility associations in several different countries and regions, mainly for comparative assessments and process benchmarking; (b) national governments for improved information systems that can then be used for performance-based sector funding and process benchmarking; and c) for regulation – by regulators as well as through performance-based contracts.

## Benchmarking by utility associations:

The Canadian experience launched in 1997 took up metric benchmarking and monitored trends in key business functions, goal setting and development of action plans. Similar efforts in the Netherlands have also seen revision of the Drinking Water Act making benchmarking mandatory for all players in the water sector. In Australia, under the National Water Initiative (NWI), utilities and state governments report on benchmarking and pricing for urban water delivery. Indonesia and Vietnam have also undertaken benchmarking initiatives; however, these have remained largely one-off exercises. The Vietnam experience gained thrust with the World Bank-funded Vietnam Urban Water Supply Development Project, where funds to provincial water companies were to be disbursed on the basis of the performance results of the 2001 benchmarking exercise. Following the United Nation's (UN) support for setting up Water Operators' Partnerships (WOPs), regional utility associations have also taken up benchmarking, as in Africa and South-East Asia.

These experiences have been largely in metric benchmarking which focuses on quantitative comparison of key performance indicators across water utilities or over time for the same utility. In some instances, metric benchmarking over a period of time has organically evolved to process benchmarking. Customer services process benchmarking has been facilitated by the IWA and Water Services Association of Australia (WSAA). The WSAA has also carried out process benchmarking exercises for asset management. The Asian Development Bank (ADB) has supported process benchmarking through twinning arrangements in

key service areas.

#### **Benchmarking by government institutions:**

Benchmarking efforts have also been promoted through national governments. Brazil established the National Sanitation Information System (SNIS) in 1996 and currently has a database of 16 years of historical data. The Water Law of Brazil also mandates use of performance of utility operators in the allocation of federal resources. The SNIS has also made its information collection system online through its link at SNISWEB. Albania has been managing a performance benchmarking and monitoring programme since 2005 for water and wastewater sectors. The results are used in determining investment priorities in the respective sectors. Tanzania has carried out performance benchmarking through Memorandums of Understanding (MoUs) with urban water supply and sewerage authorities (UWSAs) in which three-year targets to be achieved are determined. Further, in 2006, a computerised information system, Majls, was established. Majls also has an internal management information system (MIS) component for the utilities so that the UWSAs can analyse their own data, monitor trends and track their progress towards targets. Australia has, through the National Water Initiative (NWI), mandated the process of benchmarking in 2004; the state governments report on benchmarking of services and pricing for urban water delivery. In addition, the National Performance Report (NPR) on water supply and sanitation sectors has over 150 indicators related to social data, health, environmental and financial aspects. A key NWI innovation is the auditing process that ensures a consistent approach to issues of independence, level of expertise and adherence to relevant standards.

#### **Benchmarking through performance linked funds:**

Other examples of performance benchmarking have been through performance-linked grants. A certain percentage of national and state government transfers to utilities/municipalities are tied to their performance, especially in areas of operational and financial efficiency. Grants are provided to those utilities/municipalities that undertake reforms to increase performance and efficiency. Cases of Ecuador and Uganda are presented under this category.

#### **Benchmarking by water and sanitation regulators:**

Well known among the benchmarking initiatives through regulators is Ofwat, the independent economic regulator of the water and sewerage

industry in England. Ofwat uses pricing as an incentive mechanism allowing companies that perform better to charge their consumers more than companies that provided poor services. Interestingly, Ofwat is now looking to move towards a monitoring rather than a regulatory role, putting the responsibility on companies' themselves to develop their own systems and processes, while holding the companies accountable only on the basis of their outputs. Other examples in this include ADERASA (Asociación de Entes Reguladores de Agua y Saneamiento de las Américas) for Latin American countries and CRA (Conselho de Regulação do Abastecimento de Água) for Mozambique.

Indian efforts related to benchmarking have mostly involved one time efforts with varying scales of cities and purposes such as creating awareness about benchmarking, status of urban water supply and sanitation (UWSS), baseline assessment of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) cities, etc. In 2009, India initiated the Service Level Benchmarking (SLB) for urban water supply and sanitation. The SLB framework consisted of service level indicators for each sector along with guidelines on developing information system improvement plans and performance improvement plans for cities. The initiative has been further strengthened by the 13th Finance Commission (FC) recommendations that state governments notify service standards for UWSS proposed to be achieved in the next fiscal year in order to access performance based grants.

#### **Benchmarking and performance measurement in India through standardised Service Level Benchmarking:**

A recent Government of India (GoI) initiative attempts to address some of the issues facing UWSS benchmarking in India. It aims to develop a set of standardised service level indicators and related benchmarks for water supply, wastewater, solid waste management and storm water drainage. The main objectives of the SLB framework are to develop a common minimum framework for monitoring and reporting on service level indicators along with the guidelines to operationalise the framework in a phased manner, to support cities to develop an Information System Improvement Plan to improve quality and reliability of information, and to encourage the adoption of this framework for performance monitoring as well as for formulating performance improvement plans.

### State-level initiatives in benchmarking in India:

Various state government efforts in India have also made use of UWSS performance information for their own programmes, for constituting performance awards as well as for their regular routine monitoring. The review focuses mainly on the efforts in Gujarat and Maharashtra as these are the states in which Performance Assessment Systems (PAS) will be concentrating its efforts. UWSS performance information in Maharashtra has been used for three types of activities: (a) the government's own reform-linked investment programmes, namely, Sujal and Nirmal Maharashtra Abhiyan (SNMA); (b) for an innovative and home-grown sanitation award scheme called the Sant Gadge Baba awards; and (c) for the government's regular routine monitoring. The Gujarat government, on the other hand, does not have a specific UWSS reform-linked investment programme, but has introduced a common information system for regular routine monitoring. The government has also supported state-wide development of accounting and property tax systems for all municipalities in the state, as part of JNNURM reforms. This not only provides a uniform system of accounting across urban local bodies (ULBs) but also facilitates faster and more simple retrieval of information on income and expenses in service delivery, which can be further used to design financial performance improvement plans.

### Learning from international and national benchmarking efforts:

The reviews highlight the increasing recognition and emphasis on the need to develop systematic measurement of service performance and to use these for improving delivery of water and sanitation services. Efforts have ranged from developing standardised frameworks for performance measurement (for example, by IBNET, IWA and under the Gol's SLB Initiative) to carrying out periodic studies of performance levels across service providers. Many governments and utility associations have also taken up comparative benchmarking on a regular basis, increasing their efforts to make results widely available and promoting ready comparisons through use of web-based technology to enable user-led query mechanisms. Performance information has also been used for regulation in different settings by regulators and in performance contracts. The latest innovation has been to develop performance-based funding to local service providers by donors and higher levels of government.

To summarise, benchmarking programmes/initiatives have been found to be successful and sustainable when the implementing agency has the

support of the government or participating utilities. Linking benchmarking programmes to performance improvement plans further engages utilities with them. The key challenge mentioned in most studies has been the importance of good and reliable information systems. Moreover, performance-linked funding is a key driver to initiating benchmarking practices in most case studies reviewed. Finally, accountability by state and local governments to disseminate benchmarking results has also seen significant impact in the sustainability of these programmes.

# Abbreviations

ADB	Asian Development Bank
ADERASA	The Association of Water and Sanitation Regulatory Entities of the Americas (Asociación de Entes Reguladores de Agua y Saneamiento de las Américas)
AWWA	American Water Works Association
CRA	Water Regulatory Board (Conselho de Regulação do Abastecimento de Água, in Mozambique)
DANVA	Danish Water and Wastewater Association
DFID	Department for International Development
EU	European Union
GIS	Geographic information systems
GoG	Government of Gujarat
Gol	Government of India
GoM	Government of Maharashtra
IBNET	International Benchmarking Network for Water and Sanitation Utilities
ISO	International Organisation for Standardisation
IWA	International Water Association
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
KPI	Key performance indicator
MIS	Management information system
MoU	Memorandum of understanding
NEBC	Northern European Benchmarking Cooperation
NPR	National Performance Report
NWASCO	National Water and Sanitation Council (in Zambia)
NWI	National Water Initiative
NWSC	National Water and Sewerage Corporation (in Uganda)
Ofwat	The Water Services Regulation Authority (in England and Wales)
PAS	Performance Assessment Systems
PERPAMSI	National water suppliers' association representing all the local utilities in Indonesia
PI	Performance indicators
SLB	Service Level Benchmarking
SNIS	National Sanitation Information System
SNMA	Sujal and Nirmal Maharashtra Abhiyan
ULB	Urban local body
UMM	Utility Management Model
UN	United Nations
UWSS	Urban water supply and sanitation
VWSA	Vietnam Water and Sewerage Association
WOP	Water Operators' Partnerships
WSAA	Water Services Association of Australia
WSP	Water and Sanitation Program

# A Review of PERFORMANCE BENCHMARKING

## Urban Water Supply and Sanitation

The PAS project developed by CEPT University has been implemented across 400+ towns in Gujarat and Maharashtra. The project comprises three major components: Performance Measurement, Performance Monitoring and Performance Improvement. The performance measurement component refers to development and implementation of performance metrics. This includes performance indicators developed through studies and stakeholder consultations. Performance monitoring includes setting up of appropriate online monitoring systems at state and local government levels. This includes a dedicated web platform that allows each state and local government to host information and conduct real time data analysis and reporting. Finally the performance improvement component will make use of the performance indicators' analysis and provide support to develop performance improvement plans. In this context, it becomes necessary to undertake a study of the existing benchmarking programmes and initiatives at the global, regional and national levels. This study is also important to understand benchmarking experiences in developing countries and draw on the lessons learnt from these countries. The study also looks at the legal environment, laws and acts that have led to sustaining benchmarking practices in many countries.

This paper provides a review of performance benchmarking efforts in the UWSS sector over the past 20 years. The first section is based on international benchmarking frameworks developed for urban water and sanitation. The next section focuses on benchmarking efforts at national and utility levels, and by regulatory agencies across developed and developing countries. The last section focuses on the lessons drawn from the review, as well as measures and methods that would help to undertake and sustain benchmarking for water and sanitation.

### 1. Review of international efforts in benchmarking

Since the mid-1990s, increasing attention has been paid to benchmarking performance of urban water service providers. The benchmarking concept was introduced in the private sector in 1981 by Xerox to identify the best performers in the

sector and to adopt the best practices to achieve better performance. Since then the benchmarking framework has been adopted by different types of industry groups, governments, regulators, trade associations, academic associations and consultancy firms to manage, supervise or regulate service quality using performance indicators.

The initial development in benchmarking in the water sector was in Europe and North America. More recently, a number of efforts have been made to develop benchmarking frameworks specifically focused on the water and sanitation sector. These have been adapted for use by different players including utility associations, governments and regulators. Use of benchmarking in developing countries has gained increased momentum particularly through utility associations and governments. Indicators of performance are also increasingly used in performance-based contracts between governments and public utilities as well as private service providers.

### Development of benchmarking frameworks for the water sector

Over the past years, there have been a number of efforts to develop and standardise the approach to benchmarking in the water sector. Among them some notable efforts have been made by the AWWA, IWA and IBNET of the World Bank.<sup>2</sup> The IWA provides a framework within a utility perspective and a comprehensive set of indicators for water supply and waste water. Both the IBNET and AWWA provide ready-to-use frameworks and a platform for data collection, analysis, quality checks and dissemination of results. Recently, the International Organisation for Standardisation (ISO), the worldwide federation of national standards bodies, has prepared standards and guidelines for services to users, quality criteria and performance indicators of water supply and wastewater systems, and management of utilities.<sup>3</sup>

The IWA framework has been developed based on an extensive field test of performance indicators system that relied on contributions from over 70 volunteer undertakings. The participants included bulk and direct water suppliers, water only and

multi utilities, holding companies and regulators. Participants from developed and developing countries serving populations ranging from 10,000 to more than 20 million took part in the exercise to finalise the framework. Workshops were also conducted to facilitate direct contact between participants and the coordinating team at the IWA. The current IWA framework is a revised version based on feedback from the participant utilities that have used the framework in their benchmarking efforts. The IWA provides baseline framework and guidelines for operators or associations that want to undertake benchmarking. Its framework has been used in many European countries. The IWA has also initiated support to Water Operators' Partnership (WOP) being developed with United Nations' (UN) support.<sup>4</sup> WOPs have become active in Africa and South-East Asia. At a regional level, the ADB has provided support to benchmarking efforts and facilitated development of utility data books across utilities in different sub-regions and countries in Asia.

The IBNET is the first global benchmarking standard for assessment in the water and wastewater sector. It is funded by the UK Department for International Development (DFID), and jointly administered by the Water and Sanitation Program (WSP) and the Water Anchor of the World Bank. It has an online database on operational, financial and technical indicators of over 3,000 utilities from 100 countries. Since its inception in 1997, the IBNET has created partnerships with international donors, water utility associations and regulators as well as with individual utilities and municipalities throughout the world (Berg & Danilenko, 2011). It provides a platform for posting time-series information across participating utilities with user-friendly query features. The IBNET has made some efforts to add specific indicators that focus on equity and access for the poor (see Box 2).

Both the IBNET and IWA highlight the importance of reliability of information and suggest methods for assessing the reliability of indicators and related

**Table 1: Frameworks and indicators: IBNET, IWA and ADB utility data books**

Framework	Description
IWA system	Broadly consists of four parts, namely, 'data elements' that feed into variables used for the performance indicators (PIs). PIs are analysed further with respect to 'explanatory factors', and with reference to 'context information'. No. of PIs: 170 (for water); no. of variables: 182 (for wastewater)
AWWA	Consists of a dataset in five areas of water and wastewater utility operation, including organisational development, customer relations, business operations, and water and wastewater operations. No. of PIs: 22 (for water and wastewater)
IBNET system	Consists of a dataset broadly covering aspects of utility information, service area, water and sewerage service, financial and customer information. The indicators are drawn from the above dataset, along with additions of utility specific indicators. No. of data items: 148; no. of PIs: 27 (including water and wastewater)
ISO series	Consists of indicators related to water and wastewater services like provision of service, contract management and billing, and consumer relations. Wastewater systems consider both sanitary as well as industrial wastewater drained into sewers.

Sources: AWWA: Cabrera (2011), IBNET: [www.ib-net.org](http://www.ib-net.org); IWA: Alegre et al. (2006); ISO: ISO 24510: 2007, ISO 24511: 2007, ISO 24512: 2007.

level of confidence. However, the reported results do not always show the reliability assessments. For example, the utility results, as reported on the IBNET website, do not provide reliability bands for any of the results posted.

In 2007, three ISO series were developed for services related to drinking water supply and waste water for both public and private utilities. The ISO 24510 series relates to service delivery to consumers or end

users. It specifies three activities related to water and wastewater services to meet user expectations: provision of service, contract management and billing, and fostering user relationships. The ISO 24511 and 24512 series deal with infrastructural and management components of water and wastewater utilities. Objectives and possible actions to achieve the objectives have been identified. The actions are based on service assessment criteria for which performance indicators are developed. These series

<sup>2</sup>IWA: Alegre et al. (2000), Alegre et al. (2006) and Matos et al. (2002); AWWA: Cabrera (2011); and IBNET: (Berg & Danilenko, 2011).

<sup>3</sup>ISO 24510, ISO 24511 and ISO 24512.



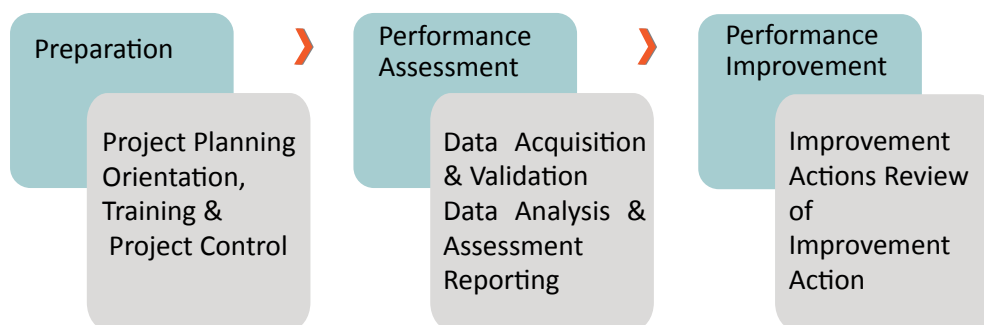
### Box 1: IWA's performance assessment and improvement framework

The International Water Association (IWA) has developed an extensive performance measurement system with sub-components of data elements, variables, performance indicators and context information. Under the IWA system, performance indicators (PIs) are classified into five groups: water resources, personnel, physical, operational, quality of service and economic and financial. Data is derived from the 'data elements' (DEs); various DEs are used to generate variables, which in turn are combined to produce the performance indicators. The 'variable' has two aspects: the numerical value (resulting from measurement/record), and the grade that represents the quality of the data. Context information can also be generated from the variables in the IWA system. A fifth and important component of the IWA system is 'explanatory factors' or driving factors, which can be used to interpret the PIs better. Explanatory factors can be certain variables themselves, PIs or even context information, as all of these help to understand the PIs clearly.

Cabrera et al. (2011) provides a comprehensive guide on initiating and sustaining benchmarking programmes consisting of preparation,

performance assessment and performance improvement. Some of the prerequisites highlighted include ensuring the utility's objectives to that of the programme, commitment of senior management to the programme ensuring that adequate resources are assigned, providing good quality data in time, sharing knowledge and experience and a stable organisation within the utility. The preparation stage consists of identifying objectives, scope of assessment and improvement, costs, communication strategy and orientation and training. The performance assessment component includes processes of data acquisition and validation, and data analysis and assessment reporting, which is followed by the most important stage of performance improvement. This covers identifying improvement actions, type of improvement and sources of information for these actions, and prioritisation of the actions. A critical component following this is the review of the improvement actions, their effectiveness and extent to which the performance gaps have been covered. It also calls for continuous improvement, increased use of technology available, innovations, etc, through continuous benchmarking.

Figure 1: The IWA Benchmarking Framework



Sources: Alegre et al. (2006), Cabrera et al. (2011).

are intended as guidelines to manage the utilities. It is also applicable for cities with intermittent supply (less than 24 hours supply per day) as well as where supply is through non-piped means (for example, trucks, bottles, etc). Wastewater systems specified in the standard include both sanitary and industrial wastewater that is drained into sewers, and sanitary waste in undiluted form. All ISO series include definitions of elements and characteristics specific to the target audience, needs/expectations, assessment criteria and related performance indicators.

## 2. Performance benchmarking in the water sector

Over the past two decades benchmarking in the water sector has been facilitated by different actors including: (a) utility associations in several different countries and regions, mainly for comparative assessments and process benchmarking; (b) national governments for improved information systems that can then be used for performance-based sector funding and process benchmarking; and (c) for regulation – by regulators as well as through performance-based contracts.

### Utility associations:

In many countries, utility associations have undertaken benchmarking as a voluntary tool for performance assessment for its member operators (see Box 3). Participation in a benchmarking exercise is often charged through a fee. In Europe, utility associations in the Netherlands and Denmark have been using performance benchmarking since the late 1990s, and have well-established metric

and process benchmarking. They have actively promoted benchmarking in other European nations and have established the North European Benchmarking Corporation for regional comparative performance assessment. As a result of these efforts in some countries, such as the Netherlands or Australia, benchmarking has been made a statutory requirement.

### Box 2: IBNET: Equity and access for the poor

Recognising that the vast majority of developing-country utilities fail to deliver services to significant populations residing within their nominal service areas, the International Benchmarking Network for Water and Sanitation Utilities (IBNET) has introduced special indicators that focus on equity and affordability aspects. This would help in measuring performance in serving poor consumers, along with other measures of efficiency and financial sustainability. The indicators are:

(a) Those focusing on access to water and sanitation

services for the poor – captured through an indicator of pro-poor options such as a standpost or community-managed kiosks for water, and shared toilet facilities.

(b) Those focusing on affordability by assessing whether the utility offers a flexible/amortised repayment option to spread the costs of connection to the water network, and assessing the monthly water bill for a household consuming 6 M3 of water per month through a household or shared yard tap (but excluding the use of standposts).

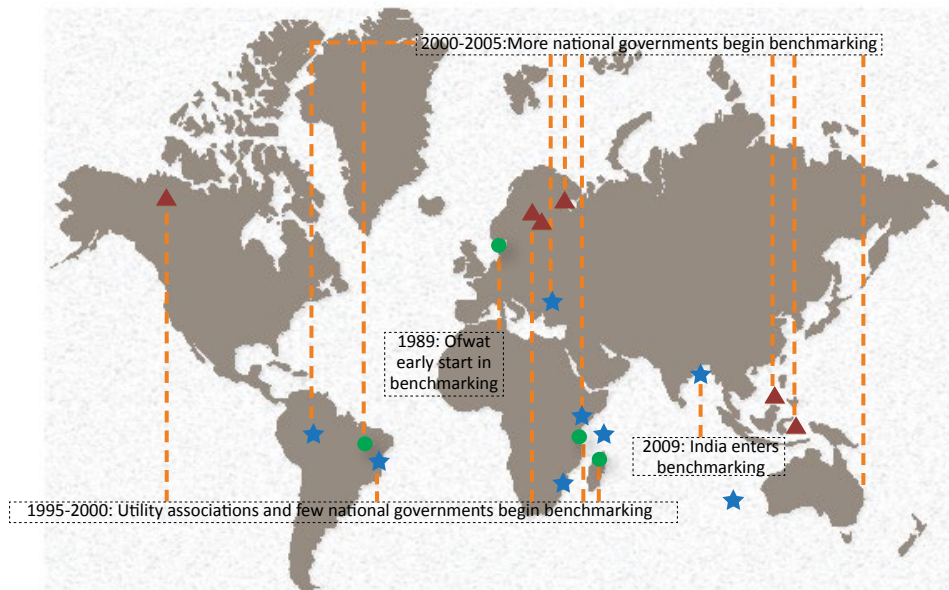
Sources: Based on Evans (n.d.) and the list of indicators reported on the IBNET website ([www.ib-net.org](http://www.ib-net.org)) as retrieved on April 16, 2010.

Table 2: Use of performance information around the world

	Utility associations	Government	Regulation
Coverage	National and regional level	National and state (province) level	National and regional level
Examples	Africa, South-East Asia, Australia, Netherlands, South Africa, Canada, Vietnam and Indonesia	Performance monitoring: Brazil, Australia, Tanzania, South Africa and India Performance-based funding: Ecuador, Uganda, Tanzania and India	Regulators: UK, Zambia and Philippines Performance-based contracts: Senegal, Uganda, Burkina Faso, Malaysia and Bangkok
Objectives	(a) Sharing information across utilities; (b) Promote process benchmarking	(a) Support decision making and improvement plans; (b) Promote process benchmarking; (c) Funding as incentive for improved performance	(a) Comparative regulation; (b) Review against agreed performance targets in contract
Major themes	Service levels, finance, consumer services, environment	Service levels, consumer services, finance, environment, health and asset management	Service levels, consumer services, finance
Frequency	Annual (Netherlands: once in three years)	Annual	Annual

<sup>4</sup>The concept of WOP was suggested by the 'Hashimoto Action Plan' (HAP) which was announced by the United Nations Secretary General's Advisory Board on Water and Sanitation (UNSGAB) during the 4th World Water Forum in Mexico in 2006. The HAP was designed to strengthen the capacity of key players engaged in the water and sanitation sector to help achieve the MDGs (UN Habitat, 2007).

Figure 2: Timeline of global benchmarking initiatives



### Box 3: Performance benchmarking by selected national utility associations

Figure 3: Schematic on various components in utility benchmarking



**Denmark:** Benchmarking initiatives started in 1999 by the Danish Water and Wastewater Association (DANVA) has led to the development of a web-based reporting and analysis system known as BESSY (Benchmark and Statistic System). Other processes initiated by the benchmarking exercise include the preparation of customer surveys, process of benchmarking projects, definition of service level targets and related indicators. As a member of the EUREAU and IWA, the DANVA has influence in matters relating

to European Union (EU) regulations and directives in the sector. It is also part of the Northern European Benchmarking Cooperation (NEBC) and is actively involved in the research and exchange of experience within the sector.

**NEBC:** Established by a group of water associations and utilities of Denmark, Finland, the Netherlands, Norway and Sweden in 2004, the NEBC is an initiative to promote benchmarking and sharing of best practices across utilities/associations. The

benchmarking framework of the NEBC is based on the IWA's framework, and a web-based tool has been developed for using the framework. Key areas of performance assessment are water quality, reliability, service quality, sustainability, finance and efficiency at three levels: basic, metric and advanced. Metric benchmarking helps identify areas for improvement, while advance benchmarking helps to identify the processes needed. The three levels of benchmarking help utilities participate at a level that is appropriate to their development requirements.

**The Netherlands:** Vereniging van Waterbedriven in Nederland (Vewin), the association of Dutch water companies, and the Association of Dutch Water Boards are two key players in water supply and treatment of wastewater, while municipalities are responsible for collection and discharge of wastewater. All 10 water companies and 26 regional water authorities of the Netherlands are members in Vewin and Dutch Water Boards, respectively. The associations have taken up process benchmarking in the areas of water quality, service levels, environmental performance, finance and efficiency. Performance assessment of the services provided by utilities is conducted once in every three years, while financial assessment is done every year. The revised Drinking Water Act 2008 has made the process of benchmarking mandatory for all players in the water sector in the Netherlands. As a founder member of the NEBC, Vewin is also associated with benchmarking efforts at an international level.

**Indonesia:** PERPAMSI, the national water suppliers' association representing all the local utilities in Indonesia, started benchmarking

efforts in 2001. However, problems faced in data collection, verification and analysis led to another initiative in 2002. Key objectives of PERPAMSI have been to represent utilities, lobby for policies and regulations, disseminate information between utilities on innovative approaches, and conduct performance assessment. In the 2002 initiative, 80 out of 306 utilities participated, and the process looked at technical, financial, managerial and customer satisfaction aspects. In the second phase that began in 2007, emphasis has been to develop a more sustainable system. Training workshops have been conducted at the province and central levels. The data is collected and verified by the utilities at the province level and is sent to the central offices for analysis and dissemination. Interestingly, after five years, PERPAMSI has not been able to increase the number of participating utilities in the benchmarking process.

**Vietnam:** The Vietnam Water and Sewerage Association (VWSA) started the benchmarking exercise primarily to create a database for water and sanitation costs for national reference for industry stakeholders. Sixty-seven provincial water companies (PWCs) participated for assessment of technical, financial, human resources and environmental aspects; data for three years, from 1997–2000, was collected. This initiative gained further thrust through the 'performance grant' component of the World Bank-funded Vietnam Urban Water Supply Development Project, where funds to the PWCs were to be disbursed on the basis of the performance results of the 2001 benchmarking exercise. Vietnam is a member of the South East Asian Water Utilities Network and has the support of regional partners to further strengthen its benchmarking initiative.

#### Box 4: Performance benchmarking by selected national utility associations: The Canadian experience

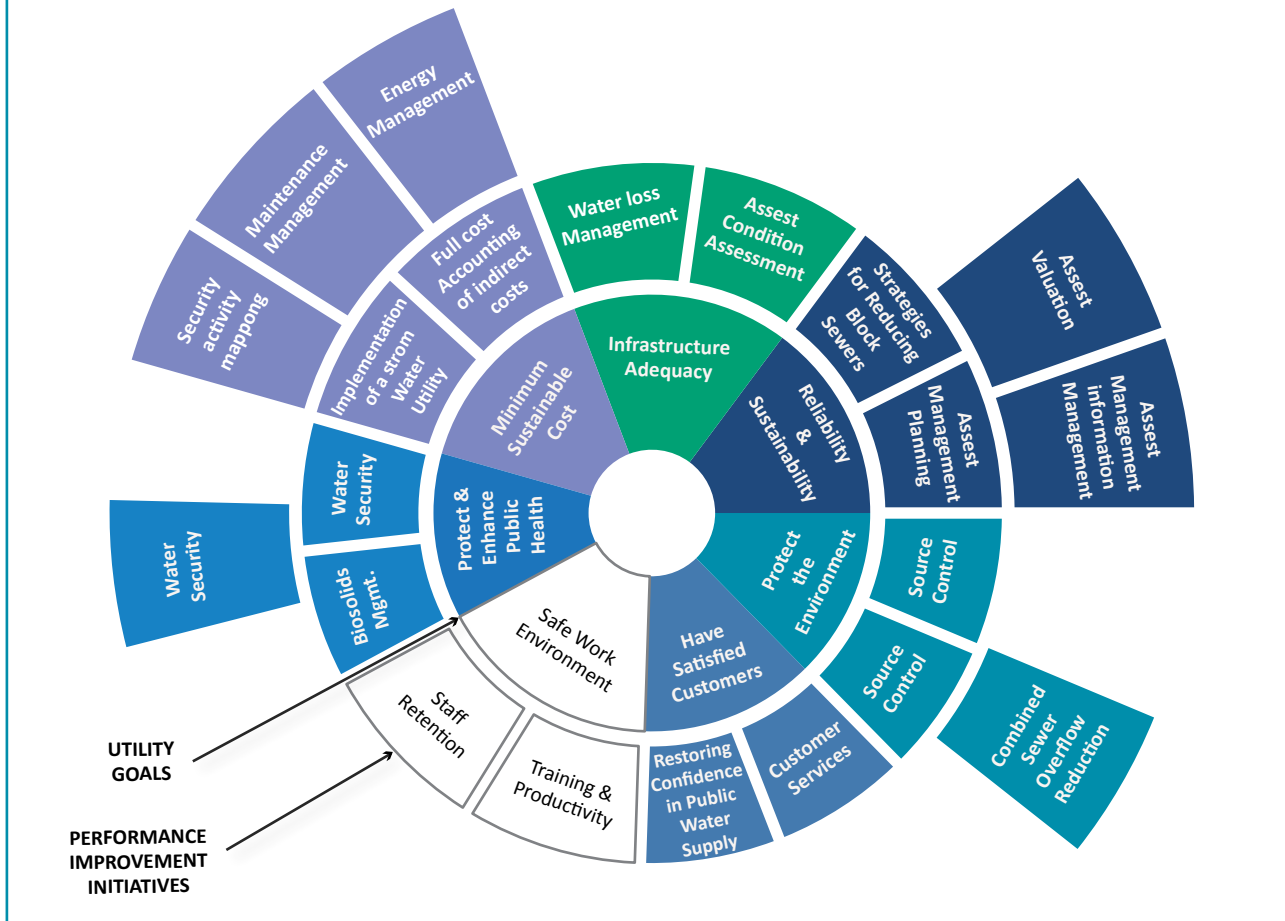
The benchmarking initiative was launched in 1997 as a pilot project that included four participating utilities as well as members from AECOM (Architecture, Engineering, Consulting, Operations and Management) Tech Corp and the National Research Council (NRC), and has since covered 34 water utilities, 39 wastewater utilities and 16 storm water management programmes. This represents 43 per cent of Canada's leading municipalities and regional districts, covering

60 per cent of the population. The tools developed through the initiative not only helped in benchmarking and data collection, but also monitoring trends in key business functions, goal setting and implementation of action plans that help make performance improvement possible. Data collection and verification was carried out through onsite visits by qualified and trained staff in association with utility staff. The Utility Management Model (UMM) developed allowed

utility managers to link their goals, performance measures and strategies, and form the basis upon which to strive for better performance (see Figure 4). The UMM framework consisted of seven goals covering reliable and sustainable infrastructure,

accessibility, service requirements, customer confidence, and environmental protection. The framework also consisted of performance measures relevant to assess the goals listed.

Figure 4: Utility Management Model approach of Canadian benchmarking



Sources: [http://nationalbenchmarking.ca/old-site/public/about/utility\\_management\\_model.htm](http://nationalbenchmarking.ca/old-site/public/about/utility_management_model.htm)

Amongst developing countries, a few national utility associations such as in Indonesia and Vietnam have initiated benchmarking amongst their members. This has often been supported by their governments. Following the UN's support for setting up WOPs, regional utility associations have also taken up benchmarking, as in Africa and South-East Asia.

An industry-wide benchmarking approach has been adapted in the water sector by utility associations in two formats: (a) metric benchmarking that focuses on quantitative comparison on key performance indicators (of the type listed in the Annexure tables) across 'water utilities'<sup>5</sup> or over time in the same utility; and (b) process benchmarking that focuses on learning from best performers who concentrate on the underlying utility processes to improve performance. A large body of experience is available for use of metric benchmarking in both developed and developing countries – essentially, comparative

reporting of performance indicators.

Compared with metric benchmarking, **process benchmarking** has not evolved much in the water sector. In some instances, metric benchmarking over a period of time has organically evolved to process benchmarking. In general, however, the adoption of process benchmarking in Europe seems to have been largely voluntary and non-systematic in nature.<sup>6</sup> There are some examples of its use in customer services process benchmarking facilitated by the IWA and WSAA (see Box 5). The WSAA has also carried out process benchmarking exercises for asset management.<sup>7</sup> The ADB has also supported process benchmarking in Asia through twinning arrangements between utilities as well as training activities for continuous improvement in key service areas.

### Box 5: Examples of process benchmarking supported by utility associations

**Customer services process benchmarking in Australia:** The Water Services Association of Australia (WSAA) has initiated the project in 2000 for industry performance comparison by providing robust, comparable and internally consistent operational and capital benchmarking information on water supply and wastewater reticulation for WSAA members. In 2002, the WSAA carried out a study with the UMS group (an international utility management consulting firm) against a broader peer group of global participants, including water, gas and electric utilities from Australia, North America, the UK, Europe and South America. The study analysed, at a detailed level, the cost to serve; it provided insights into best practices for key customer service processes such as order fulfilment, revenue collection and field response. Overall, the key finding was that WSAA participants, in general, had a high level of performance compared to UMS' global database and about a 14 per cent industry cost saving opportunity when compared to overall WSAA best performers. A re-run of the

study was done in 2006 with an increased number of international participants.

#### **Continuous Improvement and Benchmarking (CIB):**

The Water Operators' Partnership (WOPs) in Asia, a collaboration between the Asian Development Bank and the Global Water Partnership, works to enable water utilities to improve service coverage and delivery, financial sustainability, and other aspects of their performance. One of the aspects addressed is CIB, which involves collecting, analysing and comparing key performance data of water and sanitation utilities and, on the basis of analysis, developing a strategy and work programme to improve specific aspects of a utility's performance on a continuous basis. CIB workshops have been conducted for water utilities networks. Member utilities have also agreed to participate in the WOPs' CIB programme – SAWUN: 21 utilities, SEAWUN: 17 utilities and CASCWUA: 11 utilities.

**Government initiatives:** National-level performance measurement and benchmarking have been initiated by governments in several countries, often with support from an international association or a national funding agency (see Box 6). Brazil, Australia and South Africa have institutionalised performance monitoring and benchmarking. Australia has the most experience in successful benchmarking at the state level and has recently undertaken a national-level

initiative. Brazil, through the SNIS, has considerable experience and has been slowly increasing the number of participants. These efforts are backed by appropriate statutes as the development of a sector information system is included in the Water Law in Brazil. South Africa adopted benchmarking in 2001 as an initiative of its utility association, but failed to operationalise it. Subsequently, a national initiative was started in 2006.

### Box 6: Selected Government initiatives in performance benchmarking

**Albania:** The republic has been managing a performance benchmarking and monitoring programme since 2005 for the water supply and sewerage sector. The programme covers all 57 corporatised water supply and sewerage utilities, and was launched, with World Bank funding, at a time when the ownership of the water supply and sewerage infrastructure was being transferred to the local governments. The programme has completed, till December 2010, five annual data cycles so far. Reports generated from the Monitoring and Benchmarking Unit (MBU) were used in determining investment priorities for the central government. The implementation phase of the programme was phased in two parts and designed to be completed in 36 months. The first

phase involved streamlining the activity within the Directorate of Water Supply and Sewerage. This required training the senior management on the value and role of benchmarking, as well as committing the support of the Directorate to the work ahead. This phase also included development of the performance indicators, conducting pilot surveys, and training of public and rural utilities in collecting and reporting data. The second phase consisted of refining and modifying the procedures, supporting the MBU and strengthening its relationship with the reporting utilities. Another key component involved awareness creation regarding the nature and value of the performance monitoring programme with institutions of the Central government, donor community and local

Sources: Australia: IWA 2006; CIB-Asia: ADB 2005.

<sup>5</sup> The term 'utilities' is used more broadly here to encompass various forms of service providers including, amongst others, autonomous public utilities to departments within urban local governments.

<sup>6</sup> Parena et al. 2002.

<sup>7</sup> Foley 2005.

government units. This was carried out through a series of seminars and annual performance review briefing seminars where national and individual performance was presented and compared. Efforts were made to ensure that 'poor quality' and 'poor performance' of the utilities were not highlighted but rather the emphasis was put on the importance of reporting quality data and understanding the performance indicators and relating to norms in the industry. Before the actual implementation was carried out, test surveys were conducted. The utilities (rural and urban) were selected based on size of population served, systems representing gravity, as well as pumped transmission and distribution. Given that reliable measurement systems were not present for almost 70 per cent of utilities, alternate methods were used to collect and record data. Data was collected and recorded by each utility on a monthly basis using standard data collection forms. Data was then sent to the MBU on a quarterly basis, checked for accuracy and agreed to by the utility, and prepared in paper formats, saved on computer disks or retrieved as email attachments. Key performance indicators were 15, across coverage, service levels, operational aspects and finance. In the final launch of the programme, the rural utilities were excluded due to their low capacity to collect and report data, and because they represented a very small service population. Key learnings from five years of annual data cycles have been that the Central government needs to be focussed more on the process and less on data, creation of incentives (or disincentives) for non-conforming utilities, consistency in terminologies related to performance, and dissemination of the reports to stakeholders as well as provide the benchmarking information in the public domain.

**South Africa:** The initial efforts for performance benchmarking for the water and sanitation sector were initiated by the South Africa Local Government Association. When this was unsuccessful, the government took the initiative through the Water Research Commission, naming it the National Water Services Benchmarking project. A key feature of the project is to initiate both metric and process benchmarking. The benchmarking project has over 60 indicators related to service delivery, finance, customer satisfaction, human resources and environmental aspects. The annual cycle consists of data collection (data entry on web-based system restricted to designated staff at municipality), data checking and auditing, and publishing of performance indicators.

**Tanzania:** Water supply and sewerage services in Tanzania are provided by Urban Water Supply and Sewerage Authorities (UWSAs), and are monitored on the basis of memoranda of understanding (MoUs) signed with the Ministry of Water and Irrigation. These MoUs set performance targets that are to be achieved for each UWSA over three years, after which targets are refined. Initially, the monitoring process was done manually through the analysis of reports that were generated monthly. This process was quite cumbersome given the fact that data accuracy was an issue, and therefore had to be validated. Also, the lack of an understanding about reporting data for the key performance indicators did not allow comparisons across UWSAs. In 2006, a computerised information system, 'Majls' was established. The database content was designed to generate reports based on the MoUs. Additionally, it also consisted of a set of data sheets relating to technical, commercial, human resources and financial information. These were filled in by the UWSAs on a monthly basis, and at the end of a fiscal year. Majls is currently administered by the Energy and Water Utilities Regulatory Authority, which is responsible for monitoring all the UWSAs and other commercially run water utilities. Majls also has an internal MIS component for the utilities so that the UWSAs can analyse their own data, monitor trends and track their progress towards targets. Data accuracy is improved over time through feedback given to the UWSAs on submission of their annual reports.

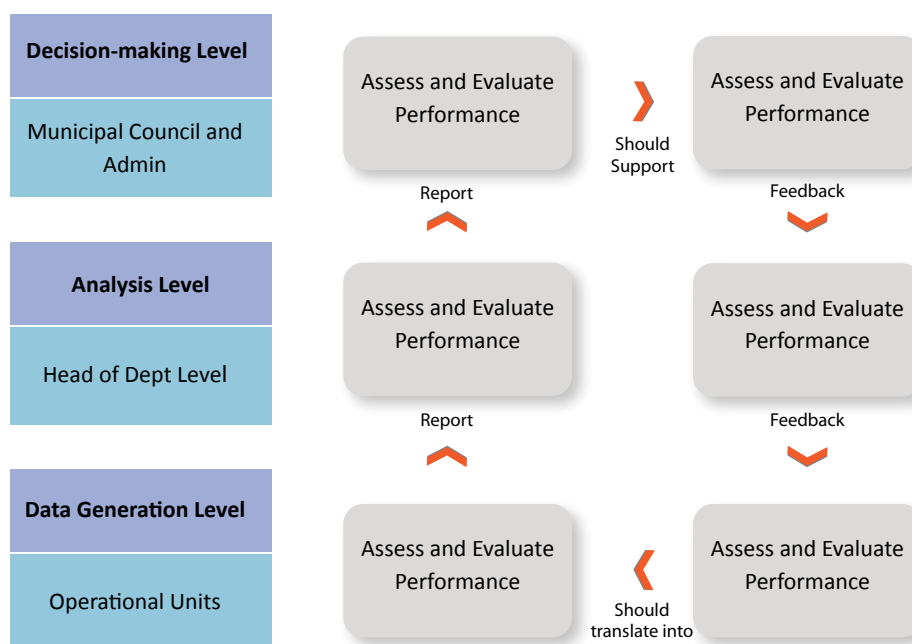
**India:** India has promoted benchmarking in urban water supply and sanitation through two key programmes. The first is the reform-linked national programme of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) launched in 2005 and the second is the Service Level Benchmarking (SLB) programme started in 2009.

**JNNURM:** Over the past five years, use of performance information has been envisaged in the JNNURM, under which funding is linked to urban local body (ULB) commitments on selected reforms. The JNNURM envisages significant investments with a commitment of Rs 50,000 crore (about US\$11 billion) by the Government of India (GoI) over a seven-year period till 2012. Interestingly, while JNNURM funds are available for all urban infrastructure, water supply, sewerage, sanitation and drainage comprise about 73 per cent of projects sanctioned by 2010 and 81 per cent of total project costs approved. Thus, urban water supply and sanitation (UWSS) is an important

component of investment funding through this national programme. The programme requires all participating ULBs to commit to selected mandatory reforms along with a timeline. In addition, the respective state governments also have to commit to mandatory state-level reforms. With reference to the UWSS sector, key areas of reforms include commitments on: equity – coverage and funding for the urban poor; financial viability – recovery of operation and maintenance costs through local revenues including property tax and reasonable user charges as well as improved financial systems; accountability – public disclosure of performance parameters and service levels, and improved consumer links through e-governance. The ULBs are also expected to introduce the administrative structural reforms and public private partnerships necessary to enhance efficiency in delivery of civic services. The reform commitments outlined under the JNNURM have been signed by nearly 700 ULBs across India.

water drainage. The main objectives of the SLB framework are to develop a common minimum framework for monitoring and reporting on service level indicators along with the guidelines to operationalise the framework in a phased manner, to support cities to develop an Information System Improvement Plan to improve quality and reliability of information, and to encourage the adoption of this framework for performance monitoring as well as for formulating performance improvement plans (see Fig 5). In the first phase of SLB development, a series of indicators have been developed through a consultative process for each of the four sub-sectors. These indicators cover areas of coverage, quantity and quality, non-revenue water levels, financial feasibility and consumer redressal. For each indicator, its definition, means of measurement, and frequency and jurisdiction of measurement and a reliability scale have been developed. The detailed work was carried out by a core group of experts from various institutions over the past two years. Under

Figure 5: Performance management system schematic of SLB



**Service Level Benchmarking:** Use of performance information has been promoted by the Gol through its flagship programmes as well as by setting up national standards for service standards for urban services related to water supply, waste water and storm water management, and solid waste management. A recent Gol initiative attempts to address some of the issues facing UWSS benchmarking in India. It aims to develop a set of standardised service level indicators and related benchmarks for water supply, wastewater, solid waste management and storm

the Ministry of Urban Development's leadership, the SLB framework has been piloted in 26 cities across India. The availability of such a nationally agreed to, and mandated basic set of, standardised indicators makes it possible to gradually develop a state-wide performance benchmarking system that can be later scaled up to other states.

The SLB initiative also puts emphasis on issues around data reliability. For each of the 28 indicators across different sub-sectors, reliability scores have been worked out depending on the



manner in which data required for the specific indicator is captured, recorded and analysed. Each reliability level has been developed on the basis of the reliability of the data source and its accuracy. This approach is developed on the basis of previous studies and knowledge about likelihood

of available information among Indian cities. While a reliability score of 'A' suggests the highest level of reliability, lower levels would suggest that the urban local authority/utility needs to improve its data and monitoring systems.

Sources: Albania: Bibolli (2011) Brazil: Marinho (2008); South Africa: Water Research Commission (2004); Tanzania: Kingu and Schaefer (2008); India: MoUD (2009)

### Box 6A: Selected government initiatives in performance benchmarking: Details of India

India's efforts to benchmark urban water supply and sanitation began with various one off studies on a pilot basis to initiate thoughts and action into benchmarking. Over the past decade, there have been three major efforts to measure performance for urban water and sanitation in selected cities (refer to Table 2 and Box 3 for details). Their purposes have varied, ranging from providing baseline information to exploring the possibility of introducing benchmarking practices to cities in India. While a National Institute of Urban Affairs (NIUA) study has covered all class I cities, the CRISIL (Credit Rating Information Services of India Limited) Advisory Services and Asian Development Bank (ADB) studies were limited to about 20 cities each. These have been largely a one-time effort and have used different indicator sets. Table A1 in the Annexures provides highlights of results across a few cities in India, drawing on the results from the ADB and Water and Sanitation Program (WSP) studies. While both studies were published in the same year, there is some variance on results for some indicators. This makes it difficult to prepare comparative assessments across cities and evolve benchmarks. For example, the CRISIL study states: "Coverage, metering and production statistics are not fully reliable. Therefore, there is no data to support a decision to choose between non-revenue water (NRW) reduction and capacity addition as a means to improve the quantity of water supplied to the consumers" (p. 5). The NIUA study also emphasises the difficulty in getting the necessary data.

**NIUA Report for UWSS in 300 Towns:** This major study was done in 1999–2000 for all metropolitan and Class I and II towns in India covering both physical and financial aspects of water supply, wastewater and solid waste management. Besides assessing the current situation, the focus was also on determining investment requirements. The study was done by the NIUA and funded by the Central Public Health and Environmental

Engineering Organisation (CPHEEO). Though not specifically a benchmarking study, it assessed performance across a large number of towns. However, it also suggests that the data can be used for inter-city comparisons, and thus is one of the first Indian studies with an intrinsic suggestion for employing benchmarking practices in the sector. Despite considerable efforts, data gaps and reliability of data remained an issue.

**UWSS Utility Data Book for 20 cities:** This study by the Ministry of Urban Development, (MoUD), Gol, and the ADB was for 20 Indian cities which are covered under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), and focused on 10 key indicators. A workshop was conducted to help the participants understand benchmarking as a tool for performance measurement and determine the most appropriate performance measurement indicators. The compilation of a performance assessment data book and benchmarking for the water utilities was envisaged to be an important step for performance improvement activities. Availability of reliable performance information for planning and monitoring has been recognised as an important factor in sustaining the reforms under this programme. The report acknowledges that despite the effort to make the data as reliable as possible there are some inconsistencies and estimates in the information provided by the utilities.

A clear message from this study was the need to focus on 24x7 water supply to achieve better services while ensuring financial sustainability. It provides a standardised utility profile for each city, inter-city comparisons and a list of good practices. This compilation uses the standard indicators as in other utility data books developed with support from the ADB for cities in Asia, and thus makes it possible to compare Indian cities with their counterparts in Asia.

**UWSS Performance Benchmarking:** A similar performance assessment and benchmarking project was undertaken by the MoUD in partnership with the WSP in response to the need for better baseline data on the performance of water utilities in urban India to support the JNNURM programme. The study was carried out by the CRISIL Infrastructure Advisory Services. The project was carried out in two phases. The first phase covered 13 utilities in 2003–04 and focused on creating awareness about benchmarking and its benefits as a tool for improvements in this sector. It helped to develop locally relevant and useful performance indicators. In the second phase, 16 cities were taken up in 2006 with the objective to scale up and identify measures to improve existing data collection systems for future benchmarking efforts. However, only 10 utilities provided the required data. A major innovation was to assess data quality and introduce a reliability scale. Two cycles of data collection were done to ensure consistency of the collected data and to understand the data collection system. The completion of the second phase of the project has reinforced the importance of benchmarking as a performance improvement tool by the utilities and the need to institutionalise it. It customised IBNET indicators in the Indian context and did detailed assessment across 12 key performance indicators. The focus on reliability assessments paved the way for incorporating this aspect in detail in the recent SLB Initiative by the Gol.

**Urban Services Environmental Rating System:** The Gol undertook a project with the United Nations Development Programme (UNDP) and Tata Energy and Resources Institute (TERI) to develop a regulatory mechanism that would enable monitoring, information sharing and adoption of best practices in the water supply sanitation and solid waste management sectors. Referred as the 'Urban Services Environmental Rating System' (USERS), this initiative aimed to develop a framework for benchmarking, test it in a few cities and disseminate it across other cities. A set of indicators were developed in consultation with different stakeholders for all the three sectors. The performance indicators for the utilities would be used to identify information gaps, prioritise issues, and identify targets, improvement measures and allocation of funds. Apart from benchmarking against targets, it also encourages inter-utility benchmarking, which could eventually be used to develop a rating system as an indicator of municipal services. The cities of Delhi and Kanpur were

identified as the pilot cities. The benchmarking initiative was to be extended to other cities after the pilot phase; however, no literature is available to review the progress of the project.

**Urban Indicators and Performance Measurement (UIPM):** The City Managers' Association of Gujarat (CMAG) with technical assistance from International City/County Management Association (ICMA) and financial assistance from USAID had undertaken a programme to introduce benchmarking as an analytical tool for policy makers to support the decision-making process in 2000. The performance assessment in this programme was applicable to all infrastructure aspects that come under the jurisdiction of a municipality and the financial aspects. The performance measurement results analysis was envisaged to be used to address issues of infrastructure and municipal finances in urban governance. The project aimed at providing urban local bodies (ULBs), decision makers/implementation agencies with an analytical tool which would enable effective planning and decision making. The study sought to analyse the situation of ULBs with regard to financial situation and service delivery. The indicators were developed to determine service levels, service coverage and its costs and efficiency. An overall ranking of various services and a comparison of 10 ULBs was done. The long-term objective of the study was to develop a management information system to collect and document the data in the required format, which would enable continuous monitoring of performance over time in a municipal body as well as comparison with other ULBs. The study would also heighten sensitivity and awareness of stakeholders towards urban management issues and create a healthy competition to improve performance.

The CMAG used the UIPM study to advocate for uniform accounting codes in cities across Gujarat and numerous handholding workshops were organised to promote use of performance information. For example, the Surat Municipal Corporation (SMC) which had a poor coverage of services to slum population under the study introduced several improvements. Today the SMC provides piped water supply to 95 per cent and sewerage network to 97 per cent of its population. The UIPM programme was adopted by other city network associations in states of Madhya Pradesh and Karnataka and also served as a learning tool for associations of Indonesia.

Various state government efforts have also made use of UWSS performance information for their own programmes, for constituting performance awards as well as for regular routine monitoring. This review focuses mainly on the efforts in Gujarat and Maharashtra. UWSS performance information in Maharashtra has been used in Maharashtra for three types of activities: (a) the government's own reform-linked investment programme, namely Sujal and Nirmal Maharashtra Abhiyan (SNMA); (b) for an innovative and home-grown sanitation award scheme called the Sant Gadge Baba awards; and (c) for the government's regular routine monitoring. The Gujarat government, on the other hand, does not have a specific UWSS reform linked investment programme, but has introduced a common

information system for regular routine monitoring. A newly constituted Gujarat government municipal award uses performance information to recognise and reward ULBs which have made remarkable progress in urban service delivery. The Government of Gujarat (GoG) has also supported state-wide development of accounting and property tax systems for all municipalities in the state (refer to Box 6). This not only provides a uniform system of accounting across ULBs but also facilitates faster and more simple retrieval of information on income and expenses in service delivery, which can be further used to design financial performance improvement plans. Similar state-wide efforts are needed to improve the quality of UWSS performance information.

### Box 6B: Selected government initiatives in performance benchmarking: Details of India's initiatives at state level

**The Sujal Nirmal Maharashtra Abhiyan (SNMA, 2009–12)** is a state-level reform linked investment programme initiated by the Government of Maharashtra (GoM) for improving the service delivery of basic water supply and sanitation infrastructure in urban areas. Key reform outcomes as envisioned in the SNMA include: full coverage of individual water supply connections to households, full metering of all bulk and individual connections, migration from single entry to double entry financial systems, water and energy audit for water supply systems, identification and regularisation of illegal connections, preparation of city sanitation plans, etc. Scores are allotted to each ULB based on its performance in the above areas. Funding for reforms is available to all ULBs; reforms are required to be done before embarking on major capital investments to increase capacity for water supply or extending utility networks. Table A3 in the Annexures provides a summary of SNMA reforms at ULB level and respective weightages.

#### **Sant Gadge Baba Awards (SGBA, 2002)**

were initiated by the GoM to promote cleanliness in rural areas. After the great success of SGBA in rural Maharashtra, the GoM initiated the same awards for urban areas in 2002. The awards are meant to incentivise ULBs for improving public and individual cleanliness including open defecation free status, adequate supply of clean drinking water, management of wastewater and solid wastes, and overall enhancement of public health. All ULBs are eligible to apply; the winners are identified through a transparent process starting at the district level. Awards are presented to ULBs in different categories with a focus on the extent of

improvement achieved. Table A4 in the Annexures provides a summary of SGBA reforms at ULB level.

#### **Routine Monitoring by Department of Urban Development:**

The Directorate of Municipal Administration (DMA) is the nodal agency responsible for all the municipalities in the state. The central and state funds are directly disbursed to ULBs or through the collector when administrative approval is required. In the monitoring process, the collector holds monthly review meetings, and DMA representatives conduct quarterly review meetings. Information is collected on a quarterly basis by the district collector with consolidation taking place at the divisional level. There is, however, no uniform system of data collection and aggregation at the state level at present.

#### **Regular Monitoring by Department of Urban Development:**

The state level monitoring framework involves a set of standard formats ('patraks') used to collect service related information regarding water supply, sanitation and finance. While some of the performance information is reported on a monthly basis, the finance information is on an annual basis. Information related to water supply and sanitation is reported to the Directorate of Municipalities within the Urban Development Department, and finance information is reported to the Gujarat Municipal Finance Board (GMFB). Similarly, in the case of grant transfers under devolution from the state to local governments, a quarterly monitoring and reporting system is in place. However, there is a need for on-ground verification of asset creation and performance improvements. In general, there is only limited

reporting of performance information and most of it is not backed by a detailed database. New efforts are being made to develop a common database across all municipalities that can be used for meeting various monitoring needs. Table A5 in the Annexures provides a summary of reports used for regular monitoring.

**Performance monitoring under Nirmal Gujarat (NG) and Swarnim Gujarat (SG) (2007):** The NG is a policy initiative of the GoG aiming to provide clean air, water and land in Gujarat. All recent state programmes and initiatives in the arena of water, sanitation, energy efficiency and CDM fall under this programme launched in 2007. It focuses on delineating scope for participating 25 state government departments and all municipalities with a holistic approach, by facilitating them to plan and develop strategy for implementation internally. Under the SG, the GoG has an ambitious set of goals to celebrate its golden jubilee as it was set up 50 years ago. Both NG and SG goals are being monitored at the highest level and feedback is received from nodal officers of different departments. This programme monitoring also encourages cross-learning between the department and ULBs.

**The Best Municipality Awards in Gujarat (2009)** were launched by the Urban Development Department of the GoG. The nodal agency for conducting the evaluation of ULBs is the GMFB. The performance of ULBs under various schemes proposed by state and central governments is reviewed for 2006–07 and 2007–08. The award scheme is based on a 100 point system given to each ULB for various parameters related to administration, finance and planning. All four classes of ULBs in the state (A, B, C and D Class) are evaluated differently. The first two ULBs in each

class and their chief officers are awarded for their efforts. Unfortunately, again, service performance information is not included in this award.

**Computerised property tax systems for municipalities in Gujarat (2008)**

have been implemented by the GMFB in coordination with All India Institute of Local Self-Government (AIILSG), Ahmedabad Regional Centre. The AIILSG carried out surveys, data entry, and software development for a property tax system for all 141 municipalities of the state. This is the first such state-wide effort in India. The programme also included training for municipality staff in the operation and management of software and the overall system. As an outcome of this exercise all municipalities have computerised databases for property tax and associated software helps to generate regular bills for property tax.

The Gujarat Municipal Accounting Reform Project (GMARP, 2005) has been developed and is being coordinated by the CMAG with support from the GoG, UDD and GMFB since November 2005. The CMAG first supported accounting reforms based on the National Accounting Manual published by the Comptroller and Auditor General of India. Under the project, local chartered accountancy firms were appointed to implement a computerised, accrual-based, double-entry accounting system in all municipalities in Gujarat. This is being funded through GoG grants. The support to municipalities is planned to be gradually phased out with the expectation that the ULBs will either develop internal capacity or meet the costs of outsourcing this from their own funds. The main outputs include: (a) preparation of balance sheets; (b) municipal fixed asset valuation; and (c) budgetary reforms.

Sources: SNMA: GR of GoM (2008); SGBA: WSSD (2002); Routine monitoring – based on discussions with GoM officials, Regular monitoring and performance monitoring under NG and SG: based on discussions with concerned officials; Municipal Awards: GoG (2009), Computerised property tax systems and GMARP: Based on discussions with concerned agencies and officials; and Mehta et al. (2011) for details of performance monitoring systems in the state of Gujarat, India.

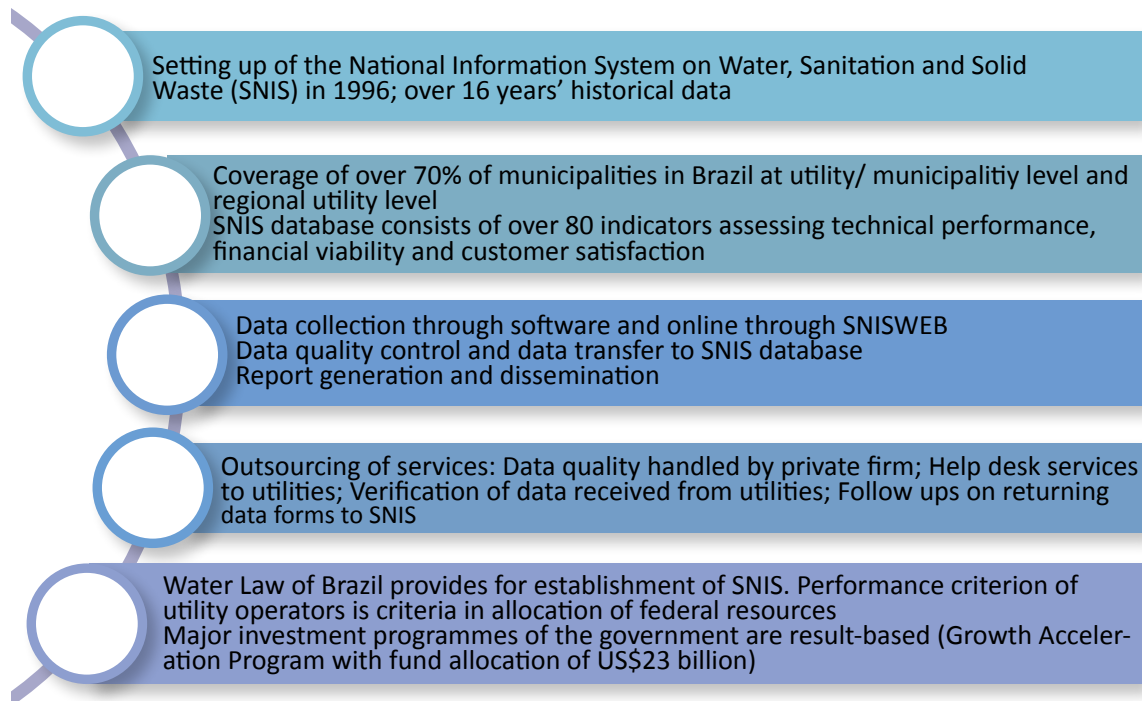
**Box 6C: Selected government initiatives in performance benchmarking: Details of Brazil's SNIS**

Recently, the National Water Agency in Brazil (ANA) has also drawn up the Atlas of Metropolitan Regions to identify the problem areas in over 60 per cent of Brazil's urban centres and to propose technical solutions to ensure sufficient water supply and access to sanitation for all these centres. Around 66 per cent of these required investments

either in increasing existing water supply systems or development of new sources of water supply with an estimated investment of US\$6.7 billion to implement these works. The work was carried out in three blocks, namely supply and demand of water, diagnostic assessment (water resource balance and systems production capacity, and planning.

The broad schematics of the setting up of the National Information System on Water Supply,

Sanitation and Solid Waste Management in Brazil are shown in the figure here:



At each stage of these activities, technical support studies were carried out to ensure systemisation of data and analysis of geo-referenced data. This was also used to update and streamline the Atlas. Moreover, the solutions indicated in the Atlas were evaluated together with the service providers and management authorities governing

hydrological resources (including pre-existing and ongoing projects). The Atlas also proposes the setting up of a Management Committee to ensure proper integration of all the stakeholders involved, and make it possible to actually implement the proposed projects in all the urban centres.

The NWI, an intergovernmental agreement in Australia between the national and state governments, was started in 2004. It sought to increase the productivity and efficiency of water use in Australia, servicing rural and urban communities, enhance health of river and groundwater systems, greater certainty for investment and environment and underpin capacity of Australia's water management regime. The primary responsibility of implementing the reforms lies with the state governments. The review of NWI is mandated under the National Water Commission Act 2004 (the NWC

Act) based on the following (see Box 7):

- Extent to which actions under the NWI have improved sustainable water management and contributed to the national interest.
- Impact on implementation of the NWI on rural and urban communities.
- Progress against the 28 performance indicators developed by the Natural Resource Management Ministerial Council

### Box 7: Water sector performance monitoring under Australia's National Water Initiative

As part of the National Water Initiative (NWI), each year the state governments report on benchmarking of services and pricing for urban water delivery. The National Performance Report (NPR) on water supply and sanitation sectors has over 150 indicators related to social data, health,

environmental and financial aspects. The annual NPR cycle consists of data collection by the Water Services Association of Australia (WSAA) or states, collation of information by the WSAA as per agreed requirements of the NWI, auditing of information by the WSAA or states as per standards agreed

by the NWI, and preparation of reports by the WSAA. The NWI has been able to ensure consistency between WSAA and NWI indicators. A key NWI innovation is the auditing process that ensures a consistent approach to issues of independence, level of expertise and adherence to relevant standards. The audit process assesses data collection (whether based on sound records and satisfactory processes/systems) and quality of data (whether data matches previous reports, missing or unusual data which may suggest data manipulation). Where the data fails to meet auditing standards, it is not published in the NPR. The 2011 Biennial Assessment of the initiative found the need to improve some of the indicators for monitoring performance against the NWI. One of the major components of the initiative is water accounting and information. The Bureau of Meteorology is responsible for the collection and publication of water data, under the Commonwealth Water Act 2007. Its responsibilities include issuing

national water information standards, publishing an annual National Water Account and enhancing understanding Australia's water resources. The government is also working with state and territory governments to set up the National Water Market System to improve efficiency of water registers and transactions and availability of market information. Specifics of the water information programme conducted by the Bureau include establishing a national water data sharing framework by collating water data from 200 organisations, providing free online access to the information (<http://water.bom.gov.au/waterstorage/awris/index.html>), analyse trends in water availability and quality, and provide effective and reliable stream flow forecasting systems for high priority water supply systems. The Water Accounting Standards Board (an independent advisory board to the Bureau) is developing nationally consistent water accounting systems.

Sources: Australia: Essential Services Commission (2004), National Water Commission (2011).

**Performance-linked funding:** Another initiative through which incentives to better performance have been successfully implemented is by performance-linked funding. A certain percentage of national and state government transfers to utilities/municipalities is tied to their performance, especially in areas of operational and financial efficiency. Grants are provided to those utilities/municipalities that undertake reforms to increase performance

and efficiency. Such grants are also linked to capacity building efforts of the municipalities. Ecuador provides a certain percentage of its tax as grant to local municipalities that show operational, institutional and financial efficiency. Uganda provides Local Development Grants to utilities that show better performance and have capacity building plans in place (See Box 8).

### Box 8: Selected examples of performance-linked funding

**Ecuador:** In 2004, the Ministry of Economy and Finance decreed that fund transfers from the national government to the water and sanitation service providers be linked to their performance, specifically operational efficiency, institutional separation and the degree of autonomy from the municipal administration. By this decree, a 10 per cent tax was levied on the revenues from the Special Consumption Tax (ICE) which have so far formed a part of the municipal administration's kitty. This has ensured that the municipalities have incentives to adopt tariffs that cover operating costs, and adopt autonomous management models. Financial incentives were given to those municipalities that introduced a delegated management model. The incentives are calculated on the basis of a formula that captures the level of delegation to an autonomous provider and the extent of cost recovery achieved. In addition, technical assistance was provided for the delegation

process by autonomous service providers. The level of government transfers are now higher for poorer municipalities, and also to those that have improved their service delivery and adopted more sustainable institutional arrangements through functional autonomy.

#### **Uganda and Tanzania:**

Performance-linked funding in Uganda and Tanzania takes the form of Local Development Grants (LDGs), where transfer of funds to local governments is based on achieving certain minimum reform requirements. The requirements are assessed on the basis of performance measures related primarily to financial management. The capital funding is given to those local governments that qualify for an entire project cycle. Additionally, the governments performing well are given 20 per cent more and the ones performing poorly are given 20 per cent less of their LDG allocation.

Capacity-building grants are also provided to those local governments that have capacity-building plans in place. The local governments are given extended time limits to ensure they meet the minimum requirements to avail the LDGs. These pertain mainly to the functional capacities of local governments in terms of development planning, finance management, internal audit, revenue performance improvement and capacity-building initiatives. The assessment in terms of performance measures relates to linkages of the development plan with the budget, staff functional capacity, capacity-building linkages with the plan, accountability performance, operation and maintenance of investments, and functionality of the water and sanitation department.

**India:** The 13th Finance Commission (FC) which recently gave its recommendations to the Government of India (GoI) has suggested a General Performance Grant for all local bodies in India. For urban local bodies (ULBs) this grant is estimated to range from about Rs 850 crore (US\$185 million) in 2011–12 to Rs 8,000 crore (US\$1.85 billion) by 2014–15. This grant requires the state governments to assess and publish information on service performance. To quote, “For a start, State Governments must notify or cause all the municipal corporations and municipalities to notify by the end of a fiscal year (31 March) the service standards for four service sectors – water supply, sewerage, storm water drainage, and solid waste management – proposed to be achieved by them by the end of the succeeding fiscal year. These levels may be different for different municipalities. We envisage such a commitment to be achieved through a consultative process with the local bodies. Such a notification will be published in the State Government gazette and the fact of publication will demonstrate compliance with this condition” (GoI 2010, p. 169).

This recommendation provides an incentive

for state governments to develop state-wide performance monitoring systems. However, as with the Jawaharlal Nehru National Urban Renewal Mission experience earlier, this will require local capacities to generate the base information and gradually improve the quality and reliability of information. Currently, 14 states in the country, including Gujarat and Maharashtra, have notified the service level targets as per the 13th FC requirements for 2011–12. A few states have instituted Service Level Benchmarking cells to continue the activities for service level assessment, while others have similar proposals in the pipeline. State agencies have also had to review the current service levels and targets to be achieved that were provided by the local governments to ensure these were realistic within the timeframe of a year. Additionally, the Ministry of Urban Development (MoUD) is also launching training programmes for state and local governments to initiate and complete the benchmarking process so as to be able to access the 13th FC funds.

In addition to these efforts, the High Powered Expert Committee set up by MoUD for estimating the investment requirements for urban infrastructure services has recommended “the creation of a Reform and Performance Management Cell (RPMC) in the Government of India that would be dedicated to providing assistance to the state governments and ULBs. It also recommends a dedicated Municipal Information Unit to be set up within RPMC to collect, collate and analyse comparable data on municipal services and finances on an annual basis”. The data so generated should be made available in the public domain. While part of the recommendations also include that the RPMC should take initiatives towards encouraging public-private partnerships, it also states that a Performance Management System should be developed along with the rating systems. It asserts the need to set RPMCs at state level to ensure that the ULBs follow their mandates.

Sources: Ecuador: Drees-Gross (2005), World Bank (2005); Uganda: MoLG (2005), Tanzania: World Bank (2006) and RALG (2006); India: GoI (2010), HPEC (2011).

**Use of performance information for regulation:** Performance information and benchmarking have been used by regulators to oversee water and wastewater services in a number of countries (see Box 9). Regulatory agencies in the United Kingdom and in the Australian state of Victoria have been employing benchmarking successfully as a regulatory tool to monitor water and wastewater services under their jurisdiction since the mid-

1990s. The systems are well developed in both cases and have been internalised by utilities in their own management information systems. It also plays a key role in the price regulation of the services. Regular target setting, testing for compliance and linking compliance with financial incentives has ensured continuous performance improvement over time. In Zambia a similar role has been played by the regulator, the National Water and Sanitation

Council (NWASCO). The regulatory agencies of the Philippines, Mozambique and Kenya have adopted benchmarking more recently. Linking performance with financial incentives and compulsory participation has resulted in the realisation of some benefits, despite some problems in the adoption

of the frameworks. Performance information has also been useful for comparative regulation and to create healthy competition amongst utilities. This approach is being used by most water regulators reviewed.

### Box 9: Use of performance benchmarking for regulation in selected countries

**Australia:** The Essential Services Commission (ESC) is the independent economic regulator for the state of Victoria. Since 2004, it has undertaken inquiries into government processes for setting South Australia Water's water and wastewater charges. As water and wastewater services are not regulated services, the commission has no other regulatory role in relation to them. The Commission's objective is to inform the customers about the level of service and to make information available to other stakeholders. The Commission seeks to initiate competitive comparisons across businesses. Over the past five years, annual reports have been published each year by the ESC. The experience suggests that the public disclosure and reporting of information can be a strong driver for performance. Key areas of reporting are affordability for consumers, customer services, network reliability, water quality, conservation and environment and historical performance. The data provided by businesses are independently audited, and businesses are given an opportunity to comment on their performance. However, the Commission is not responsible for regulating or driving improvement in reporting.

**Latin America:** ADERASA, the Association of Water and Sanitation Regulatory Entities of the Americas, represents regulators from 10 Latin American countries. The key objectives of ADERASA are to promote cooperation and coordination of efforts in the development of the water sector in Latin America by facilitating the exchange of experiences and collaboration around common initiatives in the field of regulation. As countries are at different stages of development, it provides an opportunity for south-to-south learning. Further, many of the tools can be generic and regional efforts in developing them would be valuable. As one of the main tools, ADERASA has encouraged performance monitoring. Its use in decision making – while promoting accountability within the system – also supports developmental activities in a cost-effective manner, and encourages information and best practice sharing. ADERASA uses the International Benchmarking Network for Water and Sanitation Utilities and International Water

Association (IWA) performance frameworks as a guide and has developed about 80 indicators on different aspects of both the sectors. Data quality and analysis is also done with the help of the IWA analysis tool, and external agencies are also contracted to analyse the data sets.

**Mozambique:** The Delegated Management Framework, formulated after the National Water Policy in 1995, gave the Water Supply and Asset Holding Fund (FIPAG) the overall responsibility for water and wastewater services. Initial funding and activities for rehabilitation, expansion and efficient operations has now made it possible to use regulation more effectively. The Water Regulatory Council (CRA) was given responsibility for regulating water services; in urban areas, the regulatory function is performed by municipalities. The key values of the CRA include universal services, accountability and transparency. The CRA also has defined strategies for regulating services in the peri-urban areas. Under the regulatory framework, it is compulsory for utilities to participate in the benchmarking process for water quality, access to service, customer care, planning and reporting, investment evaluation, and commerce and finance. Under the monitoring framework of the CRA, key performance indicators have been developed, and utilities can select the indicators that are most suitable to their objectives. The CRA has developed custom-made software, the Outcome Protection System, for this purpose. The software enables CRA technical staff to access the service quality by category, city and sub-system, and produce a range of reports of the service quality to suit the needs of the government, or as communication to the assets' owner or operator, or simply for the purpose of conveying information to the community and public.

**UK-Ofwat:** Ofwat – The Water Services Regulation Authority – is the independent economic regulator of the water and sewerage industry in England, established in 1989 when the water and sewerage companies were privatised. Its primary role includes: price determination, ensuring quality service to consumers by water



companies, monitoring companies' performance by setting efficiency targets and encouraging competition where it benefits the consumers. It regulates over 34 companies with a consumer base of 54 million. Annual reports are submitted by Ofwat to the respective ministries, which are to be presented before the Parliament. Overall Performance Assessment (OPA) was used as a mechanism to incentivise performance across a range of service areas. OPA is determined by measuring performance against service indicators, which are weighted to reflect consumer priorities. The performance score achieved by companies is taken into account when Ofwat reviews its price setting on consumer charges. Companies that have performed better are allowed to charge their consumers more than companies that provided poor services. As the sector has now reached acceptable levels of service delivery, Ofwat uses OPA to also capture the innovative service measures taken up by companies to address the consumers' changing requirements. Many of the current OPA measures focus on the reliability and response times of companies. They do not measure the quality of the company's response. There has been a consensus among stakeholders for some time that the qualitative aspects of service need to be incentivised. As a result Ofwat plans to now introduce a new 'service incentive mechanism' that will focus more on the quality of service and the actual customer experience. Ofwat also uses comparative competition as an important regulatory tool. For this, it compares the companies in terms of bills, service levels, quality compliance, leakage, operational costs, capital expenditure, relative efficiency, network activity and financial performance. Comparative competition has enabled efficiency and service improvements when setting price limits, thus benefiting both customers and the environment, leading to better services at lower costs. It also does systematic international comparisons to put United Kingdom companies in a wider context, in relation to similar enterprises that have a distinct corporate identity and independence.

It is interesting to note that Ofwat is now looking to change its role from the current system of regulatory reporting to a more monitoring approach, wherein it will hold companies accountable for their results and not their processes. Ofwat is also adopting a proportionate and targeted regulation, wherein resources are targeted to areas which are a real risk to outcomes for consumers. This is a significant shift in monitoring as it puts the onus on companies

to develop their own systems and assurance processes that would enable their boards to sign off a risk and compliance statement. An important aspect in this monitoring is the assessment of risks to the customers. The service incentive mechanism (SIM) used by Ofwat is designed to improve the level of service that water companies provide. It is based on two consumer experience measures: a quantitative measure based on the number of complaints and unwanted contacts a company receives; and a qualitative measure (one based on the quality of the experience) derived from a consumer experience survey. These two measures aim to capture both the number of times a company fails to meet the expectations of its consumers, as well as the experience of those consumers. The SIM encourages companies to understand and take responsibility for delivering what their customers expect.

**Zambia:** The National Water Supply and Sanitation Council (NWASCO) is the autonomous regulator established by an Act of Parliament to ensure the quality of service provision as per standards. The NWASCO regulates the 10 commercial utilities (CUs) which were set up under sector reform in Zambia. The CUs are fully owned by the municipalities and cater to 84 per cent of the urban population. The lean structure of the NWASCO (a staff of 16) is complemented by part time inspectors trained for the specific purpose, and water watch groups comprising volunteer consumers to ensure public participation. The key regulatory tools developed by NWASCO include licensing measures to be undertaken by CUs, performance guidelines, NWASCO Information System (NIS), benchmarking and a Special Regulator Supervision (SRS) tool. Guidelines developed include minimum service levels, accounting standards, human resource development, extension of service to peri-urban areas, and cooperative governance. Using the NIS, NWASCO prepares an Annual Sector Report each year. This report provides performance details and benchmarks, and also ranks providers. The top three CUs are rewarded during the launch; the worst-performing ones are reprimanded. The SRS is an enforcement tool used by NWASCO whereby utilities which perform poorly have to submit performance improvement plans and monthly reports that highlight progress achieved against these plans. Performance targets have been included in the staff incentive packages by the CUs. Over the past years, use of regulation has resulted in performance improvement for different CUs.

**Kenya:** The water and sanitation services in Kenya were bought under the regulation of the Water Services Regulatory Board (WASREB) through the Water Act 2002. Water and sanitation services in Kenya are provided through Water Services Boards (WSBs). The licenses for these boards are issued by WASREB and valid for a certain period. The licenses set conditions and targets of performance that the WSBs should achieve to ensure quality in service provision. Conditions include the development of sophisticated investment, financing and business plans, indicating how the Boards intend to achieve the government objective of increasing water access to households. The Boards are also expected to develop a pro-poor strategy and promote low cost technology in the provision of water services (WASREB, 2011). The WASREB issues warnings and penalties for non-compliance.

**Philippines:** The National Water Resources Board (NWRB) has, primarily, two regulatory functions: (a) water resource regulation; and (b) economic regulation of water services. A third function involves policy and programme coordination of water resource development plans and projects executed through its Policy and Planning Division (PPD). The PPD recommends policies on water resources development and utilisation for various

uses; evaluates and coordinates water resources plans and programmes between sectors and departments of the government; and conducts assessment of water resources supply and demand for systematic allocation and development of available resources for various functional uses. The Water Resources Assessment Section and Water Resources Information Section is a part of the PPD. The NWRB coordinated two benchmarking projects funded by Water and Sanitation Program. Part of the challenges faced by the NWRB include institutional capacity building, effective raw water pricing for efficient allocation and conservation and formulation of a long term management plan with a funding mechanism to support ongoing data collection and management efforts for a comprehensive water resources assessment. Currently the NWRB uses a five-year return on investment method as its tariff setting methodology. An average return on investment, computed by dividing the total revenue requirements for five years with the five-year consumption pattern is a feature of this method. As part of its monitoring role, utilities have to compulsorily submit annual reports, review of five-year results and use of Key Performance Indicators as benchmarks (SOPAC, 2005).

Sources: Australia: Essential Services Commission (2004) and (2013); Latin America: Carton and Molinari (2007); Mozambique: Alvarinho (2007), Beete (2007), Cistac (2007), Remane and Shellshear (2007); UK: Ofwat (2009); Zambia: Chanda (2006), Mbilima (2008), NWASCO (2008), Kenya: WASREB (2011), Philippines: NWRB (2011).

Use of performance indicators for regulation is also done through performance-based contracts. A number of different forms of such contracts have been used within the water sector (refer to Box 10). These may be between the government and service providers such as the ones used in Uganda, Burkina Faso, Johannesburg and Senegal (see Box 10) or with staff in utilities such as in Durban, Nairobi and the National Water and Sewerage Corporation (NWSC) in Uganda. The contracts made with utilities

“serve to define roles and responsibilities as well as establish performance targets within set time frames. They can also limit day to day political interference.”<sup>8</sup> Performance contracts are also used internally within the utility, such as with staff to achieve targets backed by both incentives and rewards. These are either directly with individual employees (as in Kenya or eThekweni municipality in South Africa) or with units within the utility as done by the NWSC in Uganda.

### Box 10: Use of performance-based contracts in the water sector

Use of performance contracts between government and water utilities: Performance-based contracting is based on the clear identification of sector development goals and resources, and the roles and performance that service providers need to achieve. They impose strict time-bound performance targets to be achieved by the public or private service providers along with incentives linked to improved performance. Performance targets may include the level and quality of service, management and operational efficiency,

financial and investment requirements, and institutional improvement. Such contracts need to be the outcome of a shared vision between the government and the utility, which in turn helps define resources and financing needed to realise the vision.

A number of countries in Africa use performance contracts with their utilities to guide sector reforms and to achieve targets. These contracts also help to move towards efficient and financially sustainable

water utilities. Countries that use such contracts with the public utilities include Uganda, Burkina Faso and Kenya. In Senegal, a similar performance contract has been made between the public asset holder (SONES) and private operator (SDE), which is backed by a financial model that facilitates target setting and performance monitoring within a framework of financial equilibrium. The contract incorporated targets to be met for two parameters of leakage and bill collection by the private operator, based on which revenue would be generated for the operator.

**Use of performance contracts within utilities:**

Often the utilities translate their commitments with the national governments to use contracts internally with staff to ensure that the targets are actually met through the cumulative efforts of all staff within the utility. Individual performance contracts for senior staff are a practical tool to improve financial viability and to meet other targets. “At both Nairobi Water and Sewerage Company (NWSC) in Kenya and eThekweni municipality in Durban, South Africa, all senior management staff have agreed to five-year performance contracts, and are accountable to the Board of Directors or the municipal council. All employees have clear performance targets that are reviewed annually.” (Mehta et al. 2007, p. 17)

The NWSC in Uganda provides water services in Kampala as well as in 14 other towns. It has introduced performance contracts through an internal bidding system where the winning management team enters into an Area Management Contract with the NWSC headquarters. The contract lays down the performance to be achieved, incentives for good performance and penalties for poor performance or failing to meet the agreed targets. These contracts were made with units in all the towns. Within Kampala the Area office in turn entered into contracts with the branch offices. Incentive mechanisms used performance indicators related to cash operating margins, unaccounted-for water, working ratio, day’s receivable ratio and connection efficiency.

**Use of performance-based service contracts:** Use of performance information can also be valuable for making the typical conventional service or short-term management contracts performance based. This requires providing clear incentives linked to improved performance and disincentives or penalties for failing to meet agreed performance levels. Payments for service are linked to actual

results achieved. “Such an approach could be especially attractive in situations where the government has decided to keep the water utility under public management, but is looking for ways to capitalise on the technical expertise and potential efficiency of the private sector.” (Kingdom et al. 2006, p. vi) Such contracts can be developed for any services provided by the private sector for activities such as reduction of non-revenue water, efficiency improvement in billing and collection systems, or meeting targets for new connections or consumer grievance redressal.

Kingdom et al. (2006) discuss such contracts for reduction of non-revenue water (NRW). They emphasise that “the driving factor when designing a performance-based service contract for NRW reduction is to establish an incentive framework that encourages the private sector to deliver results in the most cost-effective manner and allocates risk appropriately between the parties. Key lessons from the cases reviewed include the need to leave sufficient flexibility to the private partner, to set appropriate and realistic targets, and to limit cost. In the context of most water utilities in the developing world, the challenge will be to find a balance between accountability for end results on one side and a cost-effective level of risk transfer to the private sector on the other side.” (Kingdom et al. 2006, p. vi).

**Use of performance monitoring in public-private partnership (PPP) execution:**

Performance indicators are also helpful in the monitoring and regulation of the operational aspects of water and sanitation sector. Use of performance indicators would provide incentives (such as success bonus) and/or disincentives (penalties) to bring in efficiency of the water and sanitation operations. Examples of application of performance indicators include PPP monitoring of wastewater treatment plant built in the ‘Design, Build, Operate’ mode (financial parameters with provisions for price adjustment) and penalty in cases of non-compliance being twice the surplus effluent charge. In another case where the model of ‘Build, Own, Operate and Transfer’ of water reclamation plant, technical parameters under changeable conditions were applied. Another case of PI implementation included operations in water supply facilities. Four PIs related to water available, supply hours, power consumption and cash surplus were monitored with respect to base and target years. The incentive is calculated based on these four indicators which makes it simple to monitor for the water supply

operators. In cases of PPP monitoring related to water supply and wastewater operations, it is

important to keep the PIs simple for clarity and proper enforcement (Rudolph 2013).

Sources: Mehta et al. (2007) for NWSC (Uganda), Nairobi, Senegal, Burkina Faso and South Africa; Baietti et al. (2006) for NWSC (Uganda) and ONEA (Burkina Faso); Brocklehurst et al. (2004) for Senegal; Mugisha et al. (2004) for NWSC (Uganda); Mugisha for NWSC (2011), Kingdom et al. (2006) for NRW related contracts, and Rudolph (2013) for performance monitoring in PPP.

While the use of performance contracts has been common in many African and South-East Asian countries, these have been preceded by institutional reforms that have generally helped to establish operational autonomy of the service provider in urban settings. Thus, the use of such contracts would necessitate appropriate sector reforms that make it possible to use the system of incentives and penalties effectively.

### 3. Emerging lessons for UWSS performance benchmarking in India

The reviews in the previous sections highlight the increasing recognition and emphasis on the need to develop systematic measurement of service performance and to use these for improving delivery of water and sanitation services. The types of efforts have ranged from developing standardised frameworks for performance measurement (for example, by IBNET, IWA and under the GoI's SLB Initiative) to carrying out periodic studies of performance levels across service providers. Many governments and utility associations have also taken up comparative benchmarking on a regular basis, increasing their efforts to make results widely available and promoting ready comparisons through use of web-based technology to enable user-led query mechanisms. Performance information has also been used for regulation in different settings by regulators and in performance contracts. The latest innovation has been to develop performance-based funding to local service providers by donors and higher levels of government. Key findings from the Indian experience and lessons from international experiences are identified here.

#### Measuring performance

Past experience in India highlights the wide variation in indicators used across different studies as well as across different programmes, though the recent effort of the GoI under the SLB Initiative provides a standardised set of service indicators with related definitions.

**Common standard definitions and local choice of indicators:** Interestingly, international experience suggests that while the efforts to develop standardised performance indicators (for example, by the IBNET and IWA) have helped to evolve standard definitions, the actual choice of key

indicators has been through a local process. It is possible that a similar process will be needed in India where the state governments can use the SLB as a guiding framework.

**Indicators for monitoring versus local actions for performance improvement:** Measurement of performance can be for benchmarking or regulation which requires a few key performance indicators (KPIs) that match with the overall sector goals and key reform areas to achieve efficiency and equity. These need to be identified carefully in the given context. Benchmarks for these would also need to be set in relation to sector goals and key strategies. On the other hand, more detailed indicators may be needed for designing and monitoring performance information at the local level. These would ideally be derived from an understanding of underlying processes.

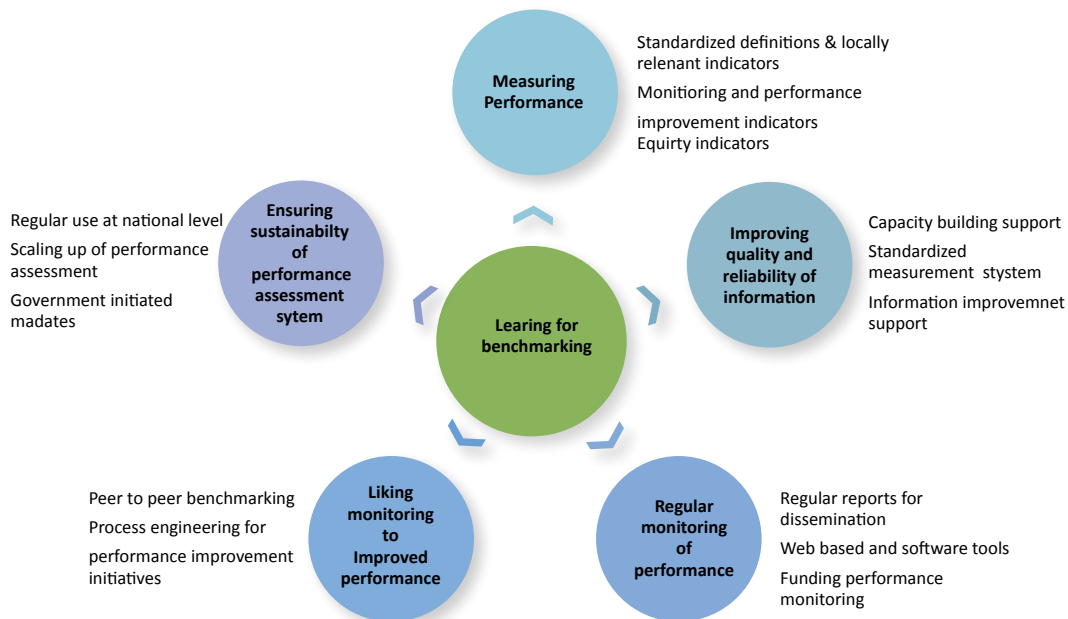
**Absence of equity related indicators:** In general, most benchmarking frameworks do not address the equity issues. While concerns about equity have been raised under the JNNURM reforms in India, lack of clear definitions makes it difficult to measure and monitor these properly. The IBNET has also attempted to develop a few key indicators to address equity concerns.

#### Improving quality and reliability of information

The review of studies and performance assessments in India clearly highlights the need to focus on ensuring good quality and reliable information, without which any comparisons or use of this information become difficult. The international literature also highlights its importance. However, it is interesting to note that in most benchmarking reports and comparative performance assessments, quality of information is not reported explicitly. Based on the review, a number of lessons have been identified to ensure that quality of information is assessed and gradually improved over time.

**Capacity building support to service providers:** At the initial stages of benchmarking, the local service providers often lack the capacity to collect the necessary data and develop indicators. In many cases agencies have resorted to outsourcing components of performance measurement when

Figure 6: Lessons from international and national review of benchmarking efforts



the in-house capacity is insufficient or stretched for such exercises. For example, in Brazil, for SNIS, this has included activities such as providing helpdesk services to local service providers, verification of data received from the utilities and follow up on returning data forms to SNIS.

**Standardised measurement of information quality and improvements over time:** Given the concerns over quality of information, it is essential to develop a standardised approach to measurement of quality of information used for developing key indicators. This is essential to measure information quality across a large number of service providers as well as to measure improvements in information quality over time.

**Supporting information system improvements:** The approach to measurement should be linked with identifying the steps needed to improve information quality. This will enable each service provider to identify ways in which it can improve quality of information. Such improvements may also be achieved through state-level policies (for example, through state-wide adoption of double-entry accrual accounting or improving slum information through surveys in all slum settlements as is being done in Gujarat).

### Regular monitoring of performance

The review highlights the wide variety in how performance information could be used, ranging from benchmarking initiatives by utility associations and governments to regulators who also have

tended to generate regular reports and used this for comparative regulation and to create healthy competition across service providers. Essentially the key to these various uses lies in regular monitoring of performance information through different efforts. To ensure that this happens regularly and is made available to stakeholders, a number of lessons emerged from the review:

**Regular reports and dissemination:** Most benchmarking efforts generate regular annual reports of comparative assessments. This is important as it helps to create a discipline of regular reporting. It is important that such reports are shared with the service providers and are made accessible to other stakeholders through appropriate dissemination channels. Experience with many efforts also suggests that public disclosure can be a strong driver for performance.

**Role of technology:** Technology plays a critical role in developing and disseminating regular reports on comparative assessments. Web-based tools are increasingly being used for data capture and standard analysis to generate and update reports in real-time. With the advent of geographic information systems (GIS) there is an increasing use of linking comparative analysis to maps for analysis and more user-friendly visual presentation. Experience also suggests the need for custom-made software that can help ease tasks in a cost effective manner, as suggested by the experience of the CRA in Mozambique.

**Use of performance monitoring for funding:**

Performance monitoring is more commonly done and sustained when it is linked with fund allocation. However, this requires careful design of the funding programme with appropriate performance-linked incentives and disincentives. It also necessitates a rigorous monitoring regime with reliable information. The funding generally is linked to setting out local level targets for improved performance.

### Linking monitoring to improved performance

While regular monitoring has become increasingly common, the use of this information to improve performance, however, has not been as common. While there have been some attempts at process benchmarking, these attempts have been less systematic and require greater attention and efforts.

#### **Need for rigorous peer-to-peer benchmarking:**

While regular reports are generally made in most performance benchmarking efforts, these are more in the nature of utility-wise reports. With benchmarking being now done across many regions and countries using standard definitions, there are clearly more opportunities for such analysis. However, compared to other sectors (such as, for example, in microfinance) our review did not find such analysis to be very commonly done. Such peer-to-peer analysis is essential to identify benchmark values for key performance indicators. It would also enable more meaningful use of performance results by individual utilities to arrive at appropriate targets for performance improvement.

#### **Process re-engineering for performance improvement:**

While process benchmarking is recognised as an important outcome of comparative assessments, it has been not taken up in a systematic manner. More work is needed to assess and map out the existing processes that determine both information capture and review as well as for improving performance. Such studies can draw on the business process mapping used in many industries. This will help define performance improvements that can be achieved through process reengineering, rather than the traditional emphasis in the water and sanitation sector on new capital investments.

**Incentives for improved performance:** Use of performance contracts has been increasingly used by governments with service providers as a way to meet the sector goals and reform agenda. As this is regularly reviewed and used in conjunction with funding, it provides incentives for utilities to improve performance. Some utilities, such as the

NWSC in Uganda, have also used the concept of performance-based contracts within the utility. Thus incentives for improved performance need to be built into upward (external) accountability as well as within the service provider as an internal system of accountability for outputs and results. This would require capacity building support and simple methods and tools that can be used by service providers to determine performance targets and track performance over time.

### Ensuring sustainability of performance assessment systems

Given the past trend of several one-time studies in India, it is important to plan from the outset to ensure long-term sustainability of performance assessment systems. While it is difficult to clearly lay down specific steps for this, a number of factors could be identified that would promote sustainability:

**Regular use at national, state and local levels:** The most important factor in sustainability is the regular use of performance information and comparative analysis generated. This may be through its use at state or national levels by linking it to performance-based funding, regulation or for use in performance contracts with service providers. Alternatively it may be regular use within the service provider organisations through internal processes for monitoring and performance rewards. In initial years, there may also be a concern with sharing of results widely, especially by the relatively poorly performing service providers. In such situations, political will is an important factor for successful institutionalisation of a benchmarking project.

It is also interesting that sustainability requires good use of performance benchmarking information and that widespread use first requires standard, comparable and reliable (trustworthy) information across a sizeable (all for links to inter-governmental transfers) number of service providers. The need for regular reporting – as seen in the regulators in the UK, Australia and Zambia – have led to well-developed systems which are then internalised by utilities in their own management information systems. This makes it easier to ensure sustainability.

**Importance of scale:** While not essential, another key aspect of sustainability is scale achieved through universal coverage across all service providers in a given jurisdiction. This is important for a number of reasons. First, this makes it possible for state and national governments to use this information to fund and routine monitoring. Over time, this can become mainstreamed in government processes.

Second, scale also forces identification of more cost-effective methods for data capture and analysis, as well as for data systems improvements. Some level of data collection is done by most service providers often for their own management and/or to report to higher levels of government or regulators. The presence of many data collection systems can be cost intensive, especially for smaller utilities. Thus, the introduction of a new data collection regime needs to be aligned with the existing system, to control costs for data collection and to make benchmarking an improvement tool rather than a burden.

Finally, universal coverage makes it easier for higher levels of government to justify allocating budgets. In general, compared to voluntary participation under schemes run by utility associations, government involvement makes it mandatory and ensures universal participation.

**Role of government to provide mandate:** While some developed countries such as the Netherlands and Australia do have regular benchmarking being carried out by their utility associations, in most developing countries it is through the mandate provided by governments (for instance, in Brazil, Tanzania and South Africa) or government agencies such as the regulator (for example, in Zambia and the Philippines). Similarly, some countries such as Brazil have incorporated the setting up of a National Information System in their Water Law.

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# Annexures

**Table A1: Comparative Information on Key Indicators: ADB and WSP Utility Benchmarking (2007)**

Category	Indicator	Bangalore		Chandigarh		Chennai		Indore		Jamshedpur		Rajkot	
		ADB	WSP	ADB	WSP	ADB	WSP	ADB	WSP	ADB	WSP	ADB	WSP
<b>Service coverage and operational performance</b>													
<b>1. Coverage</b>	Population covered (%)	93	91	100	100	89	98	77	54	74	79	98	98
<b>2. Water balance</b>	Water production (lpcd)	185	143	332	290	131	108	108	102	808	608	146	126
	% Metered connections					3.5	4.0	0.1	0.0	0.9	1.0	0.4	0.4
	Unaccounted for water (%)	45	40	39	18	17	16	n.d.	20	13	9	23	11
<b>3. Service levels and quality</b>	Water consumption (lpcd)	74	85	147	239	87	95	87	81	203	554	101	112
	Water availability (hours/day)	4.5	2.5			5.0	3.0	0.8	0.8	6.0	6.0	0.3	0.3
<b>Financial performance</b>													
<b>4. Cost efficiency and staff productivity</b>	Cost/Kl of water production			3.9	4.6	6.1				2.4	3.4	2.8	
	Power cost/operating cost (%)	65	n.a.	60	63	33	8	57	74	57	40	28	27
	Staff/1,000 connections	5.2	3.3	8.6					8.8	5.6	6.9	1.1	1.1
<b>5. Cost recovery and tariffs</b>	Non-revenue water (%)		49		25		16		50		9		12
	Collection performance (%)	112	57	94	100	152	37	89	n.a.	100	n.a.	45	0
	Operating ratio	0.8	1.0	1.4	1.3	0.4	1.4	5.3	5.5	0.6	0.9	1.6	6.6

Sources: Based on information from CRISIL (2007) and Ministry of Urban Development and Asian Development Bank (2007).

**Table A2: Indicators used in Performance-Linked Funding Programmes**

Themes	JNNURM	SNMA
<b>Water Supply</b>		
Coverage	Population covered by piped water supply, number of household-level water connections	
Service levels and quality	Quantity of water supplied and per capita supply, with hours of water supplied in a day	Hours of water supplied in a day
Financial sustainability	O&M cost recovery and unit cost for water produced	Expenditure towards O&M and depreciation
Equity in service delivery	Per capita supply of water and continuity of supply	Provision of access to water supply
Efficiency in service operation	Quantity of NRW, along with number of connections that are metered; consumer redressal systems	Introduction of consumer metering system and consumer redressal systems
<b>Sanitation and wastewater</b>		

Themes	JNNURM	SNMA
Coverage	Households with individual toilets/low cost sanitation units, along with population covered by sewerage network	Connecting public and individual toilets to the sewerage network
Service levels and quality	Quantity of sewage treated and means of disposal	
Financial sustainability	O&M cost recovery and unit cost for wastewater	
Equity in service delivery		Access to sanitation in slums
Efficiency in service operation	Consumer redressal systems	Introduction of user charges and consumer redressal systems
<b>Municipal solid waste management</b>		
Coverage	Primary collection of waste in cities	Primary collection of waste in a segregated manner: compulsory reform
Service levels and quality	Source segregation and waste treated	Source segregation, treatment of waste and scientific disposal of waste
Financial sustainability	O&M cost recovery and unit cost for SWM operations	
<b>Equity in service delivery</b>		
Efficiency in service operation	Consumer redressal systems	Introduction of user charges and consumer redressal systems

Sources: JNNURM: MoUD (2005), SNMA: Government of Maharashtra (2008).

**Table A3: Performance Improvement Measures for SNMA Reform**

<b>Water supply management</b>	
1	Identification and authorisation of unauthorised connections
2	100 per cent billing and recovery system (PSP)
3	Programme of water audit, energy audit and rehabilitation
4	Private sector participation in overall O&M
5	Increase the water supply hours
6	Cover the complete expenditure towards O&M and depreciation
7	Consumer metering
8	Incentives to pay arrears towards water bills, 'New Revised Nirbhay Yojana'
9	100 per cent consumer redressal
10	Urban bye-laws for rain water harvesting and related incentives
<b>Toilet management</b>	
1	Survey individual and public toilets in the city and necessary provision in annual budget

2	Repair and construct public toilets in city and slums (specific reference to gender sensitivity)
3	Private sector participation (BOT/BOO) or NGO for the efficient O&M of the public toilets in the city
4	Connect the public and individual toilets to sewerage system in the city
5	Abandon open defecation
<b>Wastewater and sewerage</b>	
1	Connect the properties with sewerage system
2	Reuse of water (decentralised process on wastewater and other advanced technologies)
3	Levy user charges
4	Check quality of treated wastewater
<b>Solid waste management</b>	
1	Segregation at source
2	Door to door collection of segregated waste, 'Ghantagadi system'
3	Treatment plant (centralised and decentralised using appropriate technology and private sector participation)
4	Separate collection of waste from vegetable and mutton markets, hotels
5	Levy user charges
6	Sanitary landfill facility

Sources: SNMA: Government of Maharashtra (2008).

**Table A4: Performance Indicators for Sant Gadge Baba Awards**

	<b>Compulsory Reforms</b>
<b>1.</b>	<b>Water supply and management</b>
1	Water availability as per norms (lpcd)
2	Attempts to improve/increase water supply schemes
3	Quality of supplied water (annually)
4	Water supply audit and improvements
5	Water tax improvement
6	Provision during water shortage/scarcity, supply to special classes
7	Consumer satisfaction report
<b>2.</b>	<b>Wastewater management</b>
1	Wastewater treatment capacity
2	Expenditure and recovery
3	Financial management
4	Consumer satisfaction report
<b>3.</b>	<b>Sanitation (toilet) management (individual, public, toilets)</b>
1	Public places/toilet facility for floating population
2	Toilet facilities in slums, residential area, public/administrative buildings, schools (gender and age sensitivity)
3	Innovative models adopted for construction of toilets
4	Consumer satisfaction report
5	Information, education and communication for defecation free city, public health, IEC
<b>4.</b>	<b>Solid waste management</b>
1	Implementation of central government's MSW Rules, 2000

	<b>Compulsory Reforms</b>
2	Effectiveness and implementation of ban on plastic use and penalising actions
3	Improvements/innovations in solid waste management
4	Consumer satisfaction report
	<b>Optional Reforms</b>
1	Implementation of urban facilities, surroundings, betterment of roads, beautification and development
2	Encroachment removal, prevention of unauthorised construction
3	Education, social facilities, mother-child welfare
4	Human resources, financial management and good governance
5	Financial progress, employment, poverty alleviation

Source: Government of Maharashtra – Government Resolution No./NSA2007/C.R.64/WS-21, dated 26/10/2007.

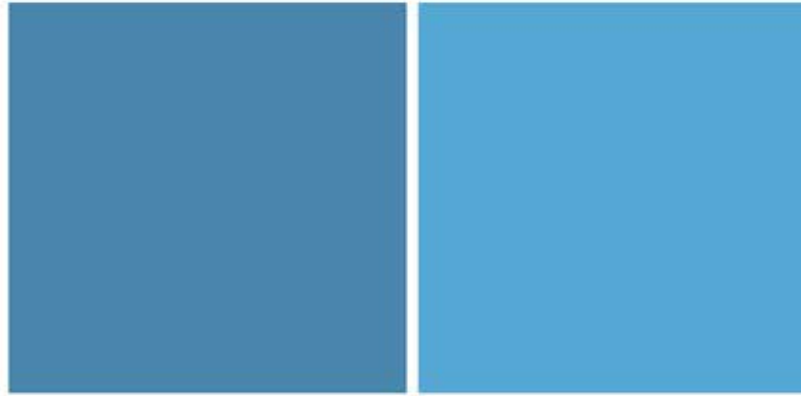
**Table A5: UWSS Information in Reports for Routine and Programme Monitoring in Gujarat**

Report no.	Department of Urban Development	Frequency
		<b>Water</b>
	<b>Sanitation</b>	
1	Pay and use toilet	
1A	Details of completed pay and use toilets	
2	Details of individual toilet programme	
23	Information regarding toilet facilities available in government primary schools	
	<b>Solid waste management</b>	
3A	Door to door collection details (for domestic properties)	
3B	Door to door collection details (for commercial properties)	
4	Sanitation Tax-related information	
8	Information related to street sweeper motivation programmes	Annually
	<b>Solid waste management</b>	
15	Information related to cleaning of schools	Monthly
16	Information related to cleaning of vegetable markets	Monthly
5	Information related to door to door collection of solid waste and its transportation	Monthly
6	Information related to transportation of solid waste	Monthly
	<b>Finance</b>	
26	Total Tax Collection Statement (Including Education Cess)	Annually
27	Heading-wise Tax Collection Statement	Annually
27A	Details of reforms for Tax Collection	Annually
35	Details of double entry accounting system implementation (GMARP)	Quarterly
36	Details of other audits done by ULBs	Annually
39	ULB Budget details	Annually
40	Details of the proposals for the revision of existing taxes and charges	Annually
45	Income and Expenditure Statement	Annually
46	Grouping of the Schedules to Balance Sheet	Annually
47	Information related to Professional Tax (category-wise)	Annually

Report no.	Department of Urban Development	Frequency
	<b>Water</b>	
	Reports received by Gujarat Municipal Finance Board (GMFB)	
	<b>Finance</b>	
1	Statement of Total Income	Annually
2	Statement of Total Expenditure	Annually
3	Details of Property Tax Billing and Collection	Annually
5A	Details of Revenue Grant	Annually
5B	Details of Capital Grant	Annually
7	Information related to wages of sweepers	Quarterly
8	Information related to details of salary of municipal staff	Quarterly
9	Information related to various taxes levied by the municipality	Annually
10	Information related to status of collection various taxes	Annually
11	Information related to total tax collection (including Education Cess)	Annually
12	Information related to implementation of Area Base Property Tax System	Annually
13	Information related to comparative information regarding Area Base Property Tax	Annually

Source: Based on details given by urban local bodies during field work in Gujarat.





## The Performance Assessment System (PAS) Project

The 'Performance Assessment System – PAS' is a five-year action research project, initiated by the CEPT University, Ahmedabad, with funding from the Bill and Melinda Gates Foundation. It supports development of appropriate tools and methods to measure, monitor and improve delivery of urban water and sanitation services in the states of Gujarat and Maharashtra. The PAS Project comprises three components of performance measurement, monitoring and improvement.

The PAS Project is supporting the development of City Sanitation Plans (CSP) to achieve open defecation free status for four small cities in Maharashtra, which are Wai, Hingoli, Ambajogai and Sinnar. These cities were selected by the Water Supply and Sanitation Department, Government of Maharashtra, and Maharashtra Jeevan Pradhikaran (MJP). A framework for city-wide assessment using the full value chain for urban sanitation has been developed, which is being used in developing these CSPs. Initial workshops were organised by the MJP with officials of these cities to discuss the CSP approach. Draft plans for these cities are ready and will be discussed with city officials.