
Ministry of Urban Development
Government of India

# HANDBOOK ON
# SERVICE LEVEL BENCHMARKING

# CONTENTS

**Figures and Tables**

# ABBREVIATIONS

| | |
|---|---|
| **BSUP** | Basic Services to the Urban Poor |
| **CPHEEO** | Central Public Health and Environmental Engineering Organisation |
| **DMA** | District Metering Area |
| **FY** | Financial Year |
| **GIS** | Geographic Information System |
| **ICAI** | Institute of Chartered Accountants of India |
| **ILCS** | Integrated Low Cost Sanitation |
| **JNNURM** | Jawaharlal Nehru National Urban Renewal Mission |
| **MoUD** | Ministry of Urban Development |
| **NRW** | Non-Revenue Water |
| **O&M** | Operations and Maintenance |
| **PROOF** | Public Record of Operations and Finance |
| **RWA** | Resident Welfare Association |
| **SLB** | Service Level Benchmark |
| **STP** | Sewage Treatment Plant |
| **SWM** | Solid Waste Management |
| **ULB** | Urban Local Body |

**Units of Measure**

| | |
|---|---|
| **lpcd** | litres per capita per day |
| **m** | metre |
| **km** | kilometre |

**Conversions**

Crore = 10,000,000

एस. जयपाल रेड्डी
S. Jaipal Reddy

मंत्री
शहरी विकास
भारत सरकार
MINISTER OF
URBAN DEVELOPMENT
GOVERNMENT OF INDIA

## Message

It has been the endeavour of the Ministry of Urban Development to promote an outcome-based approach for performance management in the Urban Local Bodies in our country. In this context, I am happy that the Ministry has brought out a handbook on "Service-Level Benchmarking" in respect of four basic municipal services namely, Water Supply, Sewerage, Solid Waste Management and Storm Water Drainage.

2. I compliment the concerned officials of the Ministry, state governments, cities, organizations and experts who contributed towards finalization of these service-level benchmarks.

3. I visualize that this handbook would prove to be a valuable reference document for continuous improvement in service-delivery across Urban Local Bodies in India.

(S. Jaipal Reddy)

104-सी, निर्माण भवन, नई दिल्ली-110108, फोन: 23063495, 23061162 फैक्स: 23062089
104-C, NIRMAN BHAWAN, NEW DELHI - 110108, PH: 23063495, 23061162 FAX : 23062089

Dr. M. Ramachandran

**Secretary**
Ministry of Urban Development
Nirman Bhawan
New Delhi

# FOREWORD

India's rapid economic growth in the last two decades has been accompanied by increased levels of urbanisation. Our cities, which are engines of growth, are under great strain to meet the growing demands and aspirations of their people.

Recognising the growing importance of improving efficiency in delivery of basic services in our cities, the Government of India has launched a series of initiatives aimed at enabling urban local bodies to meet the unprecedented challenges that they face today. These include schemes such as the Jawaharlal Nehru National Urban Renewal Mission, Urban Infrastructure Development Scheme for Small and Medium Towns, Capacity Building for Urban Local Bodies, National Urban Transport Policy, National Urban Sanitation Policy, National Mission Mode Project on E-governance and credit rating of select municipal bodies.

As part of the ongoing endeavour to facilitate critical reforms in the urban sector, the Ministry of Urban Development has now adopted National Benchmarks in four key sectors—Water Supply, Sewerage, Solid Waste Management and Storm Water Drainage. Investments in urban infrastructure have, however, not always resulted in corresponding improvements in levels of service delivery. There is, therefore, a need for a shift in focus towards service delivery. This is especially the case in water supply and sanitation. It is hoped that the Handbook on Service Delivery Benchmarking developed by the Ministry of Urban Development through a consultative process shall provide a standardised framework for performance monitoring in respect to water supply, sewerage, solid waste management services and storm water drainage, and would enable State level agencies and local level service providers to initiate a process of performance monitoring and evaluation against agreed targets, finally resulting in the achievement of service level benchmarks identified in the Handbook.

The Ministry of Urban Development would facilitate the adoption of these benchmarks through its various schemes and would also provide appropriate support to municipalities that move towards the adoption of these benchmarks. I encourage all State and local level functionaries to use this Handbook in achieving our shared goal of improved service delivery for our citizens.

Secretary (Urban Development)

A.K. Mehta

**Joint Secretary**
Ministry of Urban Development
Nirman Bhawan
New Delhi

# PREFACE

The Ministry of Urban Development initiated an exercise to develop standardised service level benchmarks with respect to basic municipal services in the year 2006. Subsequently, a core group comprising the Institute of Chartered Accountants of India (ICAI), the Public Record of Operations and Finance (PROOF), the Water and Sanitation Program (WSP) and Municipal Commissioners of Pune, Bangalore, Jaipur, Hyderabad and Kolkata was constituted by the Ministry of Urban Development, which developed a draft Handbook of Service Level Benchmarking that was circulated among all the States and other key stakeholders. Based on the comments received, the draft was revised and a National Level Workshop was held in July 2008 for the adoption of benchmarks with respect to basic municipal services related to water supply, sewerage, solid waste management and storm water drainage.

This Handbook is a result of work done over a period of about two years and is designed to enable the systematic and sustained monitoring of services using standardised indicators against agreed targets and benchmarks. It will help effect performance improvements in the identified service sectors by (i) helping local decision-makers identify gaps, plan and prioritise improvement measures; (ii) enabling the identification and transfer of best practice; (iii) enhancing accountability to customers for service delivery levels; (iv) providing a framework that can underlie contracts/agreements with service providers; and (v) making it possible to link decision-making on financial allocations to service outcomes.

It is expected that State governments and cities would adopt this performance monitoring framework at the Urban Local Body (ULB)/parastatal level, and undertake to regularly collate and analyse the performance data to improve the quality of the decision-making process in the sectors identified in this Handbook. Its adoption by all States shall facilitate uniform measurements and reporting systems, which will be of immense help to the management of the service utilities in making the right comparisons aimed at improving the efficiency of the infrastructure. It shall also be of great help in shifting the focus from infrastructure to service delivery.

I would like to sincerely thank all the persons associated with this exercise, especially all the State Government Secretaries of Urban Development, Municipal Commissioners, WSP, CRISIL, PROOF, ICAI and Technical Cell (Jawaharlal Nehru National Urban Renewal Mission [JNNURM]) in the preparation of this Handbook. I am also grateful for the support received from the Secretary, Urban Development, Dr. M. Ramachandran, who has been the driving force behind this exercise. I indeed hope that this Handbook would mark a watershed in the urban sector.

Joint Secretary (Urban Development)

# BENCHMARKS AT A GLANCE

| 2.1 | Water Supply Services | |
|---|---|---|
| S. No. | Proposed Indicator | Benchmark |
| 2.1.1 | Coverage of water supply connections | 100% |
| 2.1.2 | Per capita supply of water | 135 lpcd |
| 2.1.3 | Extent of metering of water connections | 100% |
| 2.1.4 | Extent of non-revenue water (NRW) | 20% |
| 2.1.5 | Continuity of water supply | 24 hours |
| 2.1.6 | Quality of water supplied | 100% |
| 2.1.7 | Efficiency in redressal of customer complaints | 80% |
| 2.1.8 | Cost recovery in water supply services | 100% |
| 2.1.9 | Efficiency in collection of water supply-related charges | 90% |
| **2.2** | **Sewage Management (Sewerage and Sanitation)** | |
| S. No. | Proposed Indicator | Benchmark |
| 2.2.1 | Coverage of toilets | 100% |
| 2.2.2 | Coverage of sewage network services | 100% |
| 2.2.3 | Collection efficiency of the sewage network | 100% |
| 2.2.4 | Adequacy of sewage treatment capacity | 100% |
| 2.2.5 | Quality of sewage treatment | 100% |
| 2.2.6 | Extent of reuse and recycling of sewage | 20% |
| 2.2.7 | Efficiency in redressal of customer complaints | 80% |
| 2.2.8 | Extent of cost recovery in sewage management | 100% |
| 2.2.9 | Efficiency in collection of sewage charges | 90% |
| **2.3** | **Solid Waste Management** | |
| S. No. | Proposed Indicator | Benchmark |
| 2.3.1 | Household level coverage of solid waste management services | 100% |
| 2.3.2 | Efficiency of collection of municipal solid waste | 100% |
| 2.3.3 | Extent of segregation of municipal solid waste | 100% |
| 2.3.4 | Extent of municipal solid waste recovered | 80% |
| 2.3.5 | Extent of scientific disposal of municipal solid waste | 100% |
| 2.3.6 | Efficiency in redressal of customer complaints | 80% |
| 2.3.7 | Extent of cost recovery in SWM services | 100% |
| 2.3.8 | Efficiency in collection of SWM charges | 90% |
| **2.4** | **Storm Water Drainage** | |
| S. No. | Proposed Indicator | Benchmark |
| 2.4.1 | Coverage of storm water drainage network | 100% |
| 2.4.2 | Incidence of water logging/flooding | 0 |

# SECTION 1

# SERVICE LEVEL BENCHMARKING IN THE CONTEXT OF PERFORMANCE MANAGEMENT OF URBAN SERVICES

# 1.0 INTRODUCTION TO SERVICE LEVEL BENCHMARKING

## 1.1 NEED FOR SERVICE LEVEL BENCHMARKING

Every sector has a few key performance indicators that are understood by most stakeholders in that sector. Similarly, in the urban sector too, there have been a number of performance indicators related to urban management and service delivery that have been defined, measured and reported. However, most initiatives in performance management so far have been observed to have some key limitations:

→ Different sets of performance indicators have been defined under different initiatives;

→ The definition or the assessment method may vary for the same performance indicator, thus inhibiting inter-city or intra-city comparisons;

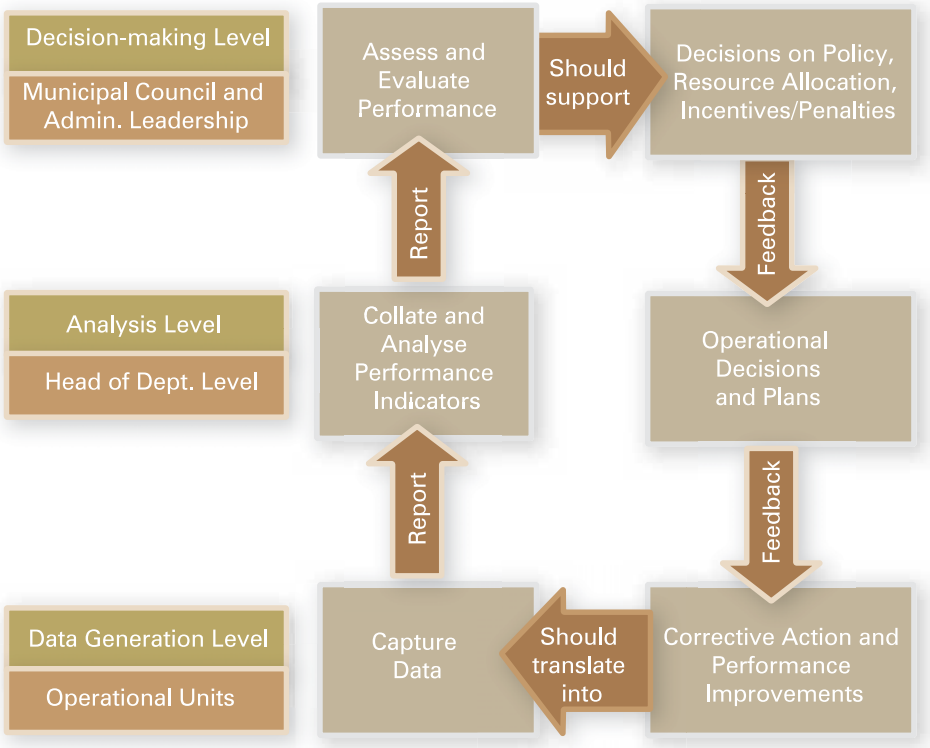
→ Most measurement exercises have been externally driven (by agencies external to the agency responsible for delivery against those performance parameters), leading to the key issue of ownership of performance reports;

→ Most performance measurement initiatives have not been institutionalised, limiting the benefits of monitoring trends in performance over time; and

→ The process of performance measurement has not been taken forward into performance management (Figure 1).

These limitations mean that systems for measuring performance and taking further action on them have not been institutionalised in urban agencies. It is therefore important that the basic minimum standard set of performance parameters are commonly understood and used by all stakeholders. Depending on the specific need, additional performance parameters can be defined and used.

**FIGURE 1:** PERFORMANCE MANAGEMENT SYSTEM




Measuring service levels of civic agencies implies measuring outcomes, and indirectly also reflects on institutional capacity, financial performance and other parameters. Service level parameters can be measured either from a utility manager's/planner's perspective or from a citizen's or consumer's perspective. In addition, to facilitate comparison between cities/service delivery jurisdictions, and changes in performance over time, it is important that the performance levels are benchmarked, and monitored against those benchmarks.

It is in this context, that the Ministry of Urban Development (MoUD) has initiated an exercise to define Service Level Benchmarks (SLBs). The MoUD constituted a 'Core Group for Service Level Benchmarking,' comprising experts from various institutions to arrive at the SLBs. Drawing on the experiences of various initiatives in measuring service level performance, the Core Group narrowed down the exercise to four basic urban services to begin with, and arrived at sets of indicators in each. After much deliberation, the indicators, their definitions, means of measurement, frequency and jurisdiction of measurement and reporting, etc., were finalised.

The Handbook of Service Level Benchmarking is a ready reckoner to enable Urban Local Bodies (ULBs) and other city level parastatal agencies implement systems for measuring, reporting and monitoring the SLBs.

## 1.2 PERFORMANCE PARAMETERS FOR BASIC URBAN SERVICES

Service level performance parameters have been identified for four basic urban services:

- Water Supply;
- Sewage;
- Solid Waste Management (SWM); and
- Storm Water Drainage

These parameters have been defined primarily from a utility manager's/planner's perspective. In other words, the parameters highlight the performance as would be monitored by the leadership/management of ULBs or other civic agencies. These performance measurements will need to be carried out by the service delivery agencies themselves, reported to higher levels of management and also disseminated widely. Clear definitions and methodologies are expected to eliminate bias in measurement and reporting.

Performance from a citizen's or consumer's point of view is better measured by capturing their perception, rather than data from the delivery agency. Measuring citizens' perception can be supplemented by reporting by the agencies themselves, and can offer interesting insights when compared with one another.

Performance parameters should be applied across all cities and regularly used by all stakeholders. Practical considerations will drive frequency of measurement and reporting; and the jurisdiction of measurement and reporting, both critical aspects in performance measurement. Performance will need to be measured at a frequency higher than or at least equal to the frequency at which it will need to be reported. Frequency should be determined at such an interval at which the variables driving the performance parameter will undergo visible change, and thereby reflect change in performance over different time periods.

Also, to the extent practical, performance should be measured at the smallest geographic jurisdiction as possible. Typically, performance measurements at the electoral ward level will be of significant value to decision-makers, especially elected representatives. Administrative jurisdictions for service delivery departments should ideally be co-terminus with ward boundaries. Service delivery performance at ward levels, when laid out spatially on the city map, may also offer interesting insights. Also from a citizen's perspective, 'ward boundaries' are the sub-ULB level jurisdictions that they can possibly relate to. However, on the other hand, in case of network utilities such as water supply and sewage, all network management data are ideally reported by the Zone/District Metering Area (DMA), which typically represents major branches in the network.

It will therefore be relevant to examine 'network management'-related performance indicators by Zone/sub-jurisdictions of the network (for example, continuity of water supply), while service delivery as experienced by the citizen is measured by civic wards as the smallest jurisdiction (for example, coverage of water supply connections).

For purposes of internal management of the ULB/utility, performance should be reported at the lowest level of jurisdiction and at maximum frequency possible. However, frequency may reduce and city-wide level performance may be reported to the higher levels of government and other external stakeholders.

## 1.3 ROLES OF DIFFERENT STAKEHOLDERS

For the service level performance parameters to be accepted as a standard, all stakeholders will need to play their parts. The roles of different stakeholders and the next steps they will need to pursue are:

- **Central Government:** MoUD, Government of India, will take the lead in disseminating these service level performance parameters and building wider acceptance. SLBs will also be institutionalised through the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and other programmes initiated by MoUD:
  - SLBs will be an integral part of City Development Planning processes, both for assessment of the current situation, and for setting targets under their plans;
  - Wherever appropriate, SLBs will be dovetailed with the commitment on reforms, and the subsequent process of appraisal of reforms;
  - The relevant SLBs should be part of Detailed Project Reports for concerned sectors, indicating both the current situation and changes the project will bring about. Subsequent processes of implementation monitoring of the project will also evaluate these SLBs; and
  - Under the JNNURM, support may be extended to enable ULBs and other civic agencies to establish systems in their respective institutions for periodic measurement, reporting and analysis of SLBs.
- **State Governments and their Agencies:** State governments and their nodal agencies in the urban sector have a critical role in driving the performance of ULBs and city level civic agencies. State governments will need to periodically evaluate the SLBs as an input for its decisions related to policy, resource allocations, providing incentives and penalties, channelising technical and manpower support, and regulatory considerations, among others. The Directorate of Local Bodies/Department of Municipal Administration will need to play a key role in this process through constant inter-city comparisons. These departments should leverage the power of information technology to build and operate systems that periodically capture and report on SLBs. Web-based technologies should be leveraged to manage information flow. For other nodal State level agencies, the SLBs will provide specific inputs for their programmes and interface with the ULBs and other civic agencies. SLBs will also be an important input to the State Finance Commissions in the course of their work.
- **Urban Local Bodies:** ULBs are the most important stakeholders for the institutionalisation of Service Level Benchmarking.
  - As *service delivery institutions*, ULBs will find it useful to institutionalise systems for performance management using SLBs. Performance data at the sub-ULB level (Zone or ward level) are particularly useful for the ULB for making appropriate decisions and monitoring performance of the various field units. Benchmarking with other cities within the State, or with similar cities, facilitates a healthy competitive environment for continuous improvement; and
  - As the *principal elected institution for self-governance in the city*, ULBs will need to examine performance of other

parastatal civic agencies, even if the ULBs are not directly responsible for service delivery in those areas.

Performance management data using SLBs should be included in the set of information disseminated under mandatory public disclosure, as required by the reforms mandate under JNNURM.

The key next steps for ULBs are to generate performance reports on SLBs periodically beginning financial year (FY) 2008-09. Data can be captured either regularly through systems on the ground (for example, weighbridges at the composting plant or landfill site, water meters capturing flow at designated points, demand collection registers for water charges, etc.), or through specific surveys carried out at defined intervals. In parallel, the ULBs will also need to institutionalise systems for the entire cycle of performance management, as depicted in Figure 1. This would imply:

- **Systems for capturing data:** Design and implement data collection systems for data to be captured at the most disaggregated level. Such data will typically be from field level staff such as sanitary supervisors, water pump operators, accounts clerks, etc. Simple data formats should be designed and provided to them to capture the data and report it upwards within the organisation for collation and determination of the service level performance;
- **Systems for collation and analysis of performance indicators:** Specific persons should be designated with the mandate to collate the data received from the field and generate the performance reports. Working directly under supervision and guidance from officers at the head of department level, young professionals with good analytical skills and moderate levels of technical skills should be able to execute these tasks;
- **Systems for assessment and evaluation of performance:** In most cases, multiple indicators need to be examined to obtain a holistic picture of service levels in a particular sector. Performance indicators reported by the department level should be closely examined at the management level of the ULB. Such reviews by the Mayor/ Municipal Commissioner should take place at a defined frequency, say monthly;

- **Systems for decision-making:** All ULBs do have systems for decision-making; however, many decisions end up being considered in the absence of quality data. To address such gaps, systems such as periodically tabling the performance reports in the Council/to the Standing Committees should be instituted. Typically, reporting ward level performance parameters, wherever applicable, will be useful;

- **Systems for operational decisions and plans:** Decisions and plans will need to be periodically reviewed in light of the performance achieved and follow-on decisions taken up. Additional capital or revenue expenditure may be needed, contracting decisions made, and remedial action taken with respect to deployment of staff, etc. A process of monthly review and follow-up decisions will need to be instituted; and

- **Systems to take corrective action for performance improvement:** To enable the operational staff implement corrective action on the ground, they will need to be adequately empowered to implement the decisions taken without lengthy approval processes. For networked infrastructure services, as in most urban services, significant efficiency improvements can be brought about through operational improvements without significant capital investment.

  A system of incentives and penalties must be instituted to attain targeted performance levels. This is critical for the field functionaries to respond in making quick operational improvements. Similarly, the system of penalties for errant staff that has lead to poor performance should be institutionalised.

→ **Other Parastatal Agencies:** The significance of Service Level Benchmarking and the next steps parastatal agencies need to undertake are very similar to that for ULBs. Parastatal agencies too need to put systems in place for performance management as mentioned above. The need for periodic reporting of SLBs to ULBs concerned and its public disclosure is further highlighted in this case, thereby bringing in higher intensity of accountability of parastatal agencies to elected bodies and the public at large.

→ **Bi-lateral/Multi-lateral Aid Agencies and Other Stakeholders:** Various urban governance and infrastructure improvement programmes initiated by bi-lateral and multi-lateral aid agencies can dovetail with and further strengthen this initiative, mainly in two ways:

- Enabling State governments and cities in design and implementation of performance management systems, with a focus on the SLBs defined; and

- Extensively using the SLBs defined in the design, implementation and monitoring of the urban programmes supported by them. Benchmarking service levels and achieving targets for each of these SLBs can be built into the design of these programmes.

Organisations such as City Managers' Associations, public administration training institutions, the Office of the Comptroller and Auditor General, other external and internal audit agencies, financial institutions and a whole range of external stakeholders should examine these SLBs in the course of their interactions with the ULBs.

→ **Citizens and Civil Society:** While the SLBs have not been defined from the citizen's perspective as such, the parameters considered provide reasonable indication of performance of the ULB/civic agency. Citizens should engage with ULBs through Area Sabhas, Resident Welfare Associations (RWAs) and other such civil society organisations, in examining the SLBs and suggesting remedial actions.

## 1.4 LIMITATIONS AND CHALLENGES IN IMPLEMENTING PERFORMANCE MANAGEMENT SYSTEMS USING SERVICE LEVEL BENCHMARKS

It is recognised that this initiative to implement performance management systems using SLBs has a number of limitations. Performance management in ULBs is being catalysed by the Central Government; however, it is acceptance and capacity at the State and city levels that will sustain this initiative. While this Handbook has attempted to address issues of definition and methodology for Service Level Benchmarking, it is anticipated that a number of complexities will arise in the course of actual implementation. Field level experience in implementing service delivery performance management systems may also throw up the need for monitoring additional parameters. This experience should then provide feedback for improving the SLBs and preparing the second version of this Handbook.

Challenges involved in implementing performance management systems using SLBs will be many. They will include:

- Systems for capturing key data elements identified for Service Level Benchmarking are not present in many cases at the field level. Ideally data are always captured at the lowest level. Interpreting and understanding performance is always easier at an aggregate level; this is not possible at the disaggregated level, if data have not been captured at that level. Also the data at city/ULB level can be credible and reasonably accurate, only if they have been captured at the lower levels, such as the ward level. For example, if ward level data are captured on hours of water supply, they can be aggregated at a ULB level. However, if the number of hours is only assessed and reported at the city level, ward-wise variances cannot be examined;

- To measure input parameters for a performance indicator, there may be a tendency to measure through ad hoc systems, which can be a one-off exercise. However, to generate data from the field level on a regular basis to sustain periodic performance measurement, sustainable systems need to be put in place;

- In some cases, there may be resistance of field staff or other stakeholders to collect and report correct information, as vested interests may be involved. Such vested interests may also want to prevent transparent disclosure of the performance measured. Such hurdles will need to be overcome;

- As mentioned earlier, definition and measurement methodology issues will continue to exist, though they will be refined with experience. Also, some other indicators may seem important or more SLBs may seem to be necessary for interpreting performance; and

- Performance management will be sustainable only if disclosure, reporting, monitoring and performance management feedback, incentives and disincentives are also brought into the cycle. Else the system of measurement and disclosure of SLBs may not sustain itself.

## 1.5 STANDARDISATION OF SERVICE LEVEL BENCHMARKS

Each indicator has been detailed out in a standardised template in the following pages to present the definition and computation methodology of the selected SLBs (performance indicators). For each selected indicator, the following details have been provided:

- **Title, units and definition:** The specific name, the unit of measurement in which the performance is to be measured, and definition for the indicator is provided;

- **Data requirements:** The specific elements of data that need to be captured are identified, along with the corresponding unit of measurement. Each data element is described, and point and frequency of data capture are mentioned. The specific formulae that should be used to arrive at the performance indicator are mentioned;

- **Rationale for the indicator:** For each performance indicator, the overall significance and rationale for assessing and monitoring the performance indicator have been provided. The benchmark value has been specified in most cases;

- **Reliability of measurement:** The performance measurement is only as reliable for meaningful management decisions as the systems that generate the data to compute the performance. Typically, four levels of reliability of data systems have been specified: 'A', 'B', 'C', and 'D,' with 'A' being of highest reliability and 'D' being lowest.

  Reliability of measurement highlights a hitherto ignored aspect in performance management of urban services—the need to design, implement and institutionalise robust systems and processes that will provide data of high reliability, on a repeat basis, and in a consistent manner. ULBs/ urban utilities are advised to institute systems corresponding to the level 'A' specified. Such a transition will not happen in a short time period. Thus, while performance levels are improved over time, so should the data systems through which data are captured. The goal, therefore, is to reach the benchmark performance level of 'A' level reliability of measurement;

- **Frequency of measurement:** Frequency of measurement of the performance indicator refers to the frequency at which the performance level will be assessed and not the frequency at which the data elements will be measured. For each indicator, the minimum frequency at which the performance should be measured is mentioned. It can then be reported at the same frequency or a lower frequency. The frequency at which performance is measured is critical since:

  - There should ideally be visible change or potential for changing the performance level between two consecutive time periods. (For example, it may not be possible to change the availability of treatment plant capacity in a few months; therefore it should be measured and reported on an annual basis. However, hours of water supply may vary with seasons and can be improved during the year, therefore it should be reported at a quarterly and an annual frequency.);

  - If the time period is set too long, the performance measured cannot effectively feed back into making operational improvements;

  - If the time period is set too short, significant time will be lost in only measuring and reporting performance; and

  - Performance cannot be reported at a frequency higher than at which it has been measured.

Performance should be reported more frequently within the organisation, and at a lower frequency to higher levels of government, for example, performance reports should be tabled to the Standing Committees and Municipal Councils at monthly or quarterly frequencies. However, they may be reported at annual frequency to State and Central governments; and

- **Jurisdiction of measurement:** This refers to the geographic jurisdiction for which performance should be measured, and not the point of data collection. Typically, measuring urban service delivery performance at a sub-city level makes more sense for city level stakeholders, than only city level performance indicators. For instance, for an urban citizen or municipal councillor, it would be useful to know the performance of a particular service in that ward, especially in relation to other wards. Also measuring performance only at the city level will disguise huge differences in service levels that exist between different localities in one city, a phenomenon common in most Indian cities.

  Similarly, for stakeholders at the State and Central level, it is useful to have city level performance indicators, as they would be useful to compare and contrast cities. Such information will then be useful for the formulation of State level and national strategies and policy responses.

  Measuring performance at a lower level jurisdiction enables aggregation of the data to indicate performance at a larger jurisdiction. Thus, if ward level performance is known for all wards, ULB level performance can also be reported.

Please note that, with respect to geographic jurisdictions for the performance indicators, the terms 'ULB' and 'city' have been used inter-changeably. This has been done since, in larger cities/urban agglomerations, there are multiple ULBs within the city while in smaller cities, the ULBs typically cover the entire urban boundaries. In many cities, certain services such as water supply and waste water management may be provided and/or managed by a parastatal utility for a larger urban jurisdiction, rather than the limits of the ULB/s. In such cases, the data and performance indicators may pertain to the jurisdictions of the parastatal utility. Therefore, the unit of ULB/city should be interpreted as appropriate to the given context.

## 1.6 STRUCTURE OF THE HANDBOOK

Section II of the Handbook provides details regarding each selected SLB. The list of indicators has been chosen after taking into account experiences in pilot initiatives in implementing Service Level Benchmarking across ULBs/utilities. The quality of available data, effort required in data collection and the significance of the indicator has been considered in arriving at this set of indicators.

Section III of the Handbook provides guidance on how Service Level Benchmarking can be operationalised. Samples of performance reports of SLBs that ULBs/civic agencies can use to set and track their performance improvement are provided.

# SECTION 2

## SERVICE LEVEL BENCHMARKS

# 2.0 SERVICE LEVEL BENCHMARKS

Lists of SLBs have been chosen so as to reflect the multiple facets of service delivery performance. SLBs for which detailed data sheets are provided are:

- **2.1 Water Supply Services:** As water is a basic need, emphasis has been laid on performance related to reach and access to quality service, and prevalence and effectiveness of the systems to manage the water supply networks. As financial sustainability is critical for continued effectiveness in service delivery, performance is measured on this aspect too. Indicators selected are:

  2.1.1 Coverage of water supply connections

  2.1.2 Per capita supply of water

  2.1.3 Extent of metering of water connections

  2.1.4 Extent of non-revenue water (NRW)

  2.1.5 Continuity of water supply

  2.1.6 Quality of water supplied

  2.1.7 Efficiency in redressal of customer complaints

  2.1.8 Cost recovery in water supply services

  2.1.9 Efficiency in collection of water supply-related charges

- **2.2 Sewage Management (Sewerage and Sanitation):** For sewage management, performance related to reach and access of the service, effectiveness of the network and environmental sustainability have been emphasised, apart from financial sustainability of operations. Indicators selected are:

  2.2.1 Coverage of toilets

  2.2.2 Coverage of sewage network services

  2.2.3 Collection efficiency of sewage network

  2.2.4 Adequacy of sewage treatment capacity

  2.2.5 Quality of sewage treatment

  2.2.6 Extent of reuse and recycling of sewage

  2.2.7 Efficiency in redressal of customer complaints

  2.2.8 Extent of cost recovery in sewage management

  2.2.9 Efficiency in collection of sewage charges

- **2.3 Solid Waste Management:** Performance related to reach and access, effectiveness of network operations and environmental sustainability have been considered, apart from financial sustainability of operations. Indicators selected are:

  2.3.1 Household level coverage of solid waste management services

  2.3.2 Efficiency of collection of municipal solid waste

  2.3.3 Extent of segregation of municipal solid waste

  2.3.4 Extent of municipal solid waste recovered

  2.3.5 Extent of scientific disposal of municipal solid waste

2.3.6 Efficiency in redressal of customer complaints

2.3.7 Extent of cost recovery in SWM services

2.3.8 Efficiency in collection of SWM charges

→ **2.4 Storm Water Drainage:** Extent of the network and effectiveness of the network are emphasised to assess storm water drainage system performance. As this service does not yield any direct revenues, financial sustainability is not considered. Indicators selected are:

2.4.1 Coverage of storm water drainage network

2.4.2 Incidence of water logging/flooding

# 2.1 WATER SUPPLY SERVICES

## 2.1.1 COVERAGE OF WATER SUPPLY CONNECTIONS

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Household level coverage of direct water supply connections | % | Total number of households in the service area that are connected to the water supply network with direct service connections, as a percentage of the total number of households in that service area. Service area implies a specific jurisdiction in which service is required to be provided. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of households in the service area | Number | The total number of households (not properties) in the service area should be calculated. The service area refers to either the ward or ULB limits. Cadastre maps supplemented through actual ground level surveys (carried out once in four to five years) should provide these data. Exclusive surveys need not be carried out, and data can be collected during other surveys carried out for property tax, or other such purposes. |
| b. Total number of households with direct water supply connection | Number | This will include households which receive municipal water supply at one common point, from where it is stored and distributed to all households (for example, as in apartment complexes). Households supplied water through public standposts or tankers should be excluded. Households completely dependent on other water sources such as borewells, open wells, etc., should not be included. |
| **Household coverage for water supply connections** | % | **Coverage = [(b/a)*100]** |

## Rationale for the Indicator

The minimum level acceptable standard for water supply service should be a household level water supply connection, that is, a direct piped connection for water supply within the household. Water provision to households (urban poor or otherwise), at common public standposts cannot be considered as an acceptable/long-term permanent service provision standard. The social costs of not having access to a piped water connection at the household level are significant. Innovative service delivery options may be adopted for delivery of piped water connections to properties with inappropriate tenure rights (as in many urban slums). It is therefore important to measure this performance indicator, the benchmark value for which should be 100 percent.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Estimation of households covered on the basis of geographical area of the city covered with the pipeline network, as a surrogate indicator for water supply coverage. |
| Intermediate level (C) | Estimation of households covered on the basis of road length in the city covered by the pipeline network, as a surrogate indicator for water supply coverage. |
| Intermediate level (B) | Estimation of households covered computed as the total number of connections (for which data are maintained) as a percentage of the estimated number of households on the basis of population (total population divided by average household size). |
| Highest/preferred level of reliability (A) | Calculation based on the actual number of households with direct service connections (for which data are maintained); and the total number of households as revealed in ground level surveys. Data are periodically updated on the basis of building units approved, and new household level water connections provided. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Quarterly** | **Measurement** | **Zone/DMA level** |

## 2.1.2 PER CAPITA SUPPLY OF WATER

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Per capita quantum of water supplied | Litres per capita per day (lpcd) | Total water supplied to consumers expressed by population served per day. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Water supplied to the distribution system | Litres per month | Daily quantities should be measured through metering, and records maintained. The total supply for the month should be based on an aggregate of daily quantum. Only treated water input into the distribution system should be measured. If water is distributed from multiple points, the aggregate of that quantity should be considered. Water purchased directly from other sources (e.g. neighbouring ULBs, Cantonment Boards) and put into the distribution system should be included. Also, water supplied in bulk to large water intensive industries/industrial estates should be excluded. The quantity should exclude bulk water transmission and distribution losses. In the absence of a reliable estimate of losses, a factor of at least 25% should be used for calculation purposes. The utility is encouraged to carry out a water audit to assess the losses to their realistic level. |
| b. Population served | Number | The number of people in the service area. |
| c. Number of days in the month | Number | The number of days in the specific month. |
| **Water supplied** | lpcd | **Per capita water supplied = [(a/c) /b]** |
| d. Additional information on water supplied at the production level | Litres per month | The daily quantity supplied at the production level (ex-treatment) should also be recorded. The total supply for the month should be based on an aggregate of the daily quantum. |
| e. Additional information on population receiving water at a rate less than 70 lpcd may also be reported | Litres per capita per day (lpcd) | The number of people in these service areas. The quantity of water supplied to these areas measured through bulk meters or by scientific calculation using flow velocity and head. |

## Rationale for the Indicator

This frequently used performance indicator provides an overall indication of the adequacy of the water supply to meet the needs of the citizens in the city. Per capita water supplied, expressed in lpcd, indicates the adequacy of the municipal water supply system in being able to source, treat water to potable standards and supply it into the distribution system. Therefore, this indicator should be periodically measured and monitored. Monitoring this on a monthly basis will reveal seasonal variations. The benchmark value for this indicator is 135 lpcd. However, the additional information in respect of the areas where water is supplied at the rate of 70 lpcd should also be indicated. The key limitation of this indicator is that it provides information on a city-wide basis, and does not reveal intra-city variations.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | The quantity of water produced is estimated on the basis of assumed pump capacity and efficiencies, and the number of hours of operation. The population served is calculated on the basis of past census figures, extrapolated to current levels. |
| Intermediate level (C) | The quantity of water produced is estimated on the basis of measurement of periodic sample surveys of production flows at all bulk production points. The population served is calculated on the basis of past census figures, extrapolated to current levels. |
| Intermediate level (B) | Not applicable. |
| Highest/preferred level of reliability (A) | The quantity of water produced is computed on the basis of measurement by bulk flow meters at the outlet of the treatment plant and/or at all bulk production points. The quantum of bulk industrial consumption is periodically monitored. The population served is known with reasonable accuracy. Any expansion of municipal limits and other significant factors are measured and factored into the current population computation. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Quarterly** | **Measurement** | **Zone/DMA level** |

## 2.1.3 EXTENT OF METERING OF WATER CONNECTIONS

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Extent of metering of water connections | % | The total number of functional metered water connections expressed as a percentage of the total number of water supply connections. Public standpost connections should also be included. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of direct service connections | Number | This will include households and establishments which receive municipal water supply at one common point, from where it may be stored and distributed for all households (for example, as in apartment complexes). Households completely dependent on other water sources such as bore wells, open wells, etc., should not be included. |
| b. Total number of public standposts | Number | The total number of public standpost connections, which are currently in use, should be considered. |
| c. Number of metered direct service connections | Number | Of the total number of direct service connections (to all categories of consumers), the number of connections which have functional meters, and metered quantities is the basis for billing of water charges. |
| d. Number of metered public standposts | Number | Typically, public standposts are not metered. However, if some are metered, they should be included. |
| **Extent of metering of water connections** | % | **Extent of metered connections = [(c + d)/ (a + b)]*100** |

## Rationale for the Indicator

While water is a basic need, the supply of potable water to citizens at their doorstep involves significant costs in building, operating and maintaining a system to do so. In a water supply system, the quantum of service provided to citizens is directly measurable, and therefore it is necessary that all the water supplied to all categories of consumers should be metered. Metering will also induce efficiency in use of water, reveal physical and administrative leakages in the system, and enable high-end consumers to be charged for consuming more. Therefore, to introduce a volumetric-based tariff structure for water charges, metering all connections is essential. It is, therefore, important to monitor this indicator, the benchmark value for which is 100 percent.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | A few meters have been installed. All installed meters are assumed to be functional and used as the basis for billing water charges. |
| Intermediate level (C) | Meters are installed for only certain categories of consumers. It is assumed all consumers of these categories have meters installed which are functional and used as the basis for billing. Records do not reveal the exact number of connections which are metered. Water is charged on the basis of average readings for the consumer category or on the basis of past trends in most cases. |
| Intermediate level (B) | Databases/records reveal the list of consumers that have meters installed in their water connections. However, there are no clear data on functioning of meters, and no linkage with the billing system that may or may not use metered quantity as the basis for billing. |
| Highest/preferred level of reliability (A) | Billing records and databases clearly identify consumers with meters (against specific meter serial number). Billing processes reveal regular reading of meters and meter readings are the basis for charging consumers. Records on standposts are available. Databases of water connections and meters are complete, and spatially referenced with a geographic information system (GIS) database. There is a mechanism in place to repair meters if found faulty. Processes for installation of new water connections, installation of meters and generation of water bills based on this are interlinked, and the data systems enable such continuity of data flow regarding these. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Quarterly** | **Measurement** | **Zone/DMA level** |

## 2.1.4 EXTENT OF NON-REVENUE WATER (NRW)

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Extent of NRW | % | This indicator highlights the extent of water produced which does not earn the utility any revenue. This is computed as the difference between the total water produced (ex-treatment plant) and the total water sold expressed as a percentage of the total water produced. NRW comprises: a) Consumption which is authorised but not billed, such as public standposts; b) Apparent losses such as illegal water connections, water theft and metering inaccuracies; and c) Real losses which are leakages in the transmission and distribution networks. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total water produced and put into the transmission and distribution system | million litres per day (or) month | Daily quantities should be measured through metering, and records on the transmission and distribution system should be maintained. The total supply for the month should be based on the aggregate of the daily quantum. Only treated water input into the distribution system should be measured. If water is distributed from multiple points, the aggregate of that quantity should be considered. This quantum should include water purchased directly from any other sources and put into the distribution system, if any. Water may have been purchased from neighbouring ULBs, Cantonment Boards, etc. |
| b. Total water sold | million litres per day (or) month | The actual volume of water supplied to customers who are billed for the water provided. Ideally, this should be the aggregate volume of water consumed as per which consumers have been billed. However, in the absence of a complete and functionally effective metering regimen, alternate methods of measurement need to be evolved, with lower but acceptable levels of reliability. |
| **NRW** | % | **NRW = [((a - b)/a)*100]** |

## Rationale for the Indicator

The reduction in NRW to acceptable levels is vital for the financial sustainability of the water utility. NRW can be reduced through appropriate technical and managerial actions, and therefore monitoring NRW can trigger such corrective measures. The reduction of real losses can be used to meet currently unsatisfied demand or to defer future capital expenditures to provide additional supply capacity. The reduction of NRW is desirable not just from a financial standpoint, but also from the economic and environmental benefits' point of view. The benchmark value for NRW may be considered at 20 percent, the levels achieved by most well-performing utilities in developed countries. NRW is also influenced by factors outside the control of the water utility such as the topography of the city, age of the network, length of the network per connection and water use per capita.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | The quantity of water produced is estimated on the basis of assumed pump capacity and efficiencies, and the number of hours of operation. A few meters have been installed in the distribution system and at the consumer end. The quantity of water sold to the category of consumers to whom bills are raised is estimated on the basis of assumed average consumption in that category and the number of consumers in that category. |
| Intermediate level (C) | The quantity of water produced is estimated on the basis of measurement of periodic sample surveys of production flows at all bulk production points. Meters are installed for a select category of consumers, such as commercial and bulk consumers. For other categories of consumers, such as domestic consumers, the number of such consumers and the average consumption per consumer are considered, to arrive at the quantum of water sold. |
| Intermediate level (B) | The quantity of water produced is computed on the basis of measurement at bulk flow meters at the outlet of the treatment plant and/or at all bulk production points. The quantum of water sold is based on the metered quantity for bulk and commercial consumers. For households, ferrule size (the size of the distribution pipe outlet at the consumer end) of each consumer connection as well as the hours of supply are known, to compute the quantum of water sold. |
| Highest/preferred level of reliability (A) | The quantity of water produced is computed on the basis of measurement at bulk flow meters at the outlet of the treatment plant and/or at all bulk production points. Metering is undertaken at all key distribution nodes (entry to DMAs) and at the consumer's end for all categories of consumers. Billing records and databases clearly reveal regular reading of meters and, therefore, the total quantum of water billed to consumers in the given time period (month/bi-monthly). |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Quarterly** | **Measurement** | **ULB level** |

## 2.1.5 CONTINUITY OF WATER SUPPLY

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Continuity of water supply | Hours per day | Continuity of supply is measured as the average number of hours of pressurised water supply per day. Water pressure should be equal to or more than a head of 7 metre (m) at the ferrule point/meter point for the connection (7 m head corresponds to the ability to supply to a single-storey building). |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| Average hours of pressurised supply per day | Hours | The number of hours of supply in each operational zone (or DMA) should be measured continuously for a period of seven days. The average of the seven days should be considered for that month. Measurement should exclude hours of supply where the pressure is less than the minimum standards for piped water supply. In case supply is not daily (e.g. thrice a week) use total hours of supply in a week divided by seven (days). |

## Rationale for the Indicator

Almost no Indian city has a continuous (24x7) water supply system, the norm for all cities in the developed world. From a citizen's perspective, it is desirable to have round-the-clock water supply daily, as it eliminates the need to provide and manage household/establishment level storage, and other resultant inconveniences. Water utilities in most Indian cities provide intermittent and limited number of hours of supply, as a means to manage inadequate supply. A number of studies have demonstrated the negative fallouts of designing and operating a system for intermittent water supply. A number of cities are undertaking substantial investments to improve this service level. It is, therefore, critical to monitor this indicator on a city-wide basis and move towards the benchmark value of 24 hours.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Estimation of the number of hours based on feedback from field level engineers. Zone-wise data are not available. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | The calculation is based on detailed operational records at each of the valve operating points. Pressure availability at the consumers' end is assumed to be adequate and meeting the stated norms. |
| Highest/preferred level of reliability (A) | The calculation is based on detailed operational records at each of the valve operating points. Pressure adequacy and the number of hours of supply at the consumers' end are assessed on the basis of a statistically valid sample survey, across all zones in the city. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **Zone/DMA level** |

## 2.1.6 QUALITY OF WATER SUPPLIED

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Quality of water supplied | % | The percentage of water samples that meet or exceed the specified potable water standards, as defined by the Central Public Health and Environmental Engineering Organisation (CPHEEO). The sampling regimen should meet standards and norms laid down. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of water supply-related complaints received per month | Number per month | The actual number of water samples that are taken for testing in the month. Samples should be drawn at both points—outlet of the treatment plant and at the consumer end. The sampling regimen should meet laid down standards and norms. |
| b. Number of samples that meet the specified potable water standards in the month | Number per month | Of the total number of samples drawn in the month, the number of samples that have met or exceeded the specified potable water standards. All parameters of the quality standards should be met. Even if one standard is not met, the sample cannot be assumed to have met the standards. |
| **Quality of water supply** | % | **Quality of water supply = [(b/a)*100]** |

## Rationale for the Indicator

The quality of water supplied is as important a performance indicator as other service delivery indicators. Poor water quality can pose serious public health hazards. Water-borne diseases are quite common in Indian cities, particularly among the urban poor. Although, in most cases, the source of water that causes such diseases/epidemics is not the municipal piped water supply, it is very important to monitor the supply. Therefore, this performance indicator must be regularly monitored, the benchmark value for which is 100 percent.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Sampling is done only at treatment plant outlets. There is absence of a sampling regimen and of required laboratory equipment, and only very basic tests are carried out. |
| Intermediate level (C) | Sampling is done at production and intermediate points along the distribution network, but only for residual chlorine. There is absence of a sampling regimen and of required laboratory equipment, and tests are intermittently carried out through a third party. |
| Intermediate level (B) | Regular sampling is done at the treatment plant outlet and consumption points. Consumption points are spatially spread across the city. The sampling regimen is well documented and practiced. Tests include residual chlorine as well as bacteriological tests. The ULB/utility has its own laboratory equipment or easy and regular access to accredited testing centres. |
| Highest/preferred level of reliability (A) | Regular sampling is done at the treatment plant outlet and consumption points. The sampling regimen is well documented and practiced. Tests include residual chlorine as well as bacteriological tests. The ULB/utility has its own laboratory equipment or easy and regular access to accredited testing centres. A periodic, independent audit of water quality is carried out. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **ULB level** |

## 2.1.7 EFFICIENCY IN REDRESSAL OF CUSTOMER COMPLAINTS

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Efficiency in redressal of customer complaints | % | The total number of water supply-related complaints redressed within 24 hours of receipt of complaint, as a percentage of the total number of water supply-related complaints received in the given time period. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of water supply-related complaints received per month | Number per month | The total number of all supply-related complaints from consumers received during the month. Systems for receiving and logging in complaints should be effective and easily accessible to the citizens. Points of customer contact will include common phone numbers, written complaints at ward offices, collection centres, drop boxes, online complaints on the website, etc. |
| b. Total number of complaints redressed within the month | Number per month | The total number of water supply-related complaints that are satisfactorily redressed within 24 hours or the next working day, within that particular month. Satisfactory resolution of the complaint should be endorsed by the person making the complaint in writing, as a part of any format/proforma that is used to track complaints. |
| **Efficiency in redressal of complaints** | % | **Efficiency in redressal of complaints = [(b/a)*100]** |

## Rationale for the Indicator

It is important that, in essential services such as water supply, the ULB/water utility has effective systems to capture customer complaints/grievances, escalate them internally for remedial action and resolve them. While many ULBs/utilities have put in place systems to capture complaints, much more work needs to be done to put in place back-end systems for satisfactory resolution of those complaints on time. As water supply is an essential service, the benchmark time for redressal is 24 hours or the next working day. It is, therefore, important to monitor this indicator. The benchmark value for this indicator will depend on a number of factors such as the size of the city, age of the network, etc. The benchmark value for this indicator may be set at 80 percent.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Complaints data are not maintained either at the ward or city level. |
| Intermediate level (C) | There are multiple mechanisms/means by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. All complaints received are assumed to be resolved quickly. |
| Intermediate level (B) | There are multiple mechanisms/means by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. However, systems do not exist for aggregating, sorting and tracking the complaints. Data available for some months have been used as a trend to report the figures for some other months. |
| Highest/preferred level of reliability (A) | There are multiple mechanisms by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. Complaints are segregated into different categories. They are collated through the computer network or other systems, and tracked on a daily basis. The status of redressal of complaints is maintained. Consumers endorse complaints being addressed on the municipal proforma. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **Zone/DMA level** |

## 2.1.8 COST RECOVERY IN WATER SUPPLY SERVICES

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Cost recovery in water supply services | % | The total operating revenues expressed as a percentage of the total operating expenses incurred in the corresponding time period. Only income and expenditure of the revenue account must be considered, and income and expenditure from the capital account should be excluded. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total annual operating expenses | Rs lakhs | Should include all operating expenses (for the year) such as electricity, chemicals, staff, outsourced operations/staff related to water supply, bulk water purchase costs and other operations and maintenance (O&M) expenses. Should exclude interest payments, principal repayments and other capital expenses. |
| b. Total annual operating revenues | Rs lakhs | Should include all water supply-related revenues (billed) during the corresponding time period, including taxes/cess/surcharges, user charges, connection charges, sale of bulk water, etc. This should exclude capital income such as grants, loans, etc. |
| **Cost recovery in water supply services** | % | **Cost recovery = [(b/a)*100]** |

| Rationale for the Indicator |
|---|
| Financial sustainability is critical for all basic urban services. In services such as water supply, benefits received by the consumers are more direct and can be quantified. Therefore, through a combination of user charges, fees and taxes, all operating costs may be recovered. Therefore, this indicator is critical for measuring overall cost recovery, the benchmark value for which is 100 percent. Cost recovery objectives provide a basis for tariff fixation, enable setting targets for revenue mobilisation and cost control in the delivery of water supply services. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | There is no segregation of budget heads related to water supply services and sanitation from the rest of the functions of the agency. A cash-based accounting system is practiced. There are no clear systems for reporting unpaid expenditure, or revenues that are due. Disclosures and reporting are not timely. Audits have a time lag and are not regular. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | Budget heads related to water and sanitation are segregated. Key costs related to water and sanitation are identifiable, although complete segregation is not practiced (for example, electricity costs for water supply services are not segregated from overall electricity costs of the ULB). Key income and expenditure are recognised based on accrual principles. Disclosures are complete and are timely. |
| Highest/preferred level of reliability (A) | In case of multi-function agencies such as municipal corporations, the budget heads related to water and sanitation are clearly separated. Cost allocation standards for common costs are in place. An accrual-based double entry accounting system is practiced. Accounting standards are comparable to commercial accounting standards with clear guidelines for recognition of income and expenditure. Accounting and budgeting manuals are in place and are adhered to. Financial statements have full disclosure and are audited regularly and on time. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Quarterly** | **Measurement** | **ULB level** |

## 2.1.9 EFFICIENCY IN COLLECTION OF WATER SUPPLY-RELATED CHARGES

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Efficiency in collection of water-related charges | % | Efficiency in collection is defined as current year revenues collected, expressed as a percentage of the total operating revenues, for the corresponding time period |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Current revenues collected in the given year | Rs lakhs per annum | Revenues collected for bills raised during the year. This should exclude collection of arrears as inclusion of arrears will skew the performance reflected. Collection efficiency is in fact an indicator of how many arrears are being built up, and therefore only current revenues should be considered. |
| b. Total operating revenues billed during the given year | Rs lakhs per annum | The total quantum of revenues related to water supply services that is billed during the year. This should include revenues from all sources related to water such as taxes, charges, cess, surcharges, sale of bulk water, etc. |
| **Collection efficiency** | **%** | **Collection efficiency = [(a/b)*100]** |

| Rationale for the Indicator |
|---|
| For a water utility, it is not just enough to have an appropriate tariff structure that enables cost recovery objectives but also efficient collection of revenues that are due to the utility. It is also important that the revenues are collected in the same financial year, without allowing for dues to get accumulated as arrears. It is, therefore, critical to monitor this indicator. The benchmark value for collection efficiency may be considered at 90 percent, since it is possible that about 10 percent of the dues may be delayed to the next year. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | There is no segregation of arrears versus current year revenue collection. A cash basis of accounting is followed. The accounting code structure does not enable clear segregation of water revenues. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | There is clear segregation of current year revenues collection versus arrears collection. However, revenue collection is not matched against the specific bill issued. Overall accrual principles of accounting are followed, and therefore deposits and advances are not included in income and expenditure, respectively. |
| Highest/preferred level of reliability (A) | Collection records are maintained for each billing cycle. Collections are clearly identified against the specific bill which has been issued. Overall accrual principles of accounting are followed, and therefore deposits and advances are not included in income and expenditure, respectively. The accounting code structure also enables monitoring of billing and collections for each ward within the ULB. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **Zone/DMA level** |

# 2.2 SEWAGE MANAGEMENT (SEWERAGE AND SANITATION)

## 2.2.1 COVERAGE OF TOILETS

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Coverage of toilets | % | This indicator denotes the extent to which citizens have access to a toilet (whether individual or community) in a service area. The toilets would include those in the category of residential, commercial, industrial and institutional properties. The service area implies a specific jurisdiction in which the service is required to be provided. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of properties with access to individual or community toilets within walking distance in the service area | Number | The total number of toilets (as against households) should be assessed. A property may have multiple tenants. A property is considered unique if it is recorded as a unique property in the municipal records. Municipal records should be up-to-date, and preferably backed up by a cadastre map. |
| b. Total number of properties without individual or community toilets within walking distance | Number | Only the total number of properties without access to individual or community toilets should be assessed. |
| **Coverage of toilets** | % | **Coverage of toilets = [a/a+b]*100** |

| Rationale for the Indicator |
|---|
| Last mile access to toilets is key to improvement in service levels of sanitation facilities. In many Indian cities, there is inadequate access to toilet facilities. Therefore, it is important to measure this parameter. The benchmark value for this indicator is 100 percent. Substantial investment in this area is being taken up under the Basic Services to the Urban Poor (BSUP) component of JNNURM as well as the Integrated Low Cost Sanitation (ILCS) scheme. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | Estimation based on the geographical area of the ULB covered with and without toilet facilities as a percentage of the total ULB area, as an indicator of service coverage. |
| Intermediate level (C) | Estimation based on the total number of properties with toilets on the premises or with access to a community toilet at walking distance and without such facilities as a percentage of the estimated number of properties, to arrive at the indicator of service coverage. |
| Intermediate level (B) | None. |
| Highest/preferred level of reliability (A) | Calculation based on the actual number of properties and the count of properties with or without toilet facilities, measured through a field survey. These data should be periodically updated on the basis of data regarding provision of toilet facilities and new properties being developed (from the building plan approval department). Field surveys throughout the city should be carried out at least once in five years. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Quarterly** | **Measurement** | **Ward level** |

## 2.2.2 COVERAGE OF SEWAGE NETWORK SERVICES

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Coverage of sewage network services | % | This indicator denotes the extent to which the underground sewerage (or sewage collection network) has reached out to individual properties across the service area. Properties include those in the categories of residential, commercial, industrial and institutional. The service area implies a specific jurisdiction in which service is required to be provided. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of properties in the service area | Number | The total number of properties (as against households) should be assessed. A property may have multiple tenants. A property is considered unique if it is recorded as a unique property in the municipal records. Municipal records should be up-to-date, and preferably backed up by a cadastre map. |
| b. Total number of properties with direct connection to the sewage network | Number | Only properties with access connection to the underground sewage network should be included. Properties that connect their sewerage outlet to storm water drains or open drainage systems should not be considered. However, this may include one or more properties with access to decentralised/ standalone underground sewage networks, which have treatment and safe effluent disposal facilities, which has been set up and operated according to laid down environmental standards. |
| **Coverage of sewage network** | % | **Coverage of sewage network services = [b/a]*100** |
| Additional information on on-site facilities | Number | Number of properties connected to sanitary on-site facilities. |

## Rationale for the Indicator

Last mile access to sewage networks is key to improvement in service levels of sewage management. In many Indian cities, sewage also flows through open drains/storm water drains, posing serious public health hazards. Also, the coverage of sewage network services is very low across most Indian cities. With substantial investments in this area being taken up in programmes such as JNNURM, it would be important to monitor this indicator to observe the impact being made on the ground. Therefore, it is important to measure this parameter. Its benchmark value is 100 percent.

This benchmark, however, does not imply that sewerage is the only option for safe liquid waste management. An appropriate mix of options including sanitary on-site facilities (e.g. septic tanks, pit latrines) may be considered depending on the city's context.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Estimation based on the geographical area of the ULB covered with the sewage pipeline network, as a percentage of the total ULB area, as an indicator of service coverage. |
| Intermediate level (C) | Estimation based on the road length in the city covered by the pipeline network, as a percentage of the total road length, as an indicator of service coverage. |
| Intermediate level (B) | Estimation based on the total number of connections as a percentage of the estimated number of properties, to arrive at the indicator of service coverage. |
| Highest/preferred level of reliability (A) | Calculation based on the actual number of properties and the count of properties with a direct connection, measured through a field survey. These data should be periodically updated on the basis of new sewage connections taken (from the sewage department), and new properties being developed (from the building plan approval department). Field surveys throughout the city should be carried out at least once in five years. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Quarterly** | **Measurement** | **Ward level** |

## 2.2.3 COLLECTION EFFICIENCY OF THE SEWAGE NETWORK

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Efficiency in collection of sewage | % | This indicator is measured as the quantum of wastewater collected as a percentage of normative sewage generation in the ULB. Wastewater generation is linked to the quantum of water supplied through piped systems, and other sources such as bore wells, when they are very extensively used.<br><br>Data should be collected daily for an entire month, so as to measure the quantities per month. While daily variations may be normalised, monthly variations may exist on account of seasonal variations. Data should be aggregated from multiple points across the ULB. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total water supplied | Million litres per day (or) month | Data on the total quantum of water supplied to the distribution system (ex-treatment plant and including purchased water, if any), less physical losses of water in the transmission and distribution system through leakages. In the absence of a reliable estimate of losses, a factor of at least 25% should be used for calculation purposes. In case municipal water is supplied through decentralised distribution networks or sourcing water from deep bore wells, it should be included. |
| b. Estimated water use from other sources | Million litres per day (or) month | An estimate of water drawn from other sources such as private bore wells. Data that will drive this estimate include the number of properties with access to bore wells or other sources of water, spatially spread across the city, and the quantity of water supplied in those areas. Alternately, data may also be collected from sample surveys. |
| c. Wastewater collected | Million litres per day (or) month | The quantum of wastewater measured at the inlet of treatment plants. The quantum of untreated sewage at outfalls, leading into rivers, lakes or other water bodies should not be included in the quantum of sewage collected. |
| **Wastewater collection efficiency** | % | **Collection efficiency of sewage networks = [c/ ((a+b)*0.8)]x100** |
| d. Additional information on septage collection | Number | Number of vehicles licenced for septage collection, e.g. vacuum trucks. |

| Rationale for the Indicator |
|---|
| While the performance indicator for coverage provides an idea of infrastructure available for access to sewage networks, the effectiveness of the system in capturing the sewage may not be adequate. Therefore, the performance indicator related to collection efficiency signifies the effectiveness of the network in capturing and conveying it to the treatment plants. Thus, it is not just adequate to have an effective network that collects sewage, but also one that treats the sewage at the end of the network. The benchmark value for this indicator is 100 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | Water production is based on 'D' category systems for measuring NRW. There are no meters at sewage treatment plants (STPs), intake is estimated on the basis of flow or treatment plant capacity. No estimates are available for water consumed from other sources. |
| Intermediate level (C) | Water production is based on 'C' category systems for measuring NRW. Sewage intake is estimated on the basis of flow or treatment plant capacity. No estimates are available for water consumed from other sources. |
| Intermediate level (B) | Water production is based on 'B' category systems for measuring NRW. Periodic measurement of wastewater collection is based on flow assessment methods at the STPs. There are no estimates for water consumed from other sources. |
| Highest/preferred level of reliability (A) | Water production is based on 'A' category measurement systems for measuring NRW. Estimates are available for water consumed from other sources. Measurement of wastewater collection occurs at all inlets of STPs by flow assessment methods. Process control automation provides accurate data, for both water production and distribution and for sewage intake and treatment. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **ULB level** |

## 2.2.4 ADEQUACY OF SEWAGE TREATMENT CAPACITY

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Adequacy of capacity for treatment of sewage | % | Adequacy is expressed as secondary treatment (that is, removing oxygen demand as well as solids, normally biological) capacity available as a percentage of normative wastewater generation, for the same time period |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total water supplied | Million litres per day (or) month | Data on the total quantum of water supplied to consumers should be based on the water supplied to the distribution system (ex-treatment plant and including purchased water, if any), less physical losses of water in the transmission and distribution system through leakages. In the absence of a reliable estimate of losses, a factor of at least 25% should be used for calculation purposes. In case municipal water is supplied through decentralised 0020 distribution networks or sourcing water from deep bore wells, it should be included. |
| b. Estimated water use from other sources | Million litres per day (or) month | An estimate of water drawn from other sources such as private bore wells. Data that will drive this estimate include the number of properties with access to bore wells or other sources of water, spatially spread across the city, and the quantity of water supplied in those areas. Alternately, data may also be collected from sample surveys. |
| c. Treatment plant capacity | Million litres per day (or) month | Total functional capacity of all wastewater treatment plants that can meet secondary treatment standards. |
| **Wastewater treatment capacity** | % | **Adequacy of treatment capacity = [c/ ((a+b)*0.8)]x100** |
| d. Additional information on septage disposal | Tonnes | Quantum of septage disposed safely, using treatment plants or sludge drying beds. |

| Rationale for the Indicator |
|---|
| Most Indian cities have inadequate capacity for treatment of sewage that is generated in their cities. Significant investments are under way in creating such capacities through programmes such as JNNURM. This indicator will highlight the adequacy of available and operational sewage treatment capacity. The benchmark value for this indicator is 100 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | Water consumption is based on 'D' category systems for measuring NRW. There is no estimate of wastewater treatment capacity that is actually functional and in operation, nor for water consumed from other sources. |
| Intermediate level (C) | Water consumption is based on 'C' category systems for NRW. There is no estimate of wastewater treatment capacity that is actually functional and in operation, nor for water consumed from other sources. |
| Intermediate level (B) | Water consumption is based on 'B' category systems for NRW. Sound engineering estimates of functional wastewater treatment capacity are available, on the basis of reliable operational data that are maintained. There are no estimates for water consumed from other sources. |
| Highest/preferred level of reliability (A) | Water consumption is based on 'A' category measurement systems for NRW. Reliable estimates are available for the quantity of water consumed from non-municipal sources. STP system capacity is assessed through rigorous testing and commissioning procedures (after which there have been no modifications to the plant). In case any modifications to the STP have been carried out, system capacity is reassessed through measuring peak throughput. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **ULB level** |

## 2.2.5 QUALITY OF SEWAGE TREATMENT

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Quality of treatment | % | Quality of treatment is measured as a percentage of wastewater samples that pass the specified secondary treatment standards, that is, treated water samples from the outlet of STPs are equal to or better than the standards laid down by the Government of India agencies for secondary treatment of sewage. While the samples are collected at the STP outlet and results should be computed per STP, this indicator should be reported at city/ULB level. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of wastewater samples tested in a month | Number per month | Sampling (quantity, periodicity, point of sample collection, etc.) should be taken as per good industry practices and laid down norms by environmental agencies, such as pollution control boards of respective States. |
| b. Number of samples that pass the specified secondary treatment standards | Number per month | Within the total valid samples, the number of samples that pass the specified secondary treatment standards, along all key parameters. |
| **Quality of treatment** | % | **Quality of treatment capacity = [(b/a)*100]** |

| Rationale for the Indicator |
|---|
| For sustainable sewage management, it is not just enough to have the infrastructure to collect and convey the sewage, or the installed capacity to treat it. It is important that the treated water that is discharged back into water bodies, or used for other purposes such as irrigation, meets the laid down environmental standards. It is therefore important to monitor this indicator. Its benchmark value is 100 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | There is an absence of a sampling regimen and of required laboratory equipment. Irregular tests are carried out. Not all parameters are tested. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | The sampling regimen is well documented and practiced on most occasions. The ULB/utility has its own laboratory equipment or easy and regular access to accredited testing centres. Only a few key parameters are assessed. |
| Highest/preferred level of reliability (A) | The sampling regimen is well documented and practiced completely. The ULB/utility has its own laboratory equipment or easy and regular access to accredited testing centres. There is periodic independent audit of wastewater quality. All parameters are assessed. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **ULB level** |

## 2.2.6 EXTENT OF REUSE AND RECYCLING OF SEWAGE

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Extent of recycling or reuse of sewage | % | The percentage of wastewater received at the treatment plant that is recycled or reused after appropriate treatment for various purposes. This should only consider water that is directly conveyed for recycling or reuse, such as use in gardens and parks, use for irrigation, etc. Water that is discharged into water bodies, which is subsequently used for a variety of purposes, should not be included in this quantum.<br><br>While measurements are done at STP inlets and outlets, the indicator should be reported at the city/ULB level as a whole. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Wastewater received at STPs | million litres per day (or) month | This should be based on the actual flow measurement, the quantum for which should be measured daily. Daily quantities should be aggregated to arrive at monthly quantum. |
| b. Wastewater recycled or reused after appropriate treatment | million litres per day (or) month | This should be based on the actual flow measurement by functional flow meters, the quantum for which should be measured daily. Daily quantities should be aggregated to arrive at the monthly quantum. |
| **Wastewater recycled or reused** | % | **Extent of sewage recycled or reused = [(b/a)*100]** |

| Rationale for the Indicator |
|---|
| For sustainable water management, it is desirable that sewage is recycled or reused after appropriate treatment. Effluent water can be directly reused in a number of areas such as used in parks and gardens, supplied for irrigation purposes for farmland on the city periphery, etc. To maximise this reuse, it is important that this indicator is measured and monitored. Its benchmark could be 20 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | There are no meters at STP inlets or points of supply of recycled water. Estimates are based on observation and STP capacity. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | Not applicable. |
| Highest/preferred level of reliability (A) | Based on data from flow measurement at STP inlets and outlets (that is, points of supply of recycled water). Data should be measured daily, and aggregated for monthly totals. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **ULB level** |

## 2.2.7 EFFICIENCY IN REDRESSAL OF CUSTOMER COMPLAINTS

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Efficiency in redressal of customer complaints | % | The total number of sewage-related complaints redressed within 24 hours of receipt of complaints, as a percentage of the total number of sewage-related complaints received in the given time period. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of sewage-related complaints received per month | Number per month | The total number of all sewage-related complaints from consumers received during the month. Systems for receiving and logging in complaints should be effective and easily accessible to the citizens. Points of customer contact will include common phone numbers, written complaints at ward offices, collection centres, drop boxes, online complaints on the website, etc. |
| b. Total number of complaints redressed within the month | Number per month | The total number of sewage-related complaints that are satisfactorily redressed within 24 hours or the next working day, within that particular month. Satisfactory resolution of the complaint should be endorsed by the person making the complaint in writing, as part of any format/proforma that is used to track complaints. |
| **Efficiency in redressal of complaints** | % | **Efficiency in redressal of complaints = [(b/a)*100]** |

## Rationale for the Indicator

It is important that in essential services such as sewage, the utility has effective systems to capture customer complaints/grievances, escalate them internally for remedial action and resolve them. While many ULBs/utilities have put in place systems to capture complaints, much more work needs to be done to put in place back-end systems for satisfactorily resolving those complaints on time. As sewage treatment is an essential service, the benchmark time for redressal is 24 hours or the next working day. It is therefore important to monitor this indicator. The benchmark value for this indicator will depend on a number of factors such as the size of the city, age of the network, etc. The benchmark value for this indicator may be set at 80 percent.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Complaints data are not maintained either at ward or city level. |
| Intermediate level (C) | There are multiple mechanisms/means by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. All complaints received are assumed to be resolved quickly. |
| Intermediate level (B) | There are multiple mechanisms/means by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. However, systems do not exist for aggregating, sorting and tracking the complaints. Data available for some months have been used as a trend to report the figures for some other months. |
| Highest/preferred level of reliability (A) | There are multiple mechanisms by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. Complaints are segregated into different categories, and are collated through a computer network or other systems, and tracked on a daily basis. The status of redressal of complaints is maintained. Consumers endorse complaints being addressed on the municipal proforma. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **Zone/DMA level** |

## 2.2.8 EXTENT OF COST RECOVERY IN SEWAGE MANAGEMENT

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Extent of cost recovery in sewage management | % | The extent of cost recovery is expressed as wastewater revenues as a percentage of wastewater expenses, for the corresponding time period. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total annual operating expenses | Rs lakhs | Should include all operating expenses (for the year) such as electricity, chemicals, staff and other establishment costs, outsourced operations/staff related to wastewater collection and treatment, and O&M expenses. Should exclude interest payments and principal repayments. |
| b. Total annual operating revenues | Rs lakhs | Should include all wastewater-related revenues billed for the year including taxes/cess/surcharges, user charges, connection charges, sale of sludge, sale of recycled water, etc. |
| **Cost recovery in sewage management** | % | **Cost recovery = [(b/a)*100]** |

| Rationale for the Indicator |
|---|
| Financial sustainability is a critical factor for all basic urban services. In services such as sewerage management, some benefits are received directly by the consumers, and some benefits accrue indirectly through a sustainable environment and public health benefits. Therefore, through a combination of user charges, fees and taxes, all operating costs may be recovered. Therefore, the indicator is critical for measuring overall cost recovery, the benchmark value for which is 100 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | There is no segregation of budget heads related to wastewater from the rest of the functions of the agency. A cash-based accounting system is practiced. There are no clear systems for reporting unpaid expenditure. Disclosures and reporting are not timely. Audits have a time lag and are not regular. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | Budget heads related to wastewater are segregated. Key costs related to wastewater are identifiable, although complete segregation is not practiced. Key income and expenditure are recognised, based on accrual principles. Disclosures are complete and on time. |
| Highest/preferred level of reliability (A) | In case of multi-function agencies such as municipal corporations, the budget heads related to wastewater are clearly separated. Cost allocation standards for common costs are in place. An accrual-based double entry accounting system is practiced. Accounting standards comparable to commercial accounting standards with clear guidelines for recognition of income and expenditure are followed. Accounting and budgeting manuals are in place and are adhered to. Financial statements have full disclosure and are audited regularly and on time. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **ULB level** |

## 2.2.9 EFFICIENCY IN COLLECTION OF SEWAGE CHARGES

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Efficiency in collection of sewage charges | % | Efficiency in collection is defined as current year revenues collected, expressed as a percentage of the total operating revenues, for the corresponding time period. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Current revenues collected in the given year | Rs lakhs per annum | Revenues collected for bills raised during the year. This should exclude collection of arrears as inclusion of arrears will skew the performance reflected. Collection efficiency is in fact an indicator of how many arrears are being built up, and therefore only current revenues should be considered. |
| b. Total operating revenues billed during the given year | Rs lakhs per annum | The total quantum of revenues related to sewage services that are billed during the year. This should include revenues from all sources related to sewage such as taxes, charges, cess, surcharges, etc. |
| **Collection efficiency** | % | **Collection efficiency = [(a/b)*100]** |

| Rationale for the Indicator |
|---|
| For a utility, it is not just enough to have an appropriate tariff structure that enables cost recovery objectives, but also efficient collection of revenues that are due to the utility. It is also important that the revenues are collected in the same financial year, without allowing for dues to get accumulated as arrears. It is therefore critical to monitor this indicator. The benchmark value for collection efficiency may be considered at 90 percent, since it is possible that about 10 percent of the dues may be delayed to the next year. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | There is no segregation of arrears versus current year revenue collection. A cash basis of accounting is followed. The accounting code structure does not enable clear segregation of water revenues. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | There is a clear segregation of current year revenues collection versus arrears collection. However, revenue collection is not matched against the specific bill issued. Overall accrual principles of accounting are followed, and therefore deposits and advances are not included in income and expenditure, respectively. |
| Highest/preferred level of reliability (A) | Collection records are maintained for each billing cycle. Collections are clearly identified against the specific bill which has been issued. Overall accrual principles of accounting are followed, and therefore deposits and advances are not included in income and expenditure, respectively. The accounting code structure also enables monitoring of billing and collections for each ward within the ULB. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **Zone/DMA level** |

# 2.3 SOLID WASTE MANAGEMENT

## 2.3.1 HOUSEHOLD LEVEL COVERAGE OF SOLID WASTE MANAGEMENT SERVICES

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Household level coverage of SWM services through door-to-door collection of waste | % | Percentage of households and establishments that are covered by a daily doorstep collection system. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of households and establishments in the service area | Number | The total number of households and establishments (not properties) in the service area should be calculated. The service area refers to either the ward or the ULB limits. |
| b. Total number of households and establishments with daily doorstep collection | Number | Include doorstep collection by the ULB itself or ULB approved service providers. This can even include door-to-door collection systems operated by RWAs, etc. |
| **Coverage** | % | **Coverage = [(b/a)*100]** |

## Rationale for the Indicator

This indicator provides the coverage of door-to-door solid waste collection services. Doorstep level collection is an essential and critical starting point in the entire chain of scientific SWM services. Waste-free clean roads and drains, scientific treatment of waste so as to maximise treatment, recycling and disposal can all be achieved in a sustainable manner only if door-to-door collection of waste is sustained. The benchmark value for this indicator is 100 percent.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Coverage numbers based on aggregate city level estimate by the service provider. |
| Intermediate level (C) | Coverage is estimated on the basis of the number of wards serviced by doorstep collection, as a percentage of the total number of wards in the ULB. |
| Intermediate level (B) | Estimation of coverage is based on the average daily waste collected by the ULB (in tonnes) from areas serviced by doorstep waste collection, divided by the estimated daily waste generation (in tonnes) by the entire city. Daily averages are based on the actual weighing of the waste collected on designated weighbridges, measured daily for seven consecutive days in a month. |
| Highest/preferred level of reliability (A) | Calculation is based on the actual number of households and establishments with doorstep collection as stated by the agency involved in doorstep collection. This may be verified from records of user charges collected for the doorstep collection services. The total number of households/establishments should be measured from updated GIS spatial data of the city. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Quarterly** | **Measurement** | **Ward level** |

## 2.3.2 EFFICIENCY OF COLLECTION OF MUNICIPAL SOLID WASTE

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Collection efficiency | % | The total waste collected by the ULB and authorised service providers versus the total waste generated within the ULB, excluding recycling or processing at the generation point. (Typically, some amount of waste generated is either recycled or reused by the citizens themselves. This quantity is excluded from the total quantity generated, as reliable estimates will not be available for these.) |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total waste that is generated and which needs to be collected | Tonnes per month | The total waste generated excluding waste processed or recycled at the generation point. This would depend on the population of the city, and the composition of economic activities. |
| b. Total quantum of waste that is collected by the ULB or authorised service providers | Tonnes per month | The total waste collected from households, establishments and common collection points. This should be based on actual weighing of the collected waste. Daily generation should be aggregated to calculate the total monthly quantum. This should exclude any special drives for waste collection, and waste generated from one-off activities such as demolitions, desilting canals, etc. |
| **Collection efficiency** | % | **Collection efficiency = [(b/a)*100]** |

## Rationale for the Indicator

This indicator is relatively easy to measure, and has been used for a long time as an indicator of efficiency in collection of waste. While the indicator is well understood, the reliability varies significantly on account of different methods used for measurement. Collection efficiency should measure waste collected in the normal course by SWM systems. Typically, the uncollected waste tends to gradually find its way into recycling, or is strewn along the roads, clogs the drains or in case of bio-degradable waste, putrefies and degrades. Therefore, collection efficiency is a key performance indicator. The benchmark value for this indicator is 100 percent.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Waste generation estimates are based on empirical standards of per capita waste generation based on the size of the city. Inadequate data available on waste collection, which is estimated based on the number of trips made by waste collection vehicles to the disposal site. |
| Intermediate level (C) | Nil. |
| Intermediate level (B) | Waste generation estimates are based on empirical standards of per capita waste generation based on the size of the city. Data available on waste collection, based on waste weighed by the weighbridge at the disposal site. |
| Highest/preferred level of reliability (A) | Waste generation estimates are based on quarterly surveys/samples of statistically significant and representative number of households and establishments. Seasonal variation in waste quantity generation is captured in these estimates. Waste collection is based on actual weighing of waste on a weighbridge at the disposal site (which is the aggregate of the waste measured at the composting yard, sanitary landfill site, and waste taken out for recycling/reuse after it has been collected). |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **Ward level** |

## 2.3.3 EXTENT OF SEGREGATION OF MUNICIPAL SOLID WASTE

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Extent of segregation of waste | % | Percentage of waste from households and establishments that is segregated. Segregation should at least be at the level of separation of wet and dry waste at the source. Ideally, separation should be in the following categories: biodegradable, non-biodegradable and hazardous waste.<br><br>It is important that waste segregated at the source is transported through the entire chain in a segregated manner. Hence the indicator is based on measurement of waste arriving in a segregated manner at the treatment/disposal site, rather than at the collection point. Bulk waste belonging to a specific category (e.g. vegetable market waste, food waste from hotels and restaurants, construction and debris waste, paper and plastics from offices) can be readily segregated by ensuring separate collection and transportation of the same. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Quantum of waste that is segregated | Tonnes per month | The total quantum of waste that arrives in a segregated manner at the treatment and/or disposal site (that is, composting yards, waste treatment plants, landfill sites, etc.). Waste that arrives at these locations in an unsegregated manner should not be considered. Waste taken away by recyclers from intermediate points should be added to this quantum. |
| b. Total quantum of waste that is collected by the ULB or authorised service providers | Tonnes per month | The total waste collected from households, establishments and common collection points. This should be based on actual weighing of the collected waste, and should exclude any special drives for waste collection, and waste generated from one-off activities such as demolitions, desilting canals, etc. (This corresponds to the quantity of (b), as measured for the indicator on collection efficiency.) |
| **Extent of segregation** | % | **Extent of segregation = [(a/b)*100]** |

## Rationale for the Indicator

Segregation of waste is a critical requirement for sustainable SWM systems. Segregation enables recycling, reuse, treatment and scientific disposal of the different components of waste. This can be readily undertaken by ULBs for bulk waste, enabling it to be treated, recycled or reused. If waste is received at treatment/disposal points in a segregated manner, it can be safely assumed that it has been segregated at source and transported so, while the converse may not be true. Therefore, segregation is being measured at this point of receipt, rather than at the point of collection. The benchmark value for this indicator is 100 percent. In cases where the ULB is adopting an integrated approach with various options for waste treatment where segregation is also taken care of, compliance with this provision may not be mandatory.

## Reliability of Measurement

| Reliability scale | Description of method |
|---|---|
| Lowest level of reliability (D) | Segregation is estimated by the service provider without any documentation of measurement methods adopted. |
| Intermediate level (C) | All households and establishments provided two separate waste containers are assumed to be 'segregating' waste. Then the percentage of households provided with two bins is used as the basis for estimating the extent of segregation. |
| Intermediate level (B) | Estimates of segregation are based on the input from agencies engaged in doorstep collection. The aggregates of estimates across all areas should be added up for the ULB-wide estimate. |
| Highest/preferred level of reliability (A) | The daily total of waste arriving in a segregated manner at disposal/ treatment sites should be measured, on the basis of weighing of individual trips. Waste taken away by recyclers from intermediate points should be added to this quantum, which can be assessed from wholesale waste recycling traders (*kabadiwalas*).<br><br>Alternately, the quantum of unsegregated waste received at the disposal point, that is, the composting yard, landfill site, or dump site, should be measured through regular weighing on a weighbridge. The daily totals should be arrived at by adding weights of all trips. The difference between the quantum collected and this quantum (unsegregated waste) should be equal to the quantity that is segregated.<br><br>A daily log of waste intake at processing facilities is maintained, which is aggregated for the monthly data. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **ULB level** |

## 2.3.4 EXTENT OF MUNICIPAL SOLID WASTE RECOVERED

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Extent of recovery of waste collected | % | This is an indication of the quantum of waste collected, which is either recycled or processed. This is expressed in terms of percentage of waste collected. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Amount of waste that is processed or recycled | Tonnes per month | The total quantum of waste intake by waste processing/recycling facilities operated by the ULB or operator at a city/ward/locality level. Inert matter, and other material refused by the processing/recycling facilities, which will go back to the dumping sites/landfills, should be deducted from the intake quantities.<br><br>Waste collected at intermediate points by informal mechanisms (rag pickers, etc.) and fed back into the recycling chain should be included in this quantity. This can be assessed through data from wholesale traders of such waste at the city level. Typically, there would be a few wholesalers at the city level from whom data can be collected. |
| b. Total quantum of waste that is collected by the ULB or authorised service providers | Tonnes per month | The total waste collected from households, establishments and common collection points. This should be based on actual weighing of the collected waste. This should exclude any special drives for waste collection, and waste generated from one-off activities such as demolitions, desilting canals, etc. (This corresponds to the quantity of (b), as measured for the indicator on collection efficiency.) |
| **Recovery** | % | **Extent of recovery = [a/b ]*100** |

| Rationale for the Indicator |
|---|
| Environmental sustainability demands that the maximum amount of waste should be either recycled, reused or processed. While the processing, recycling and reuse should be carried out without creating any health and environmental hazards, the total quantum of waste recovered is in itself a key performance parameter. Therefore, measurement of this indicator is critical. The benchmark value for this indicator will depend on the amount of inert matter included in the waste collected by the ULB. Waste composition is typically unique for each city, while being within a broad range of values for similar cities. The benchmark value for this indicator could be 80 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | Recovery estimates are based on the installed capacity of waste processing facilities. |
| Intermediate level (C) | Estimation of waste recovery is based on an aggregate mass balance. From the total estimated waste collection, deduct moisture loss and amount disposed at landfill/dump sites to arrive at the extent of waste recovered in the ULB. |
| Intermediate level (B) | Recovery estimates are based on measured consumption/inputs at the large, organised waste processing facilities, such as composting yards and waste-to-energy facilities. |
| Highest/preferred level of reliability (A) | Recovery estimates are based on measured consumption/inputs at the large, organised waste processing facilities, such as composting yards and waste-to-energy facilities. To this quantum, unorganised sector waste intake for processing is added. This will typically include community/colony level composting facilities, waste collected for recycling and reuse through the chain of waste recyclers (aggregates measured at the wholesaler level). A daily log of waste intake at processing facilities is maintained, which is aggregated for the monthly data. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **ULB level** |

## 2.3.5 EXTENT OF SCIENTIFIC DISPOSAL OF MUNICIPAL SOLID WASTE

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Extent of scientific disposal of waste at landfill sites | % | The amount of waste that is disposed in landfills that have been designed, built, operated and maintained as per standards laid down by Central agencies. This extent of compliance should be expressed as a percentage of the total quantum of waste disposed at landfill sites, including open dump sites. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total waste disposed in 'compliant' landfills every month | Tonnes per month | A daily log of waste being disposed at such 'compliant' landfill sites should be maintained, based on actual measurement at weighbridges that are preferably located at the entrance to such sites. The monthly total should be the sum of daily totals in the month. |
| b. Total waste disposed in all landfills every month | Tonnes per month | The total waste disposed after collection and recovery (if any) at landfills (including compliant landfills and open dumpsites). This quantity should be based on actual measurement at weighbridges that are preferably located at the entrance to such sites. The monthly total should be the sum of daily totals in the month. |
| **Extent of scientific disposal** | % | **Extent of scientific disposal = [a/b]*100** |

| Rationale for the Indicator |
|---|
| Inert waste should finally be disposed at landfill sites, which are designed, built, operated and maintained according to standards laid down in prevailing laws and manuals of nodal agencies. This includes collection and treatment of leachate at the landfill site. The extent of compliance should be evaluated against the total quantum of waste that is disposed at landfills. This is a critical performance parameter from an environmental sustainability perspective. The benchmark value for this indicator is 100 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | Poor data and records are available at landfill sites. There is no documentation of operations. Estimates are provided on the basis of estimated number of trips of trucks to the landfill site. |
| Intermediate level (C) | The quantity of waste being disposed at the landfill site is estimated on the basis of mass balance, that is, the total waste collected less moisture loss and waste recovered through recycling or processing. Actual measurements are not available. |
| Intermediate level (B) | Records are maintained and good quality data are available on the quantity of waste being disposed at the landfill/open dumping sites. However, there are no clear records on O&M of landfill operations. |
| Highest/preferred level of reliability (A) | Accurate and detailed records on the amount of waste being disposed at landfill sites are regularly collected, and records are maintained on operating practices and routines carried out at all landfill sites. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **ULB level** |

## 2.3.6 EFFICIENCY IN REDRESSAL OF CUSTOMER COMPLAINTS

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Efficiency in redressal of customer complaints | % | The total number of SWM-related complaints redressed within 24 hours of receipt of the complaint, as a percentage of the total number of SWM-related complaints received in the given time period. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total number of SWM-related complaints received per month | Number per month | The total number of all SWM-related complaints from consumers received during the month. Systems for receiving and logging in complaints should be effective and easily accessible to the citizens. Points of customer contact will include common phone numbers, written complaints at ward offices, collection centres, drop boxes, online complaints on the website, etc. |
| b. Total number of complaints redressed within the month | Number per month | The total number of SWM-related complaints that are satisfactorily redressed within 24 hours or the next working day, within that particular month. Satisfactory resolution of the complaint should be endorsed by the person making the complaint in writing, as part of any format/proforma that is used to track complaints. |
| **Efficiency in redressal of complaints** | % | **Efficiency in redressal of complaints = [(b/a)*100]** |

| Rationale for the Indicator |
|---|
| It is important that in essential services such as SWM, the utility has effective systems to capture customer complaints/grievances, escalate them internally for remedial action and resolve them. While many ULBs/utilities have put in place systems to capture complaints, much more work needs to be done to put in place back-end systems for satisfactorily resolving those complaints on time. As SWM is an essential service, the benchmark time for redressal is 24 hours or the next working day. It is therefore important to monitor this indicator. The benchmark value for this indicator will depend on a number of factors such as the size of the city, manpower, institutional network, etc. The benchmark value for this indicator may be set at 80 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | Complaints data are not maintained either at ward or city level. |
| Intermediate level (C) | There are multiple mechanisms/means by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. All complaints received are assumed to be resolved quickly. |
| Intermediate level (B) | There are multiple mechanisms/means by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. However, systems do not exist for aggregating, sorting and tracking the complaints. Data available for some months have been used as a trend to report the figures for some other months. |
| Highest/preferred level of reliability (A) | There are multiple mechanisms by which consumers can register their complaints such as by telephone, in person or by writing or e-mail. Complaints are segregated into different categories and are collated through a computer network or other systems, and tracked on a daily basis. The status of redressal of complaints is maintained. Consumers endorse complaints being addressed on the municipal proforma. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Monthly** | **Measurement** | **Ward level** |

## 2.3.7 EXTENT OF COST RECOVERY IN SWM SERVICES

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Extent of cost recovery for the ULB in SWM services | % | This indicator denotes the extent to which the ULB is able to recover all operating expenses relating to SWM services from operating revenues of sources related exclusively to SWM.<br><br>This indicator is defined as the total annual operating revenues from SWM as a percentage of the total annual operating expenses on SWM. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total annual operating expenses | Rs lakhs | Should include all operating expenses incurred by the ULB towards SWM services. This should include costs related to O&M expenses, all directly attributable administrative and establishment expenditure (including salaries, wages, contract labour hire charges, etc.). Operating expenses should also include payments to contractors for activities outsourced by the ULB. Should exclude interest payments and principal repayments. |
| b. Total annual operating revenues | Rs lakhs | Should include all taxes and charges for SWM, plus proceeds from processing or recycling that accrue to the account of the ULB. This should exclude income earned by contractors, or the informal sector, that is not passed onto the ULB. |
| **Cost recovery** | % | **Cost recovery = [b/a]*100** |

| Rationale for the Indicator |
|---|
| Financial sustainability is a critical factor for all basic urban services. In services such as SWM, some benefits are received directly by the consumers while some other benefits accrue indirectly through a cleaner and sustainable environment, apart from public health benefits. Therefore, costs related to SWM may be recovered through a combination of taxes and user charges. In case of SWM, there is potential to supplement user charges with revenues that can be gained from recycling, reuse and conversion of waste to either compost or fuel or directly to energy. Therefore, it is critical for measuring overall cost recovery. There is enough past precedence to reveal that the benchmark value for cost recovery may be set at 100 percent. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | There is no segregation of budget heads related to solid waste from other functions such as street sweeping and drainage. A cash-based accounting system is practiced. Account codes are not entered function-wise, and it is difficult to estimate SWM-related establishment, administrative and O&M costs. Disclosures and reporting are not timely. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | Budget heads related to SWM are segregated. Key costs related to SWM are identifiable, although complete segregation is not practiced. Key income and expenditure are recognised based on accrual principles. Disclosures are complete and on time. Accounts are finalised and closed, although the audit may be pending. |
| Highest/preferred level of reliability (A) | Budget heads related to SWM are clearly separated and cost allocation standards for common costs are in place. The accrual-based double entry accounting system is practiced. Accounting standards comparable to commercial accounting standards with clear guidelines for recognition of income and expenditure are followed. Accounting and budgeting manuals are in place and are adhered to. Financial statements have full disclosure and are audited regularly and on time. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **ULB level** |

## 2.3.8 EFFICIENCY IN COLLECTION OF SWM CHARGES

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Efficiency in collection of SWM charges | % | Efficiency in collection is defined as current year revenues collected, expressed as a percentage of the total operating revenues, for the corresponding time period. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Current revenues collected in the given year | Rs lakhs per annum | Revenues collected for bills raised during the year. This should exclude collection of arrears as inclusion of arrears will skew the performance reflected. Collection efficiency is in fact an indicator of how many arrears are being built up, and therefore only current revenues should be considered. |
| b. Total operating revenues billed during the given year | Rs lakhs per annum | The total quantum of revenues related to SWM services that are billed during the year. This should include revenues from all sources related to SWM such as taxes, charges, cess, surcharges, etc. |
| **Cost recovery** | % | **Collection efficiency = [(a/b)*100]** |

| Rationale for the Indicator |
|---|
| For a utility, it is not just enough to have an appropriate tariff structure that enables cost recovery objectives, but also efficient collection of revenues that are due to the utility. It is also important that the revenues are collected in the same financial year, without allowing for dues to get accumulated as arrears. It is therefore critical to monitor this indicator. The benchmark value for collection efficiency may be considered at 90 percent, since it is possible that about 10 percent of the dues may be delayed to the next year. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | There is no segregation of arrears versus current year revenue collection. Cash basis of accounting is followed. The accounting code structure does not enable clear segregation of revenues. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | There is clear segregation of current year revenues collection versus arrears collection. However, revenue collection is not matched against the specific bill issued. Overall accrual principles of accounting are followed, and therefore deposits and advances are not included in income and expenditure, respectively. |
| Highest/preferred level of reliability (A) | Collection records are maintained for each billing cycle. Collections are clearly identified against the specific bill which has been issued. Overall accrual principles of accounting are followed, and therefore deposits and advances are not included in income and expenditure, respectively. The accounting code structure also enables monitoring of billing and collections for each ward within the ULB. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **Ward level** |

# 2.4 STORM WATER DRAINAGE

## 2.4.1 COVERAGE OF STORM WATER DRAINAGE NETWORK

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Coverage of storm water drainage network | % | Coverage is defined in terms of the percentage of road length covered by the storm water drainage network |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Total length of road network in the ULB | Km | Only consider roads that are more than 3.5 m wide carriageway |
| b. Total length of primary, secondary and tertiary drains | Km | Only consider drains that are trained, made of pucca construction and are covered. |
| **Coverage of storm water drainage networks** | % | **Coverage = [(b/a)*100]** |
| c. Additional information on total length of storm water drains | Km | Total length of storm water drains including primary, secondary and tertiary drains—both covered and un-covered—should be included. |

| Rationale for the Indicator | |
|---|---|
| This indicator provides an estimation of the extent of coverage of the storm water drainage network in the city. The design and layout of the drainage network would vary significantly depending on factors such as topography, climate and town layout. The benchmark value for this indicator is 100 percent.<br><br>The above harmonises with the definition as per JNNURM performance awards (which presumably has anyway been taken from the SLB framework but worded differently): | |
| Coverage of storm water drainage network | Coverage is defined in terms of % of road length covered by storm water drainage network |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | Not applicable. |
| Intermediate level (C) | Estimated from city road maps, not updated in the past five years. |
| Intermediate level (B) | Estimated from city road maps (that are detailed and to scale), which have been updated in the past five years. |
| Highest/preferred level of reliability (A) | Actual ground level surveys are carried out to measure drain and road length. Surveys are carried out to verify that drains are of pucca construction and covered. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **Ward level** |

## 2.4.2 INCIDENCE OF WATER LOGGING/FLOODING

| Performance Indicator | | |
|---|---|---|
| **Indicator** | **Unit** | **Definition** |
| Aggregate number of incidents of water logging reported in a year | Number per year | The number of times water logging is reported in a year, at flood prone points within the city. |
| **Data Requirements** | | |
| **Data required for calculating the indicator** | **Unit** | **Remarks** |
| a. Identification of flood prone points within the ULB limits. The points may be named as A1, A2, A3,….An | Number | Flood prone points within the city should be identified as locations that experience water logging at key road intersections, or along a road length of 50 m or more, or in a locality affecting 50 households or more. |
| b. Number of occasions of flooding/water logging in a year | Number per year | An occasion or incident of flooding/water logging should be considered if it affects transportation and normal life. Typically, stagnant water for more than four hours of a depth more than six inches. |
| **The aggregate number of instances or occasions of water logging/flooding reported across the city in a year** | Number per year | **Aggregate incidence = (b at A1) + (b at A2) + ….. (b at An)** |

| Rationale for the Indicator |
|---|
| This indicator provides a picture of the extent to which water logging and flooding are reported in the ULB within a year, which have impacted a significant number of persons as well as normal life and mobility. This indicator provides an assessment of the impact or outcome of storm water drainage systems. The benchmark value for this indicator should be zero. |

| Reliability of Measurement | |
|---|---|
| **Reliability scale** | **Description of method** |
| Lowest level of reliability (D) | Not applicable. |
| Intermediate level (C) | Not applicable. |
| Intermediate level (B) | Based on reports/complaints filed by citizens. |
| Highest/preferred level of reliability (A) | Flood prone points should be first identified based on reports/ complaints filed by citizens, or by direct observations, and reported into a central control room. Monitoring stations (in charge of specific jurisdictions) should regularly monitor instances of flooding in the respective wards/zones, as mentioned above. Data should be captured by time, date, location and extent of flooding. |

| Minimum frequency of measurement of performance indicator | | Smallest geographical jurisdiction for measurement of performance | |
|---|---|---|---|
| **Measurement** | **Annually** | **Measurement** | **Ward level** |

# SECTION 3

## MAKING SERVICE LEVEL BENCHMARKING OPERATIONAL

# 3.0 MAKING SERVICE LEVEL BENCHMARKING OPERATIONAL

## 3.1 PERFORMANCE REPORT CARDS

Section I of this Handbook outlines the framework and provides guidance on instituting performance management systems, with the SLBs as the basis for monitoring and managing the performance of urban service delivery. Section II of this Handbook defines each of the SLBs, and outlines the most desirable system that should be applied for measuring the SLBs.

### 3.1.1 INITIATING PERFORMANCE REPORTING

Section III provides brief guidelines on how Service Level Benchmarking can be operationalised. While each ULB/utility will need to define and institutionalise the systems mentioned in Section I, a few common guidance points are mentioned here for reference.

- **Keep systems simple:** Data formats and other processes defined for performance measurement should be kept very simple to start with. For ULBs/utilities that have not had robust management information systems, it is important to take gradual steps;
- **Leadership should champion the initiative:** The Municipal Commissioner/ Chief Executive Officer of the ULB/utility should lead this initiative of making Service Level Benchmarking operational. All heads of departments will need to play an active role in this. The involvement of the Mayor/ Chairperson and other key elected representatives from the Standing Committees at the early stages is important to bring in the perspective of the elected leadership; and
- **Training and orientation:** Staff at all levels will need to undergo training and orientations on Service Level Benchmarking, to enable them to play their respective roles in the overall performance management system. Officers at the heads of department level should take the lead in orienting their respective staff.

## 3.1.2 PERFORMANCE REPORT CARDS

The minimum frequency of computation of the performance indicator, and the lowest level of geographic jurisdiction for which it should be measured, have been specified in the data sheets for each indicator. On the basis of these, the suggested frequency of reporting within the ULB/utility, and State/Central governments is provided in Table 1. Also, the geographic jurisdiction for which the indicators should be measured is specified in Table 1.

ULBs/utilities are advised to follow the framework suggested in Table 1. However, the ULB/utility may make minor changes in the frequency or jurisdiction of reporting, taking into account the size of the city and its prevailing systems. The endeavour should always be to report performance in as disaggregated a manner as possible, that is, reporting performance at the highest frequency as possible, and at the smallest geographical jurisdiction as possible.

## TABLE 1: SUGGESTED FREQUENCY AND JURISDICTION OF REPORTING

| SLB No. | Urban Service | Frequency of Measurement by ULB/Utility | Frequency of Reporting within ULB/Utility | Frequency of Reporting to State/ Central Govt. | Jurisdiction for Measurement by ULB/Utility | Jurisdiction for Reporting within ULB/Utility | Jurisdiction for Reporting to State/ Central Govt. |
|---|---|---|---|---|---|---|---|
| 1. | WATER SUPPLY | | | | | | |
| 2.1.1 | Coverage of water supply connections | Quarterly | Quarterly | Annually | Zone/DMA | Ward | ULB |
| 2.1.2 | Per capita supply of water | Monthly | Monthly | Annually | Zone/DMA | Ward | ULB |
| 2.1.3 | Extent of metering of water connections | Quarterly | Quarterly | Annually | Zone/DMA | Ward | ULB |
| 2.1.4 | Extent of non-revenue water (NRW) | Quarterly | Quarterly | Annually | ULB | ULB | ULB |
| 2.1.5 | Continuity of water supply | Monthly | Monthly | Annually | Zone/ DMA | Zone/ DMA | ULB |
| 2.1.6 | Quality of water supplied | Monthly | Monthly | Annually | ULB | ULB | ULB |
| 2.1.7 | Efficiency in redressal of customer complaints | Monthly | Monthly | Annually | Zone/ DMA | Zone/ DMA | ULB |
| 2.1.8 | Cost recovery in water supply services | Quarterly | Quarterly | Annually | ULB | ULB | ULB |
| 2.1.9 | Efficiency in collection of water supply-related charges | Annually | Annually | Annually | Zone/DMA | Ward | ULB |
| 2. | SEWAGE MANAGEMENT (SEWERAGE AND SANITATION) | | | | | | |
| 2.2.1 | Coverage of toilets | Quarterly | Quarterly | Annually | Ward | Ward | ULB |
| 2.2.2 | Coverage of sewage network services | Quarterly | Quarterly | Annually | Ward | Ward | ULB |
| 2.2.3 | Collection efficiency of sewage network | Monthly | Monthly | Annually | ULB | ULB | ULB |
| 2.2.4 | Adequacy of sewage treatment capacity | Annually | Annually | Annually | ULB | ULB | ULB |
| 2.2.5 | Quality of sewage treatment | Monthly | Monthly | Annually | ULB | ULB | ULB |
| 2.2.6 | Extent of reuse and recycling of sewage | Annually | Annually | Annually | ULB | ULB | ULB |
| 2.2.7 | Efficiency in redressal of customer complaints | Monthly | Monthly | Annually | Zone/ DMA | Zone/ DMA | ULB |
| 2.2.8 | Extent of cost recovery in sewage management | Annually | Annually | Annually | ULB | ULB | ULB |
| 2.2.9 | Efficiency in collection of sewage-related charges | Annually | Annually | Annually | Zone/DMA | Ward | ULB |

| SLB No. | Urban Service | Frequency of Measurement by ULB/Utility | Frequency of Reporting within ULB/Utility | Frequency of Reporting to State/ Central Govt. | Jurisdiction for Measurement by ULB/Utility | Jurisdiction for Reporting within ULB/Utility | Jurisdiction for Reporting to State/ Central Govt. |
|---|---|---|---|---|---|---|---|
| 3. | SOLID WASTE MANAGEMENT | | | | | | |
| 2.3.1 | Household level coverage of SWM services | Quarterly | Quarterly | Annually | Ward | Ward | ULB |
| 2.3.2 | Efficiency of collection of municipal solid waste | Monthly | Monthly | Annually | Ward | Ward | ULB |
| 2.3.3 | Extent of segregation of municipal solid waste | Monthly | Monthly | Annually | ULB | ULB | ULB |
| 2.3.4 | Extent of municipal solid waste recovered | Monthly | Monthly | Annually | ULB | ULB | ULB |
| 2.3.5 | Extent of scientific disposal of municipal solid waste | Monthly | Monthly | Annually | ULB | ULB | ULB |
| 2.3.6 | Efficiency in redressal of customer complaints | Monthly | Monthly | Annually | Ward | Ward | ULB |
| 2.3.7 | Extent of cost recovery in SWM services | Annually | Annually | Annually | ULB | ULB | ULB |
| 2.3.8 | Efficiency in collection of SWM-related charges | Annually | Annually | Annually | Ward | Ward | ULB |
| 4. | STORM WATER DRAINAGE | | | | | | |
| 2.4.1 | Coverage of storm water drainage network | Annually | Annually | Annually | Ward | Ward | ULB |
| 2.4.2 | Incidence of water logging/flooding | Quarterly | Quarterly | Annually | Ward | Ward | ULB |

On the basis of this framework, ULBs should prepare Performance Report Cards, which would form the basis for reporting and monitoring performance.

The Report Cards should necessarily contain the following information:

- The time period for which performance is being reported;
- The specific urban service and SLB for which performance is being reported;
- Current baseline and actual accomplishment of performance as time passes;
- Targeted performance levels for subsequent time periods (typically four to six time periods). For indicators that are reviewed monthly or quarterly, targets should be set for the next four to six months/quarters. Only then can tangible targets be set and monitored;
- The measure of reliability of the systems, on the basis of which the indicator has been measured (either A or B or C or D); and
- A brief plan of action for achieving the targeted performance level for each of the forthcoming time periods.

Two sample report cards are illustrated in the Annex.

# 3.2 SUSTAINING THE PERFORMANCE MANAGEMENT SYSTEM

It would be as much a challenge to sustain a good performance management system as to set up and operationalise it. Listed below are a few critical success factors to sustain a performance management system for urban services:

- **Improvement in data systems:** Along with performance levels, the review should also continuously focus on the data systems through which data are collected and performance reported. Through a process of continuous improvement, the data systems should be brought to the desired levels of highest reliability of measurement. Independent third party agencies may be engaged for verification of the performance reports on a selective basis. Data collection and reporting should, however, always be with the ULB/utility, else ownership of performance could be compromised;

- **Maintaining performance reporting and review time cycles:** To maintain the sanctity of the system, performance should be diligently reported and reviewed at the scheduled time period. If review is not periodically undertaken, the data collection, analysis and reporting systems are likely to degenerate over time;

- **Dissemination and disclosure:** Dissemination and disclosure should be essential elements of the performance management system. Performance data should be reported in the ULB's/utility's annual reports, be shared with media and other stakeholders in the interest of transparency and for enhanced accountability.

- **Input for planning and resource allocation:** Performance reports should form an important input for planning investments in capital works and operational improvements, and therefore in the budgeting process; and

- **System of awards and incentives:** A system of awards and incentives is an important and essential component of a performance management system. Awards and incentives should be directed to the field level staff that is responsible for direct impact on service delivery.


जन सुविधा केंद्र
गौरेयाघाट, जबलपुर
सुविधाएँ

# ANNEX

## ILLUSTRATIVE PERFORMANCE REPORT CARD

Sector: *Water Supply* SLB: *Coverage of Water Supply Connections*

Reporting Frequency: *Annual* Reporting Period: *FY 2008-09*

Reporting Jurisdiction: *Limits of **** Municipal Corporation* Performance Report submitted to: *State Government*

*All figures are in %*

| Time Period | Performance Achieved | Performance Targeted | Performance Achieved as per Reliability of Measurement Level | Action Plan to Achieve the Target |
|---|---|---|---|---|
| FY 2008-09 (baseline) | 71 | B | | |
| FY 2009-10 | | 75 | | • All backlog applications for new connections will be cleared in the next 12 months |
| FY 2010-11 | | 85 | | • Major source augmentation and transmission project will be completed |
| | | | | • Regularisation of all illegal connections in north of the city |
| FY 2011-12 | | 90 | | • Distribution improvement project will be taken up<br>• Standposts will be replaced in slums in Ward nos ___ to ___<br>• Regularisation of all illegal connections in south of the city |
| FY 2012-13 | | 95 | | • Standposts will be replaced in slums in Ward nos ___ to ___ |

Sector: *Solid Waste Management* SLB: *Household level Coverage of SWM Services*

Reporting Frequency: *Quarterly* Reporting Period: *January-March 2009*

Reporting Jurisdiction: *Ward No. 11 of **** Municipal Corporation* Performance Report submitted to: *Standing Committee*

*All figures are in %*

| Time Period | Performance Achieved | Performance Targeted | Performance Achieved as per Reliability of Measurement Level | Action Plan to Achieve the Target |
|---|---|---|---|---|
| Jan-Mar 2009 (baseline) | nil | | B | |
| Apr-Jun 2009 | | 75 | | • An NGO from the area will be encouraged and supported to start the doorstep collection process. If the NGO does not start the activity, it will be contracted out. Operations will commence by May 2009.<br>• All RWAs and apartments in the ward will be encouraged to keep waste at the doorstep and not dispose it directly into the municipal bin.<br>• Councillor for Ward will lead the process. |
| Jul-Sept 2009 | | 90 | | • The shopkeepers association will next be brought into the loop. The market association will be encouraged to either pay user charges to the NGO contractor, or alternately collect waste at the doorstep through own arrangements.<br>• Fine for littering will be introduced.<br>• Collection beats network will be reviewed and expanded. |
| Oct-Dec 2009 | | 95 | | • The balance houses, those not within RWAs or apartments, will be encouraged to keep waste at the doorstep for collection.<br>• Slums/poor households will be provided street corner bins, at multiple points in each slum, from where waste will be collected. |
| Jan-Mar 2010 | | 100 | | • Intensive communication will be introduced. Roadside bins/*dhalos* will be demolished. |