

# Pey Jal Survekshan 2022



Toolkit





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AMRUT 2.0 is a step towards AatmaNirbhar Bharat with the aim of making the cities 'water secure' and providing functional water tap connections to all households. The mission envisages providing tap water connections to households in all statutory towns through 2.68 crores new household tap connections and providing universal household coverage of sewerage/septage services in 485 AMRUT cities through 2.64 crore new sewer connections/coverage with septage management. This will be achieved through a circular economy of water by effecting water source conservation, rejuvenation of water bodies and wells, reuse of treated used water, and rainwater harvesting by involving the community at large.

To assess the water health of cities, Pey Jal Survekshan (PJS) has been launched in all 485 AMRUT Cities (487 cities before the merger). The survekshan will instill healthy competition among cities and act as an accelerator tool at the ULB level, providing a guiding framework for planning, implementing, and monitoring urban water supply sector.

Pey Jal Survekshan 2022 toolkit has been developed as a guiding document to assess and rank 485 AMRUT cities, on water security parameters.



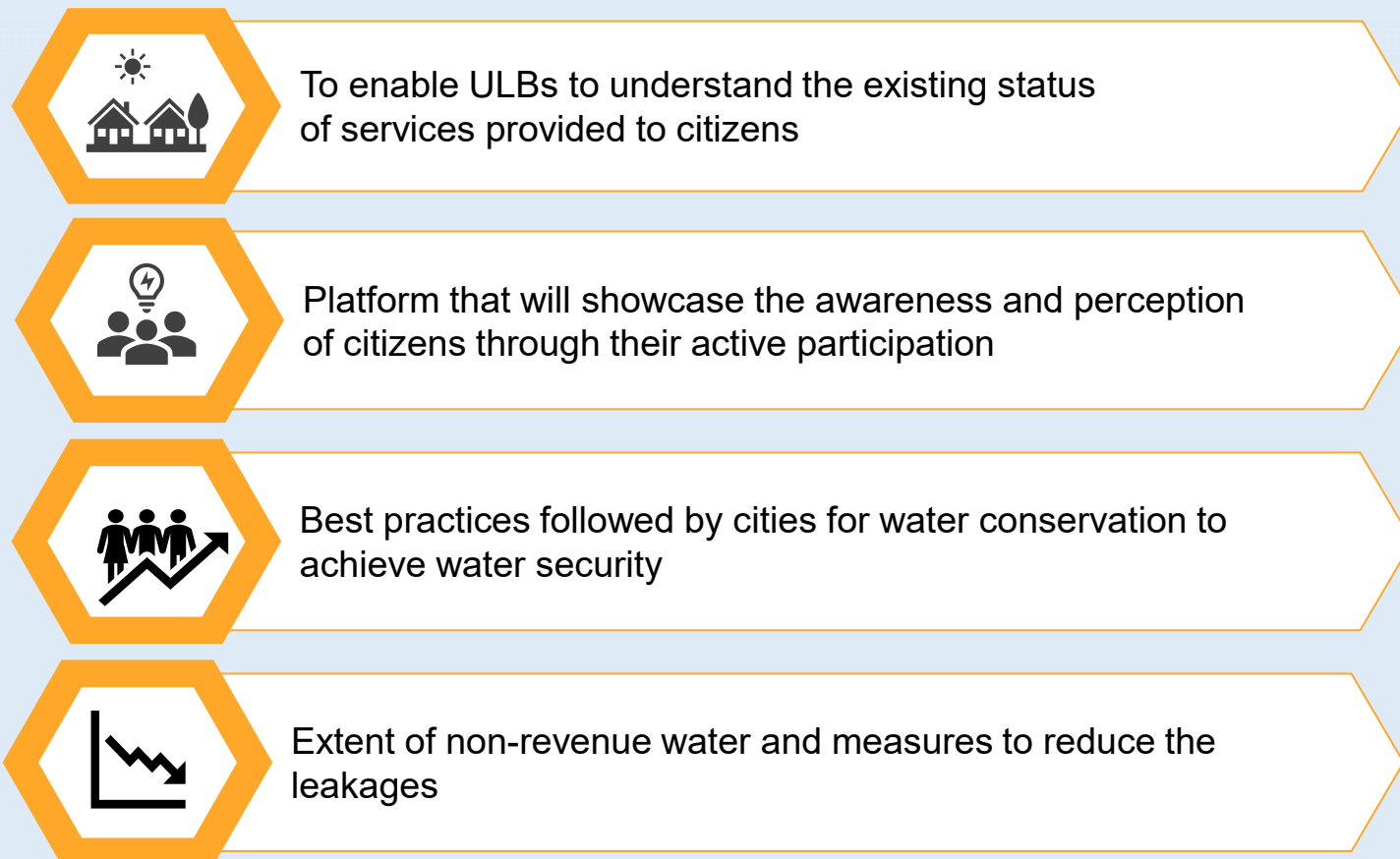
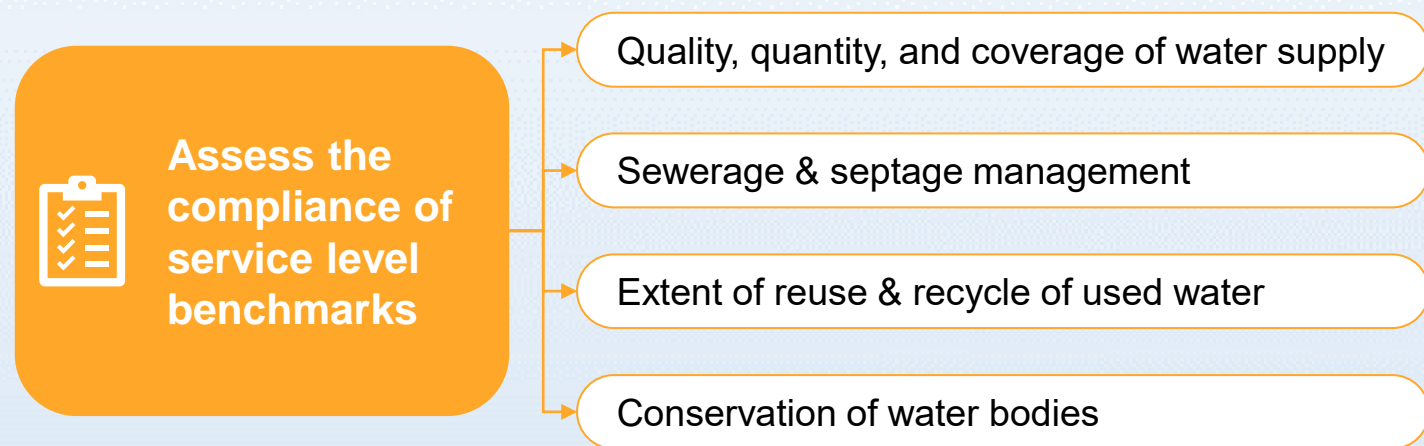




# Introduction



# Objective



### Citizen Outreach

- Redressal system (ULB Helpline)
- Information, education and communication (IEC) activities

### Access and Coverage

- Water supply, sewerage connections and city level provision of 24\*7 water supply

### Water Sustainability Parameters

- Water resource management
- Water flow measurement techniques (SCADA)
- District Metered Area (DMA)



### Service Levels

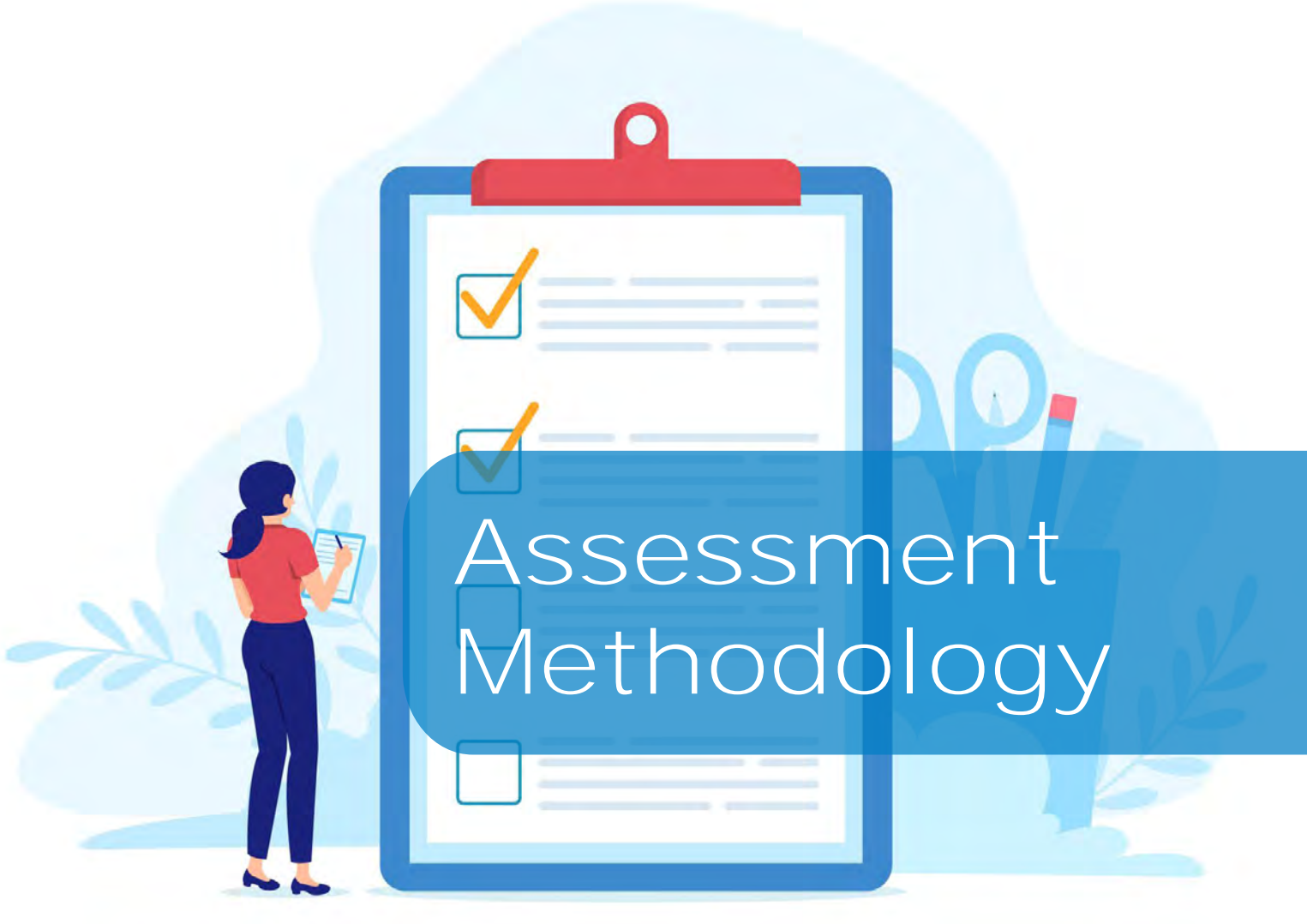
- Measuring the quantity as well as quality of potable water at WTP outlets

### Financial Sustainability

- Extent and efficiency of cost recovery for water supply services in the city

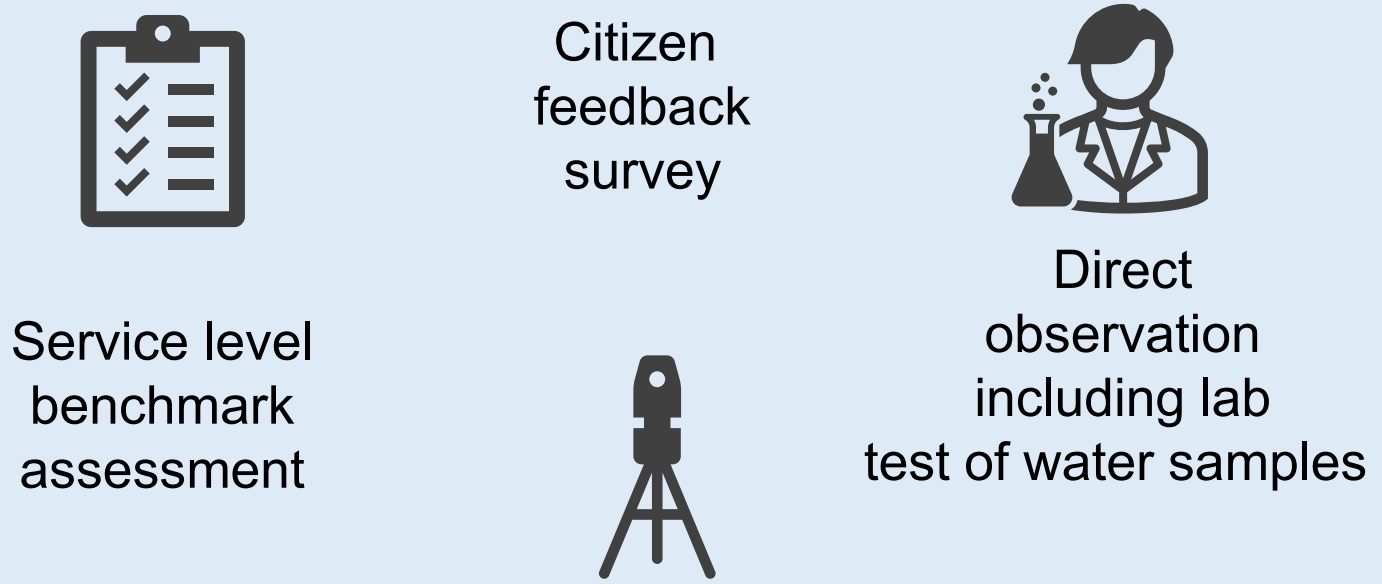
### Water Resources Rejuvenation

- Rainwater harvesting (RWH) bylaws at city level
- Rejuvenation and health of water bodies



# Key Focus Areas

## Components of Assessment





# List of Abbreviations

S.No.	Abbreviation	Full form
1	<b>AMRUT</b>	Atal Mission for Rejuvenation and Urban Transformation
2	<b>BIS</b>	Bureau of Indian Standards
3	<b>BOD</b>	Biochemical Oxygen Demand
4	<b>CF</b>	Citizen Feedback
5	<b>CFU</b>	Colony Forming Units
6	<b>COD</b>	Chemical Oxygen Demand
7	<b>CPCB</b>	Central Pollution Control Board
8	<b>DCB</b>	Demand, Collection & Balance
9	<b>DMA</b>	District Metered Area
10	<b>DO</b>	Direct Observation
11	<b>DPR</b>	Detailed Project Report
12	<b>ESR</b>	Elevated Service Reservoir
13	<b>FSTP</b>	Faecal Sludge Treatment Plant
14	<b>GSR</b>	Ground Service Reservoir
15	<b>HH</b>	Household

# List of Abbreviations

S.No.	Abbreviation	Full form
16	<b>IEC</b>	Information, Education and Communication
17	<b>IV</b>	Independent Validation
18	<b>IVM</b>	Independent Validation Matrix
19	<b>LPCD</b>	Litre Per Capita Per Day
20	<b>mg</b>	Milligram
21	<b>MLD</b>	Million Litres Per Day
22	<b>MoHUA</b>	Ministry of Housing and Urban Affairs
23	<b>MPN</b>	Most Probable Number
24	<b>NABL</b>	National Accreditation Board for Testing and Calibration Laboratories
25	<b>NRW</b>	Non-Revenue Water
26	<b>NTU</b>	Nephelometric Turbidity Units
27	<b>ODF</b>	Open Defecation Free
28	<b>OSS</b>	Onsite Sanitation
29	<b>PJS</b>	Pey Jal Survekshan
30	<b>PPS</b>	Probability Proportionate to Size

# List of Abbreviations

S.No.	Abbreviation	Full form
31	<b>RWH</b>	Rainwater Harvesting
32	<b>SCADA</b>	Supervisory Control and Data Acquisition
33	<b>SLB</b>	Service Level Benchmark
34	<b>SPCB</b>	State Pollution Control Board
35	<b>SS</b>	Sample Size
36	<b>STP</b>	Sewerage Treatment Plant
37	<b>SWD</b>	Storm Water Drains
38	<b>TDS</b>	Total Dissolved Solids
39	<b>TUW</b>	Treated Used Water
40	<b>ULB</b>	Urban Local Body
41	<b>UT</b>	Union Territory
42	<b>WRD</b>	Water Resource Department
43	<b>WTP</b>	Water Treatment Plant



Focus Areas	Maximum score
1 Water utility services	700
2 Used water utility services	700
3 Water bodies	200
4 Non-revenue water	200
5 Best practices and innovations	300
<b>Total score</b>	<b>2,100</b>



# Sampling Methodology

The information regarding the no of water bodies, plants (FSTP, STP &WTP), parks with RWH, water bodies and households with metered connection in the ULB will be available in the PJS portal. This Information will constitute the sampling universe.

Sample selection for household: Based on the population of the city, the desired sample is fixed which is mentioned in the table below. For example, in a ULB that has population of 1-3 lakh, 1000 households will be covered.

These 1000 HH will be distributed across the wards using probability proportionate to size (PPS) method. Which means the larger wards will have more sample as compared to the smaller wards, and the sample will be selected from all the wards. Sample selection for plants, parks with RWH and water bodies: Based on the declarations provided by the ULBs on the PJS portal fixed number of plants, parks with RWH and water bodies will be surveyed in each ULB as mentioned in the table below.

Population	1-3 Lacs	3-10 Lacs	10-40 Lacs	>40 Lacs
Sample Size (number of respondents)	1,000	1,000	1,000	2,000

- Sample size for water sample collection:

Water Sample Collection Area*	1-3 Lacs	3-10 Lacs	10-40 Lacs	>40 Lacs
Water Treatment Plant**	6	9	15	24
Treated Used Water (STP/FSTP)**	6	9	15	24
Tap Water	25	40	60	80
Water Body (3 water bodies- 4 samples from each)	12	12	12	12

\* All samples to be collected as per the standard BIS/CPCB methodology.

\*\* Agency has to visit all the WTP/STP/FSTP claimed by the ULB. Whichever plant is selected for samples, 3 samples will be collected from each plant one at the input side and two from at output side. This will be done for checking accuracy and differences between the samples. In case the treatment plants are not available, samples of tap water would be increased proportionately.

# Scoring Methodology and Independent Validation Matrix

## Steps

- 1 Cities will claim score on the Pey Jal Survekshan portal by submitting relevant documents.
- 2 Assessors will go on ground and collect documentary evidence as well as conduct field observations.
- 3 The score will be calculated based on the evidence and field observation. In case of sample failed, marks will be deducted.
- 4 Final score to be calculated after deducting negative marks based on the IVM (Independent Validation Matrix).



## INDEPENDENT VALIDATION MATRIX (IVM)

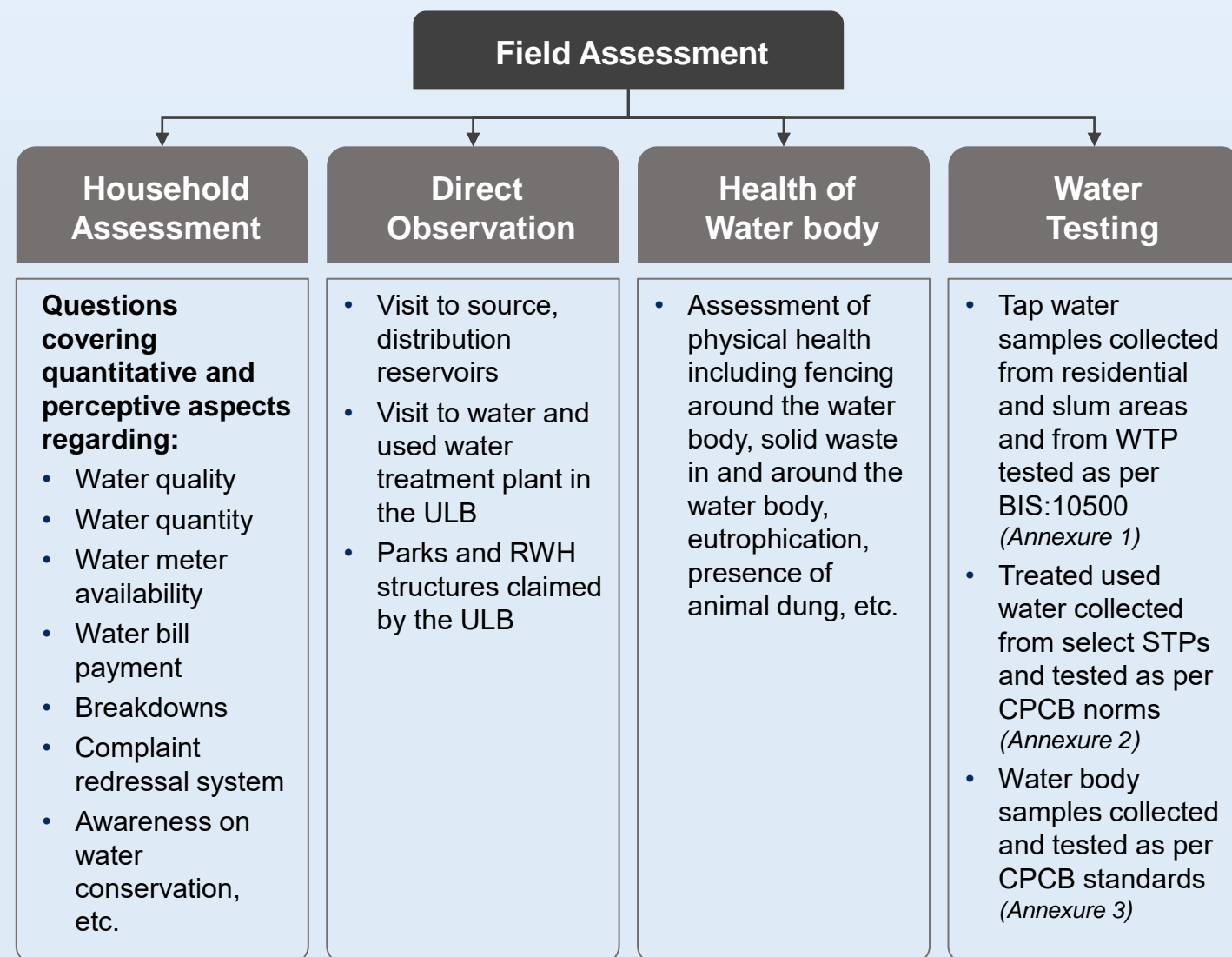
Examples	Indicator No.	Total score	Score claimed by the ULB	% of samples failed as per survey	Score to be deducted	Final Score
1	1.2	100	100	30.04%	30.04	69.95
2	1.4C	30	30	73.06%	21.92	8.07

\*These are illustrative examples.



# On-Field Assessment Process

The ULBs will upload the documents, as indicated in the toolkit on the assessment portal. The documents received will be assessed by a team of desktop assessors. Once the assessment is complete the data will be used for on-field validation and assessment. The on-field assessment will include module of household assessment, direct observation of water infrastructures (STP, FSTP and WTP), water bodies and parks. Water samples will be collected from these locations and will be sent to NABL accredited labs for testing.



## Water Utility Services



Indicator	Max score
1.1 Water supply coverage	100
1.2 Water treatment capacity	100
1.3 Water quantity supplied	50
1.4A Water quality (At WTP outlet)	50
1.4B Water quality (At Consumer end)	50
1.4C Portal availability to check water quality supplied	50
1.5 Extent of metering	50
1.6A Cost recovery in water supply services	50
1.6B Water charges collection efficiency	50
1.7A Redressal of complaints via ULB helpline	50
1.7B Redressal of complaints in 24 Hours	50
1.8 Rainwater harvesting efficiency	50



## Water Utility Services - Overview

One of the key objectives of AMRUT 2.0 is to provide adequate quantity and quality of drinking water to all urban households in the country. It will be ensured through provision of water services provided by the ULBs. There are twelve indicators in this section, on which the ULBs will be assessed for the services rendered by them. This section covers in detail the process that would be followed during the assessment for the twelve indicators.



Water supply coverage: Percentage of current households provided with piped water supply connection



% Piped Water Supply	Score
≥95%	100
75 to <95%	80
50 to <75%	60
25 to <50%	40
<25% *	20
0%	0

\* In case of <25%, reason for less coverage including dependence on alternate sources will be recorded.



# 1.1

100

Percentage of households provided with piped water supply connection

### List of Documents

- 1 Property tax software records/water register with updated records of water supply connections
- 2 Ward wise list of residential and slum households/populations with direct water service connection.

### MIS\* Value and Calculation

Total number of current** households	A1	Number
Total number of households with piped water supply	A2	Number
% Households with piped water supply	A3	$A2/A1*100$

### Validation 100% Samples from the Citizen

- 1 The assessor will randomly approach the households provided with piped water supply covering all wards claimed and ask question on the source of water supply in the households.
- 2 On the basis of response (negative/positive) received from households, Independent Validation (IV) score will be applied, and final score will be given. Final Score = Score claimed – Score adjusted as per IVM.

\*MIS Value - Data from AMRUT 2.0 Collaborative Platform

\*\*Current households – The current households shall be as per the projection for ULBs in AMRUT portal.

# 1.2

100

Water treatment: Percentage of water treated before distribution to consumers



### % of Water Treated Before Supply

% of Water Treated Before Supply	Score
≥95%	100
75 to <95%	80
50 to <75%	60
25 to <50%	40
<25% *	20
0%	0



# 1.2

100

Water treatment: Percentage of water treated before distribution to consumers

### List of Documents

- 1 Water account statement showing total volume of water produced by surface sources
- 2 Details of all water treatment plants installed by the ULB
- 3 Water produced through ground water (pumps)-DPR/Official records and treatment done, if any.
- 4 Water produced through any other sources (desalination, rainwater harvesting, etc.)-DPR/Official records

### MIS Value and Calculation

Total volume of water produced from all sources	B1	Litre
Volume of water treated before distribution	B2	Litre
% Water treated	B3	$B2/B1*100$

### Validation

60% Direct Observation + 40% Citizen Feedback (CF)

- 1 The on-field assessor will visit the water treatment plants on field to check the functionality of the plants.
- 2 The on-field assessor will also ask households with piped water supply on their satisfaction on quality of water including odour, appearance, etc.
- 3 On the basis of the observation, Independent Validation (IV) score will be applied, and final score will be given. Final Score = Score claimed – Score adjusted as per IVM.

# 1.3

50

Quantity of water supplied to the citizens in LPCD



### Water Quantity Supplied in LPCD as Percentage of Service Level Benchmarks Claimed by the ULB

Score

≥95%	50
75 to <95%	30
50 to <75%	10
<50%	0



# 1.3

50

Quantity of water supplied to the citizens in LPCD

### List of Documents

- 1 Total residential and slum population details
- 2 Details of total volume of water produced by the ULB
- 3 Service level benchmarks claimed by ULB
- 4 5 Sample household water bills from the last month

### MIS Value and Calculation

Total number of residents	A1	Number
Total volume of water produced (in L)	A2	Litre
Water supplied per capita in LPCD	A3	A2/A1

### Validation 100% Samples from the Citizen

- 1 The assessor will visit the households that are metered (as claimed by the ULB) and their monthly bills will be reviewed to check water supplied to the households, wherever applicable.
- 2 If 0% metering is done, pump details of the ULB plus hours of supply will be taken into consideration for the requisite calculation and verification.
- 3 On the basis of response (negative/positive) received from households, Independent Validation (IV) score will be applied, and final score given. Final Score = Score claimed – Score adjusted as per IVM

# 1.4A

50

Water quality (water testing): water samples passing the quality check at water treatment plant outlet (as per BIS: 10500 essential parameters)



### Water Testing Record at Treatment Plant

Water Testing Record at Treatment Plant	Score
Yes	20
No	0

### No. of Failed Samples

No. of Failed Samples	Score (30)
0	30
1 (for ULBs with 1-10 lakh population) 2 (for ULBs with 10-40 lakh population) 4 (for ULBs with >40 lakh population)	15
>1 (for ULBs with 1-10 lakh population) >2 (for ULBs with 10-40 lakh population) >4 (for ULBs with >40 lakh population)	0



# 1.4A

50

Water quality (water testing):  
Water samples passing the quality check at water treatment plant outlet (as per BIS: 10500 essential parameters)

### List of Documents

- 1 Test reports maintained at Water Treatment Plants (WTP). Reports must be from the past 3 months

### MIS Value and Calculation

Total number of samples collected	C1	Number
Total number of samples passed	C2	Number
% Samples passed	C3	$C2/C1*100$

### Validation As per Sample Test Reports

- 1 Water sample will be collected from WTPs and tested for essential parameters (Annexure-1) as per BIS:10500. Water sample must pass the test for all essential parameters in Annexure-1, else the sample will be considered as failed.

# 1.4B

50

Percentage of water samples passing the quality check at consumer end (as per BIS: 10500 essential parameters)



### % Samples Passing Quality Check

### Score

≥95%	50
75 to <95%	40
50 to <75%	30
25 to <50%	20
<25%	10
<50%	0



# 1.4B

50

Percentage of water samples passing the quality check at consumer end (as per BIS: 10500 essential parameters)

## List of Documents

- 1 Test reports for Physical/Chemical/Bacteriological tests (if available at ULB) from consumer end and total no. of samples passed at NABL accredited lab. Test reports must be from the past 3 months.
- 2 List of wards where water sample testing is done in last one year.

## MIS Value and Calculation

Total number of samples collected on ground	D1	Number
Total number of samples passed	D2	Number
% Water samples passed	D3	D2/D1*100

## Validation on Ground Lab Testing

- 1 Tap water samples will be collected from households and will be sent to NABL labs for testing the quality of drinking water (Annexure-1) as per BIS: 10500.
- 2 Samples will be collected from each ULB and tested for drinking water quality.
- 3 Water sample must pass the test for all essential parameters in Annexure-1, else the sample will be considered as failed.

# 1.4C

50

Availability of information to the citizen on quality of water supplied

The screenshot shows a public portal interface. On the left is a navigation menu with items like 'About Us', 'Organisational Setup', 'Citizens Charter', 'Customer Section', 'Information', 'Expression of Interest', 'Right to Information Act', and 'Latest News'. The main content area displays 'Water samples collection reports on 27.07.2022 to 25.08.2022' with a PDF download link and 'Language : English'. Below this is a 'CITIZEN CORNER' section with a table titled 'Habitation list of District: GURUGRAM with Water Status More than 55 lpcd'. The table lists various habitations with their respective water status (LPCD). To the right, a mobile app interface shows a 'Chloride (mg/l)' test result of 560, which is above the 'Permissible limit= 250'. The app has a gauge with 'LOW', 'MEDIUM', and 'HIGH' indicators.

## Scheme of Marking

Information available in public domain through online portal/digital/print media etc. (Last 6 months)

Score

50

Contract for development of online portal signed

30

Information not available in public domain

0



1.4C

50

Availability of information to the citizen on quality of water supplied

**List of Documents**

- 1 Work order of portal development
- 2 Link and screenshots of the portal/digital/print media showing water quality

**Validation  
100% Samples from the Citizen**

- 1 The assessor will randomly approach the households with piped water supply in wards and ask question on whether they are aware about portal available/digital/print to check quality of water supplied.
- 2 On the basis of response (negative/positive) received from households, Independent Validation (IV) score will be applied and final score given. Final Score = Score claimed – Score adjusted as per IVM

1.5

50

Extent of metering connections - percentage of households with water meters



**% Metered Connections**

**Score**

≥50%	50
30 to <50%	35
10 to <30%	20
<10%	10
0%	0



1.5

50

Extent of metering connections - percentage of households with water meters

**List of Documents**

Ward wise list of households with piped water supply and water meter connections

**MIS Value and Calculation**

Total number of households with piped water connection	E1	Number
Total number of households with water meters	E2	Number
% Households with water meter	E3	$E2/E1*100$

**Validation  
100% Citizen Feedback**

- 1 The on-field assessor will visit households with piped water supply from the list shared by the ULB and ask if water meters are installed. Water bills may also be asked for proof.
- 2 On the basis of the observation, Independent Validation (IV) score will be applied, and final score will be given. Final Score = Score claimed – Score adjusted as per IVM.

1.6A

50

Cost recovery in water supply services – Percentage of revenue earned vs Operating cost for water supply services



**Cost Recovery %**

**Score**

100%	50
75% to <100%	40
50% to <75%	30
25% to <50%	20
<25%	10
0%	0



1.6A

50

Cost Recovery in water supply services – Percentage of revenue earned vs Operating cost for water supply services

**List of Documents**

- 1 Demand, collection & balance (DCB) statement, generated through property tax software/water billing
- 2 Statement of accounts issued by the ULB/authorized department

**MIS Value and Calculation**

Total annual operating expenses	F1	Rs
Total annual operating revenue	F2	Rs
% Cost recovery	F3	$F2/F1*100$

**No Validation**

Score to be allotted as per the claims made by ULB and the documents provided.

1.6B

50

Efficiency in collection of water charges – value of bills generated vs revenue collected



**Efficiency in Collection of Water Charges** **Score**

100%	50
75% to <100%	40
50% to <75%	30
25% to <50%	20
<25%	10
0%	0



1.6B

50

Efficiency in collection of water charges – value of bills generated vs revenue collected

**List of Documents**

- 1 Demand, Collection & Balance (DCB) statement, generated through property tax software/water billing
- 2 Statement of accounts issued by the ULB
- 3 5 Sample household water bills from the last month
- 4 5 Sample commercial water bills from the last month

**MIS Value and Calculation**

Total value of bills generated for water charges	J1	Rs
Total annual revenue collected	J2	Rs
% Of collection	J3	$J2/J1*100$

**No Validation**

**Only for additional validation-**

- 1 Assessor will visit the households with piped water supply and ask citizens on the how much water bill they pay (amount) and frequency of billing.
- 2 Assessor will visit commercial areas with piped water supply and ask about user charges paid by them and collect water bill copy, wherever possible.

1.7A

50

Percentage of complaints received via the helpline no./online mode provided by the ULB



% Complaints Received via ULB Helpline/ Online Mode	Score
100%	50
75% to <100%	40
50% to <75%	30
25% to <50%	20
<25%	10
0%	0

1.7A

50

Percentage of complaints received via the helpline no./online mode provided by the ULB

1.7B

50

Redressal of complaints- Percentage of complaints resolved in 72 hours

List of Documents

- 1 Details of complaints received on the helpline number/online mode or through physical means during April 2021 to March 2022
- 2 Documents showing date of issue/renewal of helpline number.
- 3 Copy of MoU, in case the operations outsourced to some other agency.

MIS Value and Calculation

Total numbers of complaints received	G1	Number
Total number of complaints received via helpline/ online mode	G2	Number
% Complaints received via helpline/ online	G3	$G2/G1*100$

Validation 100% Citizen Feedback

- 1 On call validation: 1% of complaints or 10 contacts from each month to be called to verify the claim during April 2021 to March 2022.
- 2 On the basis of the observation, Independent Validation (IV) score will be applied, and final score given. Final Score = Score claimed – Score adjusted as per IVM.



% Complaints Resolved in 72 Hours\* Score

100%	50
75% to <100%	40
50% to <75%	30
25% to <50%	20
<25%	10
0%	0

\* Survey agency, in consultation with MoHUA, will decide upon the cases where estimated time for redressal is more than 72 hours because of quantum of work involved but ULB has taken action within 72 hours.



# 1.7B

50

Redressal of complaints-  
Percentage of complaints  
resolved in 72 hours

### List of Documents

- 1 Category wise list of complaints received by the ULB.
- 2 Contact details of the residents who've complained.
- 3 Duration to resolve the complaints.

### MIS Value and Calculation

Total numbers of complaints received	G1	Number
Total number of complaints resolved in 72 Hrs	G2	Number
% Complaints resolved in 72 Hrs	G3	$G2/G1*100$

### Validation 100% Citizen Feedback

- 1 The on-field assessor will enquire with households with piped water supply about the time taken to resolve the complaints.
- 2 On the basis of the observation, Independent Validation (IV) score will be applied and final score will be given. Final Score = Score claimed – Score adjusted as per IVM.

# 1.8

50

Rainwater harvesting structures: (i) Provisions in building bylaws, (ii) Parks with RWH system



### Scheme of Marking

### Score

<b>A. Mandatory provision for rainwater harvesting in building bylaws</b>	<b>20</b>
<b>B. Percentage of parks with RWH system</b>	<b>30</b>
100%	30
75% to <100%	20
50% to <75%	10
25% to <50%	7.5
<25%	0

# Rainwater harvesting structures: (i) Provisions in building bylaws, (ii) Parks with RWH system

## List of Documents

- 1 Copy of building bylaws highlighting provision and incentives for RWH structures.
- 2 Details of parks with RWH structures.

## MIS Value and Calculation

Total parks in the ULB	H1	Number
No. of parks with RWH system	H2	Number
% Parks with RWH	H3	$H2/H1*100$

## Validation 100% Citizen Feedback

- 1 On-field assessor will visit parks randomly to check the existing system for rainwater harvesting.
- 2 On the basis of the observation, Independent Validation (IV) score will be applied and final score will be given. These will include bylaws documents and on field survey data. Final Score = Score claimed – Score adjusted as per IVM.



# Used Water Collection, Treatment and Reuse

Score



Indicator	Max Score
2.1 Sewer connection and onsite sanitation coverage	200
2.2 Used water treatment	200
2.3 Reuse of treated used water	200
2.4 Availability of dedicated water testing facility at the used water treatment plant and frequency of testing	100



It is a collective intent of MoHUA, State/UT and ULBs to make Urban India 'water secure' and one of the method is to reuse treated used water. ULBs have taken up the task of collecting and treating used water and further using it again. There are four indicators that have been formalized in this toolkit to assess the extent to which the ULBs have been successful in implementing the same. This section covers the assessment process that will be followed for the four indicators in detail.



% Households with Sewerage Connections or OSS	Score
100%	200
75% to <100%	160
50% to <75%	120
25% to <50%	80
<25%	40
0%	0





## 2.2

200

Used water treatment:  
Percentage of used water treated vs generated

### List of Documents

- 1 Details of all used-water treatment plants available in the ULB (FSTP/STP).
- 2 Details of used water produced in the ULB (in MLD).
- 3 Test reports of the treated used-water as per CPCB norms as stated in Annexure-2. These must be recent and not be older than 3 months

### MIS Value and Calculation

Volume of used water generated	B1	Litre
Volume of used water treated (STP/FSTP)	B2	Litre
% used water treated	B3	$B2/B1*100$

### Validation

#### 100% Direct Observation and Lab Testing

- 1 On-field assessor will visit the used-water treatment plants for collection of treated used-water samples.
- 2 Samples will be tested for quality of treatment as per design standards of treatment plant and relevant as per CPCB norms (Annexure-2). If the samples fail in any of the essential parameters in Annexure 2, 50% score shall be deducted.

## 2.3

200

Reuse of treated Used Water for industrial, residential or public non-potable usage



### % of Treated Used-Water Reused

### Score

≥20%	200
15 to <20%	160
10 to <15%	120
5 to <10%	80
<5%	40
0%	0

**Note:** The treated used water must be reused for either of the following purposes: Agriculture/irrigation, industrial processes, non-potable urban applications such as parks, street plantations, toilet flushing, street washing, fire protection or ground water recharge (after tertiary treatment). If ULB is re-using treated used water for any other purposes, the same may be considered by survey agency, in consultation with MoHUA

# 2.3

200

Reuse of treated Used water for industrial, residential or public non-potable usage

### List of Documents

- 1 Volume of used water produced in the ULB (in MLD)
- 2 Volume of used water treated (in MLD)
- 3 Volume of used water reused (in MLD)
- 4 MoU with industries and other users for reuse of treated used-water.
- 5 Sale receipts of treated used-water sold.

### MIS Value and Calculation

Volume of used water produced	C1	Litre
Volume of used water reused after secondary/tertiary treatment	C2	Litre
% Used-water reused	C3	$C2/C1*100$

### Validation 100% Direct Observation

- 1 On-field assessor will visit the used water treatment plants.
- 2 The assessor will also check if used water is being reused and will collect record for the same.

# 2.4

100

Availability of dedicated water testing facility at the used water treatment plant and frequency of testing



### Water Testing Lab

### Score

Water testing facility available on site	50
Water tests outsourced to authorized labs	25
Testing not done	0

### Frequency of Testing

### Score

Daily	50
Weekly	30
Monthly	20
Testing not done	0



Availability of dedicated water testing facility at the used water treatment plant and frequency of testing

**List of Documents**

- 1 List of STP with capacity and details on inhouse lab provision.
- 2 Logbook with test results for influent and effluent water samples. These must be recent and not be older than 3 months

**Validation  
(100% Direct Observation)**

Assessor will visit the STP and collect water quality testing logbook and reports for influent and effluent samples for frequency of testing.



Water Bodies



Score



**Indicator**

**Max Score**

3.1 Health of water-bodies

200







Under AMRUT 2.0, ULBs are encouraged to take up projects for rejuvenation of water bodies. It includes measures taken up by the ULBs to reduce the pollution in and around the water body and strengthening of the embankments. The health of the water body will be assessed through lab testing of the water samples collected. The assessor will also use a checklist of thirteen sub indicators to physically observe the area around the water body to assess the overall health.



#### A. Quality of Water in Water Bodies:

Max Score-125

(i) Direct observation	75
(ii) Water quality as per lab report (CPCB guideline)	50
Class 'A'	50
Class 'B'	40
Class 'C'	30
Class 'D'	20
Class 'E'	10

#### B. Rejuvenation of Water-Bodies:

Max Score-75

**Note:** Each ULB shall nominate 3 water bodies which lie within their jurisdiction. The water body should have an area greater than one acre. For ULBs having all their water bodies of area less than one acre, they may nominate smaller water bodies.



# 3.1A

75

(i) Water body – direct observation parameters

Sl. No.	Questions	Score
1	Is there signage around the water body ? (Yes/No)	5
2	What is the colour of water? Glass test to be performed with three possible color outcomes: 1. Clear or Transparent – 15 2. Light Yellow or Light Green or Light Brown - 5 3. Any dark color – 0	15
3	Is there a fence around the water body? (Yes/No)	5
4	Does the area around the water body has any encroachment? (Yes/No)	5
5	Do you see any dustbins around the water body within 50m distance? (Yes/No)	5
6	Do you see any kind of waste around the water body within 50m distance? (Yes/No)	5
7	Do you see any human faecal matter or animal dung around the Water body within 50m distance? (Yes/No)	5
8	Does any kind of washing take place (50m) around the water body? ? (Yes/No)	5
9	Do you see any kind of waste water drain contaminating the water body? (Yes/No)	5
10	Do you see any septic tanks within 100m of the water body? (Yes/No)	5
11	Is the water body eutrophied? (Yes/No)	5
12	Do you see foam on the surface of water body? (Yes/No)	5
13	Do you see any waste on the surface of the water body ? (Yes/No)	5

# 3.1A

50

(ii) Rejuvenation of water bodies – i) Water quality report

## List of Documents

- 1 Water quality reports from ULBs of 3 water bodies selected for survekshan.
- 2 Reports must be in line with the parameters in Annexure-3. Reports must be recent and not older than 3 months

## Water Quality as per Lab Report (Annexure-3) (CPCB guideline)

Water Quality	Score
Class 'A'	50
Class 'B'	40
Class 'C'	30
Class 'D'	20
Class 'E'	10

## Validation 100% Direct Observation for Health

- 1 On-field assessor will visit the water bodies for sample collection. Samples will be sent for quality check.
- 2 Each water body shall be given score as per the class above and final score shall be the average.

Rejuvenation of water bodies – i) Sewerage points status, ii) Rejuvenation of 3 water bodies

### List of Documents

For each of the water bodies (up to three waterbodies), copy of project documents with photographic evidence or copy of project plan document, whichever is applicable for each of the three waterbodies for:

- 1 Plugging the sewerage input points;
- 2 Rejuvenation of water bodies by desilting, strengthening the embankments, stone packing etc.

Scheme of Marking	Score
All sewerage points polluting water body plugged	50
Plans (DPRs) for plugging all sewerage points prepared	25
Plans (DPRs) prepared for plugging one or more sewerage points	10
No plan for plugging sewerage contamination	0

Scheme of Marking	Score
Water body rejuvenated by desilting, strengthening the embankments, stone packing etc.	25
Plans (DPRs) prepared for rejuvenation of water body	15
No plan for rejuvenation of water body	0

### Validation: 100% Direct Observation

- 1 On field assessor will visit the water bodies for health inspection.
- 2 On field assessor will review the plan/ project documents..



# Non-Revenue Water (NRW)

Score



Indicator	Score
4.1 Measurement of non-revenue water	100
4.2 Water flow measurement techniques adopted by ULB	100



AMRUT 2.0 has a reform agenda focused on financial sustainability and water security of ULBs. Reducing non-revenue water to less than 20% is one of the major reform agenda. ULBs have been encouraged to set up systems to measure the non-revenue water and implement various techniques to reduce NRW. In this section, the assessment parameters related to non-revenue water measurement has been described.



NRW (%)	Score
0-20%	70
>20% to 30%	50
>30% to 40%	30
>40% to 50%	10
>50%	5
If no information available	0

**Note:** It is mandatory that the ULB provides information about water produced and water consumed as per the data sheet format shared.

Additional 30 marks shall be awarded if the ULB provides the data for Water Lost as per the data sheet format. This must be based on an internal water audit.

# 4.1

100

## Measurement of NRW

Water Produced	Quantity (MLD)
Volume received from water resources department	A1
Volume of water received from own sources	
Volume of water received from other sources (Excluding WRD and own)	
Water Lost	Quantity (MLD)
Unbilled metered authorized connections	A2
Unbilled unmetered authorized connections	
Apparent Water losses	
Unauthorized consumption	A2
Metering inaccuracies	
Errors in customer billing process	
Real Water losses	A2
Distribution system (From ESR/GSR to consumer water meter)	
Pure water transmission (From WTP to ESR/GSR and overflows/leakages at ESR/GSR)	
At water treatment plant (WTP) (Inclusive of master balancing reservoir)	
Raw Water Transmission (From source to WTP)	A2
Water Consumed	Quantity (MLD)
Billed authorized consumption	R1
Billed Metered Consumption (Including water exported)	
Billed Un-metered Consumption	

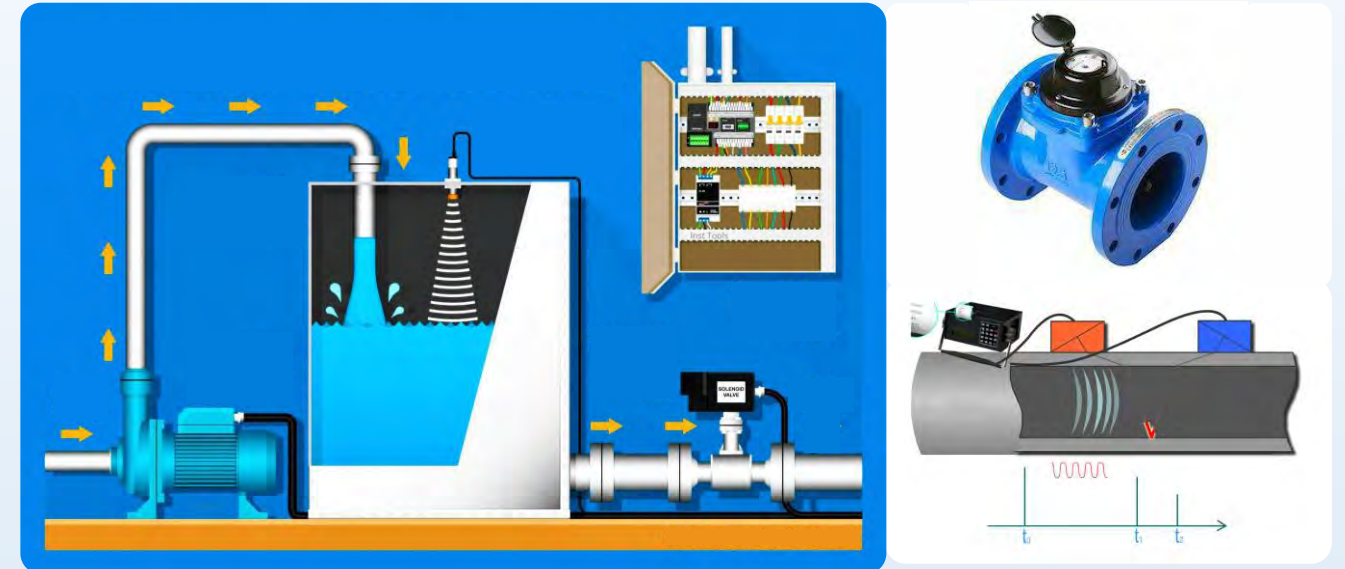
### NRW calculation

If A2 is available		
Volume of water produced	A1	MLD
Volume of water lost – unbilled, real and apparent losses	A2	MLD
%NRW	A3	$(A2/A1)*100$
If R1 is available		
Volume of water produced	A1	MLD
Total revenue water	R2	MLD
Total non-revenue water	$A2 - R1$	MLD
%NRW	A3	$(A2/A1)*100$

# 4.2

100

## Water flow measurement techniques adopted by ULB



Parameter	Score
Complete SCADA setup connecting source, treatment, distribution, and 100% water meters at consumer end	60
Centralized SCADA setup connecting all source, treatment, distribution but flow not measured/partially measured at consumer end	40
Partial SCADA- Installed in at-least 50% points: source, treatment, distribution points	20

Parameter	Score
Functional flowmeters at all sources, treatment and distribution points	40
Functional flowmeters at select source, treatment and distribution points	20
Flow not measured	0



# Water flow measurement techniques adopted by ULB

## List of Documents

- 1 DPR for SCADA system with date of commissioning/calibration/maintenance reports
- 2 Specification of flowmeters, calibration certificates
- 3 Ward wise details of households with meters and issue certificates

## Validation (100% Direct Observation)

- 1 Assessor will visit the claimed locations where flow measurement systems are setup.
- 2 Assessor will note live readings to verify the functioning.

# 5

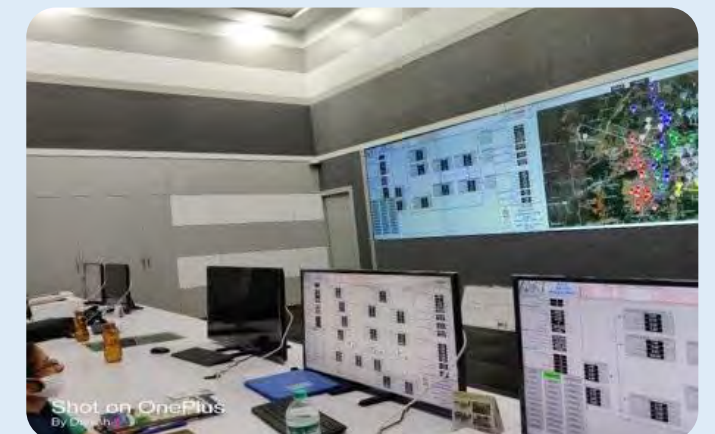


# Best Practices and Innovation

Score



Indicator	Score
5.1 24 x 7 water supply	50
5.2 Citizen awareness activities	50
5.3 Training of ULB staff	50
5.4-5.8 Best Practices	50
5.9 Development of District Metered Area (DMA)	50
5.10 Source of water supply: Surface/Ground/Both	50



Under AMRUT 2.0, IEC is one of the key components to create awareness related to water loss, ground water recharge, saving water and reuse of treated water.

ULBs have been encouraged to adopt unique and innovative methods to provide best services to the citizens as well as achieve the AMRUT 2.0 objectives. The assessment will be done for ten indicators which have been detailed out in this section.



Parameter	Score
24 x 7 water supply scheme implemented in part of ULB	50
DPR prepared for 24 x 7 water supply	25
No provision/plan for 24 x 7 water supply	0



# 5.1

50

## 24x7 Water supply

### List of Documents

- 1 DPR documents/commission report mentioning date of execution of the project
- 2 Photographic evidence of the water supply system, if applicable
- 3 Copy of contract letter/MoU
- 4 Copy of tender notice

### Validation (100% Direct Observation)

- 1 The assessor will randomly approach the households and ask citizens about frequency of water supply.
- 2 On the basis of the documents submitted and on ground observation, Independent Validation (IV) score will be applied and final score will be given. Final Score = Score claimed – Score adjusted as per IVM

# 5.2

50

Citizen awareness activities: Campaigns/ trainings/infographics/ hoardings/banners/skits competitions etc.

Awareness Areas	100% to 80% awareness	<80% to 60%	<60% to 40%	<40% to 20%	<20% but >0%	0% awareness
Water loss prevention-leakages and overflow	10	8	6	4	2	0
Groundwater recharge and Rainwater harvesting techniques	10	8	6	4	2	0
Behavior change regarding saving water	10	8	6	4	2	0
Reuse of treated water	10	8	6	4	2	0
Awareness about AMRUT and AMRUT 2.0	10	8	6	4	2	0

Total number of responses collected	A1	Number
No. of responses that exhibit awareness	A2	Number
% awareness	A3	A2/A1*100

### Validation Methodology

#### 100% on field validation

- The ULBs will claim the progress regarding the above on the portal.
- Citizen awareness will be validated by on field feedback. The assessor will ask the citizens regarding awareness campaigns by the ULB, groundwater, reuse of used water, etc.
- On call validation, if required.

Training of ULB staff: Municipality, contractors and managers, plant operators, town planners, etc.

Any training/e-course on following broad themes

- 1 Leakage detection by use of technology
- 2 Groundwater recharge and rainwater harvesting techniques
- 3 Demand side management
- 4 Used water treatment and reuse of treated water
- 5 AMRUT 2.0 mission

List of Documents

- Agenda for the training
- Training attendance with date, name of participant and contact details
- Photographs of the training

Scheme of Marking

Score

Training on Leakage detection by use of technology	10
Training on Groundwater recharge and rainwater harvesting techniques	10
Training on Demand side management	10
Training on Used water treatment and reuse of treated water	10
Training on AMRUT 2.0 mission	10

Validation Methodology

- The ULBs will claim the progress regarding the above on the portal.
- The ULBs will claim the progress. Further, on call validation with select officials (5% or 10 (officials)) to verify the claim made.
  - On the basis of the observation, Independent Validation (IV) score will be applied and final score given.

Final Score = Score claimed – Score adjusted as per IVM

Best practices and innovation

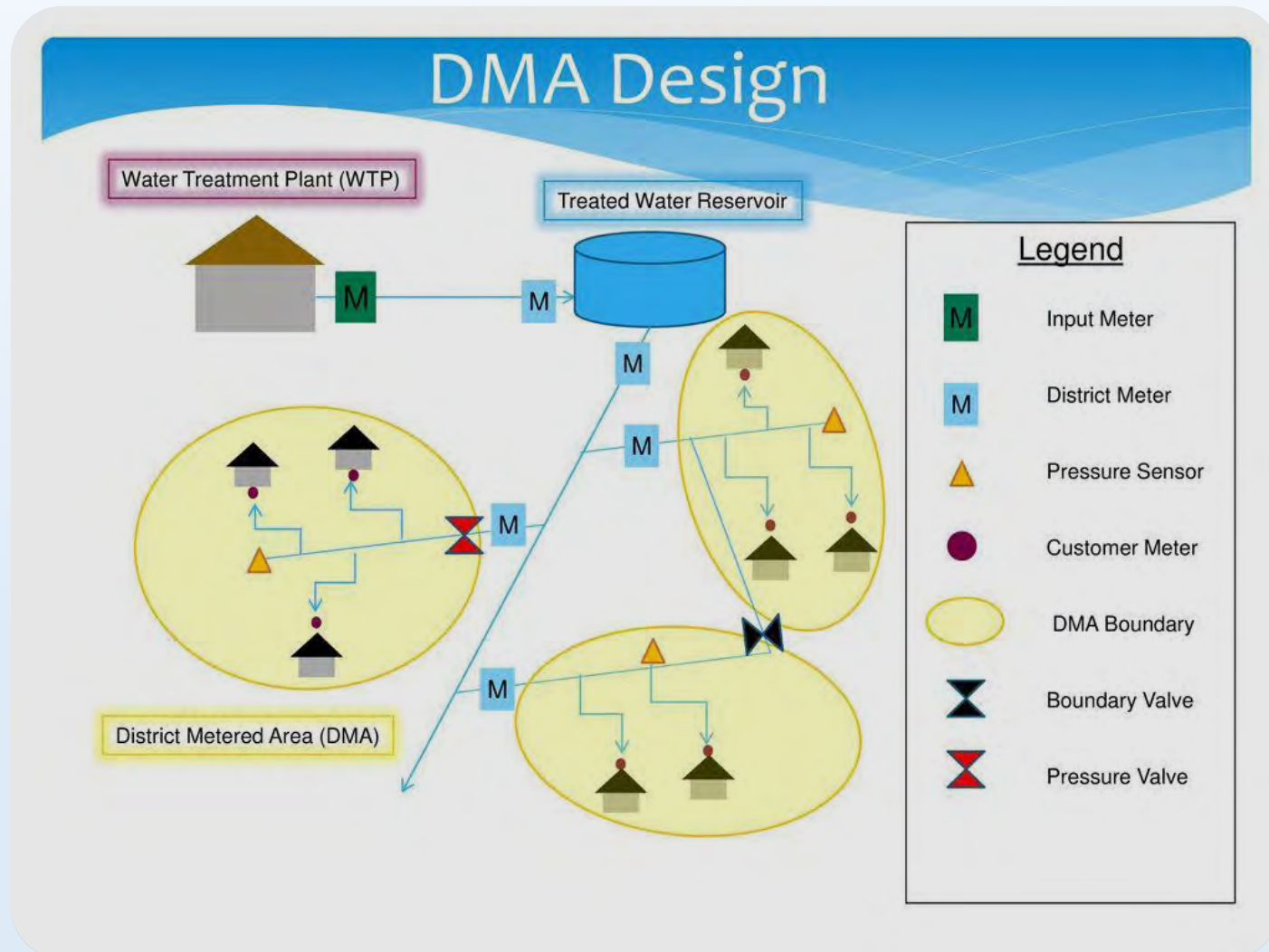
Indicator No.

Parameter

Score

5.4	<ul style="list-style-type: none"> <li>• Provision for water supply through secondary source in case of contamination in primary source</li> <li>• Validation: DPR, completion certificate of the project</li> </ul>	10
5.5	<ul style="list-style-type: none"> <li>• Use of renewable energy (solar/wind/hybrid) in water treatment operations</li> <li>• Validation: DPR, completion report, pump details at WTP sites</li> </ul>	10
5.6	<ul style="list-style-type: none"> <li>• Action taken to increase water availability, water and used water treatment capacity for the next 5 years.</li> <li>• Validation: copy of tender, contract allotted, DPR</li> </ul>	10
5.7	<ul style="list-style-type: none"> <li>• Collaborative work in the area on water conservation</li> <li>• Validation: copy of project reports, agreement copy with institutes</li> </ul>	10
5.8	<ul style="list-style-type: none"> <li>• Provision for water testing at consumer end at regular intervals (at least once in two weeks)</li> <li>• Validation: copy of official record</li> </ul>	10



**Parameter****Score**

Functional DMA

50

No functional DMA but DPR prepared

25

No action

0

**List of Documents**

- 1 DPR for development of DMA.
- 2 Details of no. of households in the DMA.
- 3 List/Copy of water meters installed in the DMA.
- 4 Sample water bills for the households in DMA.

**Validation  
(100% Direct Observation)**

- 1 The assessor will visit the DMA and collect sample water bills from the citizens.
- 2 The assessor will also interact with the citizens to verify claim.



5.10

50

Source of water supply:  
surface/ground/both



**Parameter**

**Score**

Score will be allocated in proportion to the claim made for surface water.

.....  
If 0% water is from surface source, 0 score will be allotted  
.....

If 100% water is from surface source, 50 score will be allotted  
.....

Let's say, if 70% water is from surface source, 35 score will be allotted

0 to 50

5.10

50

Source of water supply:  
surface/ground/both

**List of Documents**

- 1 Declaration mentioning sources of water supply in the ULB in different wards

**Validation**  
**100% As per ULBs Claim**

As per claim made by the ULB.







# Annexures

## Water Testing Parameters



## Annexure 1 – Select drinking water test parameters

S. No.	Essential Parameter	Permissible limit
1	Turbidity (NTU)	5
2	pH	6.5 to 8.5
3	Chloride (mg/l)	250
4	Total Dissolved Solids (mg/l)	500
5	Iron (mg/l)	0.3
6	Hardness (as CaCO <sub>3</sub> ) (mg/l)	200
7	Odour	–
8	Taste	–
9	Colour, Hazen unit	15
10	Fluoride (mg/l)	1
11	Fecal Coliform (cfu)	0
12	E. Coli (cfu)	0
13	Nitrate (mg/l)	45
14	Residual free Chlorine (min. 0.2 mg/L)	–
15	Ammonia (mg/L)	0.5

Procedure for testing the parameters will be as per BIS:10500

## Annexure 2 – Parameters to be tested for treated used-water (CPCB guidelines)

## Annexure 3 – Primary water quality criteria for various uses of fresh water (CPCB guideline)

Parameter	Total Flushing	Fire Protection	vehicle exterior washing	Non-contact impoundments	Landscaping, horticulture and agriculture			
					horticulture, golf courses	Crops		
						Non-edible crops	Edible crop-Raw	Edible Crop-Cooked
Turbidity (NTU)	<2	<2	<2	<2	<2	AA	<2	AA
SS	nil	nil	nil	nil	nil	30	nil	30
TDS				2100				
pH				6.5 to 8.3				
Temp (°C)				Ambient				
Oil and Grease	10	nil	nil	nil	10	10	nil	nil
Minimum Residual Chlorine	1	1	1	0.5	1	nil	nil	nil
Total Kjeldal Nitrogen	10	10	10	10	10	10	10	10
BOD	10	10	10	10	10	20	10	20
COD	AA	AA	AA	AA	AA	30	AA	30
Dissolved Phosphorus as P	1	1	1	1	2	5	2	5
Nitrate	10	10	10	5	10	10	10	10
Fecal Coliform/100 ml	nil	nil	nil	nil	nil	230	nil	230
Helminthic eggs/liter	AA <sup>m</sup>	AA	AA	AA	AA	<1	<1	<1
Color	Colorless	Colorless	Colorless	Colorless	Colorless	AA	Colorless	Colorless
Odor			Aseptic (Not Septic and no foul odor)					
m as arising when other parameters are satisfied								

Designated best use	Class	Criteria
Drinking water source without conventional treatment but after disinfection	<b>A</b>	Total coliform organisms MPN/100ml shall be 50 or less. pH between 6.5 and 8.5 Dissolved oxygen 6 mg/l or more Biochemical oxygen demand 2 mg/L or less
Outdoor bathing (organised)	<b>B</b>	Total coliform organisms MPN/100ml shall be 500 or less pH between 6.5 and 8.5 Dissolved oxygen 5 mg/l or more Biochemical oxygen demand 3 mg/l or less
Drinking water source with conventional treatment followed by disinfection	<b>C</b>	Total coliform organisms MPN/100ml shall be 5000 or less. pH between 6 and 9 Dissolved oxygen 4 mg/l or more Biochemical oxygen demand 3 mg/l or less
Propagation of wildlife, fisheries	<b>D</b>	pH between 6.5 and 8.5 Dissolved oxygen 4 mg/l or more Free ammonia (as N) 1.2 mg/l or less
Irrigation, industrial cooling, controlled waste disposal	<b>E</b>	pH between 6.0 and 8.5 Electrical conductivity less than 2250 micro mhos/cm Sodium absorption ratio less than 26 Boron less than 2mg/l



**THANK YOU**

**GAME CHANGERS**

