

## 4.2.5.2 Urban Water Supply and Domestic Use

### 1.0 Subject Matter

Drinking water sources in the state - urban area (Table 1).  
 Un-served and partially served/ Stress areas Households and population (Table 3).  
 Water consumption, management and quantity monitoring (Table 4a & 4b).  
 Status of access, coverage & slippages (if any) of DW supply provision for the urban population (Table 5).  
 Water quality measurement at Supply end (Source) (Table 6a & 6b)  
 Sewage treatment and recycling (Table 7)  
 Water treatment plants with capacity and treatment methods (Table8).  
 Water conservation program (Table9)

### 2. Availability, Utilizable, Supply (Sector wise and Source wise), Demand (Sector wise and Source wise), Consumption (Sector wise and Source wise). Temporal & Spatial basis is to be considered

Current drinking water demand, supply, gap and time trends. (Table 2a & 2b).

### 3. Issues and Challenges

### 4. Problem Tree / Root cause Analysis: Cause, Effect and Interventions

### 5. Governance / Management

Statute / Law / Policy/ Regulations if any  
 Institutions governing / managing / monitoring the resources and Institutional structure.  
 Areas of Peoples/Private Participation if any  
 Water Financing& Schemes (Table10)

### 6. Measurement, Monitoring and Data Constraints/ Management

### 7. Performance Indicators

Bench Marks/ Norms/ Standards and deviation from the norms/benchmarks/standards currently.  
 Conformity to quality of water supplied for drinking purpose as per (BIS 10500:2012) (Table6c).  
 Status of various Performance Indicators – for comparison across Districts/ Plants/ Units/ Products etc.

Category of Indicators (Illustrative)	Indicator	Bench Mark/ units	District.1/	District.2/
Water Measurement	No. of urban bodies fully covered with piped water supply connections	100%		
	No. of urban bodies partially covered with piped water supply connections			
	No. of urban bodies not covered with any piped water supply connections			
	Total number of sources for Urban Water Supply			
	No. of Urban bodies that have installed water meters at all sources / withdrawal points	100%		
	% of Sources installed and operational water meters at source			
	% of households installed with water meters			
	% of establishments (other than households installed with water meters)			
Sources of DW	% population covered with W/S	100%		
	% urban bodies served only from GW			
	% urban bodies served only from Surface WR			
	% urban bodies served only from RWH			
	% urban bodies served only from Recycle Water			
	% urban bodies served only from GW and SW			
Access	% urban bodies served only from GW, SW and RWH			
	% bodies covered by single piped Water Supply			
	% bodies covered by multi-habitations piped Water Supply			
	% households accessing drinking water through PWS with household connections			
	<ul style="list-style-type: none"> <li>• Metered</li> <li>• Un metred</li> </ul>			

	% of households accessing DW through public taps			
	% of households accessing DW through hand pumps throughout the year			
	% of households accessing DW through other means throughout the year			
	% of Govt. Schools / Universities covered Water Supply			
	% of Govt. Health Institutions covered Water Supply			
	% of Private Schools / Universities covered Water Supply			
	% of Private Health Institutions covered Water Supply			
	% of Anganwadies, crèches having safe WS			
Water Conservation	% of Urban bodies not having Water management / security plans	20%		
	Number of urban bodies not taken up RWH			
	Number of urban bodies taken up behavioral change awareness campaign on responsible & safe use of water	90%		
	No. of urban bodies undertaking GW recharge			
	No. of urban bodies ensured the institutions to use micro irrigation for landscaping	80%		
Water Demand Management	% of Urban bodies having mechanism to accommodate seasonal water demand variations	Available		
	Gap between Demand and Supply	0		
	Gap between Supply and consumption	0		
	Gap between Demand and Consumption	0		
	No. of unserved(with respect to piped W/S) Households	0		
	No. of partially served Households			
	% of population in unserved Households	0%		
	% of population in partially served Households	20%		
	WMI: Proportion of total urban Households fully covered with drinking water supply as on 31.03.2016			
	WMI: Proportion of total rural Households fully covered with drinking water supply as on 31.03.2017			
	% of cities/ towns covered with SCADA System	100%		
	% of household covered with leakage detecting devices	100%		
	% of households covered with metered water supply	100%		
	% of population served with other sources (other than piped)	100%		
	Water supply consistency- hours of Water Supply	24 hours a day		
	Water Stress Index			
	Volume of water supplied at Source vis-a-vis volume of water received by the end users			
Days of operation at required standards				
Water Efficiency	% Non-revenue water (leakages)	0		
	Average time for correcting water leakage points	4 Hours		
	Cities/ Towns (in numbers)that have installed water meters at all sources / withdrawal points <b>Table 4</b>	100%		
	% of Sources installed and operational water meters at source <b>Table 4</b>	100%		
	% of households installed with water meters <b>Table 4</b>	100%		
	% of establishments (other than households installed with water meters) <b>Table 4</b>	100%		
Repair times for high priority inoperative lines				
Equity	Number and % of SC and ST households not provided with PWS			
	Number and % of Minority households not provided with PWS			
	Number and %of Women Head households not provided with PWS			
	% of slums not covered with PWS			

Water Service levels	% of population with 135-150 lpcd water supply <b>Table 3</b>			
	% of population with 70-135 lpcd water supply <b>Table 3</b>			
	% of population with less than 70 lpcd water supply <b>Table 3</b>			
	% of population in unserved areas <b>Table 5</b>			
	% of population in partially served areas <b>Table 3</b>			
	% of population served with other sources (other than piped) <b>Table 5</b>			
	Water supply consistency- hours of Water Supply			
Water Stress Index	Volume of water supplied at Source vis-a-vis volume of water received by the end users			
SDG	Proportion of population using safely managed drinking water services (SDG)	100%		
	Volume of Utilization of fresh water vis-a-vis volume of Treated Water uses in domestic purpose other than drinking			
Sewage treatment and recycling	No. of sewage releasing points			
	% of sewage release points geo tagged			
	Total sewage generated			
	% of Sewage treated	100%		
	% of treated sewage recycled in the Industry	20%		
	% of treated sewage is used for other purposes	20%		
	% of un treated sewage is discharged	0%		
	No. of points where sewage is mixed with drinking water	0%		
Water treatment plants with capacity and treatment methods	Gap between the Water Treatment Design capacity and actual capacity	0 mcm		
	Volume of Utilization of fresh water vis-a-vis volume of Treated Water uses in domestic purpose other than drinking			
Water Quality Monitoring	Districts having Water Quality testing lab			
	No. of Sub-divisions without Water Quality testing labs			
	% of urban bodies not undertaking Quality surveillance ( in terms no. of samples) as prescribed.	%		
	Number of urban bodies not undertaking Quality surveillance ( in terms no. of samples) as prescribed.	Number		
	Total number of samples taken during the last year			
	Households	% of coverage		
	Schools			
	Universities	%		
	Industry	%		
	Establishments	%		
	Number of samples per 1000 population			
	No. of urban bodies that have not undertaken quality sampling as per prescribed norm			
	% of samples not qualified for BIS Norms- physio-chemical properties	10%		
	% of samples not qualified for BIS Norms- Bacteriological	0%		
	% of Households whose water sources at availability is not as per set norms/ standards	0%		
% of Households whose water sources at supply end are not as per set norms/ standards	10%			

	% of public DW sources with chemical contamination			
	% of private DW sources with chemical contamination			
	% of public DW sources with bacteriological contamination			
	WMI: % reduction in rural Households affected by Water Quality problems during the Financial Year 2015			
	WMI: % reduction in rural Households affected by Water Quality problems during the Financial Year 2016			
Water Productivity	Per capita water supply	135 lpcd/ 150 lpcd		
	No. of urban bodies failing to supply standard per capital water supply			
	Volume of water supplied at Source vis-a-vis volume of water received by the end users			
	Total volume of Fresh water supply and volume of Tertiary treated water Supply			
Waste Water	Total estimated generation of waste water in the urban areas as on 1 <sup>st</sup> June WMI			
	Capacity installed in the state to treat the urban waste-water as a proportion of the total estimated waste water generated in the urban areas of the state as on 31 <sup>st</sup> June WMI			
	% Waste water treated in CY WMI			
	% Waste Water treated in previous Year WMI			
Environmental sustainability and Water Quality	Quality of water supplied as per BIS 10500:2012	100%		
Participatory Water Management	No. of public grievances pending	80%		
Financing	% Cost recovery through water supply systems	90%		
	Total cost of operations per MCM			
	No. of PPP contracts if any			
Impact	% reduction in prevalence of Diarrhea in children under 5 from base year.			
	% reduction in IMR from base year			
Monitoring	Operationalization of online Water Quality test results information and feedback	Yes/No		
	No. of studies undertaken and shared with local bodies			

Core water supply performance indicators.%

Sr. No.	Water Supply Services	Bench Mark	Existing status		
			District 1		Nth district
1	Coverage of water supply connections	100%			
2	Per capita water supply	40 lpcd			
3	Extent of metered water supply	100%			
4	Water supply consistency	24 hours a day			
5	Quality of water supplied as per BIS 10500:2012	100%			
6	Efficiency of redressal of customer complaints	100%			

7	Cost recovery through water supply systems	100%			
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**8. Reforms undertaken/ being undertaken/ proposed if any**

**9. Road map of activities / tasks proposed for better governance with timelines and agencies responsible for each task/activity.**

## ANNEXURE

## A. WATER AVAILABILITY- source wise

Table-1

District/Basin Name	No. of Households		Source of Water supply: River		
	Urban		No.	Quantity (MCM)	Name of Water quality monitoring agency

District/Basin Name	No. of Households		Source of Water supply: Dam/ Reservoirs		
	Urban		No.	Quantity (MCM)	Name of Water quality monitoring agency

District/Basin Name	No. of Households		Source of Water supply: Ponds / Tanks		
	Urban		No.	Quantity (MCM)	Name of Water quality monitoring agency

District / Basin Name	No. of Households		Source of Water supply: Wetlands includes Lakes		
	Urban		No.	Quantity (MCM)	Name of Water quality monitoring agency

District/Basin Name	No. of Households		Source of Water supply: Desalination		
	Urban		No.	Quantity (MCM)	Name of Water quality monitoring agency

District/Basin Name	No. of Households		Source of Water supply: GW: Dug wells		
	Urban		No.	Quantity (MCM)	Name of Water quality monitoring agency

District/Basin Name	No. of Households		Source of Water supply: GW Dug cum bore wells		
	Urban		No.	Quantity (MCM)	Name of Water quality monitoring agency

District / Basin Name	No. of Households		Source of Water supply: Springs		
	Urban		No.	Quantity (MCM)	Name of Water quality monitoring agency

Table-2a Drinking water annual demand, supply, gap and time trend

District/ Basin	No of Urban Local Body	CY Total population	Demand in CY	Supply in CY


Name of district / Basin	No. of towns/cities / Urban local bodies			Population (2017)		Annual demand (MCM)	Annual supply (MCM)	Consumption	Gap	
	Total	Fully covered with w/s	Partly covered with w/s	Total	% covered with w/s				Demand - Supply	Supply-Consumption

**Table 2b Drinking water Demand, Supply and Gap- Time trend**

Name of district/ Basin	No. of towns/cities	Population			Water Demand (BCM) @135 lpcd			Water Supply based on actual (BCM)			Water consumption		
		2001	2011	CY	2001	2011	CY	2001	2011	CY	2001	2011	CY

CY: Current Year

Note: Service level benchmark is 150 lpcd for Metro cities, 135 lpcd for other cities/towns with sewerage system and 70 lpcd without sewerage system city.

**Table 3 Un-served and partially served/ Stress areas.**

Name of district	Total no. of towns/cities	Total population	Un-served Households & Population			Partially served/ supplied: Stress areas population							
			No. of House holds	Persons	% of Population	0 – 70 lpcd		70-135 lpcd		135-150 lpcd		Total	
						No. of House holds	Persons	No. of House holds	Persons	No. of House holds	Persons	No. of House holds	% of population

**Table 4 Water consumption, management and quantity monitoring****Table 4 (a) Quantity Monitoring**

District/ Basin	Water source quantity not monitored by Any agency at available Water source							
	Rivers	Dams/ reservoirs	Ponds/Tanks	Wetlands/ Lakes	Desalination plants	Dug wells	Dug/ Bore wells	Springs

District/ Basin	No. of Urban Households whose water source is not being monitored							
	Rivers	Dams/ reservoirs	Ponds/Lakes	Wetlands	Desalination plants	Dug wells	Dug/ Bore wells	Springs

**Table 4 (b) Water consumption & management**

Sr. No.	Name of district / Basin	No. of towns / cities	Total no of House holds	No. of House holds covered	% of House holds covered	Population Coverage (%)	Total water consumption from other than Piped WS, MCM	Total Piped Water Supply MCM	Total Actual Metered Consumption (MCM)	Total Actual Un-metered Consumption (MCM)	Non-Revenue Water (MCM)	Coverage of HHs with leakage detection unit	No of towns / cities with SCADA System

**Table 5 Access to Drinking Water and Domestic usage: Coverage & slippages (if any) of Drinking water supply provision for the urban population.**

Name of district/ Basin	No. of towns/cities	Total Current Population	Total Households	Total Households Connection Metered + Non-Metered	Total public stand post	Total hand pumps	Total population coverage (%)	Total slippage = Not covered (%)

**B. URBAN WATER QUALITY MONITORING: AT SUPPLY END****Table 6a Data on Water Quality at Water Supply end**

District/ Basin Name	No. of Households			Source of Water supply: River		
	Urban			No.	Quantity (MCM)	Name of National accredited Water quality monitoring agency

District/ Basin Name	No. of Households			Source of Water supply: Irrigation Projects		
	Urban			No.	Quantity (MCM)	Name of National accredited Water quality monitoring agency

District/ Basin Name	No. of Households			Source of Water supply: Ponds / Tanks		
	Urban			No.	Quantity (MCM)	Name of National accredited Water quality monitoring agency

District/ Basin Name	No. of Households			Source of Water supply: Wetlands includes Lakes		
	Urban			No.	Quantity (MCM)	Name of National accredited Water quality monitoring agency

District / Basin Name	No. of Households			Source of Water supply: Desalination		
	Urban			No.	Quantity (MCM)	Name of National accredited Water quality monitoring agency



District / Basin Name	No. of Households		Source of Water supply: GW: Dug wells		
	Urban		No.	Quantity (MCM)	Name of National accredited Water quality monitoring agency

District / Basin Name	No. of Households		Source of Water supply: GW Dug cum bore wells		
	Urban		No.	Quantity (MCM)	Name of National accredited Water quality monitoring agency

District/ Basin Name	No. of Households		Source of Water supply: Springs		
	Urban		No.	Quantity (MCM)	Name of National accredited Water quality monitoring agency

**Table 6b Monitoring of Water Quality at Supply end**

District/ Basin	Not monitored by Any agency at available Water source							
	Rivers	Irrigation Projects	Ponds/Tanks	Wetlands/ Lakes	Desalination plants	Dug wells	Dug/ Bore wells	Springs

District/ Basin	No. of Urban Households whose water source is not being monitored							
	Rivers	Irrigation Projects	Ponds/Tanks	Wetlands/ Lakes	Desalination plants	Dug wells	Dug/ Bore wells	Springs

Water Quality Status: Physio-Chemical and Bacteriological Parameters

District/ Basin	Source	No. of Households			Physio-Chemical (Annual Range) in mg/l					Bacteriological (Annual Range in MPN/100 ml)	
			Urban		Fluoride	TDS	SS	Odour	Taste	T.C	F.C

Water Quality Status: Heavy Metals and Pesticides: Annual Range

District/ Basin	No. of Households			Heavy Metals (mg/l) Annual Range										Pesticides ( mg/l)	
		Urban		As	Cd	Cu	Pb	Cr	Ni	Zn	Hg	Fe	CN	OCP	OPP

**C. WATER QUALITY CRITERION & BIS DRINKING WATER QUALITY STANDARDS****Table6c Water quality monitoring as per BIS 10500**

District	No. of Households			Water source	Name of Water source	standards					Compliance	
		Urban				pH	DO	BOD	T.C	F.C		

BIS conformity with Physico-Chemical

District	No. of urban bodies	No. of Samples collected sources wise						No. of Samples failed to conform BIS 10500					
		River	Dam/Reservoir	Lakes	Desalination	Borewells	Springs	River	Dam/Reservoir	Lakes	Desalination	Borewells	Springs

BIS conformity with Bacteriological

District	No. of urban bodies	No. of Samples collected sources wise						No. of Samples failed to conform BIS 10500					
		River	Dam/Reservoir	Lakes	Desalination	Borewells	Springs	River	Dam/Reservoir	Lakes	Desalination	Borewells	Springs

**Table 7: Sewage treatment and recycling**

Name of district	No of towns/cities	Total Generation of Sewage	Design capacity of STP	Actual Treatment capacity,	Gap	Amount of sewage recycled for industrial Purposes	Amount of sewage recycled for other Purposes	Amount of un treated sewage is discharged

**Table8: Availability of water treatment plants.**

Name of district	No of towns/cities	Total Demand	Design capacity of WTP MCM	Actual Treatment capacity, MCM	Gap, MCM

**Table9: Water conservation programs.**

Sr. No.	Name of district	No. of urban bodies not taken water conservation	No. of urban bodies taken up water Conservation Measures		
			Rain Water Harvesting	Use of all Institutions -Micro- Drip/ Sprinkler in Institutions	Behavioral change Responsible and safe use of Water

**D. WATER Financing, PRICING AND COST ACCOUNTING****Table.10 Investment on Water Schemes**

District	Scheme Name	Total No. of Urban bodies	No. of Urban bodies received money	Budget for the previous Year			Budget for CY
				Allocation	Expenditure	% Expenditure	BE

**Table10: Status of water pricing and financial performance of the agencies supplying water in the urban area.**

Sr. No.	Name of the City	No of w/s schemes	Total water Supplied (KLD)	Water Tariff (Rs./KL)	Total Billed Amount (annual)	Total Cost/Expenditure of water supply (annual)	Total Revenue Generated (annual)	Gap of O & M expenditure and revenue generated	Management Agency/ Department