

4.2.4

ESTABLISHMENTS & INSTITUTIONS

4.2.4.1 Higher Education Institutions/ Universities

1.0 Subject Matter

(Present a brief historical background on the growth of sector – a bird’s eye view picture and analysis of the Sector using the information/ tables) provided in the annexure.

GIS based map depicting location of all the Universities - District level

Type and total no. of Universities in the State – (Refer Annexure: Table-1) (Universities include all Central Universities, State Universities, Deemed University, Private University and Affiliated Colleges)

Time trend of the number (growth) of Universities in the state and Water Demand & Supply (Refer Annexure: Table-2)

2.0 Details of Water Availability, Supply, Demand, Withdrawal & Consumption for the Universities

Water Supply & Demand for all Universities in the State

Time trend of total water demand and actual current water supplied to the Universities along with growth of Universities in the state.

(Refer Annexure: Table – 2, 3a, 3b)

Total Freshwater Withdrawal and Actual Water Consumption by Universities in the State

Comparative trend of Total Freshwater Withdrawal Vs Actual Water Consumption by Universities in the State.

State Water Budgeting: Refer Annexure- Table 3(e)

Universities (district-wise)	Previous Year / Average Annual Demand (MCM)	Previous Year/ Average Annual Supply & Consumptive Use (MCM)		Demand for the present Water Year (MCM)
		Supply	Consumptive Use	
All districts				
GRAND TOTAL	Xxx	Xxx	xxx	Xxx

3.0 Issues and Challenges

Illustrative issues and challenges may include

- Water demand and supply issues in the University sector in the state, provide details
- Waste water disposal and associated surface and ground water contamination
- Capital investment related issues w.r.to wastewater treatment/ recycle/reuse, water conservation interventions etc.
- Issues related to water pricing in University sector
- Technology availability, affordability and efficiency related issues
- Issues related to monitoring and reporting of data

(Supporting data & analysis for above points may also be furnished)

4.0 Problem Tree / Root cause Analysis: Cause, Effect and Interventions

5.0 Governance / Management:

Statute / Law / Policy/ Regulations if any

- State level laws, policy and governance for the University sector in the state on water access, consumption and wastewater discharge.
- Any specific fresh and waste water regulation/ guidelines in state, provide details.

Institutions governing / managing / monitoring the resources and Institutional structure.

- Institutions governing / managing / monitoring the University water consumption and supply.

Governing body for Universities sector	Water allocation & Monitoring authority	Waste water discharge monitoring
<i>E.g. Ministry of Human Resource Development</i>	<i>E.g. CGWA/ Water resource department/ Urban or Rural body</i>	<i>e.g. State pollution Control Board</i>

Schemes, Economics & Financing-

Existing schemes and programs along with financial allocations, expenditure etc

- Water Tariff and procurement cost (*Refer Annexure: Table 6(a) & 6(b)*)
- Expenditure on Water management (*Refer Annexure: Table 6(c) & 6(d)*)

6.0 Measurement, Monitoring and Data Constraints/ Management

• **Water & Wastewater Measurement:**

Shall specify measurement methods and technologies at Raw water source and Waste Water (generation, recycle/reuse & discharge) and Water Quality as per CPCB / SPCB

- **Monitoring** at State Government: Institution/ Agency/ Official responsible for Sustainable Water Management comprehensively for this Sector.
- **Data Management:** Should specify - Frequency of measurement, Frequency of Reporting to centralized agency, Water Quality Parameters monitored, how data is being used to improve Water Use Efficiency and ensure water quality parameters are within the prescribed norms etc.
- **Constraints** with respect to the measurement & monitoring

7.0 Performance Indicators:

a. **Benchmarks on water use** (*Refer Annexure: Table-10*)

b. **Status of various Performance Indicators– for comparison across Districts/ Plants/ Units/ Products etc.**

Category	Indicator	Bench Mark (<i>as applicable</i>)	District- 1	District- 2
Water Quantity Measurement	Water Quantity			
	No. of Universities without water flow meters at all withdrawal and consumption points			
	% of water sources of universities geotagged			
	No. of Universities not undertaken internal water audit in the last year			
	No. of Universities not undertaken external water audit in the last year			
Water Conservation	No. of Universities undertaken Third party Water Audit in the last Year			
	No. of Universities with water harvesting structures as prescribed.			
	% reduction of total water demand compared to the previous year.			

Performance Indicators

Category	Indicator	Benchmark (<i>as applicable</i>)	Univ. 1	Univ. 2
Water Use Efficiency (<i>Annexure- Table 7</i>)	Specific Water Consumption (SWC); water per student consumption			

	(litres/student) (refer Annexure Table-7(a), (b) & (c))			
	Have specific water consumption norms/bench marks established	Yes/No		
	% of Universities with specific water consumption within the norms/bench marks/standards			
Waste Water (Annexure-Table 8)	% reduction in wastewater generation as compared to previous year			
Water Quality (Annexure-Table 9)	% of Universities with online water quality monitoring systems installed.			
Economics	Whether economic incentives are in place by state to encourage water efficiency & conservation?	Yes/No		
	Whether economic disincentive mechanisms like penalties etc. are in place by state to discourage water wastage & inefficient use?	Yes/No		
	Whether water use charges & tariff are revised regularly and are reflective of rational pricing mechanisms?	Yes/No		

8.0 Reforms undertaken/ being undertaken/ proposed if any**9.0 Road map of activities / tasks proposed for**

- Better governance
- Better source / supply management
- Better demand management /improved Water Use Efficiency
- Water Quality
- Water Economics and Financing
- Sustainable Water budgeting with timelines and agencies responsible for each task/activity.

ANNEXURE**1 Total number of Universities in the State**

Total Number of Universities in the State			
Type – Based on Ownership	No. of Universities	No. of total students	No. of total staff
Central Universities			
State Universities			
Deemed Universities			
Private Universities			
Affiliated Colleges			
Total			

2 Growth Trend of Universities over a period and Water Demand and Supply position

Universities – Based on Ownership	Years					
	1990	1995	2000	2005	2010	2017
No. of Universities						
Central Universities						
State Universities						
Deemed Universities						
Private Universities						

Affiliated Colleges							
Total							
Water Demand and Supply							
Total Water Demand (MCM)							
Total Water Supply (MCM)	<i>GW</i>						
	<i>SW</i>						
	<i>Total</i>						
Demand-Supply Gap							

3 Water Budgeting

3(a) Demand, Supply (Withdrawals) & Consumptive Use:

Universities: (MCM) Present Water Year: 1 st June to 31 st May next year									
INSTITUTIONS (within the Basin/ Sub-basin A)	Previous Year/ Average Annual Demand	Demand for Present Water Year	Previous Year/ Average Annual Supply				Previous Year/ Average Annual Waste Water Generated	Previous Year/ Average Annual Consumptive Use	Remarks
			Rain Water	Surface Water	Ground Water*	TOTAL SUPPLY			
Unit 1									
Unit 2									
GRAND TOTAL									

*GW Draft can be calculated from the number of GW abstraction structures & corresponding draft for each Industrial Use/ Process.

3(b) Source Wise: Previous Year/ Average Annual Water Supply

Universities: (MCM)										
Source	Sub Source	Unit 1	Unit 2	Unit 3	Unit 4					TOTAL
Rain Water	Directly Harvested Rain Water									
Total										
Surface Water	Springs, Nallahs									
	Major Projects									
	Medium Projects									
	Minor Projects									
	Ponds, Tanks									
	Wetlands									
	Sea Water /Desalinated Water									
	Inter Basin Transfer									
Total										
Ground Water* (Dynamic / Static)	Dug wells (Total No. x Draft)									
	Dug cum Bore well (Total No. x Draft)									

	Bore/Tube wells (Total No. x Draft)										
	Others etc										
Total											
Treated Waste Water											
GRAND TOTAL											

*GW Draft can be calculated from the number of GW abstraction structures & corresponding draft for each Industrial Use/ Process.

3(c) Previous Year/ Average Annual Demand, Supply (Source wise) and Consumption for Basin/ Sub-basin A:

Source of Water	Demand of all Units in Basin/ Sub-basin A	Supply/ Withdrawal for all Units	Consumptive Use of all Units	Gap/Remarks
Rain Water (Directly Harvested)				
Springs, Nallahs				
Major Projects				
Medium Projects				
Minor Projects				
Ponds, Tanks				
Wetlands				
Desalinated Water/ Sea water				
Inter-Basin Transfer				
Ground Water (Dynamic)				
Treated Waste Water				
TOTAL (MCM)				

3(d) Previous Year/ Average Annual Demand, Supply (Source wise) and Consumption for Whole State:

Source of Water	Demand of all Units in the State	Supply/ Withdrawal for all Units	Consumptive Use of all Units	Gap/Remarks
Rain Water (Directly Harvested)				
Springs, Nallahs				
Major Projects				
Medium Projects				
Minor Projects				
Ponds, Tanks				
Wetlands				
Desalinated Water/ Sea water				
Inter-Basin Transfer				
Ground Water (Dynamic)				
Treated Waste Water				
TOTAL (MCM)				

3(e) Summary State Water Budget for Universities

Universities in state (District-wise)	Previous Year / Average Annual Demand (MCM)	Previous Year/ Average Annual Supply & Consumptive Use (MCM)		Demand for the present Water Year (MCM)
		Supply	Consumptive Use	
All Districts	Xxx	xxx	xxx	xxx

4 Proportion of Water withdrawal and consumption by Universities against total industries in the State

Total Water Withdrawal by all Universities (%) (Refer 4(a) below)	Total water withdrawal by all Establishments in state	Total Water Consumption by all Universities (%) (Refer 4(b) below)	Total water Consumption by all Establishments in state

4(a) Total Water Withdrawal/Abstraction by Universities in the State as percentage of Total water withdrawal by all the industries in the State

$$\text{Total water withdrawal by University Sector (\%)} = \frac{(\text{Total water withdrawal by all Universities in the State}) \times 100}{(\text{Total water withdrawal by all Establishments in the state})}$$

4(b) Total Actual Water Consumption by Universities in the state as percentage of Total water consumed by all establishments in the State

$$\text{Total water consumption by Sector(\%)} = \frac{(\text{Total actual water consumed by all Universities in State}) \times 100}{(\text{Total water consumed by all the Establishments in the state})}$$

4(c) Total Freshwater Withdrawal and Total Actual Water Consumption by all Universities in the State

	CY -11	CY -10	CY -9	CY -8	CY -7	CY -6	CY -5	CY -4	CY -3	CY -2	CY -1	CY / 2017
Total Fresh Water Withdrawal by all Universities (MCM)												
Total Actual Water Consumption by all Universities (MCM)												

5 Total Water Withdrawal (Abstraction) and Actual Water Consumption as percentage of total renewable freshwater resources

	CY-5	CY-4	CY-3	CY-2	CY-1	CY/ 2017
Total Fresh Water Withdrawal by all Universities (%) (Refer 5(a) below)						
Total Actual Water Consumption by Universities (%) (Refer 5(b) below)						

5(a) Total Water Withdrawal/Abstraction by Universities in the State as percentage of Total available freshwater resources of the State

$$\text{Total water withdrawal by University Sector (\%)} = \frac{(\text{Total water withdrawal by all the Universities in the State}) \times 100}{(\text{Total available freshwater resources of the state})}$$

5(b) Total Actual Water Consumption by Universities in the state as percentage of Total available freshwater resources of the State

$$\text{Total water consumption by University Sector(\%)} = \frac{(\text{Total actual water consumption by all Universities in State}) \times 100}{(\text{Total available freshwater resources of the state})}$$

6 Water Economics & Financing:

6(a) Water Tariff (Rs./m³)

Source	CY-5	CY-4	CY-3	CY-2	CY-1	CY/ 2017
GW						
Urban body						
Treated Waste Water for reuse						
Others						

6(b) Procurement Cost of Water (in Rs)

Year wise cost of procurement of Water				
CY-5	CY-4	CY-3	CY-2	CY-1

6(c) Expenditure on Water including Treatment and Management-Time trend at State level

	CY-5	CY-4	CY-3	CY-2	CY-1	CY/ 2017
Total Capex by Universities on water treatment and management (Lakhs)						
Total O&M Expenditure by Universities on water treatment and management (Lakhs)						
Total						
O&M Expense (%)						

6(d) Expenditure by Universities at district level for the Current Year- CY

District	Capital Expenditure (Lakhs)	O&M Expenditure (Lakhs)	Total	O&M Expense (%)
District 1				
District 2				
District 3				
District 4				
Total				

7 Water Use Efficiency:

Water use efficiency in terms of Specific Water Consumption (SWC) viz. amount of water used/consumed per unit. In case of Universities, it can be represented as the total volume of water used/consumed (litres) per student.

Specific Water Consumption (SWC) of Universities:

Volume of water consumed by the University, (litres)

Specific Water Consumption; (litres per student) = $\frac{\text{Volume of water consumed by the University, (litres)}}{\text{Total no. of students (student)}}$

7(a) Specific Water Consumption (water consumption per student) for Current Year in terms of litres per student

	Total Vol. of Water Consumed (litres)	Total no. of students	SWC (litres per student)
District 1			
District 2			
District 3			

7(b) Average water consumption per student of Universities for the State – time trend (also represent through Graph)

	CY-5	CY-4	CY-3	CY-2	CY-1	CY/ 2017
Average water consumption per student in Universities for State						

7(c) Specific Water Consumption (SWC)

Trend of average Specific Water Consumption (SWC) of Universities at district level:

Percentage of industries having specific water consumption within the norms/bench marks/standards (if applicable)

8Waste Water

	Bench Mark (as applicable)	District 1	District 2	District 3
Total Waste Water Generated from Universities (m ³ /annum)				
% Total quantum of wastewater discharged after recycling				

9Water Quality

		Bench Mark (as applicable)	District 1	District 2	District 3
Water Quality	% of Universities with online water quality monitoring systems installed.				
	% of Universities with compliance of wastewater regulatory quality discharge norms.				

Water Quality Time trend- Graphs: Compliance to Waste water discharge Quality norms (E.g. BOD / PH /COD / TSS etc.)

10Bench Marks/ Norms/ Standards and deviation from the norms/bench marks/standards currently for each industrial sector in state.

10(a) Benchmark for Water Consumption, Waste Water Generation etc.

	Parameters	Unit	Indian Bench Mark	International Bench Mark
1	Specific Water Consumption	litres per student		
2	Waste Water generation	litres per student		
3	Waste Water discharged	litres per student		