

4.2.3.2 Textiles and Jute

1.0 Subject Matter

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

GIS based map depicting location of all the Textile industries - District level

Type and total no. of Textiles industries in the State along-with production details (Refer Annexure: Table-1)

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

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

Water Supply & Demand for Textile industries in the State

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

Provide trend analysis (10-15 years) with breakup. (Refer Annexure: Table – 2, 3a, 3b)

Total Freshwater Withdrawal and Actual Water Consumption by Textile industries in the State

Comparative trend of Total Freshwater Withdrawal vs Actual Water Consumption by Textile industries in the State:

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

SECTOR (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	
District 1				
District 2				
GRAND TOTAL	xxx	xxx	xxx	xxx

3.0 Issues and Challenges

Illustrative issues and challenges may include

- Waste water disposal and associated surface and ground water contamination
- Water demand and supply issues in the Textile sector in the state, provide details
- Capital investment related issues w.r.to wastewater treatment/recycle/reuse, water conservation interventions etc.
- Issues related to water pricing in Textile sector
- Technology availability, affordability and efficiency related issues
- Issues & challenges relevant to the water supply & consumption
- 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 Textile sector in the state on water access, consumption and wastewater discharge.
- Any specific fresh and waste water regulation/ guidelines in state, provide details.
- Has the state notified any regulations including for zero liquid discharge for the Textile sector in state? Provide details.

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

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

Governing body for Textile sector	Water allocation & Monitoring authority	Waste water discharge monitoring
<i>E.g. Ministry of Textiles (MOT)</i>	<i>E.g. CGWA/ Water resource department/ Urban or Rural body</i>	<i>e.g. State pollution Control Board</i>

Areas of Peoples/Private Participation if any

- Water Projects set up by textile industries for the benefit of neighborhood/ local community/ Environment.

Textiles	Any OE ⁷ or critical block within the watershed	Water Conservation / Waste Water Treatment initiatives if any	Partnership			Sustainability of initiative
			Community Participation	PPP	Others	

Textiles	Any OE or critical block within the watershed	Water Reuse/ Recycle initiatives under PPP	PPP Yes/No	Sustainability of initiative

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, industrial process 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 Industry 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 within the prescribed norms etc.
- **Constraints** with respect to the measurement & monitoring

7.0 Performance Indicators:

a. **Benchmarks on water use** (*Refer Annexure: Table-13*)

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

Performance Indicators

Category	Indicator	Bench Mark (<i>as applicable</i>)	District- 1	District- 2
Water Quantity Measurement	Water Quantity			
	% of textile industries with water flow meters			

⁷Overexploited block of groundwater

	% of textile industries undertaken internal water audit in the last year			
	% of textile industries undertaken external water audit in the last year			
	% of textile industries undertaken Third party Water Audit in the last Year			
Water Conservation	% of textile industries with water harvesting structures?			
	% reduction of total water demand compared to the previous year.			

Performance Indicators

Category	Indicator	Benchmark (as applicable)	District 1	District 2
Water Use Efficiency (Annexure-7)	Specific Water Consumption (SWC); (m ³ /kg or tonne or m ³ /metre of cloth produced) (refer Annexure-7(a),(b) & (c))			
	Have specific water consumption norms/bench marks established	Yes/No		
Waste Water (Annexure-8)	% reduction in wastewater generation as compared to previous year?			
Water Quality (Annexure-9)	% of Textile units with online water quality monitoring systems installed.			
	% of Textile units having compliance with the wastewater quality discharge norms.			
	% of Textile units discharging wastewater into open area/ earthen nallah /open drain/ municipal sewer?			
	% of Textile units notified for violating effluent discharge norms for discharge in natural resources (surface/ground)?			
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, types & production of Textile industries in the State

Type of Textile industries in the State and production details		
Type (based on raw material)	No. of Textile industries	Daily Average Production (kg or tonnes/day)
Cotton & blended		
Wool & blended		
Jute		
Silk		
Man-made (Polyester, Viscose, etc.)		
<i>Total</i>		

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

Textiles	Years					
	1990	1995	2000	2005	2010	2017
No. of Industries						
Cotton & blended						
Wool & blended						
Jute						
Silk						
Man-made (Polyester, Viscose, etc.)						
<i>Total</i>						
<i>Water Demand and Supply</i>						
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:

Textile Industries: (MCM) Present Water Year: 1 st June to 31 st May next year									
INDUSTRY (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

Textile Industries: (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 Textiles

Textiles 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 Textile industries against total industries in the State

Textiles – Raw material type	Total Water Withdrawal by Textile industries (%) (Refer 4(a) below)	Total water withdrawal by all the Industries in state	Total Water Consumption by Textile industries (%) (Refer 4(b) below)	Total water Consumption by all the Industries in state
Cotton & blended				
Wool & blended				
Jute				
Silk				
Man-made				
Total				

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

$$\text{Total water withdrawal by Textile Sector (\%)} = \frac{(\text{Total water withdrawal by Textile units in the State}) \times 100}{(\text{Total water withdrawal by all the industries in the state})}$$

4(b) Total Actual Water Consumption by Textile industries in the State as percentage of total water consumption by all industries in the State

$$\text{Total water consumption by Textile Sector (\%)} = \frac{(\text{Total actual water consumption by Textile units in State}) \times 100}{(\text{Total water consumption by all the industries in the state})}$$

4(c) Total Freshwater Withdrawal and Total Actual Water Consumption by all Textile industries 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 Textile industries (MCM)												
Total Actual Water Consumption by all Textile industries (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 Textile industries (%) (Refer 5(a) below)						
Total Actual Water Consumption by all Textile industries (%) (Refer 5(b) below)						

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

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

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

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

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 Textile industries on water treatment and management (Lakhs)						
Total O&M Expenditure by Textile industries on water treatment and management (Lakhs)						
Total						

O&M Expense (%)						
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6(d) Expenditure by Textile units at district level for the Current Year- CY

Textiles	Capital Expenditure (Lakhs)	O&M Expenditure (Lakhs)	Total	O&M Expense (%)
District 1				
District 2				
District 3				
District 4				
District 5				
Total				

7 Water Use Efficiency:

Water use efficiency in terms of Specific Water Consumption (SWC) viz. amount of water used/consumed per unit of product produced. In case of Textiles it can be represented as the total volume of water used/consumed (m³) per unit (kg/tonne/metre) of cloth produced.

Specific Water Consumption (SWC) of Textiles:

$$\text{Specific Water Consumption; (m}^3\text{/kg or tonne or mtr.)} = \frac{\text{Volume of water consumed by the Textile unit, (m}^3\text{)}}{\text{(Total Production by the unit), (kg/tonne/mtr.)}}$$

7(a) Specific Water Consumption (SWC) for Current Year

	Vol.of Water Consumed(m ³)	Total Production kg/tonne/mtr.)	SWC (m ³ /kg or tonne or mtr.)
District 1			
District 2			
District 3			

7(b) Average SWC of Textile units for the State – time trend (also represent through Graph)

	CY-5	CY-4	CY-3	CY-2	CY-1	CY/ 2017
Average SWC of Textile units in State						

7(c) Specific Water Consumption (SWC)

SWC of Textile Sector in the State {in categories such as Cotton & blended, Wool & blended, Jute, Silk & Man-made; Decadal trends or 15 years trend to be provided.

Trend of average Specific Water Consumption (SWC) of Textile industries at district level.

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

8 Waste Water

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

9 Water Quality

	Bench Mark (as applicable)	District 1	District 2	District 3

Water Quality	% of Textile units with online water quality monitoring systems installed.				
	% of Textile units 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.

Benchmark for Water Consumption, Waste Water Generation etc. – Provide Category-wise benchmarks

	Parameters	Unit	Indian Bench Mark	International Bench Mark
Cotton & blended				
1	Specific Water Consumption	m ³ /kg or tonne or mtr.		
2	Waste Water generation	m ³ /kg or tonne or mtr.		
3	Waste Water discharged	m ³ /kg or tonne or mtr.		
Wool & blended				
1	Specific Water Consumption	m ³ /kg or tonne or mtr.		
2	Waste Water generation	m ³ /kg or tonne or mtr.		
3	Waste Water discharged	m ³ /kg or tonne or mtr.		
Jute				
1	Specific Water Consumption	m ³ /kg or tonne or mtr.		
2	Waste Water generation	m ³ /kg or tonne or mtr.		
3	Waste Water discharged	m ³ /kg or tonne or mtr.		
Silk				
1	Specific Water Consumption	m ³ /kg or tonne or mtr.		
2	Waste Water generation	m ³ /kg or tonne or mtr.		
3	Waste Water discharged	m ³ /kg or tonne or mtr.		
Man-made				
1	Specific Water Consumption	m ³ /kg or tonne or mtr.		
2	Waste Water generation	m ³ /kg or tonne or mtr.		
3	Waste Water discharged	m ³ /kg or tonne or mtr.		

Existing benchmarks/norms in certain sectors for reference

Benchmarks:

Textile sector

	Parameters	Unit Value	Indian Bench Mark	International Bench Mark
1	Specific Water Consumption	m ³ /tonne	200-250 ⁸	Less than 100
2	Waste Water generation	m ³ /tonne		
3	Waste Water discharged	m ³ /tonne	ZLD (draft)	

Norms:

Textile Sector⁹:

The draft notification for standards for effluents from textile industries came in 2015. It stated the following: Textiles unit (having dyeing process/cotton or woollen processing units and all integrated textile units) where wastewater discharge is greater than 25 KLD shall establish Zero Liquid Discharge (ZLD) – Effluent Treatment Plant (ETP).

The recovered water from ZLD-ETP through Reverse Osmosis (R.O.)/ Multi Effect Evaporator (MEE) shall be re-used in the process by the units and no ground water abstraction is allowed except for make-up water and drinking water purpose as assessed by respective State Pollution Control Board (SPCBs)/Pollution Control Committee (PCCs).

⁸<http://www.cseindia.org/dte-supplement/industry20040215/misuse.htm>

⁹<http://www.moef.nic.in/sites/default/files/Effluents%20from%20textile%20Industry.PDF>