

4.2.3.6 Pharmaceuticals

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 Pharmaceutical industries - District level

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

Time trend of the number (growth) of Pharmaceutical 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 Pharmaceutical industries

Water Supply & Demand for Pharmaceutical industries in the State

Time trend of total water demand and actual current water supplied to the Pharmaceutical 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 Pharmaceutical industries in the State

Comparative trend of Total Freshwater Withdrawal vs Actual Water Consumption by Pharmaceutical 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 Pharmaceutical 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 Pharmaceutical 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 Pharmaceutical 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 Pharmaceutical 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 Pharmaceutical sector	Water allocation & Monitoring authority	Waste water discharge monitoring
<i>E.g. Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers</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 Pharmaceutical industries for the benefit of neighborhood/ local community/ Environment.

Pharmaceuticals	Any OE ¹⁵ or critical block within the watershed	Water Conservation / Waste Water Treatment initiatives if any	Partnership			Sustainability of initiative
			Community Participation	PPP	Others	

Pharmaceuticals	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 (as applicable)	District- 1	District- 2
Water Quantity Measurement	Water Quantity			
	% of Pharmaceutical industries with water flow meters			

¹⁵Overexploited block of groundwater

	% of Pharmaceutical industries undertaken internal water audit in the last year			
	% of Pharmaceutical industries undertaken external water audit in the last year			
	% of Pharmaceutical industries undertaken Third party Water Audit in the last Year			
Water Conservation	% of Pharmaceutical 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); (litres per unit of product) (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 Pharmaceutical units with online water quality monitoring systems installed.			
	% of Pharmaceutical units having compliance with the wastewater quality discharge norms.			
	% of Pharmaceutical units discharging wastewater into open area/ earthen nallah /open drain/ municipal sewer?			
	% of Pharmaceutical 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 Pharmaceutical industries in the State

Total no. of Pharmaceutical industries in the State and production details		
District-wise	No. of Pharmaceutical industries	Daily Average Production (in litres or tonnes)
District 1		
District 2		
District 3		
<i>Total</i>		

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

Pharmaceuticals	Years					
	1990	1995	2000	2005	2010	2017
Total no. of Pharmaceutical Industries						
<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:

Pharmaceuticals 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

Pharmaceuticals 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 Pharmaceuticals

Pharmaceuticals 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 Pharmaceutical industries against total industries in the State

Total Water Withdrawal by Pharmaceutical industries (%) (Refer 4(a) below)	Total water withdrawal by all Industries in the state	Total Water Consumption by Pharmaceutical industries (%) (Refer 4(b) below)	Total water Consumption by all Industries in the state

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

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

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

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

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

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

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

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

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

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 Pharmaceutical industries on water treatment and management (Lakhs)						
Total O&M Expenditure by Pharmaceutical industries on water treatment and management (Lakhs)						
Total						
O&M Expense (%)						

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

Pharmaceuticals	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. In case of Pharmaceuticals it can be represented as the total volume of water used/consumed (litres) per unit of medicinal product.

Specific Water Consumption (SWC) of Pharmaceuticals:

$$\text{Specific Water Consumption; (litres per unit of medicinal product)} = \frac{\text{Volume of water consumed by the Pharmaceutical unit, (litres)}}{\text{(Total Production by the unit)}}$$

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

	Vol. of Water Consumed (litres)	Total Production (in litres or tonnes)	SWC Lit./litre of product or litre/tonne of product
District 1			
District 2			
District 3			

7(b) Average SWC of Pharmaceutical 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 Pharmaceutical units in State						

7(c) Specific Water Consumption (SWC)

SWC of Pharmaceutical Sector in the **State**; Decadal trends or 15 years trend to be provided.

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

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

8Waste Water

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

9Water Quality

		Bench Mark (<i>as applicable</i>)	District 1	District 2	District 3
Water Quality	% of Pharmaceutical units with online water quality monitoring systems installed.				
	% of Pharmaceutical 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
1	Specific Water Consumption	litre/litre of product or litre/tonne of product		
2	Waste Water generation	litre/litre of product or litre/tonne of product		
3	Waste Water discharged	litre/litre of product or litre/tonne of product		