

Responsible by Design: Embedding Water Sustainability in Pharma.

Prioritizing water stewardship for resilience and ESG alignment:

Geena Malhotra



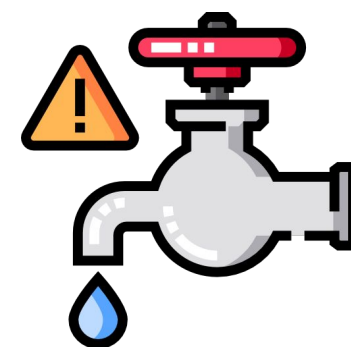
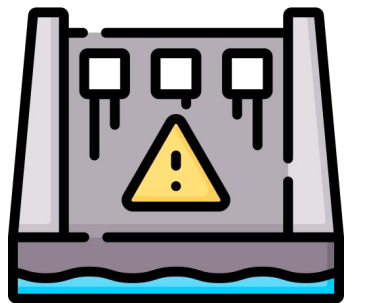
Imagine a world without Water.

The Reality of DAY ZERO 



On 19th June 2019 Chennai City officials Declared DAY ZERO or the day when Almost no Water is left as all the reservoirs had run dry!

In 2017-2018 Cape Town (South Africa) dams dropped to very low levels declaring Day Zero when the taps would be turned off!



10 metropolitan Cities , among them, Bengaluru is fast moving towards “Day Zero” – a situation where taps start running dry.

“ Day Zero ” is the term for a city’s hypothetical day when its main water supply runs out due to non availability of water.

Our Evolution: From EHS to ESG to Stewardship.

Tracking pharmaceutical sustainability's
strategic shift from compliance to
regenerative resource management

2023:

- EHS Focus
- Centered on Environment, Health, and Safety with safety protocols and compliance.

2024:

- ESG Alignment
- Introduced greenhouse gas reduction, renewable energy, and supplier sustainability programs.

2025:

- Water Stewardship
- Integrates safety, environment, and governance into a regenerative framework, marking strategic maturation.

ESG IS COMPLIANCE (Have to), STEWARDSHIP IS COMMITMENT (Want to)



Why Water Recharge Harvesting must be Pharma’s top sustainability priority in India?

Factor	GHG/Energy	Water
Global Focus & Maturity	Scaled & Financed	Early stage, fragmented
Policy Innovation	National Mission	Multi-scheme approach
Impact on Agriculture/Rural Livelihoods	Moderate	Strong
Substitute	Power Import possible	Water is local only
Operational risk	Low (grid backup)	High (Aquifer dependency)
Time to impact	Years	Immediate resilience

While climate action dominates global headlines and attracts significant investment, **water scarcity determines immediate livelihoods**—and in India, it represents the direct, urgent crisis. For pharmaceutical operations, water shortages will disrupt production and community relations long before carbon constraints become binding.



India's Water Crisis: A Growing Threat

India is home to 18% of world population but has only 4% of global fresh water resources

Over 600 million people face severe **water stress** in India

54% of India's land experiences high water stress with ground water declining by 0.5- 1 M annually in many industrial belts

Groundwater depletion intensifies with over 4,000 monitored wells showing continuous water level drops

This crisis extends beyond policy to a **survival imperative** for communities and water-dependent industries

Per capita water availability plunged from 5,200 m³ in 1951 to under 1,500 m³ today, a **71% decline**



Our Extraction is More Than Replenishment

- ❑ 102 districts are overexploited, where extraction exceeds recharge.
- ❑ 22 districts are critical, with 90-100% groundwater extraction.
- ❑ 69 districts are semi-critical, with 70-90% groundwater extraction.
- ❑ These categories emphasize urgent need for interventions to prevent further depletion.



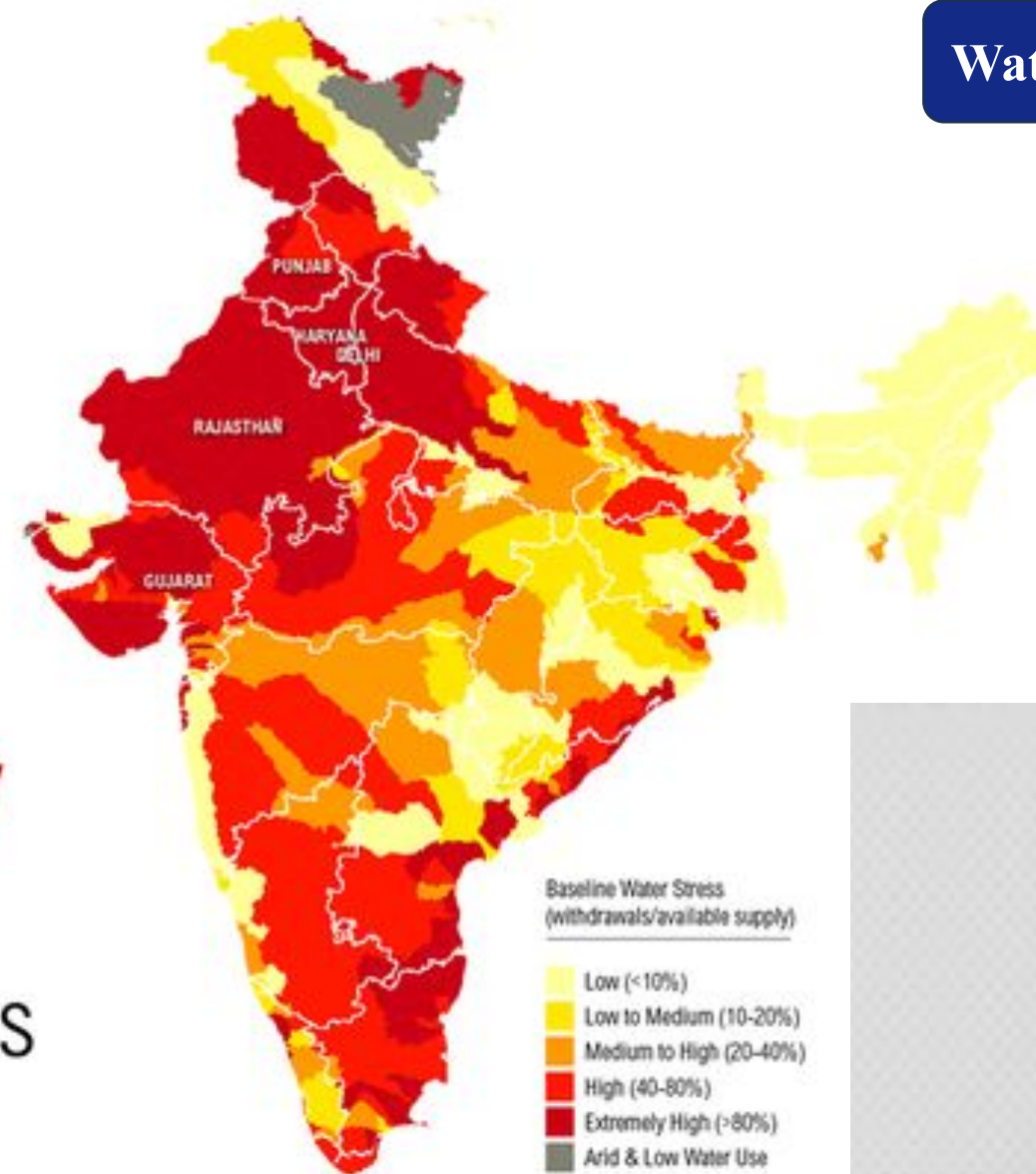
State-wise number of ‘OCS (Over Exploited, Critical and Semi Critical)’ Districts as per National Compilation of Dynamic Ground Water Resources of India, 2024

S.No.	State/Union Territories	No. of Over-Exploited	No. of Critical Districts	No. of Semi-Critical Districts	Total no. of OCS Districts
1	Bihar	0	0	2	2
2	Chhattisgarh	0	1	3	4
3	Gujarat	4	0	2	6
4	Haryana	16	1	2	19
5	Jharkhand	0	0	1	1
6	Karnataka	5	4	5	14
7	Kerala	0	0	2	2
8	Madhya Pradesh	6	1	6	13
9	Maharashtra	0	0	5	5
10	Punjab	19	1	0	20
11	Rajasthan	29	0	0	29
12	Tamil Nadu	9	3	10	22
13	Telangana	1	0	2	3
14	Uttar Pradesh	5	7	26	38
15	West Bengal	0	0	1	1
16	Dadra and Nagar Haveli and Daman and Diu	3	0	0	3
17	Delhi	5	4	1	10
18	Puducherry	0	0	1	1
	Grand Total	102	22	69	193

Pharma Clusters are operating in Water Stressed regions!

The water stress map highlights pharmaceutical clusters situated in highly stressed water regions across India. This geographic overlap emphasizes the critical need for water stewardship within the industry to safeguard operations and communities.

54%
of India
Faces
**High to
Extremely
High**
Water Stress



Water Stress Map

Pharma Cluster



Why It Is Imperative for Pharma to Focus on Water

Understanding water’s critical role across pharma operations and sustainability strategies

In water Stewardship Terms :

Blue water = what industries use from water reservoirs and should reduce

Green water = what nature provides (rain –fed systems)

Grey water = what we Cn reuse or recycle within



Pharma’s water neutrality strategy rests on three pillars

- Reduce blue water usage
- Enhance rainwater and treated water use
- Support community water conservation programs

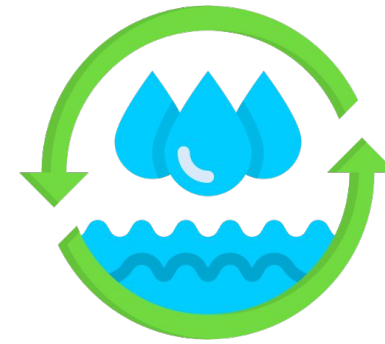
This comprehensive approach is essential for sustainable operations



Water Withdrawal (in KL)				
Companies	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Cipla	16,46,351	15,66,809	16,14,079	16,32,537
Sun Pharma	2,299,489	2,151,878	1,802,434	1,784,738
Dr. Reddys	1,838,019	1,884,363	2,047,864	2,123,116
Torrent Pharma	1,045,000	1,046,000	1,082,000	1,104,000
Divis Lab	26,03,936	28,38,710	28,09,573	27,95,303

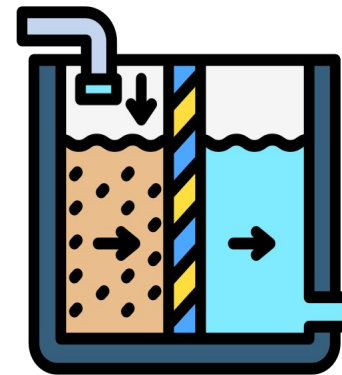
Within Our Boundaries: Water Efficiency & Recycling

Pharma leads with innovative water
stewardship beyond compliance



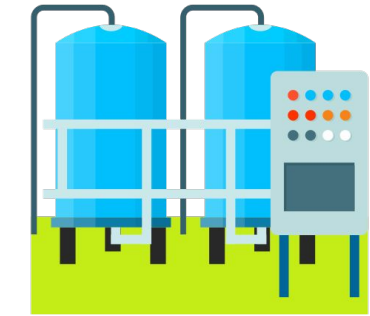
Pharma conserves water through rainwater harvesting, borewell recharging, recycling, and Zero Liquid Discharge (ZLD).

- Captures monsoon water through tanks, pits, and recharge shafts to maximize natural replenishment.



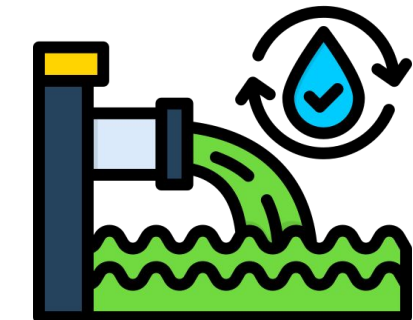
Reverse osmosis reject water is consumed within operational processes.

- Utilities, Ancillary Systems & Sanitation / Waste Management.



Wastewater management increases treated water reuse across operations.

- Channels processed wastewater for landscaping, cooling, and sanitation, reducing fresh water demand.



ZLD ensures zero discharge of wastewater outside pharma facilities.

- Treats all wastewater onsite, recycling every drop or converting it into solid waste, ensuring no liquid waste leaves.



Beyond Our Boundaries: Community & Watershed Engagement

True water stewardship extends far beyond factory gates. Our responsibility includes restoring water security in the villages and aquifers that support our operations:

Driving Water Neutrality Through Community Action



Rejuvenate Dried Borewells:

- Scientific assessment and restoration of depleted community borewells through desilting and recharge enhancement
- Rejuvenated a borewell dry for over 10 years, now overflowing and supplying water.



Renovate Traditional Water Structures:

- Reviving centuries-old stepwells, tanks, and ponds that communities once relied upon for water security
- Renovates dilapidated water structures to restore water storage capacity

Beyond Our Boundaries: Community & Watershed Engagement



Ridge-to-Valley Watershed Programs:

- Comprehensive landscape interventions from hilltops to plains—creating natural water retention across entire catchment areas
- Implements ridge to valley water collection leveraging terrain contours for effective harvesting



Co-Invest in Rural Recharge:

- Partnership funding for check dams, farm ponds, and community-scale recharge infrastructure in water-stressed villages
- These initiatives foster shared water security and strengthen the company's social license

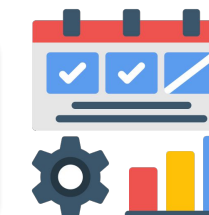
The Investment Case: High Impact, Low Capital

Unlock exceptional value with efficient,
rapid watershed restoration



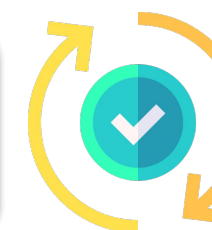
Watershed restoration delivers exceptional financial efficiency compared to infrastructure-heavy solutions like ZLD

Requires lower capital expenditure and reduces project risk through distributed implementation



Deploys rapidly via NGO and government partnerships for swift impact

Outcomes measurable within 2-3 monsoon cycles, enabling quick validation



Every ₹1 invested generates multi-dimensional social, environmental, and economic value

Benefits include employment, women's empowerment, increased agricultural yields, and biodiversity restoration



Impact extends far beyond regulatory compliance, creating sustained value

Investment for Watershed Programs Is Not Expensive

₹40 per kilolitre (kL) of water potential is the approximate cost incurred for generating water potential through the construction of water harvesting structures.

- Considering both flat plains and hilly terrains, this cost benchmark highlights the importance of selecting technically feasible and hydrologically effective sites.
- In flat areas, structures like line farm ponds, percolation tanks, and farm bunds are more effective, whereas check dams, core wall gabions, and contour trenches are better suited for hilly regions.
- Therefore, careful planning and prioritization based on terrain, recharge potential, and community needs are essential to ensure cost-efficient and impactful implementation.

Topographic Landforms	Structure Type	Cost (INR)	Estimated Water Potential (kL)	Cost INR/kL of Water Potential
Hilly Terrain	Earthen Nala Bund	2,24,95,443.75	5,48,073.24	40.03
	Nala Deepening & Widening (NDW)	2,08,42,798.72	9,65,739.23	34.48
	Check Dam	1,32,00,000.00	3,89,373.39	41.45
	Percolation Tank	1,25,55,794.95	4,04,477.63	35.09
	Line Farm Pond	99,00,000.00	24,415.41	412.56
	Water Absorption Trenches (WAT)	92,21,383.38	14,51,539.59	5.3
	Core Wall Gabion	60,68,000.00	34,122.71	383.74
	Deep Cross-section Contour Trenches	56,73,333.72	10,42,624.30	18.24
	New Farm Bund	54,23,853.18	7,97,321.76	8.57
	Repair of Farm Bund (RFB)	3,83,049.77	90,784.32	4.49
	New Cement Nala Bund	2,31,840.00	20,232.61	11.46
Flat Plain	Desiltation of Pond	2,17,34,800.00	1,33,982.32	581.29
	Check Dam	60,10,000.00	51,377.08	136.32
	Rooftop Rain Water Warvesting	60,00,000.00	90	66,666.67
Weighted Average of Cost (INR)/ kL of Water Potential				39.27

Cost-effective and accessible solutions for impactful water stewardship:

Cipla - Leading with Water Positivity

Driving sustainable water management through innovative practices and community impact

Plants with ZLD implemented

67 %

Percentage of Cipla plants achieving Zero Liquid Discharge

Reduction in water withdrawal since FY 2019-20

13 %

Decrease in total water withdrawal across operations

Water recycled internally

50 %

Proportion of water reused within plants for cooling, landscaping, and utilities

Community watershed conserved volume

24 Lakh KI

Water conserved via community partnerships

Families benefited by water programs

4000+

across 27 villages

Families gaining improved water access, reduced migration, and enhanced agriculture and education

Effective Water Conservation Across Ridge to Valley

Harnessing terrain contours for sustainable watershed restoration and groundwater recharge



Water Absorption Trenches enhance infiltration along slopes



Core-wall Gabions stabilize soil and trap sediment along contours



Checkdams slow water flow and increase soil moisture retention



Percolation Tanks collect runoff, promoting groundwater recharge



Core-wall Gabions stabilize soil and trap sediment along contours



Earthen Nala Bunds strategically slow surface runoff to retain water

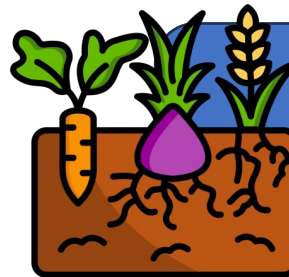
Conserving Water Unlocks Multiple Social Benefits



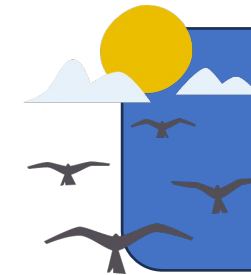
Direct Person
Days Generated



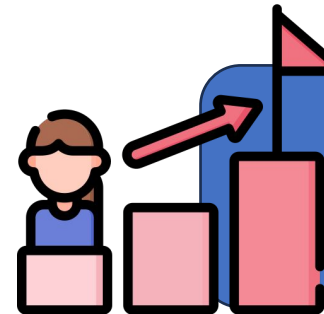
Stop Migration



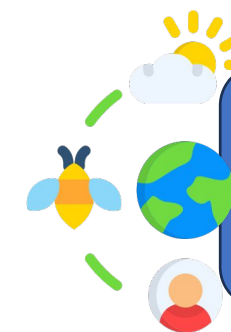
Multiple Crops



Migratory Birds



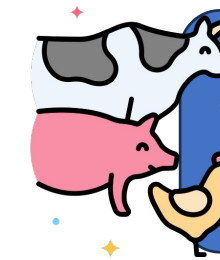
Women
Empowerment



Improve Biodiversity



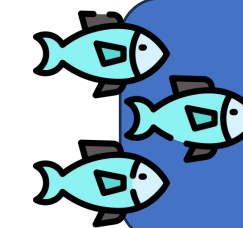
Water Harvested



No. of cattle watering



Income increase



No. of fish
farming units



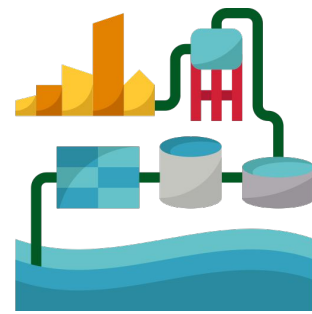
Increase in Yield



Education and Capacity
Building to
beneficiaries

The Future for Pharma: Think Big, Act Bold

Driving Water Positivity Through Collaboration
and Innovation.



Basin-Level Collaboration:

Coordinate watershed restoration efforts through partnerships at the basin level to replenish more water than consumed.



Integrated Water KPIs:

Embed water Key Performance Indicators into ESG audits, supplier scorecards, and investment decisions to drive accountability and transparency.



Water-Neutral Manufacturing:

Commit to implementing water-neutral manufacturing practices in key states to secure sustainable production.



Water Security as a Core Priority:

Elevate water security alongside energy independence as defining pillars for a sustainable pharmaceutical future.

"Energy independence defined the last decade. Water security will define the next. The companies that act now—investing in both technology and community—will set the benchmark for sustainable manufacturing in India and secure their operational future."

Snapshot – Water Stewardship in Indian Pharma

Evaluating water sustainability efforts across leading pharma companies for FY 2024-25



“Source: Annual reports of companies”

Company	Water Positive % (FY 2024-25)	Notes
Cipla Limited	100%+	Fully water positive in India
Sun Pharma	N/A	Significant recycling (200 Mn L)
Dr. Reddy’s	N/A	1.2 Bn L recycled
Divi’s	N/A	90% recycled water
Torrent	N/A	75% recycled ZLD + smart metering
Mankind	N/A	60% reuse; awareness programs
Zydus	N/A	80% recycled
Lupin	N/A	Rainwater harvesting focus
Alkem	N/A	65% recycled
Aurobindo	N/A	75% recycled

**Future for Pharma:
Think BIG**

**Partnerships will
help accelerate
your vision**



When it comes to water, it's time to think bigger.

The Alliance for Water Stewardship (AWS) is a global, multi-stakeholder membership alliance and international standard for responsible water use. We convene and catalyse action on water stewardship, uniting over 200 members from business, civil society and the public sector.

Why get certified?

Certification to the AWS Standard is confirmation of having met the global benchmark for responsible water stewardship. Only with certification can organisations and businesses provide the assurance to external and internal stakeholders that your claims of good water stewardship are credible.

Certified sites use their AWS Standard certification to demonstrate the efficacy of their water stewardship practices to a range of audiences, including retail customers, wholesalers, consumers, government agencies, regulators, NGO's, local civil society organisations, local communities, investors and development financiers, and more.



Confederation of Indian Industry



Pledge Commitment to Water Sustainability

“Don’t Let Your Future Dry Up” -





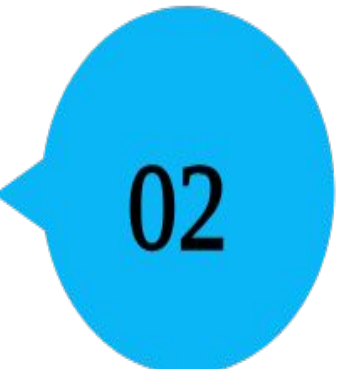
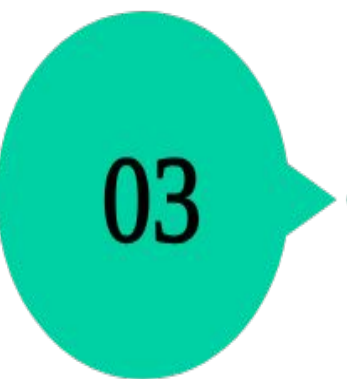
Within Our Boundaries: Water Efficiency & Recycling

Four programs transform water use into sustainable resource management, supporting local aquifers

Rainwater Harvesting Infrastructure:
Captures monsoon water through tanks, pits, and recharge shafts to maximize natural replenishment.



RO Reject & Wastewater Consumption:
Reintegrates reject and treated water into non-critical uses, optimizing resource recovery.



Treated Water Reuse:
Channels processed wastewater for landscaping, cooling, and sanitation, reducing fresh water demand.



Zero Liquid Discharge (ZLD):
Treats all wastewater onsite, recycling every drop or converting it into solid waste, ensuring no liquid waste leaves.

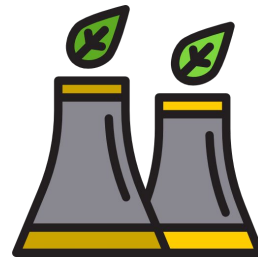
We've made significant progress—every facility implementing rainwater harvesting and reuse systems functions as a local water bank. **Now we must expand and measure these systems for quantifiable recharge outcomes** that contribute to regional aquifer health.

What is sustainability in Pharmaceutical context:



Minimize environmental impact during drug production.

Focus on reducing carbon emissions, water, and energy usage.



Use green chemistry and efficient manufacturing processes.

Responsible sourcing of raw materials (e.g., excipients).



Reduce reliance on single-use plastics



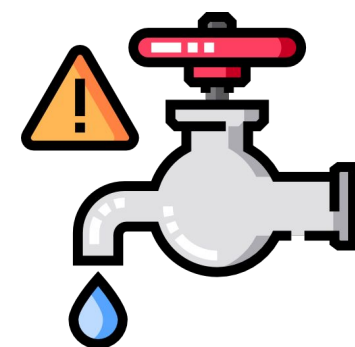
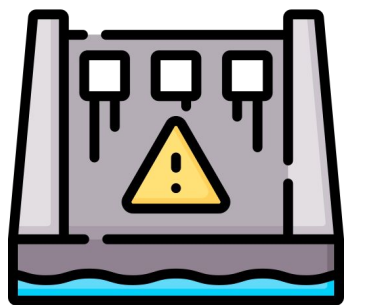
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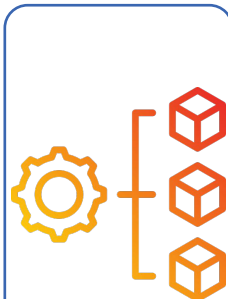
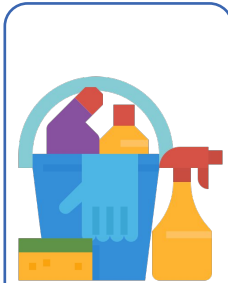
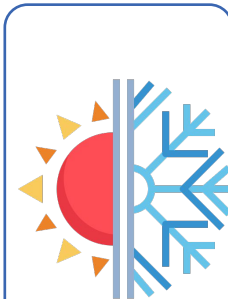
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Pharma's Evolution: From Water User to Water Custodian

“The next phase of pharmaceutical ESG transcends clean energy and waste minimization. It's about securing water for the ecosystems upon which we depend—moving beyond regulatory compliance to genuine co-ownership of water resources.”

Key Water Dependencies:



Strategic Water Stewardship (4Rs Framework):

