7. India's Reservoirs - Geography

1. Background and Definitions

Background

India supports approximately 18% of the global population but possesses only 4% of the world's freshwater resources. This disparity makes India one of the most water-stressed nations globally. The CWC monitors 166 major reservoirs which collectively hold a live storage capacity of 183.565 BCM (Billion Cubic Metres), representing about 71.2% of the country's total estimated storage capacity.

Key Definitions

Live Storage Capacity: The portion of a reservoir's capacity that can be utilized for various purposes like irrigation, power, and drinking water (excluding "dead storage" at the bottom).

Water Reservoirs: Natural or artificial storage spaces (rivers, lakes, glaciers, aquifers, or dam-backed basins) used to collect and store water for future use.

Siltation: The process by which water-borne sediments (silt and debris) settle at the bottom of a reservoir, gradually reducing its storage volume.

Eutrophication: Nutrient enrichment (often from fertilizers) in water bodies that causes excessive plant and algae growth, depleting oxygen and occupying storage space.

2. Current Status of India's Water Storage (2026)

The latest CWC data reveals a troubling trend across the country's hydrological infrastructure:

Overall Depletion: Major reservoirs are currently operating at less than 45% of their total capacity.

River Basin Stress: Most of the 20 monitored river basins are holding only 30% to 60**%** of their capacity.

Regional Steepest Drops: * Southern India: Experiencing the most severe decline, raising alarms for urban centres like Bengaluru and Chennai.

1. Bihar: The Chandan dam has notably run completely dry.

Critical Levels: Several reservoirs have reached "dead storage" or zero levels, meaning no further water can be drawn for supply.

3. Reasons for the Decline in Reservoir Capacity

The reduction in available water is not just a factor of low rainfall, but also systemic degradation:

Siltation and Sedimentation: Accumulation of debris reduces the actual "bowl" size of the reservoir over time.

Catchment Area Degradation: Deforestation, mining, and overgrazing in areas feeding the reservoirs increase soil erosion, leading to higher sediment inflow.

Encroachment: Illegal occupation of feeder channels and reservoir perimeters reduces effective storage and blocks natural flow.

Invasive Species: The growth of aquatic weeds and algae (Eutrophication) occupies space and degrades water quality.

Climate Change: Erratic rainfall patterns and prolonged droughts result in insufficient "recharge" of these basins.

4. Drivers of Water Scarcity in India

Category	Major Contributing Factors
Agricultural	Inefficient irrigation (flood irrigation) and promotion of water-intensive crops (Rice, Sugarcane).
Industrial/Urban	Rapid urbanization and the "Data Centre Boom" (60–80% of data centres face high water stress).
Environmental	Climate change causing irregular monsoons; excessive groundwater extraction (Avg. stage at 60.4%).

Managerial	Lack of proper storage infrastructure, pollution of existing bodies, and poor demand management.

5. Governance and Constitutional Framework

Water management in India is legally and institutionally complex:

State Subject: Under Entry 17 of the State List (Seventh Schedule), states have primary jurisdiction over water.

Union Role: Under Entry 56 of the Union List, the Central Government regulates inter-state rivers and valleys.

Article 262: Provides the Constitutional mechanism for Parliament to adjudicate disputes relating to inter-state rivers.

Key Governance Challenges

Fragmented Institutions: Jurisdictional conflicts between states often stall comprehensive basin management.

Engineering Bias: A historical focus on "Supply-side" (building more dams/canals) while neglecting "Demand-side" (conservation/efficiency).

Data Gaps: A lack of reliable, real-time water data leads to poor planning and unregulated extraction.

Neglect of E-Flows: Environmental flows (the water needed to keep a river "alive") are often ignored for the sake of human consumption.

6. Major Government Initiatives

The Government of India has launched several missions to address both rural and urban water security:

Jal Jeevan Mission (JJM): Aimed at providing functional household tap connections to every rural home.

Jal Shakti Abhiyan (2019): A campaign for water conservation and groundwater recharge in water-stressed districts.

AMRUT 2.0: Focuses on making cities "water secure" through rejuvenation of water bodies and green spaces.

Atal Bhujel Yojana: A specific scheme to improve groundwater management in overexploited and critical blocks.

Amrit Sarovar Mission: A target to develop and rejuvenate 75 water bodies per district to commemorate 75 years of independence.

NAQUIM: The National Aquifer Mapping Program helps map underground water sources for sustainable scientific management.

7. Conclusion and Way Forward

To prevent a future of terminal water scarcity, India must transition from an engineering-centric approach to a sustainability-centric approach.

Integrated Management: Treating water as a shared, finite resource across state borders rather than a local commodity.

Demand Management: Promoting "Per Drop More Crop" in agriculture and rational water pricing in urban areas to prevent wastage.

Ecosystem Focus: Incorporating land and forest management into water policy to reduce siltation and enhance natural recharge.

Technological Adaptation: Addressing the water-intensive needs of modern industries (like Data Centres) with recycled water and cooling efficiencies.

Source: https://www.downtoearth.org.in/rivers/dry-rivers-shrinking-reserves-indias-reservoirs-fall-below-half-capacity-data-shows#:~:text=Storage%20in%20the%20166%20monitored,a%20few%20above%20that%20range.