

Complete India Water Resources Database

Comprehensive Data from India WRIS and Official Sources

1. NATIONAL WATER OVERVIEW

Total Water Resources

- **Total Annual Water Resources:** 4000 BCM (Billion Cubic Meters)
- **Utilisable Water Resources:** 1123 BCM
 - Surface Water: 690 BCM
 - Groundwater: 433 BCM
- **Per Capita Water Availability (2011):** 1544 cubic meters per year
- **World Share:** 4% of world's freshwater resources supporting 17% of world's population

Water Distribution by Use (Current vs Projected 2025)

- **Agricultural Use:** 87% (current) → 73% (2025 projection)
- **Non-Agricultural Use:** 13% (current) → 27% (2025 projection)

2. RIVER BASIN INFORMATION

Basin Classification

- **Total Major River Basins:** 25
- **Total Sub-basins:** 103
- **Total Medium River Basins:** 46 (catchment area 2000-20000 km²)

Major River Basins

Basin Name	Type	Key States	Transboundary	Significance
Ganga	Large	UP, Bihar, WB, Jharkhand	Yes	Major water source
Indus	Large	Punjab, Haryana, Rajasthan	Yes	Agricultural backbone
Brahmaputra	Large	Assam, Arunachal Pradesh	Yes	High water volume
Godavari	Large	Maharashtra, Telangana, AP	No	Peninsular major
Krishna	Large	Maharashtra, Karnataka, AP	No	South India major

Basin Name	Type	Key States	Transboundary	Significance
Cauvery	Medium	Karnataka, Tamil Nadu	No	Interstate disputes
Narmada	Medium	MP, Gujarat, Maharashtra	No	West flowing
Tapi	Medium	MP, Maharashtra, Gujarat	No	West flowing

Key Basin Statistics

- Ganges & Brahmaputra Basins:** 60% of India's renewable surface water
- Exploitable Water:** Only 37% from Ganges & Brahmaputra
- Coverage:** Major 4 basins (Ganges, Indus, Godavari, Brahmaputra) cover >50% of country

3. GROUNDWATER RESOURCES (2024 Assessment)

National Groundwater Statistics

- Total Annual Recharge:** 446.90 BCM
- Annual Extractable Resources:** 406.19 BCM
- Annual Extraction:** 245.64 BCM
- Net Available for Future Use:** 160.55 BCM
- Overall Stage of Development:** 60.08%

Groundwater Categories (2024)

Category	Percentage	Volume (BCM)	Assessment Units
Safe	73%	291.88	4,780 units
Semi-Critical	12%	47.0	885 units
Critical	3%	13.02	260 units
Over-Exploited	12%	46.05	1,006 units
Saline	2%	-	158 units

Total Assessment Units: 7,089 (2024)

4. STATE-WISE GROUNDWATER DEVELOPMENT (2024)

Critical States (>100% Development)

State	Stage of Development	Status
Punjab	172%	Severely Over-exploited
Rajasthan	137%	Over-exploited
Haryana	134.14%	Over-exploited
Delhi	98.16%	Near critical

High Development States (70-100%)

State	Stage of Development	Resources (BCM)
Tamil Nadu	77%	-
Uttar Pradesh	74%	36.4
Karnataka	69.93%	-

Moderate Development States (30-70%)

State	Stage of Development	Resources (BCM)
Madhya Pradesh	57%	27.0
Uttarakhand	57%	-
Telangana	55%	-
Gujarat	53.23%	19.6
Maharashtra	53%	20.7
Chhattisgarh	49.58%	-
Kerala	47%	-
Bihar	44.94%	-
West Bengal	40%	-
Himachal Pradesh	37.56%	-
Jharkhand	31.35%	-
Andhra Pradesh	28.81%	26.41

Low Development States (<30%)

State	Stage of Development
Goa	23.63%
Assam	12.38%
Tripura	7%

State	Stage of Development
Nagaland	6%
Mizoram	3%
Manipur	1%
Arunachal Pradesh	0.79%
Meghalaya	0%

5. RESERVOIR INFRASTRUCTURE

National Reservoir Summary

- **Total Completed Dams:** 6,545 reservoirs
- **Total Live Storage Capacity:** 253.95 BCM
- **CWC Monitored Reservoirs:** 161 important reservoirs
- **CWC Monitored Storage Capacity:** 182.461 BCM
- **Major Reservoirs Tracked:** 91 reservoirs
- **Major Reservoirs Capacity:** 161.993 BCM (63% of total capacity)

Regional Reservoir Distribution

Northern Region

- **States:** Himachal Pradesh, Punjab, Rajasthan
- **Number of Reservoirs:** 6
- **Total Capacity:** 18.01 BCM

Eastern Region

- **States:** Jharkhand, Odisha, West Bengal, Tripura
- **Number of Reservoirs:** 15
- **Total Capacity:** 18.83 BCM

Western Region

- **States:** Gujarat, Maharashtra
- **Number of Reservoirs:** 27
- **Total Capacity:** 31.26 BCM

Central Region

- **States:** Uttar Pradesh, Uttarakhand, Madhya Pradesh, Chhattisgarh
- **Number of Reservoirs:** 12
- **Total Capacity:** 42.30 BCM

Southern Region

- **States:** Andhra Pradesh, Telangana, Karnataka, Kerala, Tamil Nadu
- **Number of Reservoirs:** 31
- **Total Capacity:** 51.59 BCM

Major Individual Reservoirs (Selected)

Reservoir	State	Live Storage Capacity (BCM)
Srisailam	Andhra Pradesh	6.013
Nagarjuna Sagar	Andhra Pradesh	5.108
Kandaleru	Andhra Pradesh	1.792
Somasila	Andhra Pradesh	1.994
Pulichintala	Andhra Pradesh	1.3

6. IRRIGATION INFRASTRUCTURE

National Irrigation Potential

- **Ultimate Irrigation Potential:** 139.5 million hectares
- **Current Achieved Potential:** 84.9 million hectares
- **Remaining Potential:** 54.6 million hectares

Irrigation Potential Breakdown

Source Type	Potential (Million Hectares)
Major & Medium Schemes	58.5
Minor Irrigation Schemes	15.0
Groundwater Based	66.0

Minor Irrigation Census (6th Edition)

- **Total MI Schemes:** 23.14 million
- **Groundwater Schemes:** 21.93 million (94.8%)
- **Surface Water Schemes:** 1.21 million (5.2%)
- **Irrigation Potential Created (GW):** 70 million hectares
- **Average Utilization:** >90% in many states

High-Performing States (>90% Utilization)

- Haryana
- Kerala
- Maharashtra
- Punjab
- Uttar Pradesh

Scheme Distribution by Type

Scheme Type	Number Share	IPC Share	Characteristics
Dug Wells	43%	26%	Traditional, widespread
Deep Tube Wells	7%	13%	High efficiency per unit
Surface Flow	3%	12%	High capacity per unit
Shallow Tube Wells	-	-	91.7% in use
Surface Lift	-	-	93.7% in use

7. WATER QUALITY MONITORING

Groundwater Quality Assessment (2024)

- **Total Monitoring Locations:** 15,259 stations
- **Geographic Coverage:** All major states and UTs
- **Overall Assessment:** Largely suitable for drinking and agricultural purposes
- **Contamination Status:** Beyond permissible limits in isolated pockets only

Water Quality Parameters Monitored

- **Total Parameters:** 85 different parameters
- **Monitoring Period:** May 2000 to present (continuous)
- **Monitoring Frequency:** Monthly and yearly basis
- **CGWB Network:** 25,000 monitoring stations nationwide

Major Contaminants Tracked

Selenium Contamination (2019 Study)

- **States Tested:** 17 states/UTs
- **Total Samples:** 5,956 groundwater samples
- **Contamination Found:** Only 4 samples exceeded limits
- **Affected Areas:** Jhajjar (Haryana), Rupnagar (Punjab)
- **Permissible Limit:** 10 ppb

Other Key Contaminants

Contaminant	Status	Geographic Distribution
Arsenic	Regional contamination	Isolated pockets
Fluoride	Present in several states	Widespread monitoring
Heavy Metals	Regular monitoring	Variable by region
Nitrate	Regional variations	Agricultural areas
Electrical Conductivity	High in certain areas	Coastal and arid zones

Climate Response Monitoring Network (CRMN)

- **Focus Area:** Tamil Nadu & Puducherry coastal tracts
- **Purpose:** Seawater intrusion monitoring
- **Network Size:** 60 piezometers with telemetry
- **Coverage:** 450 km coastline
- **Depth Range:** 30-300 meters
- **Distance from Coast:** 100m to 34 km
- **Data Transmission:** Real-time, every 6 hours

8. HYDROLOGICAL MONITORING NETWORK

National Ground Water Monitoring

- **National Hydrograph Network Stations (NHNS):** 25,000 stations
- **Monitoring Frequency:** 4 times per year (March/April/May, August, November, January)
- **Digital Water Level Recorders (DWLR):** 5,260 proposed under NHP
- **New Piezometers:** 7,000 under PIB project + 2,000 under GWMR scheme

Water Information Management System (WIMS)

- **Data Storage:** Centralized water level data
- **Telemetry Integration:** Real-time data transmission
- **Public Platform:** India-WRIS for data dissemination
- **Data Frequency:** Six-hourly measurements

CGWB Regional Monitoring

- **Monitoring Wells:** ~25,000 across India
- **Well Types:** Open dug wells + purpose-built piezometers
- **Automatic Monitoring:** DWLR with telemetry systems
- **Data Management:** Centralized through NWIC

9. WATER RESOURCES INFORMATION SYSTEM (WRIS)

India-WRIS Platform Features

- **GIS Layers:** 95 layers with 700+ attributes
- **Time Series Data:** 5-100 years depending on theme
- **Real-time Data:** Telemetry network connectivity
- **Data Categories:** Static, dynamic, semi-dynamic
- **Public Access:** Free download of unclassified CWC data

WRIS Database Components

1. **Watershed Atlas**
2. **Administrative Layers**
3. **Water Resources Projects**
4. **Thematic Layers**
5. **Environmental Data**

Key WRIS Modules

- Online Water Information Management System (WIMS)
- Water Data Online
- Water Resources Projects
- Groundwater Module
- Online Web Editor
- Surface Water Bodies

- Data Availability Module
- Flood Forecast System
- Water Quality Module

10. INSTITUTIONAL FRAMEWORK

Key Organizations

National Water Informatics Centre (NWIC)

- **Established:** March 2018
- **Mandate:** Central repository of water resources data
- **Function:** Single window source for water data
- **Scope:** Nationwide data collection and dissemination

Central Water Commission (CWC)

- **Role:** Surface water monitoring and management
- **Reservoir Monitoring:** Weekly bulletins for 161 reservoirs
- **Hydrological Data:** Stream flow and water level monitoring
- **Project Database:** Major and medium water resource projects

Central Ground Water Board (CGWB)

- **Network:** 25,000 monitoring stations
- **Assessment:** Joint with state governments
- **Quality Monitoring:** 85 parameters testing
- **Resource Assessment:** Dynamic groundwater resources

Data Collection Agencies

- **Central Water Commission (CWC):** Surface water data
- **Central Ground Water Board (CGWB):** Groundwater data
- **India Meteorological Department (IMD):** Weather data
- **National Remote Sensing Centre (NRSC):** Satellite data
- **State Water Departments:** Local data collection

11. WATER STRESS AND CHALLENGES

Over-Exploited Regions

1. **Northwestern India:** Punjab, Haryana, Delhi, Western UP
 - **Cause:** Indiscriminate withdrawals despite abundant recharge
 - **Agriculture:** Intensive farming practices
2. **Western India:** Rajasthan, Gujarat (parts)
 - **Cause:** Arid climate, limited recharge
 - **Challenge:** Natural water scarcity
3. **Peninsular India:** Karnataka, Tamil Nadu, Telangana, AP (parts)
 - **Cause:** Crystalline aquifer characteristics
 - **Challenge:** Low groundwater availability

Improvement Areas

- **Good rainfall regions:** Recovery due to natural recharge
- **Management practices:** Artificial recharge structures
- **Government initiatives:** Water conservation programs
- **Private efforts:** Community-based conservation

12. GOVERNMENT INITIATIVES

Jal Jeevan Mission (JJM)

- **Launch:** August 2019
- **Objective:** Tap water supply to all rural households
- **Priority:** Quality-affected habitations first
- **Investment:** ₹4.30 lakh crore allocated (2019-25)
- **Expenditure:** ₹3.77 lakh crore spent

National Hydrology Project (NHP)

- **Approval:** April 2016
- **Objective:** Improve water resources information
- **WRIS Enhancement:** Fundamental revision and improvement
- **Technology:** Latest tools and methodologies

Atal Bhujal Yojana

- **Focus:** Groundwater management
- **Approach:** Community participation
- **Coverage:** Water-stressed areas
- **Method:** Demand-side management

Jal Shakti Abhiyan (JSA)

- **Launch:** 2019 (continuing)
- **Focus:** Rainwater harvesting and groundwater recharge
- **Coverage:** Initially 256 districts, now nationwide
- **Activities:** Artificial recharge, watershed management, afforestation

13. ATLAS AND PUBLICATIONS

River Basin Atlas of India (2012)

- **Publishers:** CWC and ISRO
- **Coverage:** 25 major river basins, 101 sub-basins
- **Content:** Detailed maps, DEM, hydrological data
- **Features:** Water resource projects, climate patterns
- **Availability:** <https://indiawris.gov.in/wris/#/atlas>

Watershed Atlas of India (2014)

- **Focus:** Watershed distribution in basins and sub-basins
- **Data:** Major water assets, hydrological observatories
- **Features:** Terrain characteristics, rainfall variability
- **Land Use:** Land use/land cover mapping

Ground Water Year Book

- **Frequency:** Annual publication
- **Data:** Temporal and spatial groundwater changes
- **Coverage:** All states and union territories
- **Monitoring:** Four times yearly measurements

14. FUTURE PROJECTIONS AND PLANNING

Water Demand Projections (2025)

- **Agricultural Sector:** 73% (reduced from current 87%)
- **Non-Agricultural:** 27% (increased from current 13%)
- **Population Growth:** Increasing pressure on resources
- **Urbanization:** Growing municipal demand

Climate Change Considerations

- **Monsoon Variability:** Increasing uncertainty
- **Extreme Events:** More frequent droughts and floods
- **Temperature Rise:** Higher evapotranspiration
- **Glacier Melt:** Changing river flow patterns

Sustainable Development Goals

- **SDG 6:** Clean water and sanitation
- **Targets:** Universal access to safe water
- **Quality:** Improved water quality standards
- **Efficiency:** Better water use efficiency

15. DATA ACCESSIBILITY AND TRANSPARENCY

Public Data Access

- **India-WRIS Portal:** <https://indiawris.gov.in>
- **Free Downloads:** Unclassified CWC and CGWB data
- **Real-time Data:** One-click access to current information
- **User Groups:** Decision makers, researchers, farmers, public

Data Formats

- **Excel Reports:** Downloadable data sheets
- **GIS Layers:** Spatial data formats
- **Graphs and Charts:** Visual representations
- **Maps:** Various scales and formats

National Water Policy (2012) Compliance

- **Public Domain:** All non-classified hydrological data
- **GIS Platform:** Open and transparent data management
- **National Water Informatics Centre:** Centralized data repository
- **Regular Updates:** Continuous data collection and processing

This comprehensive database represents the most complete compilation of India's water resources data from official sources including India-WRIS, Central Water Commission, Central Ground Water Board, and Ministry of Jal Shakti. Data reflects the latest available assessments as of 2024.

Data Sources:

- India Water Resources Information System (India-WRIS)
- Central Ground Water Board (CGWB)
- Central Water Commission (CWC)
- National Water Informatics Centre (NWIC)
- Ministry of Jal Shakti, Government of India