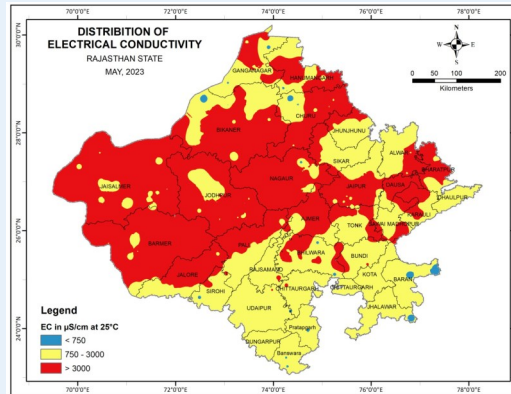


Groundwater Quality Scenario in Rajasthan

Parameters	No of samples	Permissible limit	No. of Samples above permissible limit	% Samples above permissible Limit
EC	630	3000 $\mu\text{S}/\text{cm}$	306	48.57
Fluoride	630	1.5 mg/L	272	43.17
Nitrate	630	45 mg/L	312	49.52
Uranium	627	30 ppb	133	21.2



Districts with anomalous values at sporadic locations

EC (3000 $\mu\text{S}/\text{cm}$)	Ajmer, Alwar, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittaurgarh, Churu, Dausa, Ganganagar, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhunjhunu, Jodhpur, Karauli, Nagaur, Pali, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk, Udaipur
Fluoride (F > 1.5 mg/L)	Ajmer, Alwar, Banswara, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittaurgarh, Churu, Dausa, Dhaulpur, Dungarpur, Ganganagar, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhalawar, Jhunjhunu, Jodhpur, Karauli, Nagaur, Pali, Pratapgarh, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk, Udaipur
Nitrate (Nitrate > 45 mg/L)	Ajmer, Alwar, Banswara, Baran, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittaurgarh, Churu, Dausa, Ganganagar, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhalawar, Jhunjhunu, Jodhpur, Karauli, Nagaur, Pali, Pratapgarh, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk, Udaipur
Arsenic (As > 10 ppb)	Not Any
Uranium (U > 30 ppb)	Alwar, Barmer, Bharatpur, Bhilwara, Bikaner, Churu, Dausa, Ganganagar, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhunjhunu, Jodhpur, Karauli, Nagaur, Pali, Rajsamand, Sawai Madhopur, Sikar, Tonk

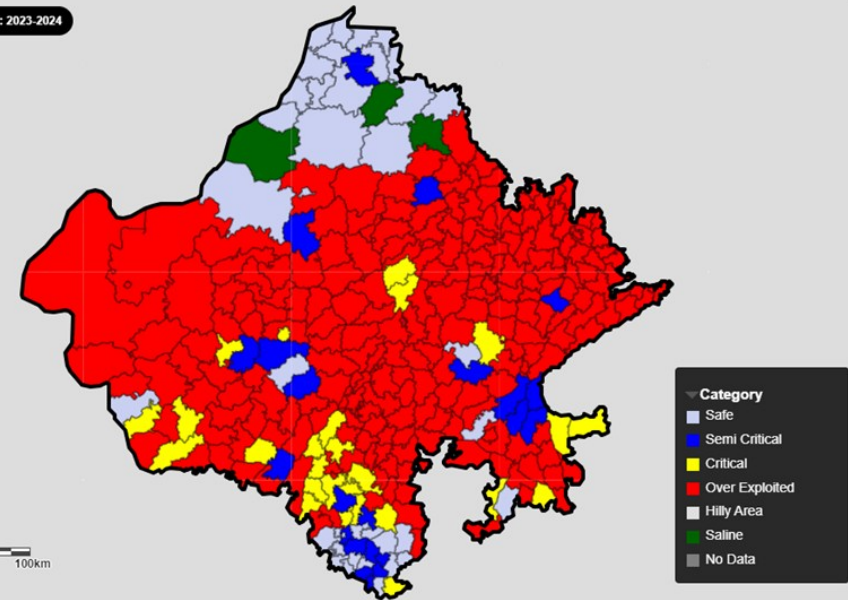
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Central Ground Water Board
 Department of Water Resources, RD & GR
 Ministry of Jal Shakti, Government of India

Assessment year: 2023-2024



Dynamic Ground Water Resources &
 Ground Water Quality of Rajasthan, 2024

December, 2024

Groundwater Resource Scenario in Rajasthan

- ◆ Ground Water Resources Assessment (GWRA)- jointly carried out by Central Ground Water Board and State Nodal/Ground Water Department periodically as per the Ground Water Resource Estimation Committee (GEC) methodology.
- ◆ Carried out under the guidance of the respective State/UT Level Committees (SLCs) and overall supervision of Central Level Expert Group (CLEG).
- ◆ As part of the assessment, 'Annual Extractable Ground Water Resource' as well as 'Annual Ground Water Extraction are assessed for each assessment unit (Block).
- ◆ The 'Stage of Ground Water Extraction' is computed as the ratio of 'Annual Ground Water Extraction' with respect to 'Annual Extractable Ground Water Resource' and is usually expressed in percentage. Based on the stage of extraction, the assessment units are categorized as Safe (<= 70 %), Semi-Critical (>70 % and <=90 %), Critical (>90 % and <=100%) and Over-Exploited (>100 %).
- ◆ GWRA-2024, 2023, 2022 and 2020 has been carried out through a software/web-based application "INDIA-GROUNDWATER RESOURCE ESTIMATION SYSTEM (IN-GRES)" developed by CGWB through IIT-Hyderabad.

Salient Features

1	Rainfall	472.31 mm
2	Hydrogeology	Diversified geology ranging from Archean metamorphic to recent alluvial sediments. Large part of the State is underlain by Quaternary sediments (Thar desert).
3	Recharge Worthy Area of the State	3.17 Lakh Sq. Km
4	Assessment Unit (AU) Type / Number	Block / 302 Numbers
5	Average area of Assessment Unit	1049.70 Sq. Km

Findings

	Attribute	GWRA-2017	GWRA-2020	GWRA-2022	GWRA-2023	GWRA-2024
1	Total Annual Ground Water Recharge (in bcm)	13.21	12.24	12.13	12.45	12.58
2	Annual Extractable Ground Water Resources (in bcm)	11.99	11.07	10.96	11.25	11.37
3	Annual Ground Water Extraction (in bcm)	16.77	16.63	16.56	16.74	17.05
4	Stage of Ground Water Extraction (in %)	139.88	150.22	151.07	148.77	149.86

bcm: Billion Cubic Meters

Categorization of Assessment Units based on the 'Stage of Ground Water Extraction

Sl. No	Category	GWRA-2017		GWRA-2020		GWRA-2022		GWRA-2023		GWRA-2024	
		Number of AUs	% of AUs	Number of AUs	% of AUs	Number of AUs	% of AUs	Number of AUs	% of AUs	Number of AUs	% of AUs
1	Safe	45	15	37	13	38	13	38	12.58	37	12.25
2	Semi-critical	29	10	29	10	20	7	22	7.28	21	6.95
3	Critical	33	11	23	8	22	7	23	7.63	27	8.94
4	Over-exploited	185	63	203	69	219	73	216	71.52	214	70.86
5	Saline	3	1	3	1	3	1	3	0.99	3	0.99
Total number of AUs		295		295		302		302		302	

Recommendations

- * The State of Rajasthan has diversified geology, ranging from Archean metamorphic to recent alluvial sediments. The state of Rajasthan can be divided into three broad hydrogeological units. (i) Unconsolidated formation (ii) Semi-consolidated formation (iii) Consolidated (Fissured formation). Large part of the State is underlain by Quaternary sediments (Thar Desert) consisting of clay, silt, sand and gravel of various grades.
- * The dynamic ground water resources for the state have been assessed block-wise. Total Annual Ground Water Recharge of the State has been assessed as 12.58 bcm and Annual Extractable Ground Water Resource as 11.37 bcm. The Annual Gross Ground Water Extraction is 17.05 bcm and the Stage of ground water extraction in the state is 149.86%.
- * Out of the 302 assessment units (blocks and urban areas), 214 units (70.86 %) have been categorized as 'Over Exploited', 27 units (8.94 %) as 'Critical', 21 units (6.95 %) as 'Semi-Critical', 37 units (12.25 %) blocks as 'Safe' and 3 units (0.99 %) as 'Saline'.
- * Exploring the possibilities of enhancing surface water source through diverting surplus water of Indus basin.
- * Rooftop rain water harvesting and traditional methods of harvesting for domestic needs.
- * Increase in irrigation efficiency through adopting micro irrigation techniques in more areas i.e. sprinkler, drip irrigation, feeder separation, pipeline irrigation, crop pattern change, crop rotation.
- * Participatory Management at village level.
- * Creating awareness (Mass Awareness Campaign for public and farmers, slideshows, display boards on water conservation, Water Management Training Programme for personnel related with water sector, painting/essay competition for school students etc.) regarding water conservation etc may be organized at appropriate level.
- * National Aquifer Mapping & Management Programme (NAQUIM) Reports prepared by CGWB (<https://cgwb.gov.in/cgwbpnmi/>) which are also being shared with State/District Authorities and Ground Water Year Book published by CGWB having water level & water quality data may be used in Ground water management. (<https://cgwb.gov.in/cgwbpnmi/>).
- * State may review their free/subsidized electricity policy to farmers (if applicable), bring suitable water pricing policy and may work further towards crop rotation/diversification/other initiatives to reduce overdependence on groundwater.
- * Regulation & control of Ground water Extraction: Ministry of Jal Shakti has issued the guidelines for control and regulations of ground water extraction vide notification dated 24.09.2020 which has further been amended in March 2023. Concerned departments may ensure implementations of the guidelines.