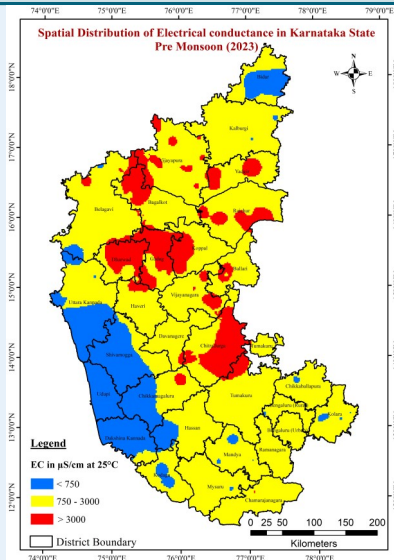


Groundwater Quality Scenario in Karnataka

Parameters	No of samples	Permissible limit	No. of Samples above permissible limit	% Samples above permissible Limit
EC	345	3000 $\mu\text{S}/\text{cm}$	50	14.49
Fluoride	345	1.5 mg/L	61	17.68
Nitrate	345	45 mg/L	169	48.99
Arsenic	125	10 ppb	4	3.2
Uranium	125	30 ppb	6	4.8



Districts with anomalous values at sporadic locations

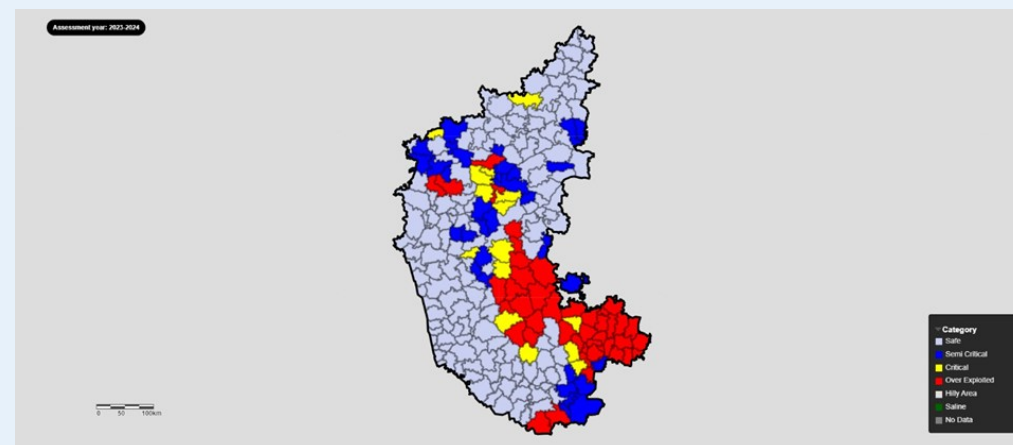
EC (3000 $\mu\text{S}/\text{cm}$)	Bagalkot, Belgaum, Bellary, Bijapur, ChamaraJanagara, Chikkamagaluru, Chitradurga, Davanagere, Dharwad, Gadag, Koppal, Raichur, Tumkur, Vijayanagara, Yadgir
Fluoride (F > 1.5 mg/L)	Bellary, Bengaluru Rural, Bijapur, Chikballapur, Chitradurga, Davanagere, Dharwad, Gadag, Gulbarga, Haveri, Kolar, Koppal, Mandya, Mysore, Raichur, Ramanagara, Tumkur, Vijayanagara, Yadgir
Nitrate (Nitrate > 45 mg/L)	Bagalkot, Belgaum, Bellary, Bengaluru Rural, Bidar, Bijapur, ChamaraJanagara, Chikballapur, Chitradurga, Davanagere, Dharwad, Gadag, Gulbarga, Hassan, Haveri, Kodagu, Kolar, Koppal, Mandya, Mysore, Raichur, Ramanagara, Shivmoga, Tumkur, Uttara Kannada, Vijayanagara, Yadgir
Arsenic (As > 10 ppb)	Gadag, Raichur
Uranium (U > 30 ppb)	Kolar, Raichur, Tumkur

For Further Information, Contact to :
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Central Ground Water Board
 Department of Water Resources, RD & GR
 Ministry of Jal Shakti, Government of India



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

December, 2024

Groundwater Resource Scenario in Karnataka

- ◆ 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 ($\leq 70\%$), Semi-Critical ($>70\%$ and $\leq 90\%$), Critical ($>90\%$ and $\leq 100\%$) 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	938.22 mm
2	Hydrogeology	Nearly 73 % of the State is occupied by hard rocks. Remaining area occupied by semi-consolidated and unconsolidated formations in the eastern part including coastal tract.
3	Recharge Worthy Area of the State	1.09 Lakh Sq. Km
4	Assessment Unit (AU) Type / Number	Taluk / 313 Numbers
5	Average area of Assessment Unit	347.01 Sq. Km

Findings

	Attribute	GWRA-2017	GWRA-2020	GWRA-2022	GWRA-2023	GWRA-2024
1	Total Annual Ground Water Recharge (in bcm)	20.22	19.59	21.11	21.59	21.51
2	Annual Extractable Ground Water Resources (in bcm)	18.2	17.69	19.09	19.51	19.46
3	Annual Ground Water Extraction (in bcm)	14.73	14.67	14.43	14.42	14.45
4	Stage of Ground Water Extraction (in %)	80.94	82.93	75.59	73.91	74.26

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	427	37	409	35	463	40	125	39.34	127	40.58
2	Semi-critical	163	14	225	19	231	20	56	17.89	55	17.57
3	Critical	79	7	63	5	78	7	27	8.63	20	6.39
4	Over-exploited	462	40	435	37	360	31	100	31.95	106	33.87
5	Saline	35	3	34	3	34	3	5	1.60	5	1.60
Total number of AUs		1166		1166		1166		313		313	

Recommendations

- * Tamil Nadu state is underlain by diverse hydrogeological formations. Nearly 73 % of the state is occupied by hard rocks, semi-consolidated and consolidated formations which are mainly confined to the eastern part including the coastal tract. In semi consolidated and unconsolidated formation, shallow zones are tapped by filter points and shallow tube wells and deeper zones through deeper tube wells.
- * The ground water resources for the State have been assessed Block-wise (Taluka). The Firka (1202 Firka) resources were summed up to taluk level. Total Annual Ground Water Recharge of the State has been assessed as 21.51 bcm and Annual Extractable Ground Water resources as 19.46 bcm. The Annual Ground Water Extraction is 14.45 bcm and Stage of Ground Water Extraction as 74.26 %.
- * Out of 313 assessment units (taluka), 106 units (33.87 %) have been categorized as 'Over Exploited', 20 units (6.4 %) as 'Critical', 55 units (17.6 %) as 'Semi-Critical', 127 units (40.3 %) as 'Safe' and 5 units (1.60 %) have been categorized as 'Saline'.
- * More numbers of Water Harvesting and Conservation Structures may be constructed to catch the rain as the State is blessed with more than 900 mm annual rainfall particularly in the hard rock terrain. State may also effectively use "Master plan for Artificial Recharge" prepared by CGWB in consultation with State Government. (<https://cgwb.gov.in/cgwbpm/publication-detail/324>).
- * Restoration/rejuvenation of all the existing tanks should be taken up with the view of accommodating the available surface run off and thus augmentation of the ground water resources by artificial recharge. Periodical maintenance of these tanks is to be ensured. The "Manual on Artificial Recharge Techniques for augmentation of ground water" prepared by CGWB may be used for planning. (<https://cgwb.gov.in/sites/default/files/MainLinks/Manual-Artificial-Recharge.pdf>).
- * Increase in irrigation efficiency through adopting of micro—irrigation techniques in more areas.
- * 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.
- * 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.