

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

Sl. No	Category	GWRA-2017		GWRA-2020		GWRA-2022		GWRA-2023	
		Number of AUs	% of AUs	Number of AUs	% of AUs	Number of AUs	% of AUs	Number of AUs	% of AUs
1	Safe	245	94	244	94	241	92	241	91.63
2	Semi-critical	10	4	10	4	11	4	11	4.18
3	Critical	2	1	2	1	6	2	6	2.28
4	Over-exploited	3	1	3	1	5	2	5	1.9
5	Saline								
Total number of AUs		260		259		263		263	

Recommendations: - The State is underlain by diverse rock types of different geological ages ranging from Archaean to Recent. The major rock types are igneous and metamorphic rocks covering nearly 85 percent of the geographical area of the state. The Total Annual Ground Water Recharge of the State has been assessed as 6.25 bcm and Annual Extractable Ground Water Resources is 5.73 bcm. And Stage of Extraction is 31.38 %. Out of 263 assessment units 5 units categorized as 'Over-exploited', 6 units (2.28 %) as 'Critical', 11 units (4.18 %) as 'Semi-critical' and rest 241 units (91.63 %) are under 'Safe' category.

More numbers of Water Harvesting and Conservation Structures may be constructed to catch the rain as the State is blessed with more than 1300 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. (<http://cgwb.gov.in/Master%20Plan%20to%20to%20GW%20Recharge%202020.pdf>)

Development of springs and their catchment in hilly areas for their sustainability.

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. (<http://cgwb.gov.in/documents/Manual%20on%20Artificial%20Recharge%20of%20Ground%20Water.pdf>).

National Aquifer Mapping & Management Programme (NAQUIM) Reports prepared by CGWB (<http://cgwb.gov.in/AQM/AQM-Reports.html>) 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. ([http://cgwb.gov.in/Ground-Water/GW%20YEAR%20BOOK%202019-0%20ALL%20INDIA%20FINAL%20752021%20\(1\).pdf](http://cgwb.gov.in/Ground-Water/GW%20YEAR%20BOOK%202019-0%20ALL%20INDIA%20FINAL%20752021%20(1).pdf)).

In the safe category areas of Jharkhand, State Government can judiciously develop the ground water resource mainly for agricultural use, however, at no point of time the extraction level should exceed 70%.

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.

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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, 2023 Jharkhand

January, 2024

Background

- ◆ 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-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.

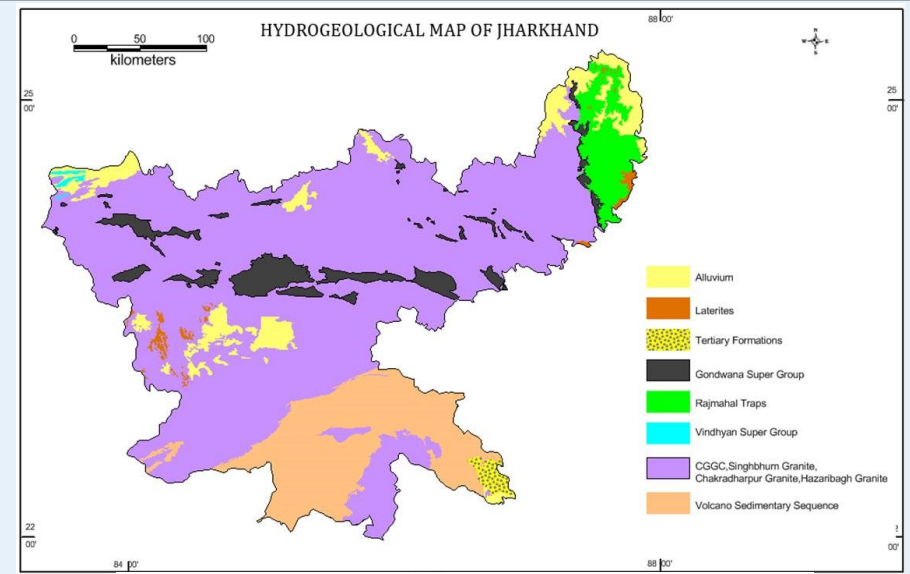
Salient Features

1	Average Annual Rainfall	1444.8 mm
2	Hydrogeology	Nearly 85 % of the State is underlain by hard rocks. Rest of the State is underlain by semi-consolidated formations and unconsolidated sediments.
3	Recharge Worthy Area of the State	60.65 Thousand Sq. Km
4	Assessment Unit (AU) Type / Number	Block / 263 Numbers
5	Average area of Assessment Unit	231 Sq. Km

Findings

	Attribute	GWRA-2017	GWRA-2020	GWRA-2022	GWRA-2023
1	Total Annual Ground Water Recharge (in bcm)	6.21	6.15	6.21	6.25
2	Annual Extractable Ground Water Resources (in bcm)	5.69	5.64	5.69	5.73
3	Annual Ground Water Extraction (in bcm)	1.58	1.64	1.78	1.8
4	Stage of Ground Water Extraction (in %)	27.73	29.13	31.35	31.38

bcm: Billion Cubic Meters



Symbol	Age	Lithology	Hydrogeological Conditions	Groundwater Potential
Yellow	Quaternary	ALLUVIUM-Clay, Silt, Sand, Gravel, Pebble, Calc Concretions	Groundwater occurs under unconfined to locally semi-confined condition. Thickness varies from 5 to 30m	Moderately low yield potential up to 40 m ³ /hr
Orange	Tertiary	LATERITES- primary and secondary laterites, lithomerges	Thickness varies from 5 to 20m. Groundwater occurs under unconfined condition	Very limited yield prospect generally within 10 m ³ /hr
Black	Carboniferous-Cretaceous	GONDWANA SP- Silt stone, clay stone, grit, sandstone, shale, conglomerate including intrusives	Thickness of deposit up to 130m. Multi-layered sandy silt, gravel, pebbles, under semi-consolidated condition	Moderate yield potential upto 30 m ³ /hr
Green	Jurassic-E Cretaceous	RAJMAHAL BASALT- basalt flows with inter-trap pebbles of fine grained sediments	Groundwater with in weathered zone, under unconfined condition and at deeper level with primary and secondary porosity under semi-confined to confined condition	Limited yield prospect upto 30 m ³ /hr
Cyan	Proterozoic Cambrian	VINDHYAN SQ- Quartzite, conglomerate, limestone, sandstone, siltstone, shale	Groundwater restricted to weathered zone under unconfined condition and semi-confined condition at deeper fractures/joints	Very limited yield potential up to 20 m ³ /hr
Purple	Proterozoic Archean	CHOTANAGPUR GRANITE GNEISSIC COMPLEX (CGGC), SINGHBHUM GRANITE, CHAKRADHARPUR GRANITE & HAZARIBAGH GRANITE- variety of gneisses and granites	Groundwater restricted to weathered zone under unconfined condition and within deeper fractures/joints down to 200m under unconfined to semi-confined conditions	Limited yield potential generally within 30 m ³ /hr
Light Orange	Proterozoic Archean	VOLCANO SEDIMENTARY SEQUENCE- Schists, phyllites, mica and calcic intrusives	Groundwater restricted to weathered zone under unconfined condition and within deeper fractures/joints down to 140m under semi-confined condition	Very limited yield potential. Generally within 15 m ³ /hr

