

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	4	100	4	100	6	100	6	100
2	Semi-critical								
3	Critical								
4	Over-exploited								
5	Saline								
Total number of AUs		4		4		6		6	

Recommendations: -

Sikkim is a small mountainous State characterized by rugged undulating topography with series of ridges and valleys. The various rock types prevalent in the state are pelitic and carbonate rocks and gneiss over a gneissic basement and occasional colluviums and valley fill deposits, as well as alluvial terraces along higher order streams and river courses. The formations reveal an intense tectonic-structurally complex deformational history. Ground water occurs largely in disconnected localized pockets and in deeper fractures zones. Springs are the main source and conduits of water.

The ground water resource assessment (in 2023) for the State of Sikkim has been carried out as per GEC 2015 guidelines through 'IN-GRES', with Districts as primary assessment units. Total Annual Ground Water Recharge has been estimated at 0.24 bcm and Annual Extractable Ground Water Resource has been estimated at 0.22 bcm. Current Annual Ground Water Extraction for all uses has been estimated at 0.012 bcm, which translates into a Stage of Ground Water Extraction at 5.54 %, and as per the present assessment all the six assessment units (Six Districts – Gangtok, Gyalshing, Mangan, Namchi, Pakyong, Soreng) are in 'SAFE' category.

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

National Aquifer Mapping & Management Programme (NAQUIM) Reports prepared by CGWB (<http://cgwb.gov.in/AQM/AQM-Reports.html>) which are 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)).

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.

For Further Information, Contact to :

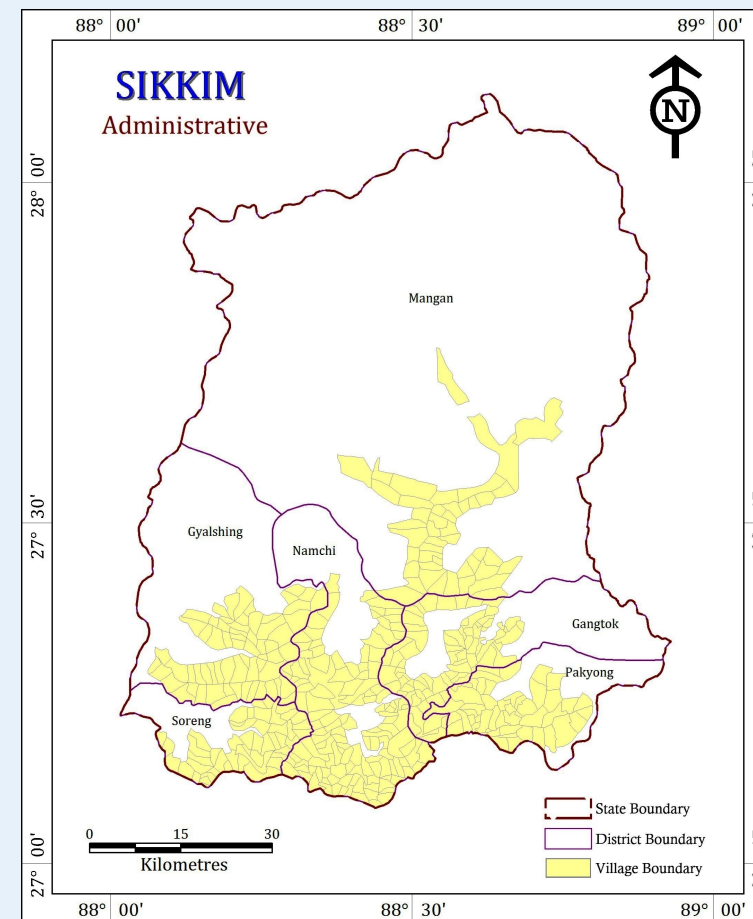
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Central Ground Water Board Department of Water Resources, RD & GR Ministry of Jal Shakti, Government of India



Dynamic Ground Water Resources, 2023 Sikkim

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 (District).
- ◆ 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	3043.3 mm
2	Hydrogeology	The various rock types prevalent are Pelitic Carbonate rocks and Gondwanas over a gneissic basement and occasional Colluvials and valley fill deposits, as well as alluvial terrains along higher order streams and river courses. Ground water occurs largely in disconnected localized pockets and in deeper fractures zones.
3	Recharge Worthy Area of the State	1.50 Thousand Sq. Km
4	Assessment Unit (AU) Type / Number	District / 6 Numbers
5	Average area of Assessment Unit	249 Sq. Km

Findings

	Attribute	GWRA-2017	GWRA-2020	GWRA-2022	GWRA-2023
1	Total Annual Ground Water Recharge (in bcm)	5.63	0.96	0.27	0.24
2	Annual Extractable Ground Water Resources (in bcm)	1.52	0.86	0.24	0.22
3	Annual Ground Water Extraction (in bcm)	0.001	0.01	0.02	0.01
4	Stage of Ground Water Extraction (in %)	0.06	0.86	6.04	5.54

bcm: Billion Cubic Meters

