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**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL**  
**PRINCIPAL BENCH, NEW DELHI**  
**ORIGINAL APPLICATION NO. 419 OF 2025**

**IN THE MATTER OF:**

**News Item titled "Groundwater not glacier melt keeps Ganga flowing in summer: IIT-Roorkee study" appearing in India Today dated 01.08.2025 Date of hearing: 20.08.2025**

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1.	<b>Reply Affidavit</b> on behalf of Respondent no 3 i.e. National Mission for Clean Ganga (NMCG).	
2.	<b>Annexure- I:</b> Copy NMCG letter dated 23.10.2025	
3.	<b>Annexure – II:</b> Copy of report of Central Ground Water Board dated 21.01.2026	

**THROUGH**

**DATE: 05.02.2026**  
**PLACE: NEW DELHI**

  
**Gigi.C.George, Advocate**  
**Advocate for Respondent**  
**Ch No. 457, Lawyers Block-1**  
**Delhi High Court, New Delhi**  
**Email- gicggoerge.adv42@yahoo.in**  
**Mob-9810625315**

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH, NEW DELHI  
ORIGINAL APPLICATION NO. 419 OF 2025

IN THE MATTER OF:

News Item titled "Groundwater not glacier melt keeps Ganga flowing in summer: IIT-Roorkee study" appearing in India Today dated 01.08.2025 Date of hearing: 20.08.2025

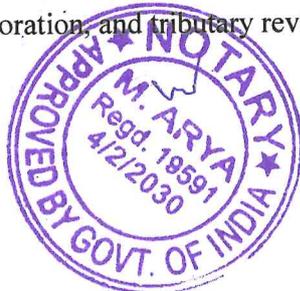
REPLY AFFIDAVIT IN COMPLIANCE OF ORDER DATED 20.08.2025 ON BEHALF OF NATIONAL MISSION FOR CLEAN GANGA i.e. RESPONDENT NO 3.

MOST RESPECTFULLY SHEWETH:

I, Brijendra Swaroop, aged about 58 years, presently working as Executive Director (Project) in the National Mission for Clean Ganga (NMCG), Ministry of Jal Shakti, Government of India, New Delhi do hereby solemnly affirm and state as under:

- 1) That I am working as Executive Director (Project) in the National Mission for Clean Ganga (NMCG), Ministry of Jal Shakti, Government of India, New Delhi. I am duly authorized for and on behalf of the Respondent No. 3 to swear to the present Affidavit. I am fully conversant with the facts and circumstances of the present case from the records;
- 2) That the National Mission for Clean Ganga (NMCG) is one of the authorities constituted in accordance with the provisions of sub-section 3 of Section 3 of the *Environmental (Protection) Act, 1986* vide notification no. S.O. 3187(E) dated 07.10.2016 inter-alia to take measures for prevention, control and abatement of environmental pollution in river Ganga and to ensure continuous adequate flow of water so as to rejuvenate the River Ganga. NMCG is a nodal agency for the implementation of the provisions of the above notification and for effective abatement of pollution and rejuvenation, protection and management of the River Ganga and its tributaries;
- 3) That it is submitted that matter present pertains to a study conducted by IIT-Roorkee indicating that groundwater, and not glacier melt, is the main source of maintaining the summer flow of River Ganga, particularly beyond the Himalayan foothills up to Patna. The study, based on isotope analysis of the Ganga and its tributaries, highlights that glacier melt contributes very little to the river's flow beyond the hilly regions, while groundwater discharge increases the river's volume by nearly 120 percent in the plains. It further notes that about 58 percent of the river's water is lost to evaporation during summer and emphasizes the need for initiatives like Namami Gange and Jal Shakti Abhiyan to focus on groundwater recharge, aquifer management, wetland restoration, and tributary revival to maintain steady river flow.

*Brijendra Swaroop*  
05.02.2026



- 4) That it is submitted that NMCG, vide letter dated 23.10.2025, sought inputs from the Central Water Commission (CWC), National Institute of Hydrology (NIH), and Central Ground Water Board (CGWB) to comprehensively examine the matter and submit a detailed report containing factual findings, technical observations, actions taken/proposed, and recommendations to enable NMCG to take appropriate steps.

Copy of the NMCG letter dated 23.10.2025 is marked and attached herewith as '*Annexure R-1*'.

- 5) That it is further submitted that, in this regard, a status report has been received in respect of the Central Ground Water Board (CGWB), Respondent No. 4, on the groundwater scenario in the Ganga Basin, wherein it has been, inter-alia, stated as under:
- a) That the Ganga River is a major river of the Indian subcontinent rising in the Himalayan mountains and flowing about 2,525 km generally eastward through a vast plain in five states namely Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal, and then continues into Bangladesh where it is named as Padma. The Indo-Gangetic Plain is geologically known as a fore deep or foreland basin comprised of multi-layered alluvial sedimentary sequences forming one of the principal aquifer systems in India.
- b) **Concept of Inter-relation of Ground Water and Surface Water:** Sections of streams/ rivers that receive groundwater are called *gaining streams/ rivers or effluent streams/ rivers*. Water that enters a river from the groundwater system sustains base flow of the river. In locations where the water table is deeper than the elevation of the water surface in the river, water flows from the stream into the subsurface, and such sections are called *losing streams/ rivers or influent streams/ rivers*. The losing and gaining nature of a river varies both spatially and seasonally depending on the relative water level between the river and the surrounding water table. The continuous, dynamic, two-way exchange between groundwater and surface water bodies illustrates the close connection between groundwater and surface water.
- c) **Ground Water Monitoring by CGWB:** Groundwater levels are the most important parameter in any study involving evaluation, development and management of groundwater resources. At present, CGWB carries out national-level groundwater monitoring through an extensive network of monitoring stations comprising dug/open wells, purpose-built wells/piezometers, hand pumps and others across the country. These stations are monitored manually four times a year during January, April/May, August and November. The collected data are used for preparation of maps depicting seasonal depth to water levels, water table contours referenced to mean sea level, groundwater flow in aquifers, and seasonal fluctuations.

*hit*  
05.02.2026

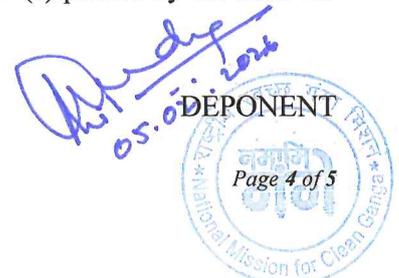


## d) Ground Water Scenario in Ganga Basin

- i. **Decadal fluctuation of groundwater level:** Decadal analysis of 4,386 monitoring stations across the Ganga Basin comparing post-monsoon 2024 with the decadal average (2014-23) shows that 67% of monitoring wells recorded a rise in groundwater levels, while 33% recorded a fall, as detailed in the tabulated data submitted by CGWB.
- ii. **Water table contour and river-groundwater interaction:** Water table contour maps reveal that along the course of River Ganga, from the Himalayan foothills to the India-Bangladesh border, the river exhibits both influent and effluent characteristics. In the upper reaches, the river is predominantly influent, contributing water to the phreatic aquifer, whereas in the middle and lower plains, it functions as a gaining river, receiving continuous groundwater discharge. Long-term comparative analysis for the years 2004 and 2024 indicates persistence of similar groundwater-surface water interaction patterns over two decades.

Copy of Central Ground Water Board report dated 21.01.2026 is marked and annexed herewith as 'Annexure R -2'.

- 6) That it is respectfully submitted that while the factual and technical inputs as available at present have been placed on record, and the detailed reply from the Central Water Commission in the present matter is still awaited. *Upon receipt of the same, the National Mission for Clean Ganga shall place the said reply before this Hon'ble Tribunal by way of an additional affidavit.*
- 7) That in view of the foregoing submissions, it is respectfully submitted that a comprehensive and coordinated effort is being undertaken by NMCG in close collaboration with all concerned authorities to ensure strict compliance with the directions of this Hon'ble Tribunal. NMCG remains fully committed to safeguarding the riverine ecosystem, strengthening floodplain protection measures, and facilitating timely action by the relevant Central and State agencies. It is further submitted that NMCG continues to monitor progress at regular intervals, issue necessary directions wherever required, and extend all possible technical and administrative support to ensure effective implementation of measures aimed at preventing encroachment, restoring river health, and mitigating future risks.
- 8) That, the answering respondent herein craves leave of the Hon'ble Tribunal to file additional reply, in future, if required.
- 9) That in the view of the above submission, it is respectfully submitted that the Respondent shall abide by all the order (s) and/ or direction (s) passed by the Hon'ble Tribunal in the instant case and render justice.



VERIFICATION:

I, deponent above named do hereby verify that the contents of the aforesaid affidavit are true and correct to my knowledge and belief and nothing material has been concealed therefrom.

Verified at New Delhi on this 5<sup>th</sup> day of February 2026

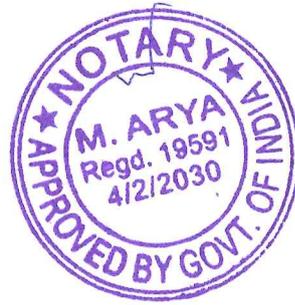
*[Handwritten Signature]*  
05.02.2026

DEPONENT



Date: 05.02.2026

Place: New Delhi



ATTESTED

NOTARY PUBLIC

05 FEB 2026



(COURT MATTER: PRIORITY)

File No.: L-25012(11)/21/2025-O/o ED(TECH) NMCG

Date: 23.10.2025

*Subject: Request for Action and Submission of Status Report in OA No. 419/2025 – Regarding suo motu Original Application registered by Hon’ble NGT based on the news article titled “Groundwater not glacier melt keeps Ganga flowing in summer: IIT-Roorkee study” published in India Today dated 01.08.2025.*

This is with reference to the suo motu Original Application registered by the Hon’ble National Green Tribunal (NGT), Principal Bench, New Delhi, based on a news article titled “Groundwater not glacier melt keeps Ganga flowing in summer: IIT-Roorkee study” published in India Today dated 01.08.2025. The Hon’ble National Green Tribunal has impleaded the National Mission for Clean Ganga (NMCG) as Respondent No. 5 in the matter.

2. The matter was listed before the Hon’ble Tribunal on 20.08.2025 (copy of the order enclosed), wherein it was observed that the issue pertains to a study conducted by IIT-Roorkee indicating that groundwater, and not glacier melt, is the main source maintaining the summer flow of River Ganga—particularly beyond the Himalayan foothills up to Patna. The study, based on isotope analysis of the Ganga and its tributaries, highlights that glacier melt contributes very little to the river’s flow beyond the hilly regions, while groundwater discharge increases the river’s volume by nearly 120 percent in the plains. It further notes that about 58 percent of the river’s water is lost to evaporation during summer and emphasizes the need for initiatives such as Namami Gange and Jal Shakti Abhiyan to focus on groundwater recharge, aquifer management, wetland restoration, and tributary revival to maintain steady river flow.

3. The Hon’ble Tribunal has observed that the above matter raises substantial issues relating to compliance with environmental norms and implementation of the provisions of the Environment (Protection) Act, 1986.

4. In this regard, NMCG requests the Central Water Commission (CWC), National Institute of Hydrology (NIH), and Central Ground Water Board (CGWB) to urgently examine the matter comprehensively and furnish a detailed status report. The report may include factual

findings, technical observations, actions taken/proposed, and specific recommendations. The same may kindly be shared with NMCG at the earliest to enable submission of a consolidated response before the Hon'ble Tribunal in compliance with its directions.



**Anup Kumar Srivastava**  
**Executive Director (Technical)**

To,

1. The Chairman, Central Water Commission (CWC)  
2nd Floor (South), Sewa Bhawan , R K Puram, New Delhi 110066  
Email: [chairman-cwc@nic.in](mailto:chairman-cwc@nic.in)

3. The Chairman, Central Ground Water Board,  
Bhujal Bhawan, NH-IV, Faridabad – 121001  
Email: [chmn-cgwb@nic.in](mailto:chmn-cgwb@nic.in) [tschmn-cgwb@nic.in](mailto:tschmn-cgwb@nic.in)

2. The Director, National Institute of Hydrology (NIH)  
Roorkee - 247667 (Uttarakhand), India.,  
Email: [tr.nihr@gov.in](mailto:tr.nihr@gov.in)

**Copy for information and necessary action to:**

1. PS to DG, NMCG, [ps.dg@nmcg.nic.in](mailto:ps.dg@nmcg.nic.in)

**Central Ground Water Board**  
**Report on the Ground Water Scenario in Ganga Basin**

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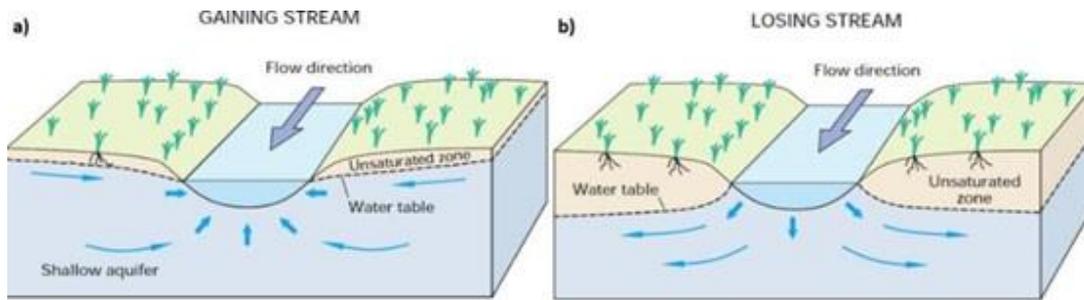
1. Introduction
2. Concept of Inter-relation of Ground Water and Surface Water
3. Ground Water Monitoring by CGWB
4. Ground Water Scenario of Ganga Basin
5. Observations

**1. Introduction**

The Ganga River is a major river of the Indian subcontinent rising in the Himalayan mountains and flowing about 2,525 km generally eastward through a vast plain in five states Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, West Bengal and then continues into Bangladesh where it's named as Padma. The Bhagirathi, considered to be the source stream of the Ganga, emanates from Gangotri Glacier at Gaumukh at an elevation of 3,892 m (12,770 feet). The River Ganga has a catchment area of 8,61,404 sq. km covering 11 states namely, Rajasthan, Haryana, Delhi, Madhya Pradesh, Chhattisgarh, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal. The major tributaries of river Ganga are Yamuna, Ramganga, Gomti, Ghagara, Gandak, Damodar and Kosi etc. The Indo-Gangetic Plain is geologically known as a **foredeep** or **foreland basin** comprised of multi-layered alluvial sedimentary sequences forming one of the principal aquifer systems in India.

**2. Concept of Inter-relation of Ground Water and Surface Water**

Sections of streams/rivers that receive groundwater are called **gaining streams/rivers** or **effluent streams/rivers** (Figure-1a). This is the primary mechanism for groundwater to discharge to the surface. Water that enters a river from the groundwater system sustains **baseflow** of the river. In locations, where the water table is deeper than the elevation of the water surface in the river, water flows from the stream into the subsurface. Sections of streams where water seeps into the subsurface are called **losing streams/rivers** or **influent streams/rivers** (Figure-1b).



**Figure-1:** Schematics of a) gaining and b) losing streams (adapted from Winter et al., 1998).

The losing and gaining nature of a river varies both spatially and seasonally. A segment of a river can be gaining on one day or in one season and losing on/in another, all depending on the relative water level between the river and the surrounding water table. Conditions along a river's length may vary between gaining and losing many times. The continuous, dynamic, two-way exchange between groundwater and surface water bodies illustrates the close connection between groundwater and surface water.

### 3. Ground Water Monitoring by CGWB

Groundwater levels are the most important parameter in any study involving the evaluation, development and management of groundwater resources. It is the cardinal parameter that best describes the health of an aquifer. At present, CGWB carries out national level groundwater monitoring through an extensive network of monitoring stations, comprising of dug/ open wells, purpose-built wells/ piezometers, handpumps and others spread over different parts of the country. These monitoring stations are being monitored manually 4 times a year, during January, April or May, August and November. Collected water level data from these stations are utilized for preparing various maps like the seasonal distribution of depth to water levels, preparation of water table contour maps (referenced to mean sea level) for depicting the groundwater flow in the aquifers, seasonal fluctuations of the water levels/piezometric levels etc. Water table contour maps are useful in estimating the groundwater flow through an area.

### 4. Ground Water Scenario in Ganga Basin

The behaviour of ground water level, decadal fluctuations in water level and findings of dynamic ground water resources assessment are presented below.

#### 4.a. Decadal fluctuation of groundwater level of the phreatic aquifer in Ganga Basin

Decadal analysis (fluctuation of post monsoon 2024 vs decadal average post monsoon 2014-23) of **4,386 monitoring stations across the Ganga Basin** covering parts of 11 states as shown in the table, shows that **67% of monitoring wells recorded a rise in groundwater levels**, with only 33% showing a fall. The details are shown in the table below (**Table-1**).

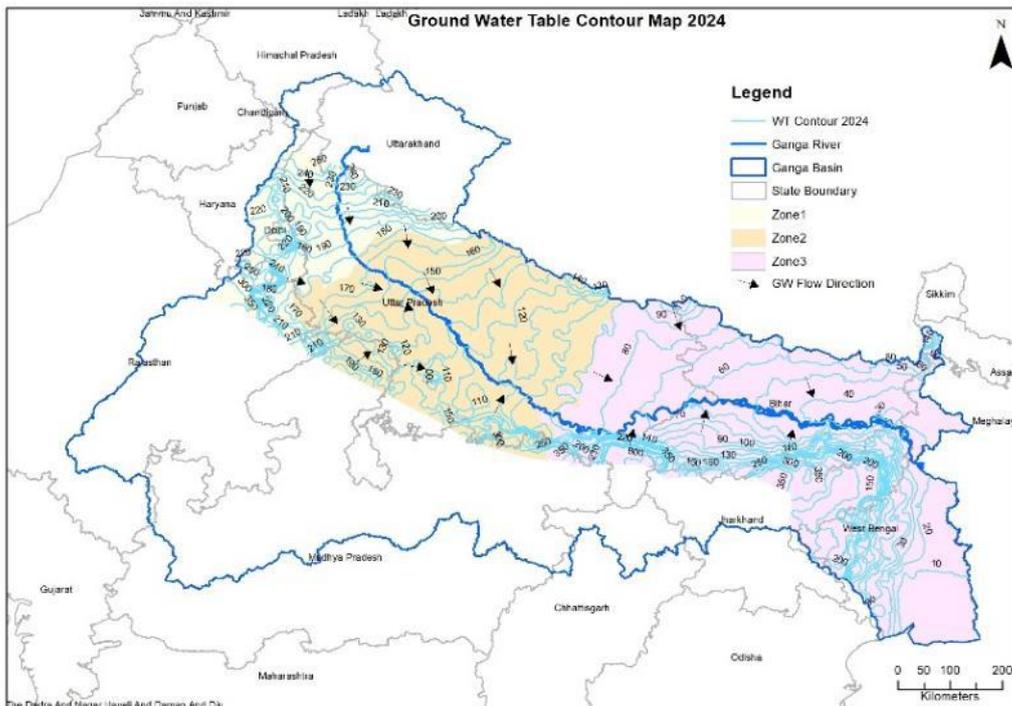
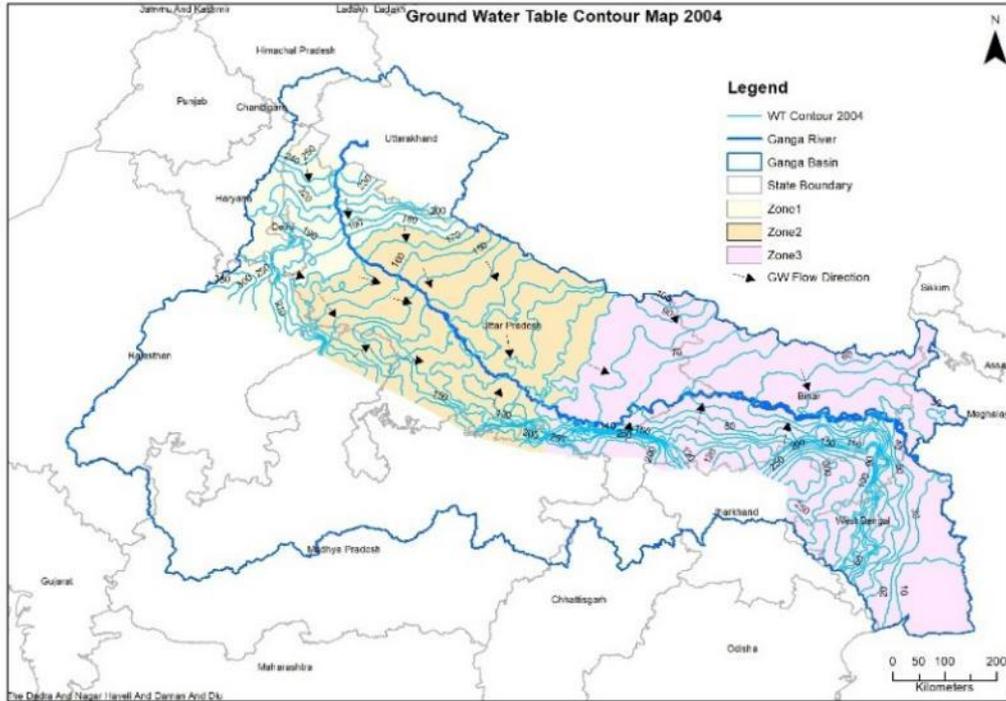
**Table-1: Decadal Water Level Trend Post Monsoon 2024 vs decadal average post monsoon 2014-23 (Unconfined Aquifer)**

S. No.	States in Ganga Basin	Total No. of analysed wells	Rise		Fall	
			No.	%	No.	%
1	Bihar	717	400	55.8%	317	44.2%
2	Chhattisgarh	124	85	68.5%	39	31.5%
3	Delhi	88	61	69.3%	27	30.7%
4	Haryana	249	132	53.0%	117	47.0%
5	Himachal Pradesh	10	7	70.0%	3	30.0%
6	Jharkhand	216	124	57.4%	92	42.6%
7	Madhya Pradesh	884	715	80.9%	169	19.1%
8	Rajasthan	479	280	58.5%	199	41.5%
9	Uttar Pradesh	815	562	69.0%	253	31.0%
10	Uttarakhand	162	92	56.8%	70	43.2%
11	West Bengal	642	471	73.4%	171	26.6%
	<b>Total</b>	<b>4386</b>	<b>2929</b>	<b>66.8%</b>	<b>1457</b>	<b>33.2%</b>

#### 4.b. Water Table Contour and interaction between river-groundwater along the course of Ganga River

The water table contour map (**Figure-2a** and **b**) of the monitoring stations reveals that, along the course of the River Ganga, from the Himalayan foothills to the India–Bangladesh border, the river exhibits both effluent (gaining) and influent (losing) characteristics at different stretches. In the upper parts of the Ganga River depicted as Zone-1 in **Figure-2**, the river is predominantly influent in nature, which signifies that the river is contributing water to the phreatic aquifer. However, in the middle and lower Ganga plains, the river functions as a gaining (effluent) river, continuously receiving groundwater discharge from the phreatic aquifer (**Figure-2** Zone 2 & 3). Long-term comparative analysis of the water table contour patterns for the years 2004 (**Figure-2a**) and 2024 (**Figure-2b**) indicates that a similar groundwater–surface water interaction has persisted over the two decades along the course of the River Ganga.

**Figure-2:** Groundwater Table Contour Map along the Ganga River during (a) Post-monsoon 2004 and (b) Post-monsoon 2024.



#### **4.c. Assessment of Dynamic Groundwater Resources in Ganga Basin**

Assessment of Dynamic Ground Water Resources of India is being carried out jointly by the Central Ground Water Board (CGWB) and State/UT Ground Water Departments under the overall coordination of the Central Level Expert Group (CLEG) constituted by DoWR, RD & GR, MoJS. The assessment process involves estimation of groundwater recharge, annual extractable groundwater resources, and total groundwater extraction. The assessment units (blocks/taluks/mandals etc.) are categorized based on the Stage of Extraction (SoE), which is the ratio between annual groundwater extraction and annual extractable groundwater resources, as 'Safe' if  $SoE < 70\%$ ; 'Semi-critical' if  $SoE > 70$  and  $\leq 90\%$ ; 'Critical' if  $SoE > 90$  and  $\leq 100\%$  and 'Over-exploited' if  $SoE > 100\%$ . Assessment unit in which the ground water resources are entirely saline, have been categorized as 'Saline'.

According to the Dynamic Ground Water Resources of River Basins of India-2025, the annual extractable of the Ganga Basin has been estimated as 153.57 billion cubic meters (bcm). The total annual groundwater extraction for all uses of the Ganga Basin has been estimated as 101.54 bcm. The overall Stage of groundwater extraction of the river basin has been estimated as 66.12 %. Out of the total 2,365 assessment units (Blocks) in the basin, 269 units (11.37%) have been categorized as 'Over-exploited' indicating ground water extraction exceeding the annual replenished ground water recharge. In, 102 (4.31 %) assessment units, the stage of groundwater extraction is between 90-100% and have been categorized as 'Critical'. There are 340 (14.38 %) "Semi-critical" units, where the stage of ground water extraction is between 70 % and 90 % and 1594 (67.40 %) 'Safe' units, where the stage of Ground water extraction is less than 70 %. Apart from these, there are 60 (2.54%) assessment units, which have been categorized as 'Saline' as major part of the ground water in phreatic aquifers in these units is brackish or saline. The majority of the over-exploited assessment units are located along the western boundary of the basin, in the state of Rajasthan.

#### **5. Observations**

- (i) The decadal groundwater level analysis of the Ganga River basin indicates a rise in water levels at a majority of the monitoring stations (67%).

- (ii) As per Ground Water Resource Estimation (**GWRE**), 2025, **67.4%** assessment units in Ganga Basin fall in “Safe” category and 14.38% in “Semi-critical category”.