

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL BENCH, NEW  
DELHI**  
**Original Application No.694/2023**

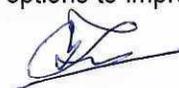
**Suo Moto matter in re:news item appearing in Hindustan Times dated 26/10/2023  
titled as "UN predicts groundwater level in India will reduce to "low" by 2025"**

**Report on behalf of Central Ground Water Authority, New Delhi in OA No. 694/2023**

A recent report, published in October 2023 by the United Nations University's Institute for Environment and Human Security, focuses on groundwater depletion in specific regions, including N-W parts of India, NE China, the Western United States, Mexico, Iran, Saudi Arabia, and parts of Northern Africa. This report examines the groundwater depletion scenario in these areas, drawing from the research conducted by Aeschbach-Hertig and Gleeson in 2012. It elucidates the factors responsible for declining groundwater levels, analyzes the socio-economic consequences of this depletion, and presents a comprehensive strategy for the strategic management of groundwater resources in the near future. The report references the paper by Aeschbach-Hertig and Gleeson from 2012, titled "Regional strategies for the accelerating global problem of groundwater depletion" published in Nature Geoscience (Vol. 5, No. 12, pp. 853–861). In this paper, the authors utilize NASA GRACE Satellite data collected between 2002 and 2008 to analyze groundwater depletion in the northwestern regions of India. The report identifies the drivers and root causes of groundwater depletion in India as **lack of information, insufficient regulations and enforcement, and inadequate future planning**. The following broad measures has been presented by the authors for moving towards path of sustainability

- (i) Balancing the withdrawal of groundwater to the rates of aquifer recharge
- (ii) Reducing wastage of water by way of fixing leakages, efficient irrigation practices
- (iii) Enhancing the monitoring of groundwater levels
- (iv) Using alternative sources of water for reducing the stress on the aquifers
- (v) Adopting water harvesting and recharge

The authors have argued that different interventions when applied together as a package are more effective in combating the impending crisis. It has been suggested that a mix of the technological options to improve



water use in irrigation, Managed Aquifer recharge and improved rules and regulations can lead towards path for sustainability of the aquifers.

That this Hon'ble Tribunal vide order registered on 04-11-2023 took suo-moto cognizance and issued notice to The Central Ground Water Authority, New Delhi (CGWA).

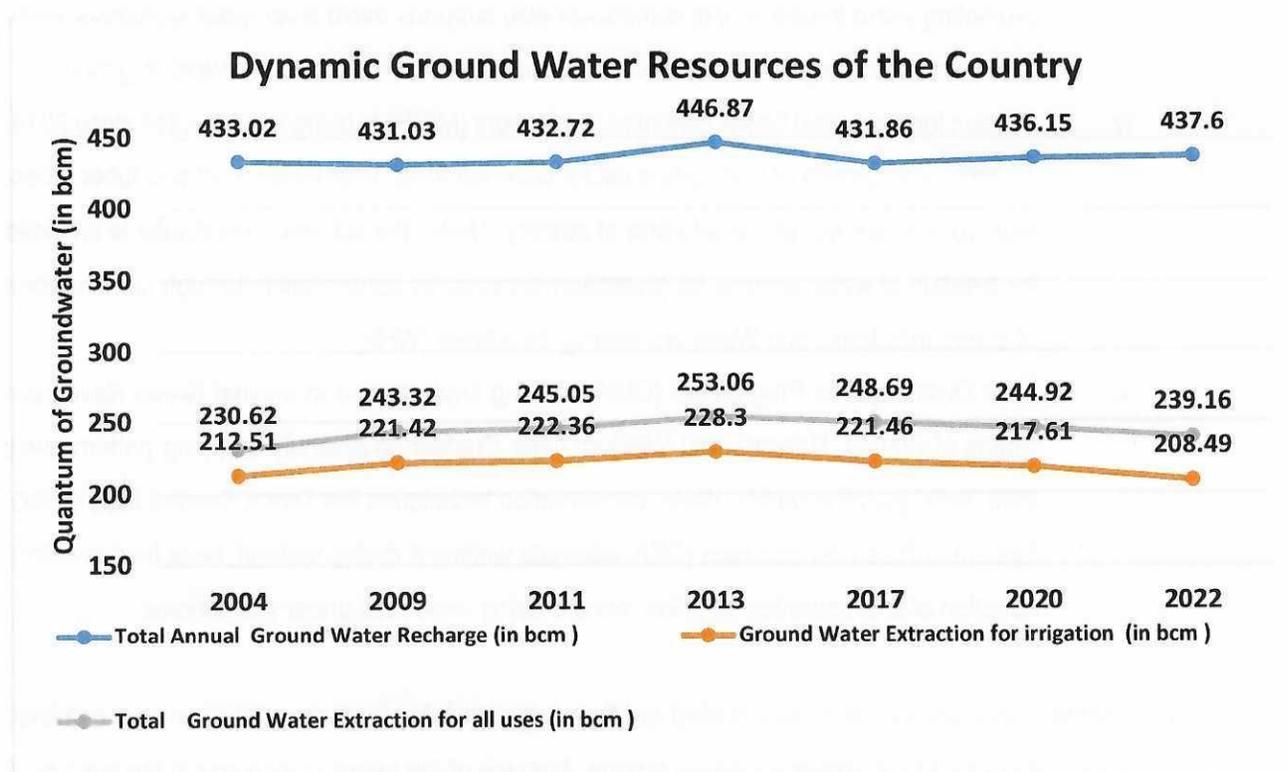
In view of the above points outlined in the report published in Hindustan Times on 26-10-2023, the comments of CGWA/CGWB on the initiatives taken by Government of India for sustainable management of groundwater in the country are outlined as under:

1. CGWB, Ministry of Jal Shakti, Govt. of India has recently completed Phase I of the National Aquifer Mapping and Management (NAQUIM) programme (started from 2012) in the country in which the aquifers in the entire hydrogeologically mappable area of the country have been mapped on a scale of 1:50,000. The generated data serves as the scientific foundation for managing the nation's groundwater resources. The Aquifer mapping study reports have outlined various demand and supply interventions necessary for sustainable groundwater management and have been shared with district and state authorities for implementation.  
Furthermore, the state-of-the-art Heliborne Electromagnetic (EM) Surveys have also been employed to systematically cover nearly 1 lakhsq km area in arid parts of the country spread over parts of Rajasthan, Haryana, and Gujarat, to identify 3D geophysical models, geophysical thematic maps, aquifer geometry, and the distribution of fresh and saline zones within aquifer systems for providing a detailed understanding of groundwater dynamics. CGWB, is currently engaged in a more detailed study in areas with specific groundwater related problems under NAQUIM 2.0 which has started from the current year (2023-24).
2. In order to provide a major boost to monitoring of groundwater levels and automation of the monitoring networks a special project has been sanctioned by the Government of India under which CGWB is implementing the construction of 9000 piezometers with Digital Water Level Recorders (DWLRs) in identified priority areas which includes the over-exploited, critical, semi-critical areas of North-West India.
3. CGWB in association with the State Ground Water Departments carries out the assessment of groundwater resources in the country. As a part of this assessment, quantification of the recharge and groundwater extraction is made. For recharge, the estimation is made for recharge from rainfall and sources other than rainfall both during the monsoon and the non-monsoon seasons. Likewise,



the groundwater extraction is estimated for various uses like irrigation, drinking and domestic and industries. The previous assessments that have been done so far are for the year 2004, 2009, 2011, 2013, 2017, 2020 and 2022.

The figures for the groundwater extraction during nearly 18 years (year 2004 and 2022) reveal that there is not much change in the overall groundwater extraction in the country. The data reveals that the total groundwater extraction for irrigation in India was 212.5 BCM in the year 2004 which peaked to 228.3 BCM during 2013 and since then has registered a fall to 208.49 BCM during 2022.



- i. As per the latest assessment of ground water resources for the year 2022, the total annual ground water recharge for the country is 437.6 billion cubic meters (bcm), which is 1.45 bcm more as compared to the 2020 assessment (436.15 BCM) and 5.74 bcm more as compared to 2017 assessment (431.86 bcm). Increase in ground water recharge is attributed mainly to increase in recharge from 'Other sources' i.e from canal seepage, return flow of irrigation water, recharges from water bodies/tanks and water conservation structures.
- ii. According to the results of the Dynamic Ground Water Resource Estimation for the years 2017 and 2022, it has been observed that groundwater extraction has decreased by 7.76 billion cubic meters (bcm) in Punjab and 0.96 bcm in Haryana in 2022 compared to 2017.

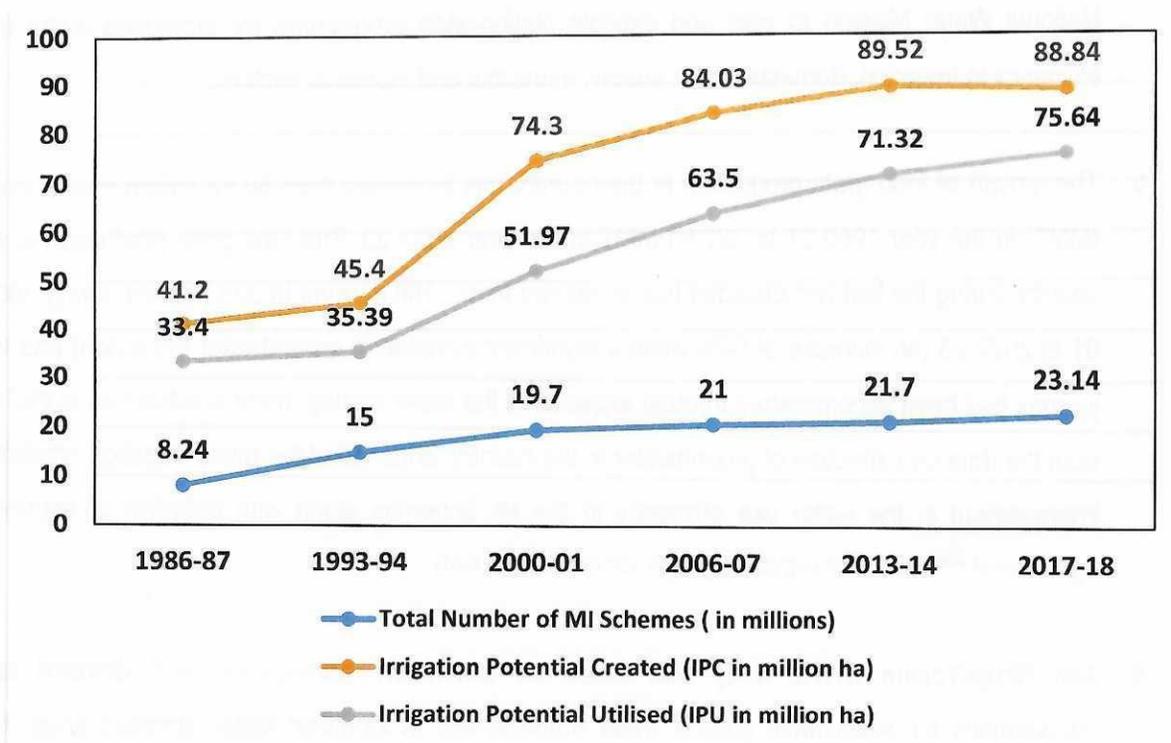
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This reduction has led to an overall decrease in the Stage of Ground Water Extraction in 2022 for both states. The government's efforts in promoting micro-irrigation through various schemes are one of the major factors contributing to the reduction in groundwater extraction in both states.

- iii. Under the umbrella of PMKSY, DA&FW is implementing PMKSY-Per Drop More Crop (PDMC) since 2015-16. The PMKSY- PDMC focuses on enhancing water use efficiency at farm level through Micro Irrigation viz. Drip and Sprinkler Irrigation System. Besides promoting micro Irrigation, this component also supports micro level water storage or water conservation/management activities to supplement source creation for Micro Irrigation.
  - iv. Mission for Integrated Development of Horticulture (MIDH) is being implemented since 2014-15 for holistic growth of horticulture sector covering fruits, vegetables, root and tuber crops, mushrooms, spices, etc. in all parts of country. Under the scheme, assistance is provided for creation of water sources for promotion of rainwater conservation through constructions of community tanks and Water Harvesting Structures (WHS).
  - v. Crop Diversification Programme (CDP) is being implemented in original Green Revolution States of Punjab, Haryana and Western Uttar Pradesh to diversify cropping pattern away from water guzzling paddy. Water conservation techniques like Direct Seeded Rice (DSR), System of Rice Intensification (SRI), alternate wetting & drying method, laser land levelling, adoption of short duration varieties, etc are being promoted under this scheme.
4. Another important source of data related to Minor irrigation infrastructure in the country is available in the form of six Minor Irrigation Census reports. Analysis of the trends of increase in the number of MI Schemes in the country over the years along with the Irrigation Potential Created (IPC) and Irrigation Potential Utilized (IPU) in the MI census reports is summarized in the following graph





The growth of the groundwater irrigation in India during the past 4 decades (as nearly 94% of the total MI schemes are groundwater based schemes) can be divided into two distinct periods i.e. 1986-87 to 2000-01 and 2000-01 to 2017-18. During the period 1986-87 to 2000-01, the interpolated growth rate of MI schemes registered an increase of nearly 10% per year while during 2000-01 to 2017-18, the increase has stabilized to 1% per year. During the last two decades there has been a steady increase in the percentage of utilization of the irrigation potential created through minor irrigation schemes from 69.95 % during 2000-01 to 85.14 % during 2017-18. It can thus be inferred that there has been substantial improvement in bridging the gap between the IPC and IPU of MI schemes during the 2001-2018.

The MI census reports also highlight the improvement in the Water Use Efficiency and decline in wastage of water through use of improved water distribution devices over the years. The MI Census data reveals that the share of the open channels for water distribution has decreased significantly from 81% in the year 2000-01 to 42% in the year 2017-18. Thus, during the period 2000-01 to 2017-18, the efficient water distribution system like surface pipe, underground pipe, drip and sprinklers has replaced the open channel field distribution system which were earlier used for conveying water to the field. Further, Bureau of Water Use Efficiency has been established under

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National Water Mission to plan and execute Nation-wide programme for promoting water use efficiency in Irrigation, domestic water supply, municipal and industrial sectors.

5. The growth of food grain production in the country has increased from 50.52 million metric tonne (MMT) in the year 1950-51 to 322.55 MMT in the year 2022-23. The food grain production in the country during the last two decades has increased from 196.81 mmt to 323.55 mmt during 2000-01 to 2022-23 (an increase of 64% without significant increase in groundwater extraction) and this journey has been accomplished through increase in the water management practices as is evident from the data on extraction of groundwater in the country, adoption of the micro-irrigation practices, improvement in the water use efficiency in the MI Schemes along with adoption of improved agricultural practices for enhancing agricultural productivity.
  
6. Atal BhujalYojana (ATAL JAL) with focus on community participation and demand side interventions for sustainable ground water management in identified water stressed areas has been taken up by DoWR RD &GR. This scheme is expected to contribute significantly towards the water and food security of the participating States. The scheme was launched by the Hon'ble Prime Minister on 25.12.2019 and is being implemented from 01.04.2020 for a period of 5 years. The scheme is being taken up in 8220 water stressed Gram Panchayats of 229 administrative blocks/ Talukas in 80 districts of seven states, viz. Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh spread over Northern, Central and Southern Parts of the Country.  
 ABhY is currently being implemented in 36 Blocks across 13 Districts in Haryana. List of such blocks are attached in the **Annexure-I**.  
 The proposal for scaling up of the Atal BhujalYojana in other parts of the country is also under consideration in the DoWR RD & GR.
  
7. Jal Shakti Abhiyan -I (JSA-I) was launched in 2019 in 1592 blocks in 256 water stressed districts of the country to promote water conservation and water resource management by focusing on accelerated implementation of five targeted interventions viz. water conservation and rainwater harvesting, renovation of traditional and other water bodies, reuse of water and recharging of structures, watershed development and intensive afforestation. Besides, the special interventions included development of Block Water Conservation Plans and District Water Conservation Plans,

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Krishi Vigyan Kendra Melas, Urban Wastewater Reuse and 3D contour mapping of all villages. In 2019, on the scope of JSA was expanded and "Jal Shakti Abhiyan: Catch the Rain" (JSA:CTR) with the theme "Catch the Rain - Where it Falls When it Falls" was taken up to cover all the blocks of all districts (rural as well as urban areas) across the country during 22nd March 2021 to 30th November 2021 - the pre-monsoon and monsoon period. The special campaign has further been taken up during 2022 and 2023.

This Abhiyan is also being implemented in Punjab and Haryana.

8. With a view to conserve water for the future, the Hon'ble Prime Minister has launched a new initiative named Mission AmritSarovar on 24th April 2022. Under this Mission, 75 water bodies in each district of the country are being developed and rejuvenated as a part of celebration of Azadi ka Amrit Mahotsav.

Under this campaign, a total of 2373 water bodies have been identified in Punjab, and 7746 water bodies have been identified in Haryana. In Punjab, 1404 water bodies, and in Haryana, 3367 water bodies have been successfully developed and rejuvenated.

9. Master Plan for Artificial Recharge to Groundwater- 2020 has been prepared by CGWB in consultation with States/UTs which is a macro level plan indicating various structures for the different terrain conditions of the country including estimated cost. The Master Plan envisages construction of about 1.42 crore Rain water harvesting and artificial recharge structures in the Country to harness 185 Billion Cubic Metre (BCM) of monsoon rainfall.

10. To ensure the sustainable management of the country's groundwater resources, the government has implemented several laws, policy and regulations.

- i. The National Water Policy (2012), developed by the Department of Water Resources, RD & GR, emphasizes rainwater harvesting, water conservation, and increasing water availability through direct rainfall utilization. It promotes scientific conservation of rivers and infrastructure with community involvement, discourages encroachment on water bodies and drainage channels, and calls for their restoration and maintenance where encroachment has occurred.
- ii. Central Ground Water Authority (CGWA) has been constituted under Section 3 (3) of the "Environment (Protection) Act, 1986" for the purpose of regulation and control of ground water

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development and management in the Country. CGWA has advised States/UTs to take measures to promote/adopt artificial recharge to ground water / rain water harvesting. CGWA grants No Objection Certificates (NOCs) for ground water abstraction to Industries, Infrastructure units and Mining projects in feasible areas in certain States/UTs where regulation is not being done by the respective State/UTs. Ministry has circulated a Model Bill to all the States/UTs to enable them to enact suitable ground water legislation for regulation of its development, which also includes provision of rain water harvesting. So far, 19 States/UTs have adopted and implemented the ground water legislation.

- iii. In compliance to the decision taken by the Committee of Secretaries, an 'Inter Ministerial Committee' under the Chairmanship of Secretary (WR, RD & GR) has been constituted to take forward the subject of 'Push on Water Conservation Related Activities for Optimum Utilization of Monsoon Rainfall'.
- iv. Hon'ble Prime Minister has written a letter to all Sarpanchs on 08.06.2019 regarding the importance of water conservation and harvesting and exhorted them to adopt all appropriate measures to make water conservation a mass movement.
- v. However, several steps are being taken by the State Govt. of Punjab in this regards. Some of the points are as below,
  - a. For Ground Water management, the State Government, through its notification had enacted "Punjab Water Regulation and Development Authority (PWRDA) Act, 2020" to regulate the water resources of the state for ensuring their judicious, equitable and sustainable utilization and management.
  - b. The Punjab Preservation of Sub-soil Water Act-2009 is such an effort to conserve groundwater resource by mandatory delay in the transplanting paddy beyond 15th June to escape periods of very evapo-transpiration demands
  - c. Subsidy of Rs.1500/- per acre has been initiated by Punjab Government for adopting Direct seeded Rice area (DSR), which takes less water during irrigation and saves around 15 to 20% of water.
  - d. To harness surplus water in canal outlets for groundwater recharge, the Punjab Government has sanctioned 129 canal-based recharge schemes with 258 injection wells. Work on these projects has already commenced.

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11. In the report, it has been stated that energy subsidies, among other factors, have been shown to drive groundwater depletion. However, this issue has already been examined by the Parliamentary Committee on Water Resources.
- i. Under the provisions of Electricity Act 2003, respective State Electricity Regulatory Commissions (SERCs) determine the electricity tariff for retail supply of electricity to end consumers including Agricultural consumers. Section 65 of the Electricity Act, 2003 provides that State Government can provide subsidy to any class of consumers in the tariff determined by the SERCs. States like Punjab, Haryana, Telangana and Tamil Nadu offer completely free power, while other States have provision for collection of token charges.
  - ii. However, in the CGWA Guidelines, States/UTs have been advised to review their free/subsidized electricity policy to farmers, bring suitable water pricing policy and work further towards crop rotation/ diversification/ other initiatives to reduce over-dependence on Ground water.
  - iii. Punjab introduced a scheme by way of which farmers were refunded money if they consumed less electricity. They further note that under Deendayal Upadhyay Gram Jyoti Yojana of Ministry of Power, separate component of agriculture and non-agriculture feeders have been created for facilitating judicious rostering of supply to agriculture & non-agriculture consumers in rural areas.
  - iv. The committee has suggested that use of electricity pumps need to be further discouraged by way of devising such measures as introduction of pre-paid cards for power supply, restricting it for a few hours in the day, etc.

### **Analysis of Decadal ground water levels of Haryana and Punjab**

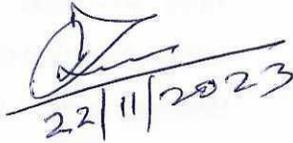
Decline in groundwater levels in the North Western parts of the country has been highlighted in several reports of CGWB. With a view to understand the impact of the interventions made by the Government for management of groundwater resources, an analysis of the behavior of water level for the period 2012-22 has been carried out for both pre and post-monsoon seasons. For this, a comparison of depth to water level of pre-monsoon (May) and post-monsoon (November) for the year 2022 has been compared with the decadal mean pre-monsoon and post-monsoon water levels for the period 2012-2021. The analysis reveals

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decline in water level during pre-monsoon in nearly 65% and 85% of the monitoring stations and rise in nearly 35% and 15% of the stations in Haryana and Punjab respectively. However, during the post-monsoon season, there is rise in water levels in 56% of the stations in Haryana and 25% of the stations in Punjab.

### Conclusion

From the afore-mentioned paras, it may be concluded that a suite of measures encompassing all the suggested measures outlined in the UN University Report have been taken up by the Government to improve the situation of groundwater in the country.



22/11/2023

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भारत सरकार / Government of India

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Annexure-I

**List of 36 blocks under Atal BhujalYojana in Haryana State**

<b>Sr. No.</b>	<b>District</b>	<b>Block</b>
1.	Bhiwani	Badra, Behal, Kairu, Loharu, Tosham
2.	Fatehabad	Tohana
3.	Gurugram	Farukhnagar, Pataudi, Sohna, Gurgaon
4.	Kaithal	Gulha, Rajaund
5.	Kurukshetra	Ladwa, Pehowa, Shahbad
6.	Karnal	Karnal
7.	Panipat	Bapoli, Samalkha
8.	Sirsa	Rania, Ellenabad
9.	Faridabad	Municipal Corporation of Faridabad, Ballabhgarh
10.	MahenderGarh	Nangal Chaudhary, Narnaul, Kanina, Ateli, Mahendergarh
11.	Rewari	Khol
12.	Palwal	Palwal, Hassanpur, Hathin, Hodal
13.	Yamuna Nagar	Jagadhri, Mustafabad, Radour, Sadhaura



22/11/2023

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