Environment & Ecology · GS - III

Examine the factors responsible for depleting groundwater in India. What are the steps taken by the government to mitigate such depletion of groundwater?

EXAM YEAR	PAPER	SUBJECT
2025	GS - III	Environment & Ecology

MARKS	WORD LIMIT
15	~250 words

Answer Hint

Groundwater depletion, irrigation, water-intensive crops, subsidised electricity, urbanisation, industrialisation, rainfall variability, CGWB, Atal Bhujal Yojana, PMKSY, rainwater harvesting

Model Answer

Introduction

Groundwater is a critical source of irrigation and drinking water in India, but excessive extraction has created significant regional groundwater stress. The Central Ground Water Board regularly assesses groundwater resources and categorises assessment units according to extraction pressure.

1. Causes of depletion

Major factors include:

1. Expansion of groundwater-intensive irrigation, particularly for paddy and sugarcane.
2. Subsidised electricity encouraging excessive pumping in some regions.
3. Monsoon variability and recurrent droughts reducing recharge.
4. Urbanisation and concretisation reducing natural infiltration.
5. Industrial extraction and growing domestic demand.

6. Inefficient flood irrigation and low water-use efficiency.
7. Inadequate aquifer recharge and degradation of wetlands and water bodies.

2. Government measures

The government has adopted a combination of supply-side and demand-side interventions:

1. Atal Bhujal Yojana promotes community-led groundwater management in water-stressed areas.
2. Pradhan Mantri Krishi Sinchayee Yojana promotes irrigation efficiency and “Per Drop More Crop”.
3. Jal Shakti Abhiyan: Catch the Rain promotes rainwater harvesting and recharge.
4. National Aquifer Mapping Programme improves scientific understanding of aquifers.
5. Model groundwater legislation encourages regulated extraction.
6. Watershed development, restoration of traditional water bodies and artificial recharge increase groundwater replenishment.

3. Way forward

Crop diversification, rational electricity pricing, micro-irrigation, treated wastewater reuse and aquifer-based participatory management are essential.

Conclusion

Groundwater depletion is fundamentally a demand-management problem as much as a recharge problem. Sustainable extraction must therefore align agricultural incentives, local water governance and scientific aquifer management.

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