



CGWB Report on Groundwater Contamination

For Prelims: [Central Groundwater Board](#), [Fluoride](#), [Uranium](#), [Central Ground Water Authority](#), [Waterborne Diseases](#), [Blue baby syndrome](#), [Jal Shakti Abhiyan \(JSA\)](#), [National Aquifer Mapping and Management Program \(NAQUIM\)](#), [Atal Bhujal Yojana \(ABHY\)](#).

For Mains: Environmental Pollution and Management, Water Resources Management, Water Quality

[Source: TH](#)

Why in News?

The [Central Groundwater Board \(CGWB\)](#) report reveals a troubling rise in groundwater contamination across India, with more districts showing excessive nitrate levels.

- This chemical contaminant poses significant health risks, particularly to **young children**, while also raising environmental concerns.

What are the Key Findings of the CGWB Report?

- **Increase in Nitrate Contamination:** As of 2023, **440 districts** reported excessive nitrate levels in groundwater, up from **359 districts** in 2017.
 - **56%** of India's districts have nitrate concentrations exceeding the safe limit of **45 mg per litre**.
- **Regional Hotspots:** **Rajasthan** (49%), **Karnataka** (48%), and **Tamil Nadu** (37%) reported the highest levels of nitrate contamination.
 - **Maharashtra, Telangana, Andhra Pradesh**, and **Madhya Pradesh** are showing notable levels of nitrate contamination, with growing concerns in central and southern India.
- **Monsoon Impact:** **Nitrate contamination** increases after the monsoon, with **32.66%** of samples exceeding safe limits during the rainy season, compared to **30.77%** pre-monsoon.
- **Other Groundwater Contaminants:** **Fluoride contamination** remains a major issue in **Rajasthan, Haryana, Karnataka, Andhra Pradesh**, and **Telangana**.
 - **Uranium** contamination exceeds safe levels in **Rajasthan, Punjab, Haryana, Gujarat, Tamil Nadu, Andhra Pradesh**, and **Karnataka**, particularly in over-exploited groundwater zones.
- **Groundwater Extraction:** **60.4%** of groundwater is being extracted across India, maintaining a steady rate since 2009.
 - However, there has been an improvement in the **availability of groundwater**, with **73% of the blocks classified as being in the 'safe' zone**, a significant increase from **67.4% in 2022**.

Central Ground Water Board (CGWB)

- **About:** The **CGWB**, established under the **Ministry of Water Resources**, (now **Ministry of Jal Shakti**), is the apex body for **managing, exploring, monitoring, assessing, and**

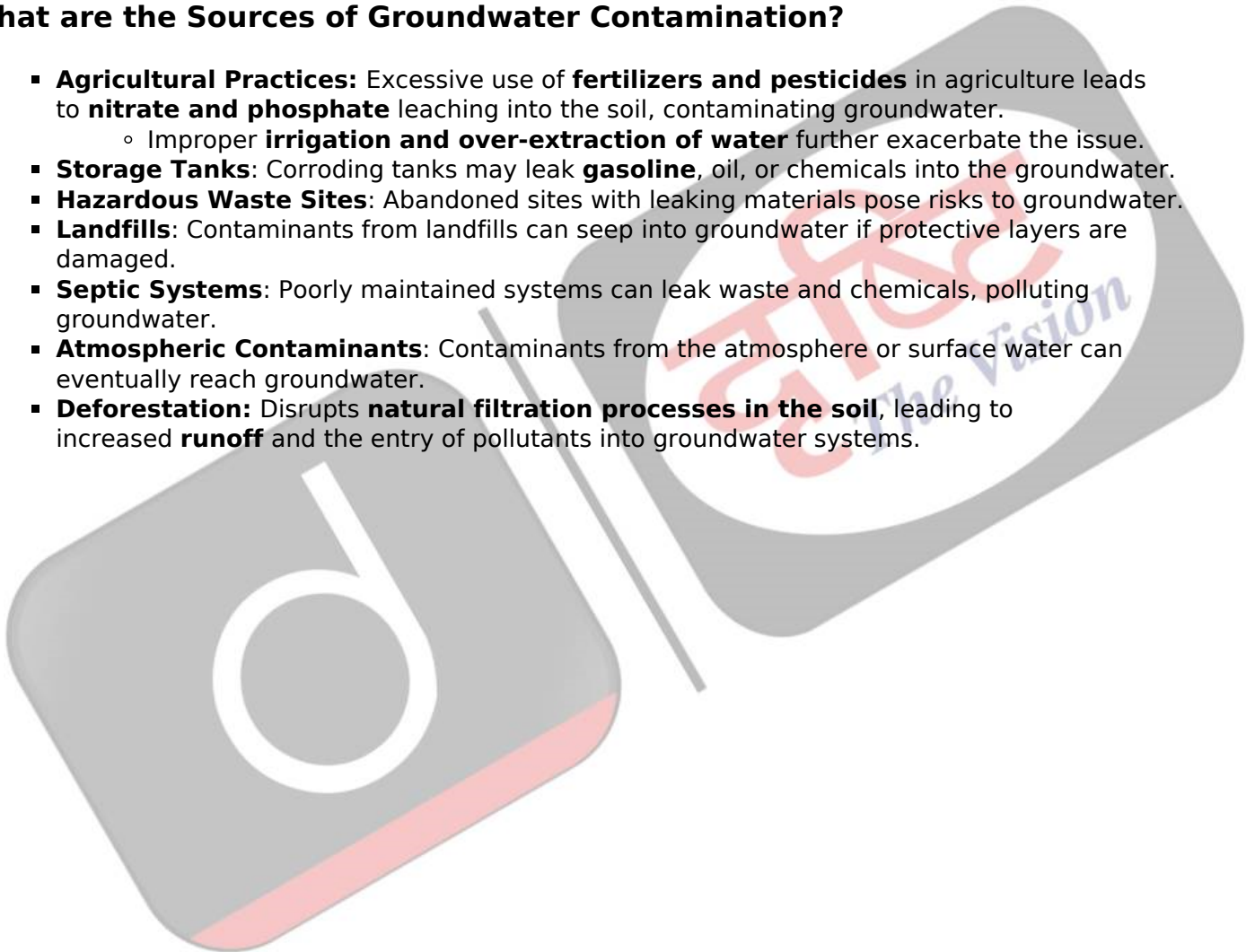
regulating groundwater resources in India.

- Established in **1970**, CGWB was initially formed by renaming the **Exploratory Tube Wells Organization** and was later merged with the **Ground Water Wing of the Geological Survey of India in 1972**.
- The **Central Ground Water Authority (CGWA)**, constituted under the **Environmental Protection Act, 1986**, regulates groundwater development to ensure its sustainability.
- **Key Functions and Responsibilities:** CGWB provides scientific expertise for groundwater management, including exploration, monitoring, and water quality assessments.
 - It also implements schemes for **artificial recharge** and **rainwater harvesting** to augment groundwater levels.
- **Scientific Reports:** CGWB releases State and District hydrogeological reports, ground water year books and Atlases.

What are the Sources of Groundwater Contamination?

- **Agricultural Practices:** Excessive use of **fertilizers and pesticides** in agriculture leads to **nitrate and phosphate** leaching into the soil, contaminating groundwater.
 - Improper **irrigation and over-extraction of water** further exacerbate the issue.
- **Storage Tanks:** Corroding tanks may leak **gasoline**, oil, or chemicals into the groundwater.
- **Hazardous Waste Sites:** Abandoned sites with leaking materials pose risks to groundwater.
- **Landfills:** Contaminants from landfills can seep into groundwater if protective layers are damaged.
- **Septic Systems:** Poorly maintained systems can leak waste and chemicals, polluting groundwater.
- **Atmospheric Contaminants:** Contaminants from the atmosphere or surface water can eventually reach groundwater.
- **Deforestation:** Disrupts **natural filtration processes in the soil**, leading to increased **runoff** and the entry of pollutants into groundwater systems.

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GROUND WATER SITUATION



Total no. of assessment units

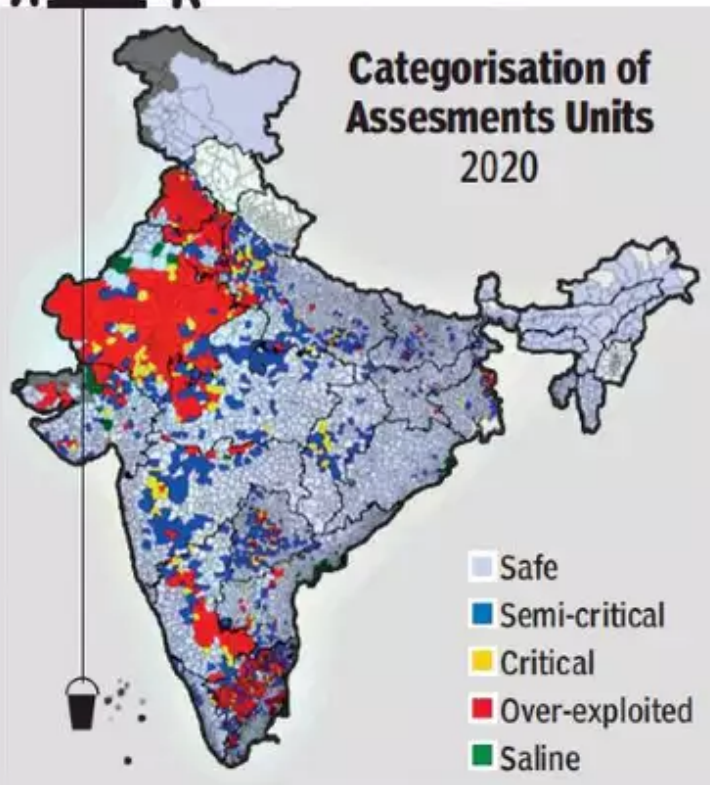
2017: 6,881

2020: 6,965

2017 vs 2020

	No. of units	% of total
Safe		
2017	4,310	62.6
2020	4,427	63.6
Semi-critical		
2017	972	14.1
2020	1,057	15.2
Critical		
2017	313	4.6
2020	270	3.9
Over-exploited		
2017	1,186	17.2
2020	1,114	16
Saline		
2017	100	1.5
2020	97	1.3

Categorisation of Assessments Units 2020



Safe
Semi-critical
Critical
Over-exploited
Saline

*units: block/taluk/tehsil/mandal/firka; Source: Central Ground Water Board

What are the Implications of Groundwater Contamination?

- **Health Risks:** Contaminants such as **fluoride, nitrates, and heavy metals** pose serious health risks and lead to [Waterborne Diseases](#).
 - Excessive **nitrate contamination**, particularly for infants and young children, can cause **methemoglobinemia, also known as "blue baby syndrome."**
- **Food Production:** Groundwater contamination with heavy metals and pollutants used for irrigation can lead to toxic substances **accumulating in crops, compromising food safety and human health.**
- **Environmental Impact:** Nitrate pollution can disrupt local ecosystems, impacting plant and aquatic life.
 - Contaminants in groundwater can cause [soil contamination and salinization](#).
- **Increased Costs:** Contaminated groundwater requires **costly treatment processes** to make it safe for consumption.
 - Groundwater contamination can spread to **surface water**, worsening water quality. **Chronic contamination reduces freshwater availability**, leading to water shortages and potential socio economic crises.

What are the Measures Taken to Curtail Groundwater Contamination?

- [Jal Shakti Abhiyan \(JSA\)](#).
- [National Aquifer Mapping and Management Program \(NAQUIM\)](#).
- [Atal Bhujal Yojana \(ABHY\)](#).
- **Pollution Control Programs:** [Central Pollution Control Board's \(CPCB\)](#) and [State Pollution Control Boards](#) enforce pollution control measures under the **Water (Prevention & Control) Act, 1974**, focusing on the prevention of contamination.
 - Installation of [Sewage Treatment Plants \(STPs\)](#) and [Effluent Treatment Plants \(ETPs\)](#) to treat water before release into the environment.
- **Public Awareness Campaigns:** Training stakeholders through institutions like the **Rajiv Gandhi National Ground Water Training & Research Institute (RGNGT&RI)**.
 - Efforts like ["Catch the Rain"](#) and [Swachh Bharat Mission](#) educate communities about groundwater protection.

Way Forward

- **Regulating Fertilizer Use:** Greater attention must be paid to the **overuse of nitrogenous fertilizers** in agriculture. Implementing [sustainable farming practices](#) could help mitigate this issue.
- **Rainwater Harvesting:** Encouraging **rainwater harvesting** and the **replenishment of groundwater** through natural processes can help reduce the reliance on **overexploited aquifers**.
- **Improved Waste Management:** Efficient waste management systems in urban areas can prevent groundwater contamination. Decentralized **waste treatment and recycling initiatives are effective solutions**.
- **Better Monitoring and Policies:** Increasing the monitoring of groundwater quality and creating stricter regulations regarding chemical contaminants can help prevent further contamination.

Drishti Mains Question:

What are the impacts of groundwater contamination in India? How can groundwater be better managed?"

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q.1 Which one of the following ancient towns is well known for its elaborate system of water harvesting and management by building a series of dams and channelizing water into connected reservoirs? (2021)

- (a) Dholavira
- (b) Kalibangan
- (c) Rakhigarhi
- (d) Ropar

Ans: (a)

Q.2 With reference to 'Water Credit', consider the following statements: (2021)

1. It puts microfinance tools to work in the water and sanitation sector.
2. It is a global initiative launched under the aegis of the World Health Organization and the World Bank.
3. It aims to enable the poor people to meet their water needs without depending on subsidies.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Ans: (c)

Mains

Q.1 What are the salient features of the Jal Shakti Abhiyan launched by the Government of India for water conservation and water security? **(2020)**

Q.2 Suggest measures to improve water storage and irrigation system to make its judicious use under the depleting scenario. **(2020)**

PDF Refernece URL: <https://www.drishtiiias.com/printpdf/cgwb-report-on-groundwater-contamination>

