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DAILY EDITORIAL ANALYSIS

TOPIC

INDIA'S GROUNDWATER CRISIS

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In Context

- The Union Ministry of Jal Shakti recently released the **Annual Groundwater Quality Report 2024**, prepared by the **Central Ground Water Board (CGWB)**. This comprehensive report sheds light on the state of India's groundwater resources, their quality, usage trends, and challenges, while emphasizing the urgent need for sustainable management practices.

Key Findings of the Report

- **Groundwater Quality Trends:**
  - **Positive Indicators:**
    - **81%** of groundwater samples are suitable for irrigation.
    - **100% of groundwater samples** in **North-Eastern states** were rated as excellent for agriculture.
  - **Contamination Concerns:**
    - Regions show contamination by **nitrates**, **fluoride**, and **arsenic**, posing health risks.
  - **Seasonal Trends:**
    - Post-monsoon recharge improves groundwater quality in many regions.
- **Agricultural Suitability:**
  - Favorable levels of **Sodium Adsorption Ratio (SAR)** and **Residual Sodium Carbonate (RSC)** enhance irrigation potential.
  - However, high sodium content in some regions could lead to **soil degradation**, necessitating targeted interventions.

Challenges to Groundwater Sustainability

- **Over-Extraction:** India is the **world's largest extractor of groundwater**, accounting for **25% of global withdrawals**.
  - **256 out of 700 districts** are classified as critical or overexploited.
- **Agricultural Dependency:** Unsustainable agricultural practices contribute significantly to groundwater depletion, with traditional crops demanding excessive water.
- **Projected Water Crisis:** By **2030**, 21 Indian cities are expected to exhaust their groundwater reserves.
- **Climate Change:** Erratic monsoons, unpredictable rainfall patterns, and population growth exacerbate groundwater stress.
- **Policy Gaps:** Inefficiencies in implementation and lack of stringent regulations continue to hinder groundwater management.

Government Initiatives to Address the Crisis

1. **Atal Bhujal Yojana (ABY):** Focuses on **water-stressed Gram Panchayats** in 80 districts across seven states.
   - Emphasizes **community-led water management**, including:
     - **Water budgeting.**
     - **Rainwater harvesting** and **aquifer recharge.**
     - Encouraging **water-efficient cropping patterns**.
2. **Rainwater Harvesting:** Promoted through various state-level programs and **urban regulations**.
   - Examples:
     - **Rooftop harvesting** in Tamil Nadu.
     - Large-scale recharge structures in Gujarat.
3. **Jal Shakti Abhiyan – Catch the Rain (5th Phase):** Encourages rainwater harvesting and water conservation in both **rural** and **urban districts**.
4. **Participatory Groundwater Management (PGWM):** Encourages **local governance**, collaboration between communities, and NGOs to monitor and conserve groundwater.

5. **Technological Innovations:** Adoption of **GIS**, **remote sensing**, and **AI** for mapping and predicting groundwater availability.
    - Partnerships with **ISRO** for aquifer mapping and resource planning.
6. **Community-Led Success Stories:**
    - **Rajasthan:** NGOs like Tarun Bharat Sangh revived rivers and aquifers through traditional water harvesting techniques such as **johads**.
    - **Maharashtra's Pani Foundation:** Mobilized villages to adopt **watershed management**, significantly improving groundwater levels.
    - **Gujarat's Jyotirgram Yojana:** Separated electricity feeders for agriculture and domestic use, incentivizing judicious groundwater utilization.

Other Significant Programs

- **Pradhan Mantri Krishi Sinchai Yojana (PMKSY):** Expands irrigation coverage with a focus on water-use efficiency.
    - Includes components like **Har Khet Ko Pani** and **watershed development**.
- **Mission Amrit Sarovar:** Aims to create or rejuvenate **75 waterbodies per district** to enhance rainwater harvesting.
- **National Aquifer Mapping (NAQUIM):** Completed for over **25 lakh sq. km**, aiding in recharge and conservation planning.
- **Bureau of Water Use Efficiency (BWUE):** Promotes improved water use efficiency across sectors, including **irrigation**, **power generation**, and **domestic water supply**.

Key Recommendations for Groundwater Revival

- **Strengthening Policies and Regulations:** Introduce stringent laws to prevent over-extraction.
    - Ensure accountability in policy implementation at the local level.
- **Promoting Sustainable Agricultural Practices:** Encourage **micro-irrigation**, **drip systems**, and **crop diversification** to reduce water demand.
- **Scaling Up Successful Models:** Expand initiatives like **Atal Bhujal Yojana** and **PGWM** nationwide.
- **Technology-Driven Solutions:** Invest in advanced technologies like **AI** and **GIS** for real-time monitoring and predictive planning.
- **Public Awareness and Behavioral Change:** Raise awareness about groundwater conservation through education and community participation.
- **Climate-Resilient Water Management:** Develop contingency plans for regions vulnerable to erratic rainfall and droughts.

Conclusion

- India's dependence on groundwater necessitates a **holistic approach** that integrates **policy reforms**, **technological innovation**, and **community-led efforts**. While initiatives like **ABY**, **rainwater harvesting**, and **aquifer mapping** are steps in the right direction, challenges such as over-extraction, policy gaps, and climate variability require urgent attention. By fostering collective responsibility and embracing sustainable practices, India can ensure **water security** for its 1.4 billion citizens and preserve this critical resource for future generations.

Source: LM

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Mains Practice Question

[Q] How can India's urban areas address the worsening groundwater crisis while balancing economic development and environmental sustainability?