Towards Effective Water Management in India

This editorial is based on "Jal Jeevan Mission: Hits and misses" which was published in The Hindu on 07/05/2024. The article brings into picture the slowed progress of the Jal Jeevan Mission, now extended to 2028, and highlights the risk of neglecting traditional water conservation methods amid India's growing water crisis.

For Prelims: Jal Jeevan Mission, Article 48A (Directive Principle), Inter-State River Water Disputes Act, 1956, Environment (Protection) Act, 1986, National Water Policy, 2012, Atal Bhujal Yojana, Heat wave, PM Krishi Sinchai Yojana, Direct Benefit Transfer

For Mains: Current Water Governance Framework in India, Key Issues Associated with Water Management in India**.**

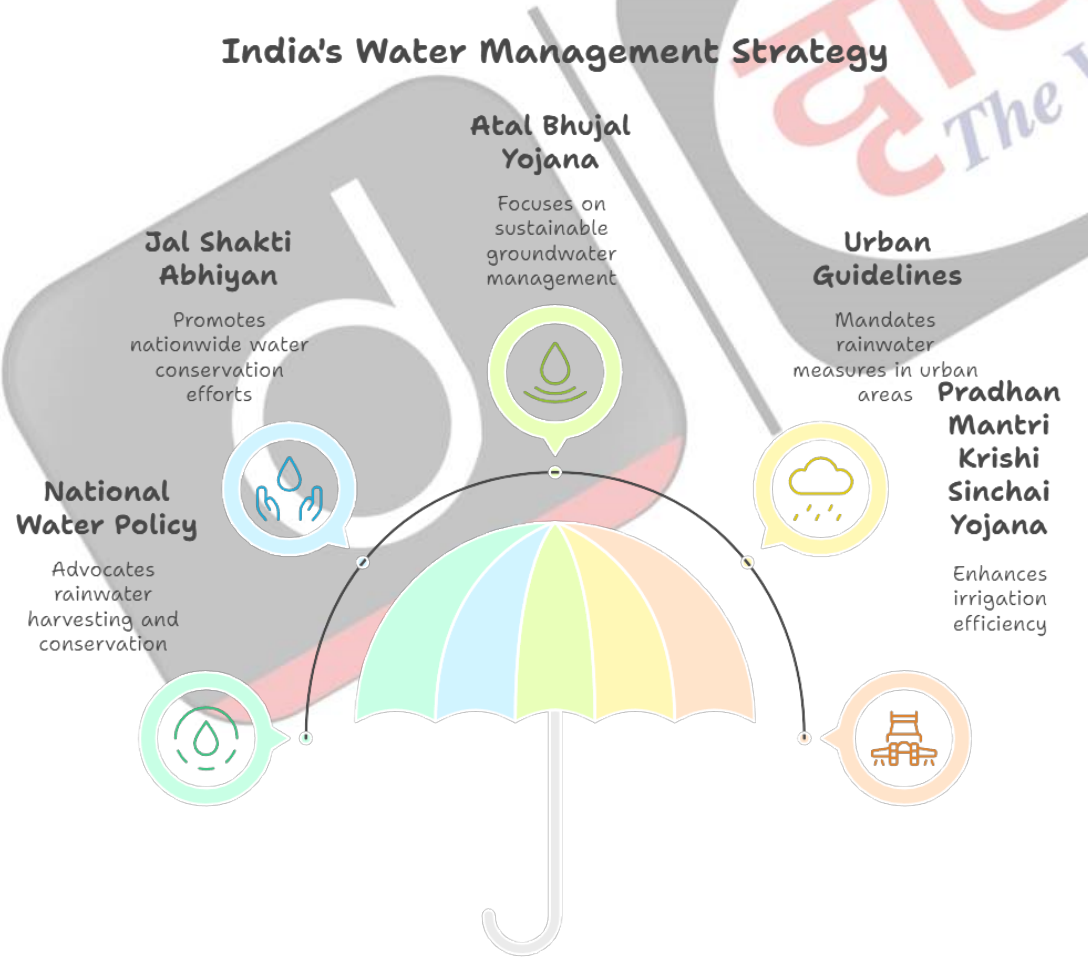
India's ambitious **Jal Jeevan Mission** promised functional tap connections to every rural household by **2024**, but despite covering nearly **80% of rural homes**, progress has slowed significantly, prompting a four-year extension to 2028. The mission's single-minded focus on tap connections risks **neglecting traditional water conservation methods, as evidenced in Kerala where only 20% have piped water but 60% access sustainable traditional sources.** India must work diligently and urgently to address its multifaceted water crisis before it becomes an insurmountable national emergency.

What is the Current Water Governance Framework in India?

- **Constitutional Provisions**
  - **Water as a State Subject**: Entry 17 of the State List (List II, Seventh Schedule) Water falls under the jurisdiction of state governments.
  - **Inter-State River Waters**: Entry 56 of the Union List allows the **Centre to regulate inter-state rivers** and river valleys.
  - **Environmental Protection**: **Article 48A (Directive Principle) and Article 51A(g) (Fundamental Duty)** promote the protection and improvement of the environment, including water bodies.
- **Institutional Framework**

Level	Key Institutions
Central	Ministry of Jal Shakti (formed in 2019 by merging Ministry of Water Resources & Ministry of Drinking Water and Sanitation)
State	State Water Resource Departments, Jal Boards, Groundwater Authorities
Local	Panchayati Raj Institutions (Gram Panchayats, Jal Samitis), Urban Local Bodies

- **Specialised Agencies**:
  - **Central Ground Water Board (CGWB)**: Monitors and manages groundwater.
  - **Central Water Commission (CWC)**: Designs and coordinates surface water resource projects.
  - **National Water Development Agency (NWDA)**: Works on river interlinking and water planning.
- **Legal Framework**
  - **Inter-State River Water Disputes Act, 1956**: Mechanism to resolve disputes (e.g., Cauvery, Krishna).
  - **Environment (Protection) Act, 1986**: Overarching legislation for pollution control of water bodies.
  - **Water (Prevention and Control of Pollution) Act, 1974**: Governs discharge standards and monitoring of polluted water.
  - **Model Groundwater (Control and Regulation) Bill** – Proposed to regulate groundwater use (adoption by states varies).
- **Policy Framework**
  - **National Water Policy, 2012** (Under Revision):
    - Water as an economic good
    - Participatory and integrated water management
    - Focus on sustainability and conservation
  - **Draft National Water Policy, 2020** (Proposed but not adopted):
    - Prioritises climate-resilient infrastructure
    - Suggests Water Regulatory Authorities in all states
    - Emphasises wastewater reuse and groundwater pricing



What are the Key Issues Associated with Water Management in India?

- **Overexploitation of Groundwater and Policy-Induced Depletion:** India's groundwater crisis is largely policy-driven, with **free electricity and lack of regulation** encouraging **indiscriminate extraction**, especially in agriculture.
    - States like **Punjab, Haryana, and parts of Rajasthan** are already experiencing severe groundwater stress.
        - The absence of metering or incentives for conservation worsens the situation.
    - India is the largest user of groundwater globally, extracting more than the **United States and China** put together.
        - The **rate of depletion of groundwater** in India during **2041-2080** will be thrice the current rate with global warming
- **Fragmented Institutional Framework and Poor Data Synchronisation:** Water governance is fragmented across **multiple ministries**, **leading to coordination failures and inconsistent implementation.**
    - Definitions and indicators of water access vary across **JJM, NFHS, NSS, and Census,** making tracking progress unreliable.
    - Without integrated databases, targeted policy making becomes ineffective.
    - **Only 36.6% of Indian households** had access to piped drinking water, **as of 2020-21**, data from the Multiple Indicator Survey **(NSS round 78), though JJM dashboard claims different data.**
        - The difference illustrates data incomparability and verification gaps.
- **Inadequate Urban Water Infrastructure and Rising Demand:** Urban India is facing a silent water crisis due to **aging infrastructure, rapid population growth, and unplanned urbanization.**
    - Most cities supply water only a few hours a day and fail to recycle wastewater at scale. Demand outpaces supply, affecting households and industries alike.
    - **No Indian city provides continuous piped water;** even metros like **Bengaluru and Delhi face summer shortages.**
- **Concerning Quality and Safety of Drinking Water:** Access to water does not guarantee its safety—many households receive contaminated or chemically unsafe water. Fluoride, arsenic, and iron contamination affects millions, especially in eastern and central India.
    - Monitoring mechanisms under JJM are still evolving and not uniformly implemented.
    - **163 million Indians lack access to safe drinking water (World Bank).** Around **21% of communicable diseases are linked to unsafe water.**
- **Neglect of Traditional and Sustainable Water Sources:** In the rush to meet **Functional Household Tap Connection Targets** under JJM, many traditional water systems—**wells, tanks, stepwells—are being overlooked.**
    - This affects long-term water security, especially in water-abundant but infrastructure-poor states like Kerala.
        - Ignoring these systems also weakens community-led conservation.
    - For instance, the proportion of total rural habitations fully covered with drink- ing water supply in Kerala **is only 28%.**
        - Excessive focus on infrastructure risks sidelining low-cost, sustainable water solutions.
- **Climate Change and Increasing Hydrological Extremes:** Erratic rainfall patterns, frequent droughts, and devastating floods due to climate change are destabilising India's water regime.
    - Monsoon dependence makes both drinking water access and irrigation highly vulnerable.
        - Climate-resilient water management remains underdeveloped.
    - Moody's report stated that the **heat wave in June 2024,** with temperature hitting **50 degrees Celsius in Delhi** and the northern Indian States, strained water supply.
        - India's per capita annual water availability is expected to fall to **1,367 m³ by 2031 (Ministry of Water Resources).**

What Measures can India Adopt for Effective Water Management?

- **Integrating JJM with Atal Bhujal Yojana for Source Sustainability:** The success of Jal Jeevan

Mission depends **not just on infrastructure but on the long-term sustainability of water sources.**
    - Integrating it with Atal Bhujal Yojana can **help ensure that functional household tap connections are backed by stable groundwater tables.**
        - A community-led water budgeting approach should be institutionalised in villages.
    - Such convergence ensures that water supply expansion is matched with groundwater conservation efforts for lasting impact.
- **Promoting Urban Water Security through Circular Economy:** India's urban water stress demands a shift from linear to circular water use models.
    - Cities must invest in **wastewater recycling, greywater reuse, and rainwater harvesting** at both household and institutional levels.
    - Linking **Smart Cities Mission with AMRUT 2.0** can ensure tech-driven urban water infrastructure with sustainability focus.
        - Mandating **water-sensitive urban design (WSUD) in building bylaws** can mainstream conservation in urban growth.
- **Strengthening Decentralised Water Governance through Panchayati Raj Institutions:** Decentralised planning through Gram Panchayats and Jal Samitis must be empowered with financial and technical autonomy.
    - Local bodies should manage water infrastructure **O&M (Operation and Maintenance)** and monitor quality through community-based systems.
        - Decentralised governance fosters accountability, context-specific solutions, and a sense of ownership among communities.
- **Modernising Irrigation through Technology and Incentive-Based Models:** India needs a radical overhaul of irrigation practices to reduce inefficiency and groundwater depletion.
    - Expanding **micro-irrigation under PM Krishi Sinchai Yojana** and integrating it with **Direct Benefit Transfer** for power subsidies can incentivise farmers to adopt precision techniques.
    - Technologies like soil moisture sensors and AI-enabled irrigation scheduling should be scaled.
        - This measure addresses both water use efficiency and energy-water-agriculture nexus simultaneously.
- **Institutional Convergence and Unified Water Data Architecture:** Fragmentation across ministries (Jal Shakti, Agriculture, Urban Affairs) weakens coordination and accountability in water policy.
    - **A National Integrated Water Data Platform** should be established to harmonise definitions, indicators, and progress tracking across JJM, NFHS, NSSO, and Census.
    - Real-time data transparency can improve inter-agency coordination and public trust.
        - **Institutional synergy and unified monitoring systems** will enable evidence-based and outcome-driven water management.
- **Embedding Climate Resilience in All Water Infrastructure Projects:** With climate change intensifying droughts and floods, resilience must become a non-negotiable criterion in project planning.
    - Water infrastructure—**dams, canals, urban drains—**should be designed using climate risk assessments and nature-based solutions.
    - Linking **National Adaptation Fund with Jal Shakti Abhiyan** can fund localised climate-resilient interventions.
        - **Embedding resilience** ensures that infrastructure is not just built to last, but also to adapt.
- **Reviving Traditional Water Bodies through Community-Led Initiatives:** India has a rich heritage of traditional water harvesting systems—**stepwells, tanks, johads**—which have fallen into neglect.
    - Reviving these through convergence of schemes like **MGNREGS and Jal Shakti Abhiyan** can create water storage capacity while generating rural employment.
    - Community ownership must be incentivised through reward-based models for upkeep.
        - **Blending cultural knowledge with modern planning** offers both sustainability and social capital enhancement.
- **Promote Usage of Recycled Water:** To encourage residential societies to adopt treated water for non-potable purposes, the government can introduce subsidized dual plumbing systems that separate potable and recycled water.

    - Additionally, a tiered volumetric pricing structure can be implemented, charging higher rates for excessive use of fresh water while offering incentives for using recycled water.
    - Strict enforcement of the **Central Pollution Control Board's (CPCB) Zero Liquid Discharge (ZLD) guidelines** is essential to ensure wastewater is effectively treated and reused.
    - Furthermore, industries should be mandated to use treated water, following the example of the Power Tariff Policy 2016, which requires thermal power plants within a **50 km radius of sewage treatment plants (STPs)** to utilize treated sewage water for non-potable purposes.
- **Implementing Mihir Shah Committee's Recommendation:** The **Mihir Shah Committee r**ecommends a One Water Approach for integrated water management, merging CGWB and CWC into a **National Water Commission (NWC**) for **better governance, and strengthening decentralized water management.** Some of the other Recommendations made by the committee are:
    - **Broadening Disciplinary Scope:**
        - Current dominance of civil engineers (CWC) and hydrogeologists (CGWB) is inadequate.
        - **Emphasized inclusion of:**
            - Social scientists and management experts – for participatory models.
            - Agronomists – for crop water budgeting and WUE.
            - Ecological economists – to value ecosystem services.
            - River ecologists – essential for river rejuvenation projects.
    - **Holistic and Participatory Water Governance:**
        - Advocated breaking groundwater-surface water silos.
        - Encouraged community involvement and decentralised decision-making.
        - Stressed that water's value is not just economic, but ecological, social, and cultural.
    - **Governance Overhaul:**
        - **Redesign existing organisations** into a **progressive, agile, and compact structure** that can effectively tackle current and future water governance challenges.
        - **Simplify and rationalise the bureaucratic setup** of the existing bodies by addressing issues like numerous overlapping designations and lack of accountability.
    - **Participatory and Inclusive Water Management**
        - **Promote participatory irrigation and groundwater management**, which require engagement with local communities and multi-disciplinary expertise.
        - **Shift focus from purely economic valuation of water** to include **social, ecological, and cultural values** in water conservation and management strategies.
        - **Make water governance more inclusive**, participatory, and transparent with active stakeholder engagement at all levels.

Conclusion

India's water management must go beyond infrastructure expansion to ensure long-term sustainability. **Integrating traditional conservation methods with modern solutions** is crucial for resilience against climate change and resource depletion. Strengthening decentralized governance, data transparency, and community participation will enhance efficiency

Drishti Mains Question:

Effective water management in India requires a holistic approach that balances infrastructure development with traditional conservation practices. Discuss the challenges in achieving this balance and suggest sustainable solutions.

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)
