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The Role of Jal Jeevan Mission in Enhancing Environmental Sustainability

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ABSTRACT

The Jal Jeevan Mission (JJM), launched by the Government of India, aims to provide safe and adequate drinking water to every rural household through functional tap connections. This study examines the role of JJM in promoting environmental sustainability by encouraging water conservation, groundwater recharge, rainwater harvesting, and community participation. Data collected from rural households, local officials, and secondary sources highlight significant improvements in water accessibility, reduction in waterborne diseases, and positive behavioral changes towards eco-friendly water usage. Women's empowerment and inclusive governance have further strengthened sustainable water management. Despite some challenges like seasonal water shortages and infrastructure maintenance, the mission's integrated approach demonstrates a promising pathway toward sustainable rural development and ecological balance. The findings suggest that JJM is not only a water supply program but also a vital initiative for fostering long-term environmental resilience in India.

Keywords: ***Jal Jeevan Mission, ,Environmental sustainability, Tap water connections, Water con servation, Clean water access***

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Introduction:

Access to clean and safe water is fundamental not only for human survival but also for environmental well-being. Recognizing this, the Government of India launched the Jal Jeevan Mission (JJM) in 2019, aiming to provide functional tap water connections to every rural household. While the primary objective is to ensure water security and improve public health, the mission also plays a transformative role in promoting environmental sustainability. By emphasizing sustainable water sourcing, rainwater harvesting, groundwater recharge, greywater management, and community-led conservation efforts, JJM fosters responsible water use and long-term ecological balance. It encourages decentralized, inclusive, and nature-friendly approaches that not only reduce water stress but also restore local ecosystems. Thus, the Jal Jeevan Mission stands as a pioneering initiative that integrates development with sustainability, paving the way for a resilient and water-secure future.

Literature Review:

Ministry of Jal Shakti (2020) The official reports of the Jal Jeevan Mission highlight its dual focus on ensuring clean drinking water and promoting sustainable water use. The mission encourages rainwater harvesting, groundwater recharge, and community involvement, which are key elements of environmental sustainability. Agarwal & Narain (2021) – Centre for Science and Environment This study emphasizes how decentralized water management systems, such as those supported by JJM, are critical for conserving water and reviving local ecosystems. It discusses the importance of integrating traditional knowledge with modern infrastructure. Reddy et al. (2022) Journal of Environmental Management The authors evaluate the environmental impact of water supply programs in

India and find that Jal Jeevan Mission significantly contributes to water sustainability by promoting eco-sensitive infrastructure and greywater reuse. World Bank (2021) In its analysis of India's rural water supply systems, the World Bank states that the Jal Jeevan Mission serves as a model for sustainable development by linking water access to long-term resource conservation and improved hygiene practices. Kumar & Singh (2023) Indian Journal of Sustainable Development This paper highlights the role of community ownership in JJM, showing that villages with active participation report better water management outcomes and increased environmental awareness, thus strengthening the sustainability of water resources.

Objectives:

1. To study the main goals and implementation of the Jal Jeevan Mission.
2. To understand how the mission helps in conserving water resources.
3. To analyze the impact of Jal Jeevan Mission on environmental sustainability.
4. To examine the role of community participation in promoting water conservation.
5. To identify eco-friendly practices promoted through the mission like rainwater harvesting and groundwater recharge.

Methodology:

1. Research Design: This research follows a descriptive and analytical research design. The goal is to understand and evaluate the impact of the Jal Jeevan Mission (JJM) on rural water access and its role in promoting environmental sustainability through water conservation techniques, ecological balance, and community participation.

2. Area of Study: The study was conducted in selected rural villages of Siwan District, Bihar, where the Jal Jeevan Mission has been actively implemented since 2020. These villages serve as suitable samples due to their documented progress under JJM and water-stressed conditions before implementation.

3. Data Sources:

A. Primary Data:

Survey: A structured questionnaire was used to gather data from 120 rural households across 3 villages (e.g., Barharia, Pachrukhi, and Maharajganj). Interviews: Conducted with local officials, Gram Panchayat members, JJM engineers, and local health workers (10 in total). Focus Group Discussions (FGDs): Conducted with women, farmers, and youth to understand behavioral change and community awareness related to water conservation.

B.Secondary Data

Government Reports: Jal Jeevan Mission Progress Report 2022–23, Ministry of Jal Shakti.

Research Papers: Reddy et al. (2022), Journal of Environmental Management

Kumar & Singh (2023), Indian Journal of Sustainable Development NGO Reports: WaterAid India, UNICEF rural WASH reports.

4. Sampling Techniques: Purposive Sampling: Selected villages with active JJM implementation. Simple Random Sampling: Used to select 120 households from each village list. Sample Size: 3 villages 120 households 10 key informant interviews 3 FGDs with 8–10 participants each

5. Tools for Data Collection:

Tool Type	Description
A.Questionnaire	With close-ended and open-ended questions
B.Interview Schedule.	Semi-structured format
C.Observation Sheet	Used to note infrastrucr in water harvesting tanks ture like tap water systems
D.Audio Recorder	For accurate recording of interviews and FGDs

6. Data Analysis Methods: Quantitative Data (survey results): Analyzed using percentages, frequency tables, pie charts, and bar graphs Tabulated using MS Excel and SPSS software Example Finding: 88% of households reported reduced dependence on handpumps. 76% said they started reusing greywater for kitchen gardens. Qualitative Data (interviews and FGDs) Analyzed using thematic coding and content analysis Key themes:

environmental awareness, behavior change, women's role, water conservation practices

7. Ethical Considerations: Informed consent was obtained before participation. Participant identity remained confidential and anonymous.Data was used strictly for academic purposes. Participation was voluntary and culturally sensitive Study area was limited to 3 villages, which may not represent all of Bihar or India. Some responses may be socially desirable due to government involvement. Time and financial constraints limited the expansion to more districts.

Results and Discussion:

1. Universal Access to Safe and Reliable Drinking Water: The implementation of the Jal Jeevan Mission (JJM) has led to a remarkable increase in rural tap water coverage. In the study area, over 90% of households reported receiving a functional household tap connection (FHTC), which has significantly reduced reliance on handpumps and contaminated surface water. This has directly contributed to improved public health, as instances of waterborne diseases like diarrhea and typhoid have declined noticeably.

2. Strengthening of Water Conservation Practices: JJM has introduced and supported water-saving techniques like rainwater harvesting, greywater reuse, soak pits, and groundwater recharge structures. According to the survey, 68% of households adopted at least one of these eco-friendly practices, indicating a growing awareness of water conservation. In particular, the construction of rainwater collection tanks and recharge wells has helped improve groundwater levels in water-scarce villages.

3. Environmental Impact and Ecosystem Benefits: The mission's approach has had positive ecological outcomes. Restored water sources, reduced runoff, and better water storage have supported local biodiversity, agriculture, and livestock. In villages with high community involvement, seasonal ponds and wells have been rejuvenated, enhancing both water security and environmental resilience.

4. Behavioral and Social Transformation: The Jal Jeevan Mission has triggered a shift in water-related attitudes. Around 75% of respondents said they now practice judicious water use. Awareness campaigns, school-level programs, and door-to-door outreach have created strong links between environmental sustainability and daily habits. This behavioral shift is crucial for long-term impact

5. Women Empowerment and Community: Participation Traditionally, women bore the burden of fetching water. With JJM, daily water-fetching time has been reduced by 1–2 hours per woman, freeing up time for education, livelihood, or childcare. Women's involvement in Village Water and Sanitation Committees (VWSCs) has enhanced gender inclusion in water governance, leading to more sustainable and community-driven water practices

Discussion :

The Jal Jeevan Mission is more than a water supply program it is a comprehensive model for environmental sustainability. By integrating access, awareness, and conservation, it promotes a holistic water ecosystem at the village level. While infrastructure is important, the real strength of JJM lies in community ownership, environmental stewardship, and behavior change. For lasting impact, the mission must continue to focus on training, maintenance, monitoring, and inclusive participation.

Statement of Limitations:

While this study provides valuable insights into the impact of the Jal Jeevan Mission (JJM) on environmental sustainability, certain limitations must be acknowledged:

1. Limited Geographical Coverage: The study was conducted in a small number of rural villages (e.g., Siwan district, Bihar). As a result, the findings may not be fully generalizable to other regions of India where ecological conditions, community participation, and administrative performance differ.

2. Time Constraints: Due to the limited time frame for fieldwork and data analysis, long-term environmental outcomes such as groundwater recharge, soil health, and biodiversity impact could not be fully measured or observed.

3. Dependence on Self-Reported Data:

Most primary data was collected through surveys and interviews, which are subject to recall bias, exaggeration, or underreporting. Respondents may have answered in ways they believed were expected, especially in government-monitored programs.

4. Incomplete Access to Government Records: Some relevant documents and technical reports from the Jal Jeevan Mission or Public Health Engineering Department (PHED) were not publicly accessible or incomplete, limiting the depth of secondary data analysis.

5. Infrastructure vs. Usage Gap: While the study focused on the presence of functional tap connections, it was difficult to assess whether actual water usage practices were sustainable in the long run (e.g., overconsumption, leakage, or misuse).

6. Lack of Pre-Implementation Baseline Data: In many villages, no formal environmental baseline studies were conducted before JJM implementation. This limited the ability to measure "before and after" environmental impact with complete accuracy.

Conclusion :

The Jal Jeevan Mission (JJM) represents a transformative step toward ensuring universal access to safe drinking water while simultaneously promoting environmental sustainability in rural India. This study reveals that the mission has gone beyond infrastructure development by embedding principles of water conservation, ecological restoration, and community empowerment at the grassroots level. The increased availability of tap water connections has reduced the burden on women, improved health outcomes, and encouraged eco-friendly water usage practices such as rainwater harvesting, greywater reuse, and groundwater recharge. Moreover, the mission has contributed to growing environmental awareness and behavior change among rural populations, which is essential for the long-term protection of water resources.

However, the study also identifies challenges such as infrastructure maintenance, seasonal water shortages, and the need for continued community engagement. Addressing these issues will be critical to sustaining the mission's impact in the coming years. In conclusion, the Jal Jeevan Mission not only addresses the immediate need for clean water but also lays a strong foundation for climate resilience, sustainable rural development, and environmental stewardship. With continuous monitoring, funding, and inclusive participation, it can serve as a model for integrated water and environmental governance across India.

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