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Environmental Impact Assessment on Rural Water Supply Scheme Under Jal Jeevan Mission.

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ABSTRACT

The Jal Jeevan Mission (JJM), launched by the Government of India in 2019, aims to provide safe and adequate drinking water through Functional Household Tap Connections (FHTC) to all rural households. This research paper evaluates the environmental impacts of rural water supply schemes implemented under JJM. The study analyzes positive impacts such as improved water quality, reduction in waterborne diseases, and sustainable water management, as well as potential environmental challenges including groundwater depletion and infrastructure-related ecological disturbances. The findings suggest that while JJM significantly improves rural living standards, proper environmental management and sustainable water resource planning are essential for long-term success.

INTRODUCTION

Access to clean, safe, and adequate drinking water is not merely a necessity but a basic human right recognized globally. In India, where a significant proportion of the population resides in rural areas, the challenge of ensuring universal water access remains substantial. This challenge is exacerbated by various factors such as over-extraction of groundwater, contamination from industrial and agricultural runoff, and poor infrastructure maintenance. In response, the Government of India launched the Jal Jeevan Mission (JJM) in 2019 with a transformative vision: to provide Functional Household Tap Connections (fhtcs) to every rural household by 2024. This ambitious program emphasizes the principles of service delivery, source sustainability, community participation, and quality

This seminar report presents a comprehensive Environmental Impact Assessment of rural water supply schemes implemented under the Jal Jeevan Mission. It systematically analyzes potential environmental impacts across different phases of the project lifecycle—planning, construction, operation, and decommissioning. The report also proposes appropriate mitigation strategies and environmentally responsible design considerations. These assessments aim to promote sustainable infrastructure development that aligns with both local ecological parameters and global environmental goals.

In addition to evaluating the environmental aspects, the seminar underscores the significance of community engagement and participatory governance. Rural communities play a critical role in sustaining water sources and ensuring proper utilization. The report advocates for the inclusion of

Objectives of the Study

The main objectives of this study are:

1. To evaluate the environmental impacts of rural water supply schemes under Jal Jeevan Mission.
2. To assess the sustainability of water sources used in the scheme.

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3. To examine the environmental benefits and risks associated with the implementation of the project.
4. To suggest sustainable management practices for rural water supply systems.

Environmental Impact Assessment (EIA):

Environmental Impact Assessment (EIA) is a process used to identify and evaluate the environmental consequences of development projects before implementation.

In rural water supply schemes, EIA focuses on:

- Water source sustainability
- Groundwater impact
- Land use changes
- Ecosystem disturbance
- Wastewater management

Positive Environmental Impacts:

Improved Water Quality

JJM promotes treated and safe drinking water, reducing dependence on contaminated wells and ponds.

Reduction in Waterborne Diseases

Access to safe drinking water helps reduce diseases such as diarrhea, cholera, and typhoid. The program is estimated to prevent millions of water-related illnesses and improve public health.

Reduction in Groundwater Contamination

Properly designed water treatment and distribution systems reduce exposure to contaminated groundwater sources.

Improved Sanitation and Hygiene

Availability of water encourages better sanitation practices, improving environmental cleanliness in rural areas.

Negative Environmental Impacts:

Groundwater Depletion

Many rural water supply schemes rely on bore wells, which may lead to over-extraction of groundwater.

Energy Consumption

Water pumping systems require electricity, increasing energy demand and environmental footprint.

Construction Impacts

Pipeline installation, pump houses, and storage tanks may cause:

- Soil disturbance

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- Vegetation removal
- Land use changes

Wastewater Generation

Increased water supply leads to higher wastewater generation, which may pollute soil and water bodies if not managed properly.

Environmental Management Measures

To reduce environmental impacts, the following measures are recommended:

1. Rainwater harvesting systems
2. Groundwater recharge structures
3. Solar-powered water pumps
4. Wastewater treatment and reuse
5. Regular water quality monitoring
6. Community participation in water management

Case Study (Example)

Studies conducted in rural regions such as Jharkhand and Maharashtra show that Jal Jeevan Mission has significantly improved access to drinking water and reduced water scarcity issues. However, challenges remain related to water source sustainability and long-term infrastructure maintenance.

CONCLUSION

The Environmental Impact Assessment (EIA) of rural water supply schemes under the Jal Jeevan Mission (JJM) reflects a critical effort to align rural infrastructure development with principles of environmental sustainability, public health, and community empowerment. As India works toward the goal of providing Functional Household Tap Connections (FHTCs) to every rural household, it becomes increasingly important to ensure that such interventions do not come at the cost of ecological degradation or resource depletion.

This seminar demonstrates that large-scale rural water schemes can have both positive and adverse environmental impacts. On the one hand, they enhance public health, reduce waterborne diseases, and improve quality of life. On the other hand, they can lead to aquifer depletion, habitat disruption, construction-related pollution, and inefficient energy use, particularly if not designed and managed responsibly. The EIA process helps to anticipate these outcomes across the project lifecycle—from planning and construction to operation and maintenance.

Key findings emphasize the importance of source sustainability, proper siting, and the use of eco-friendly materials and renewable energy technologies. Further, the role of community participation, particularly through Village Water & Sanitation Committees (VWSCs), is shown to be critical for long-term success. Environmental management is most effective when local people are empowered to monitor water quality, manage infrastructure, and conserve natural resources.

Despite its strengths, the study acknowledges challenges such as limited baseline data, regional variability, and policy-implementation gaps. Addressing these requires stronger institutional frameworks, technological tools, and interdisciplinary collaboration. The future of sustainable water infrastructure lies in embracing data-driven environmental planning, continuous monitoring, and adaptive management.

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In conclusion, the integration of EIA into rural water supply schemes under JJM is vital for balancing human needs with environmental protection. It ensures that access to clean water does not compromise groundwater reserves, biodiversity, or climate resilience. This seminar reinforces that infrastructure development and ecological stewardship are not opposing goals but are complementary and essential for a sustainable future in rural India.

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