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Evaluating the Impact of Jal Jeevan Hariyali Mission in Bhagalpur District (Bihar) - A Critical Analysis

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ABSTRACT

The Jal Jeevan Hariyali Mission (JJHM) is an ambitious environmental initiative launched by the Bihar government to address critical ecological challenges, focusing on water conservation, afforestation, and sustainable agricultural practices. This study evaluates the impact of JJHM in Bhagalpur District, with an emphasis on its effectiveness in improving rural livelihoods, restoring water bodies, and increasing green cover. The mission involves multiple facets such as the construction of water conservation structures, afforestation, and promoting alternative agricultural practices like drip irrigation. The study reveals that JJHM has successfully engaged rural communities, providing employment opportunities through the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and enhancing local water and green resources. However, challenges such as limited financial resources, weak inter-departmental coordination, and insufficient community participation hinder its full potential. Despite these obstacles, the program has achieved notable success, including the restoration of public water bodies, afforestation, and increased soil health. The findings suggest that while the scheme has positively impacted environmental conservation and rural livelihoods, its sustainability depends on strengthening community involvement,

increasing awareness, and improving inter-departmental collaboration. The study underscores the need for continued investment and strategic planning to ensure long-term environmental and social benefits.

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1. Introduction

Bihar, one of India's most populous states, faces pressing environmental challenges due to its high population density, with over 88% of its population residing in rural areas, many of whom rely on agriculture for their livelihoods. The state's agricultural sector, which accounts for a significant share of the state's Gross State Domestic Product (GSDP), is directly affected by environmental stressors such as unpredictable rainfall, water scarcity, and climate change. With a population density of 1,106 persons per square kilometer, the demand for water and natural resources is immense, further exacerbating the vulnerability of the region to climatic changes. In 2022, Bihar experienced a decline in average annual rainfall, which fell to 849.1 mm, a significant reduction from the long-term average of 1,009.4 mm. This variation in rainfall patterns, coupled with declining groundwater levels, places enormous pressure on the state's already strained resources.

1.1. The Critical Need for Sustainable Environmental Management

The state is particularly vulnerable to climate-induced disasters, such as flooding and droughts. In 2022-23, Bihar witnessed an estimated crop production loss of ₹ 5,257.69 lakh due to flood-induced damage, impacting over 0.57 lakh hectares of agricultural land. The negative impact on agriculture, which employs more than 47% of the state's workforce, underscores the urgent need for sustainable environmental solutions that can mitigate these challenges while supporting economic development.

Agricultural productivity in Bihar remains highly dependent on the monsoon, making the sector extremely vulnerable to erratic weather patterns. This dependence is compounded by soil degradation and limited irrigation infrastructure, with only 37.38 lakh hectares of irrigation potential created as of March 2023, far from meeting the demands of the vast rural population. To address these pressing issues, the state government launched the *Jal Jeevan Hariyali Mission* (JJHM) in 2019, aiming to rejuvenate water resources, restore green cover, and promote sustainable agricultural practices.

2. The *Jal Jeevan Hariyali Mission*: A Comprehensive Solution

The *Jal Jeevan Hariyali Mission* is a visionary initiative designed to tackle the twin crises of water scarcity and environmental degradation. The mission is focused on three main pillars: water conservation, afforestation, and promoting sustainable agriculture. A key feature of the initiative is the creation of water conservation structures, including check dams and rooftop rainwater harvesting systems, alongside a series of afforestation projects aimed at expanding the green cover across the state.

Under the mission, more than 288.31 lakh trees were planted in 2022-23, contributing to both carbon sequestration and the restoration of soil fertility. Additionally, the Western Kosi Canal Scheme, a significant Rs. 803 crore project, is expected to create irrigation potential for over 2.65 lakh hectares in the districts of Madhubani and Darbhanga. These projects are integral to enhancing agricultural resilience in the face of climate change and improving water availability for both agricultural and domestic use.

The mission's comprehensive approach integrates modern water management practices, such as the construction of water reservoirs, and aims to reduce the adverse impacts of climate change on agricultural production. For example, the state has been promoting bio-farming and organic agricultural practices to not only conserve water but also reduce dependency on chemical fertilizers, which have been depleting the soil quality over the years.

Aligning with Sustainable Development Goals (SDGs)

The *Jal Jeevan Hariyali Mission* aligns with the United Nations' 2030 Agenda for Sustainable Development, particularly in its pursuit of clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), and climate action (SDG 13). Through its various initiatives, Bihar aims to reduce its carbon footprint, enhance the resilience of local farming communities, and restore the balance between development and environmental sustainability. With its combination of policy support, government-led infrastructure development, and community involvement, the mission is a significant step towards ensuring that future generations in Bihar can thrive in a more sustainable and climate-resilient environment.

The success of the mission, however, will depend on continuous investment, better governance, and increased participation from local communities. The integration of sustainable practices into agriculture, such as water-efficient irrigation methods and climate-resilient crops, will play a key role in ensuring

long-term success. As the state grapples with increasing climatic uncertainties, the *Jal Jeevan Hariyali Mission* offers a ray of hope for a sustainable, green, and prosperous Bihar.

3. Review of Literature

The existence of the living world cannot be imagined without water. In the worship of everyday life, it is repeatedly prayed that "May the holy water protect us". In the Indian way of life, digging a puddle and offering it duly sacrificed and offered it for the benefit of the common man has been termed as 'Lokatar Karma'. But this is an irony, that their children are reversing the deeds done by the ancestors with the desire of wider public interest. The growing population weighs all the works in terms of immediate economic benefits, whose ill-effects are in front of everyone today. Today it has become necessary that we keep in mind that on the one hand there is the irony of drought and on the other hand there is a situation of rainwater flowing into the sea in different parts of the country. The meaning of our economy is that we stop that water by making proper arrangements. We have no other solution to meet the water needs of the growing population of the world. Nature has certainly taken all the measures to fulfill our needs but it has no answer for our greed.

Singh, A., & Kumar, M. (2020). This study aims to evaluate the impact of the Jal Jeevan Hariyali Abhiyan (JJHA) on rural livelihoods in Bihar. The authors found that the scheme has positively impacted the lives of rural communities by providing them with access to clean drinking water, promoting sustainable agriculture practices, and improving their livelihoods. However, the study also identified some implementation challenges, such as insufficient financial resources, lack of coordination between government departments, and limited community participation.

Singh, A., & Kumar, M. (2020). This paper focuses on the impact of the Jal Jeevan Hariyali Scheme on rural agriculture development in Bihar. The study found that the scheme has contributed to improving agricultural productivity, enhancing soil health, and promoting sustainable farming practices. The authors also highlighted some challenges, such as the lack of adequate resources, low community participation, and weak implementation capacity at the grassroots level.

Kumar, S., & Singh, R. (2021) This study evaluates the Jal Jeevan Hariyali Scheme in Bihar in terms of its impact on the provision of safe drinking water, enhancing agricultural productivity, and improving livelihoods. The authors found that the scheme has made significant progress in achieving its objectives, but there is still a need for greater community participation and capacity building of local institutions.

The research suggests that the Jal Jeevan Hariyali Scheme has positively impacted rural communities in Bihar by providing them with access to safe drinking water, promoting sustainable agriculture practices, and improving their livelihoods. However, there are still some challenges that need to be addressed to ensure the scheme's long-term sustainability and effectiveness.

4. Objectives of the Jal Jeevan Hariyali Mission:

The government of Bihar has taken several initiatives under Jal Jeevan Hariyali Mission. The objectives of this study are to explore and evaluate various measures for improving water conservation, enhancing water bodies, and promoting sustainable practices in Bihar. The study focuses on the removal of encroachments from public water bodies, the development of water storage and recharge infrastructure, and afforestation initiatives.

- Removal of encroachments from public water bodies, reservoirs, and related areas.
- Construction of check dams and water conservation structures near rivers, drains, and in hilly areas.
- Development of soak pits/recharge pits and other water conservation structures near public wells and hand pumps.
- Restoration and rejuvenation of public water bodies such as ponds, tanks, and aahars/payeens.
- Establishment of nurseries and massive afforestation to enhance green cover.

5. Research Methodology

Referred Period: This study covers a time period from FY 2019-2020 to FY 2022-2023, with a focus on the development and progress of various water conservation and environmental sustainability efforts under the *Jal Jeevan Hariyali Mission* in Bihar, particularly in Bhagalpur district.

Data Source: The study is primarily based on secondary data collected from a range of sources, including: Bihar Government reports and documents related to the *Jal Jeevan Hariyali Mission*. Newspapers and other relevant publications.

Data obtained from the official Bihar Government website and the *Jal Jeevan Hariyali* portal. In addition to secondary data, field visits were conducted to areas where work has been implemented to understand the practical outcomes and challenges of the mission on the ground.

Data Analysis and Tools Used:

The collected data was processed both manually and with the aid of computer software tools. Specifically, **Microsoft Excel** was used for organizing and analyzing the data, including creating charts, tables, and performing statistical analysis as required.

6. Limitation of the Study

The Bihar government's Jal Jeevan Hariyali scheme, launched in 2019, aims to promote water conservation, afforestation, and sustainable agriculture in rural areas. The scheme involves the participation of multiple departments of the Bihar government, including the Department of Agriculture, Department of Environment and Forest, Department of Rural Development, Department of Water Resources, and Department of Energy, among others. However, the present study focuses only on the Department of Rural Development and its role in the implementation of the Jal Jeevan Hariyali mission. Therefore, the findings of this study are limited to the Department of Rural Development's initiatives and may not reflect the overall impact of the scheme across all departments.

7. Data Source and Study Area

This study analyzes secondary data that spans four fiscal years (FY 2019-2023). The primary source of the data is the *Jal Jeevan Hariyali* portal of the Bihar Government, which provides detailed information about the implementation of the mission in various districts, including Bhagalpur. The data includes reports on encroachments, construction of water structures, afforestation projects, and other conservation activities undertaken during these years. The Bhagalpur district, which consists of sixteen blocks, namely Bihpur, Colgong, Gopalpur, Goradih, Ismailpur, Jagdishpur, Kharik, Narayanpur, Nathnagar, Naugachhia, Pirpainti, Rangra Chowk, Sabour, Shakund, Sanhaula, and Sultanganj, has been the focal point of this study.

The analysis also involves evaluating the effectiveness of these interventions and comparing the progress over the four years to draw conclusions about the impact of these efforts on water conservation and environmental sustainability in the region.

Table No. – 01
Public water harvesting structures such as ponds/ponds puddles /ponds aharon/aharon renovation of pines

Sl. No.	Block Name	Total No. of Scheme	No. of Scheme which is Started	No. of Scheme which is Completed	% of Completed Scheme
1	2	3	4	5	6
1	Bihpur	3	3	1	33.33
2	Colgong	253	252	244	96.83
3	Gopalpur	21	21	19	90.48
4	Goradih	226	226	226	100.00
5	Ismailpur	0	0	0	0.00
6	Jagdishpur	172	169	154	91.12
7	Kharik	17	16	16	100.00
8	Narayanpur	18	18	13	72.22
9	Nathnagar	97	97	95	97.94
10	Naugachhia	15	15	9	60.00
11	Pirpainti	66	64	63	98.44
12	Rangra Chowk	20	16	9	56.25
13	Sabour	25	25	23	92.00
14	Shahkund	235	234	226	96.58
15	Sonhaula	364	360	349	96.94
16	Sultanganj	263	260	247	95.00
	Total	**1795**	**1776**	**1694**	**79.82**

Source : Jal Jeevan hariyali Website : www.jaljeevanhariyali.bih.nic.in/JalJeevanHaryali/

Table 1 presents data on public water harvesting structures in the Bhagalpur district, including ponds, puddles, ponds aharon, and the renovation of aahars (traditional water reservoirs). The table provides insights into the number of schemes initiated and completed, as well as the completion percentage for each block. Out of a total of 1,795 schemes, 1,776 were started, and 1,694 were completed, resulting in an overall completion rate of 79.82%. The blocks of Goradih, Kharik, and Nathnagar show excellent

performance with a completion rate of 100%, indicating that all schemes started in these areas were successfully completed.

However, there are some areas where the completion rate is relatively lower. For instance, Bihpur has only 33.33% of its schemes completed, indicating potential challenges in the execution or completion of water harvesting projects in this block. Similarly, Rangra Chowk and Naugachhia show completion rates of 56.25% and 60%, respectively, highlighting the need for further efforts to ensure timely completion of ongoing schemes. Despite these challenges, the majority of the blocks show high completion rates, with Sabour, Shahkund, Sonhaula, and Sultanganj reporting rates above 90%, indicating significant progress in the overall water harvesting initiative across the district.

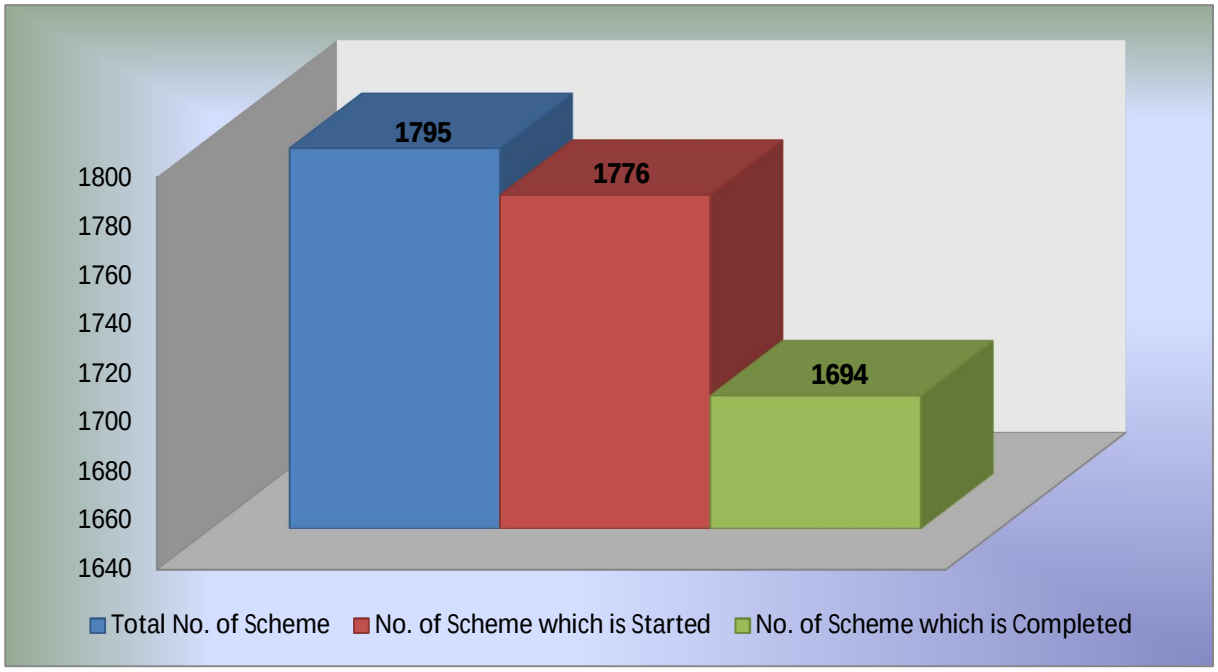


Table No. - 02

Construction of Soak pits, Recharge pits and other water conservation structure near public wells and hand pumps

Sl. No.	Block Name	Total No. of Scheme	No. of Scheme which is Started	No. of Scheme which is Completed	% of Completed Scheme
1	2	3	4	5	6
1	Bihpur	273	133	99	74.44

2	Colgong	728	634	474	74.76
3	Gopalpur	152	136	124	91.18
4	Goradih	308	292	107	36.64
5	Ismailpur	91	69	60	86.96
6	Jagdishpur	489	357	232	64.99
7	Kharik	299	299	298	99.67
8	Narayanpur	282	214	176	82.24
9	Nathnagar	269	267	259	97.00
10	Naugachhia	234	204	203	99.51
11	Pirpainti	1132	700	674	96.29
12	Rangra Chowk	150	102	48	47.06
13	Sabour	137	105	61	58.10
14	Shahkund	594	429	379	88.34
15	Sonhaula	564	207	118	57.00
16	Sultanganj	550	496	488	98.39
	Total	**6252**	**4644**	**3800**	**78.29**

Source : Jal Jeevan hariyali Website : www.jaljeevanhariyali.bih.nic.in/JalJeevanHaryali/

Table 2 outlines the progress of water conservation initiatives, specifically the construction of soak pits, recharge pits, and other water conservation structures near public wells and hand pumps across the Bhagalpur district. The data shows a total of 6,252 schemes planned across various blocks in the district, with 4,644 schemes started and 3,800 completed, resulting in an overall completion rate of 78.29%. Among the blocks, Kharik and Naugachhia stand out with completion rates of 99.67% and 99.51%, respectively, indicating highly efficient implementation of water conservation projects. Similarly, Sultanganj also shows excellent performance with a completion rate of 98.39%.

However, there are blocks where the completion rate is lower, such as Goradih with just 36.64% and Rangra Chowk at 47.06%. These blocks may face challenges in completing the planned schemes,

possibly due to logistical issues, resource constraints, or other local factors. Additionally, areas like Gopalpur, Ismailpur, and Shahkund report good progress, with completion rates above 80%. The data highlights the varying degrees of success across different blocks, and it is evident that while some blocks have made significant progress, others may require additional attention to meet the targeted goals.

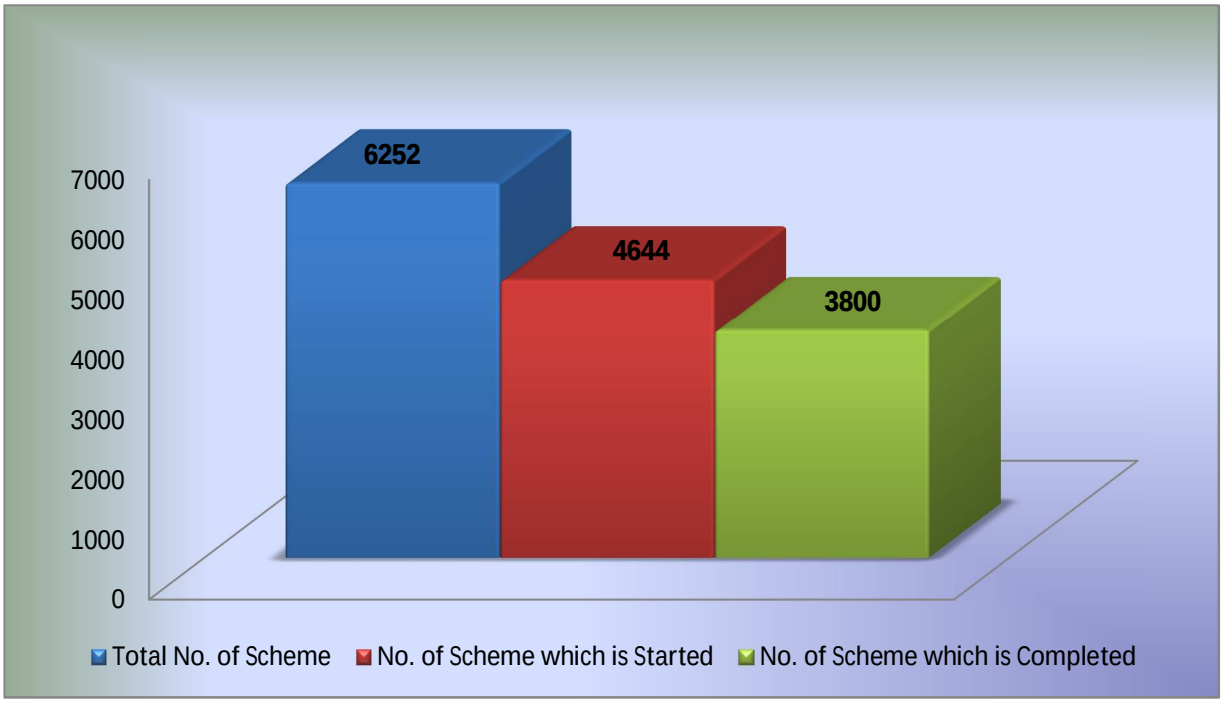


Table No. - 03

Developing nurseries and massive afforestation

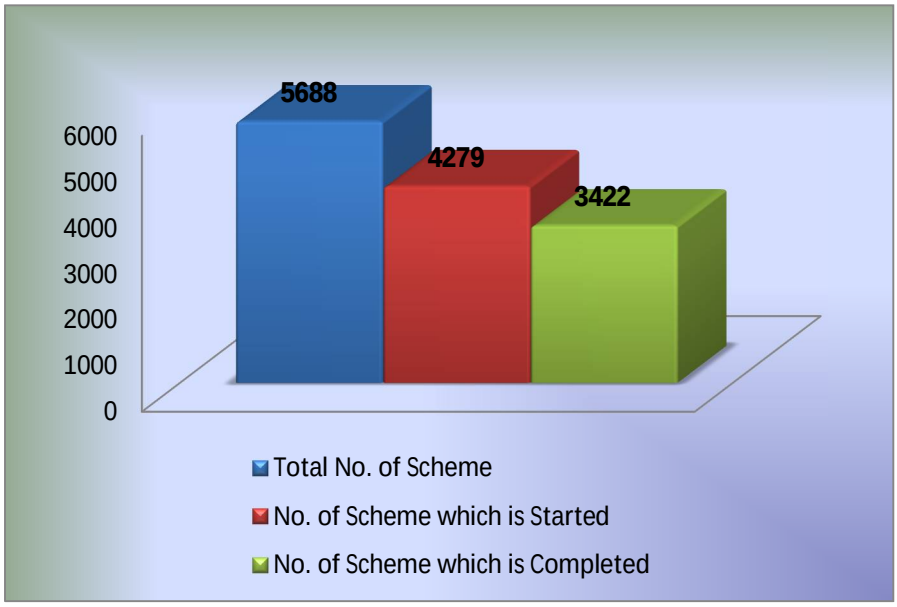
Sl. No.	Block Name	Total No. of Scheme	No. of Scheme which is Started	No. of Scheme which is Completed	% of Completed Scheme
1	2	3	4	5	6
1	Bihpur	369	293	264	90.10
2	Colgong	930	655	537	81.98
3	Gopalpur	275	271	208	76.75

4	Goradih	322	301	201	66.78
5	Ismailpur	69	62	49	79.03
6	Jagdishpur	376	259	196	75.68
7	Kharik	375	364	357	98.08
8	Narayanpur	266	129	48	37.21
9	Nathnagar	216	172	158	91.86
10	Naugachhia	310	234	234	100.00
11	Pirpainti	516	371	272	73.32
12	Rangra Chowk	199	139	68	48.92
13	Sabour	222	162	91	56.17
14	Shahkund	457	264	183	69.32
15	Sonhaula	461	358	320	89.39
16	Sultanganj	325	245	236	96.33
	Total	**5688**	**4279**	**3422**	**76.93**

Source : Jal Jeevan hariyali Website : www.jaljeevanhariyali.bih.nic.in/JalJeevanHaryali/

Table 3 presents the progress of nurseries and afforestation projects across the Bhagalpur district. The data highlights a total of 5,688 planned schemes for developing nurseries and afforestation, with 4,279 schemes initiated and 3,422 successfully completed, resulting in an overall completion rate of 76.93%. Among the blocks, Naugachhia stands out with a perfect completion rate of 100%, reflecting a fully successful implementation of its afforestation schemes. Similarly, Kharik and Nathnagar have high completion rates of 98.08% and 91.86%, respectively.

However, some blocks show significantly lower completion rates. Narayanpur has the lowest completion rate at just 37.21%, with only 48 out of 129 schemes completed. Rangra Chowk and Sabour also report lower completion rates of 48.92% and 56.17%, respectively, indicating challenges in completing the afforestation initiatives in these areas. Despite these areas lagging behind, blocks like Bihpur, Sonhaula, and Sultanganj have made substantial progress, with completion rates of 90.1%, 89.39%, and 96.33%, respectively, underscoring the successful efforts in these regions.



Result and Discussion

Due to global warming, the heat is increasing a lot, it is threatening the earth. That Government of Bihar are starting the Jal-Jeevan-Hariyali campaign. A comprehensive action plan is being prepared for this. Whether it is humans, animals, birds or other creatures, everyone's life depends on water and greenery. The logo also reflects the broader concepts of the campaign, which reads – Jal Jeevan Hariyali, only then will there be prosperity. He said that after coming to the government, the survey showed that the green cover area of the state was 9.7 per cent. Bihar Earth Day, Van Mahotsav are celebrated to promote environmental protection in the state. To increase the green cover area in the state, a target of planting 24

8. MGNREGA and Hal Jeevan Hariyali Mission

MGNREGA has been playing a crucial role in the implementation of the Jal Jeevan Hariyali Scheme (JJHM) as it provides employment opportunities to the rural population for activities related to water conservation, afforestation, and rural infrastructure development. The scheme is aimed at increasing the income of the rural population and improving their living standards by promoting agriculture, horticulture, and other allied activities.

MGNREGA works are reflected on the JJHM website as the scheme aims to promote the convergence of various government schemes to achieve maximum impact on the ground. By providing employment

opportunities and promoting activities related to water conservation and afforestation, MGNREGA is contributing to the achievement of the objectives of JJHM. Therefore, it is important to acknowledge the role of MGNREGA in the successful implementation of JJHM.

9. Limitations and Challenges of Jal Jeevan Hariyali Mission

Limited scope: The scheme is focused on only a few specific areas such as water conservation, soil health, and afforestation. It does not address other critical issues such as healthcare, education, and livelihoods.

Implementation challenges: The implementation of the scheme faces several challenges, such as inadequate funds, lack of coordination between departments, and weak monitoring and evaluation systems.

Limited awareness: The success of the scheme depends on the participation and awareness of the local community. However, there is limited awareness among the people about the scheme, its objectives, and its benefits.

Sustainability: There is a risk that the impact of the scheme may not be sustained in the long term if the community is not involved in its implementation and maintenance.

The performance report of the Jal Jeevan Hariyali Scheme only shows the government's reported data and may not necessarily reflect actual progress. There may be discrepancies between the data reported for the Jal Jeevan Hariyali Scheme and the data reported for the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). While some MGNREGA schemes may not have been started, some schemes under the Jal Jeevan Hariyali Mission may have already been completed.

10. Recommendations for Improving the Jal Jeevan Hariyali Scheme

Strengthening Implementation and Coordination: To enhance the effectiveness of the *Jal Jeevan Hariyali Scheme*, the government must focus on addressing the implementation challenges. Improving coordination between the various departments involved in the scheme—such as water resources, rural development, and agriculture—is essential for the smooth execution of water conservation initiatives. Additionally, ensuring that adequate funds are allocated for the scheme is crucial for its successful implementation. Strengthening monitoring and evaluation systems will help track progress, identify any

delays, and allow for adjustments to be made in a timely manner, ultimately ensuring the program's success.

Increasing Community Participation: A key aspect of the scheme's success lies in increasing community participation. The government should focus on creating awareness about the benefits of the scheme and actively involve local communities in its implementation and ongoing maintenance. Engaging the community in the decision-making process, as well as in the management of water bodies and conservation efforts, will ensure ownership and long-term sustainability. This approach will also help in fostering a sense of responsibility within the local population, leading to more effective water conservation efforts at the grassroots level.

Enhancing Monitoring of the Jal Jeevan Hariyali Mission : There are significant gaps in the monitoring of the Jal Jeevan Hariyali Mission (JJHM) in the Bhagalpur district, with notable discrepancies between the actual sites of operation and the data reported on the JJHM website. Monitoring mechanisms need to be strengthened to ensure that the schemes are being implemented as planned. The current system does not accurately reflect the progress or completion of various projects, leading to inefficiencies and underreporting of the true state of the mission's impact. Addressing these monitoring issues is crucial for ensuring transparency, accountability, and the successful realization of the mission's objectives.

Fostering Partnerships for Greater Impact: Lastly, it is essential for the government to foster partnerships with civil society organizations, research institutions, and the private sector. These partnerships can bring valuable expertise, innovative solutions, and additional resources to the *Jal Jeevan Hariyali Scheme*. By collaborating with other stakeholders, the government can tap into a wealth of knowledge and financial support that will help overcome challenges and accelerate progress. These collaborations can lead to the adoption of best practices, the use of advanced technologies, and better outcomes in water conservation and rural development efforts.

11. Conclusion

The *Jal Jeevan Hariyali Mission* (JJHM) has made significant strides in addressing water conservation, afforestation, and rural development in Bihar, particularly in Bhagalpur district. With the state's agricultural sector heavily impacted by erratic rainfall and water scarcity, the mission has focused on rejuvenating water bodies and promoting sustainable agricultural practices. According to the data, the mission has successfully started and completed thousands of water conservation projects, including the

construction of soak pits, recharge pits, and water harvesting structures. For instance, more than 288 lakh trees were planted in 2022-23, and the mission's various schemes have resulted in substantial improvements in water availability and environmental restoration.

However, challenges such as low completion rates in some blocks, inadequate financial resources, and coordination issues persist. As seen in the results, blocks like Bihpur and Rangra Chowk report completion rates as low as 33.33% and 47.06%, indicating that some areas require more focused attention to meet the scheme's goals. Despite these obstacles, the overall success of the scheme—reflected in the high completion rates in regions like Kharik, Goradih, and Naugachhia—demonstrates its potential for positive long-term impacts on both the environment and rural livelihoods. Moving forward, addressing the implementation gaps, fostering greater community participation, and expanding the scope of the scheme to address additional sectors like healthcare and education will ensure its sustainability and broader impact, ultimately leading to a greener, more water-secure Bihar.

"Our planet's alarm is going off, and it is time to wake up and take action!"

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