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The Role of Jal Jivan Haryali Mission in Mitigating the Potential Threats of Droughts in Haryana, India

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Abstract

The desert region of Haryana, India, has a unique set of development problems and prospects. This region has historically endured socioeconomic inequities due to its arid climate, paucity of water, and limited agricultural potential. Haryana, a northern Indian state, includes a substantial desert region characterised by arid conditions, low agricultural production, and paucity of water. The central government started the Jal Jivan Haryali Mission in 2019 to solve these concerns and promote inclusive growth. The objective of this program is to increase agricultural output by implementing innovative water management practices and improving livelihoods by supporting alternative income streams. The Jal Jivan Haryali Mission (JJHM) is a ground-breaking project aimed at improving water management, promoting sustainable farming methods, and increasing community resilience to droughts. This research paper is an attempt to analyse the JJHM's crucial role in alleviating the possible effects of droughts in Haryana through water conservation, effective resource management, and community engagement.

Keywords: Jal Jivan Haryali Mission, Haryana, Water Harvesting, Land Development, Micro Irrigation

Introduction

Haryana includes a substantial desert region characterized by arid conditions, low agricultural production, and paucity of water (Murthy & Pandey, 1977). The Desert Area Development Programme (DADP) was established in 1977-78 to address these challenges and foster inclusive growth. The DADP prioritizes water management, rainwater gathering, and the cultivation of drought-resistant crops (Siwach, 2018). After this programme when, Haryana was confronted with significant difficulties, such as diminishing groundwater levels, soil degradation, biodiversity loss, and the negative consequences of climate change (Kumar, 2019). To address these concerns, the government launched the Jal Jivan Haryali Mission, a comprehensive initiative aiming to restore the state's ecological health, boost sustainable agriculture, and improve inhabitants' livelihoods in the year 2019.

The Jal Jivan Haryali Mission's main goals are to conserve and revitalize water bodies, increase green cover through afforestation and reforestation, promote sustainable agricultural methods, improve rural livelihoods, and empower communities (Singh & Mann, 2020). The JJHM's major focus is to conserve water resources. This is especially important in drought-prone places like Haryana, where water scarcity during dry spells exacerbates agricultural and environmental concerns. The mission's emphasis on revitalizing traditional water bodies, building check dams, and introducing rainwater gathering systems helps replenish groundwater, making the region more drought-resistant. The JJHM promotes effective water management practices such as drip irrigation and efficient canal systems, which reduce water waste and ensure water supply for agriculture even during drought seasons.

Due to soil deterioration, deforestation, and unsustainable land use practices, desertification is a major concern in some areas of Haryana. By increasing green cover and stabilising soil, the JJHM's afforestation and reforestation

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operations directly battle desertification. The mission's tree planting programs along roads, canals, and in rural areas help to avoid desert encroachment, prevent soil erosion, and improve the region's general ecological health. The JJHM enhances soil fertility and moisture retention by fostering sustainable agriculture and agroforestry, lowering the risk of desertification and making the land more resistant to arid conditions.

Drought and desertification can cause severe disruptions in livelihoods, particularly among communities reliant on agriculture and natural resources. The JJHM's emphasis on livelihood enhancement contributes to the creation of alternative income streams, making communities more robust to drought-induced agricultural losses. The mission's training in sustainable agriculture and agro-processing provides rural populations with skills necessary for adjusting to changing climatic circumstances and minimizing vulnerability to droughts. Community involvement tactics implemented by the mission empower local populations, allowing them to actively participate in water conservation and afforestation activities, resulting in more sustainable land management and a lower danger of desertification.

As a result, this paper is an attempt to investigate the impact of JJHM's activities on local communities while also providing a detailed description of key components and strategies of the ground-level implementation of such initiatives in Haryana.

Study Area

Haryana is an Indian state in the country's northwestern region. On November 1, 1966, it was created out of the previous state of East Punjab on linguistic grounds. Haryana has a total size of 44,212 km^2 and is located between 27°39' N and 30°35' N latitude and 74°28' E and 77°36' E longitude. Haryana's elevation ranges from 200 to 1200 meters above sea level. It is bordered to the north-east by Himachal Pradesh, to the east by the Yamuna River, to the west and south by Rajasthan, and to the north by the Ghaggar-Hakra River, which flows along its northern boundary with Punjab. Because Haryana borders the country's capital, Delhi, on three sides (north, west, and south), a considerable portion of the state is included in the economically significant National Capital Region for planning and development purposes. It has 6 administrative divisions, 22 districts, 72 sub-divisions, 93 revenue tehsils, 50 sub-tehsils, 140 community development blocks, 154 cities and towns, 6,848 villages, and 6222 village panchayats, accounting for (1.4%) of India's land area.

Source: Statistical Abstract of Haryana, 2019.

Map 1: Administrative Divisions of Haryana

Objective of the Study

- To study the components and strategies of the Jal Jivan Haryali Mission in Haryana.
- To explore the ground-level implementation of activities under the Jal Jivan Haryali Mission in Haryana.

Data Sources and Methodology

Both primary as well as secondary data has been used in the present study. Primary data is in the form of plates collected from various panchayat officials in various districts of Haryana, and secondary data has been collected from the official reports of Jal Jivan Haryali Mission in context of Haryana from the year 2019 to 2022. Appropriate tables and graphs have been used to depict the results of the study.

Results and Discussion

- Components and Strategies of Jal Jivan Haryali Mission in Haryana.
- Activities of Jal Jivan Haryali Mission in Haryana.

Components and Strategies of Jal Jivan Haryali Mission in Haryana

The Jal Jivan Haryali Mission is an important step toward addressing Haryana's ecological and socioeconomic concerns. The mission establishes a hopeful trajectory for a greener, more affluent, and resilient future for the state and its citizens by supporting sustainable practices, encouraging community engagement, and embracing new solutions. JJHM's many components and strategies are as follows:

Components

- *Water Conservation:* To address the serious issue of dwindling groundwater supplies, the JJHM stresses the restoration of traditional water bodies, the construction of check dams, rainfall collection, and effective water management.
- *Afforestation and Reforestation:* To offset the impact of deforestation and desertification, the mission promotes large-scale afforestation, tree planting along roads and canals, and the construction of green belts.
- *Sustainable Agriculture:* To improve soil health, increase agricultural output, and reduce dependency on chemical inputs, the JJHM promotes organic farming, the use of effective irrigation systems, and crop variety.
- *Livelihood Enhancement:* The mission aims to empower rural people by offering sustainable agriculture training, boosting agro-processing, and assisting in the development of small-scale rural firms.

Strategies for Implementation

- *Community Engagement:* The JJHM encourages local community involvement in designing and implementing various programs, generating a sense of ownership and assuring project sustainability.
- *Technology Adoption:* For efficient planning and monitoring of its ecological and agricultural interventions, the mission employs current technology such as remote sensing and Geographic Information System (GIS).
- *Public Awareness:* Through awareness campaigns, workshops, and educational programs, the JJHM highlights the importance of environmental conservation and sustainable practices.

The Jal Jivan Haryali Mission has the ability to revitalise Haryana's ecosystem, increase agricultural productivity, and strengthen rural communities (Prakash, 2022). Its success is dependent on the efficient implementation of long-term strategies, the active participation of local stakeholders, and ongoing monitoring and adaptation in response to new difficulties.

Activities of Jal Jivan Haryali Mission in Haryana

Various activities are being carried out in Haryana under the Jal Jivan Haryali Mission, which have been covered in the following section under the following subheadings:

- Water conservation and rainwater harvesting.
- Watershed development.
- Intensive afforestation.
- Renovation and maintenance of traditional water harvesting structures.
- Reuse and recharge structures.

The Table and Fig. 1 below shows the total number of works initiated and completed in different districts of Haryana as part of the Jal Jivan Haryali Mission. Water conservation, rainwater collecting, watershed development, extensive afforestation, rehabilitation and maintenance of traditional water harvesting structures, and the installation of reuse and recharge structures are among the activities covered by these activities (Plate 1).

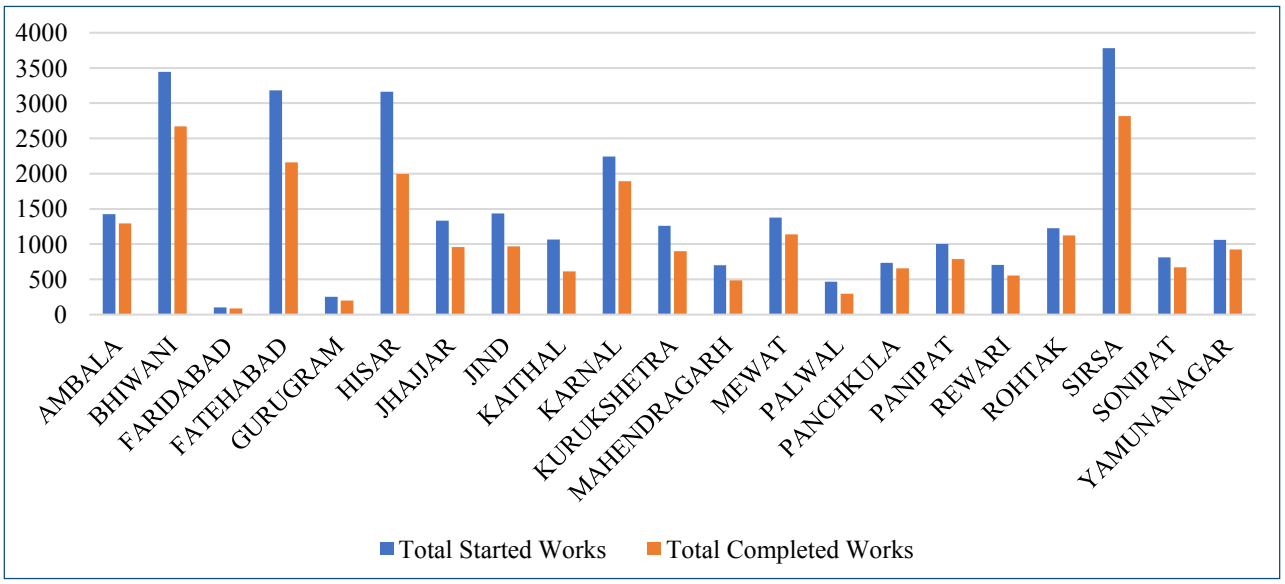
According to the data, the mission was launched in numerous districts across Haryana, showing a comprehensive strategy for addressing water conservation and related issues. The overall number of works started indicates that major efforts are being undertaken throughout the state to address challenges such as water scarcity, drought resistance, and sustainable land management.

The completion rates for these projects differ by district. Some districts, such as Ambala, Fatehabad, and Hisar, have substantially higher completion rates, indicating good implementation and potentially positive consequences in terms of water conservation and drought risk mitigation. Some districts, such as Bhiwani and Karnal, have a large number of works started but a smaller number of completed ones. This could suggest difficulties or delays in deployment. Identifying and correcting the causes of these differences would be critical to ensuring the mission's objectives are met.

Table 1: Haryana: Total Number of Started and Completed Works under JJHM, 2019-2022

District	*Total Started Works*	*Total Completed Works*
Ambala	1423	1293
Bhiwani	3444	2671
Faridabad	99	86
Fatehabad	3181	2159
Gurugram	251	199
Hisar	3160	1992
Jhajjar	1332	959
Jind	1433	969
Kaithal	1065	614
Karnal	2240	1894
Kurukshetra	1258	899
Mahendragarh	702	485
Mewat	1375	1138
Palwal	468	298
Panchkula	732	658
Panipat	1003	788
Rewari	706	556
Rohtak	1227	1121
Sirsa	3778	2818
Sonipat	812	672
Yamunanagar	1062	925
Total	30751	23194

Source: Reports of Jal Jivan Haryali Mission, Haryana, 2019-2022.



Source: Reports of Jal Jivan Haryali Mission, Haryana, 2019-2022.

Fig. 1: Haryana: Number of Started and Completed Works under JJHM, 2019-2022

The data additionally shows regional differences in the distribution of works. Districts with more agricultural or water-related issues, such as Sirsa, have seen a greater number of works begun and completed, reflecting the mission's focus on places with major water management needs. Water supply, agricultural output, and community resilience to drought may already be improving in districts with greater completion rates, such as Ambala and Fatehabad. These districts could serve as models for other regions, illustrating the effectiveness of the mission's efforts. Continuous monitoring and evaluation of current projects are required to verify that the mission's objectives are met. Understanding the causes of variations in completion rates can aid in the improvement of strategies and the efficient allocation of resources.

In a nutshell, the data presented shows the scope of Haryana's Jal Jivan Haryali Mission, highlighting both triumphs and challenges in the execution of water conservation and related activities throughout several districts. It emphasises the significance of a concerted and continuous effort to alleviate water scarcity, promote sustainable land management, and strengthen community resilience in the face of potential droughts.

Water Conservation and Rain Water Harvesting

Water conservation is a cornerstone of Haryana's Jal Jivan Haryali Mission (JJHM). Various initiatives are carried out as part of this project to optimise water utilisation and reduce water scarcity. The promotion of rainwater harvesting is one of the main components. Rooftop rainwater harvesting systems are being installed in both rural and urban locations, allowing homeowners to gather and store rainwater for a variety of domestic and agricultural purposes. The mission also educates communities on the necessity of rainwater harvesting and provides technical assistance to guarantee that these systems are properly implemented. This action not only relieves pressure on groundwater supplies, but also improves water availability during dry periods, making the region more drought-resistant.

Watershed Development

Another important part of the JJHM in Haryana is watershed development. The mission concentrates on holistic and integrated watershed management, especially in rain-fed and hilly areas. Soil and water conservation techniques, contour bunding, and the construction of check dams and percolation tanks are all examples of watershed development operations. These measures aid in the prevention of soil erosion, the conservation of rainwater, and the recharge of groundwater aquifers. The mission seeks to improve the overall health of watersheds by applying sustainable land management methods, consequently lowering community vulnerability to droughts and increasing the availability of water resources for agricultural and residential usage.

Intensive Afforestation

The JJHM prioritizes growing green cover in the state through vigorous afforestation operations. The mission identifies ideal spots for tree planting in both rural and urban areas. Afforestation not only helps to combat desertification and soil deterioration, but it also helps to reduce water evaporation and maintain soil moisture levels. Indigenous and drought-tolerant plant species are frequently used to ensure the long-term viability of afforestation initiatives. The mission improves the region's overall ecological health by developing a robust network of forests and green belts, making it more resilient to the effects of droughts.

Renovation and Maintenance of Traditional Water Harvesting Structures

Haryana's traditional water harvesting facilities, such as village ponds, step wells, and check dams, have a rich legacy. These constructions may have deteriorated over time. The JJHM understands the significance of resurrecting these historic traditions. The objective is to renovate and preserve these buildings so that they can function as effective water storage during the monsoon season. By resurrecting these age-old processes, the mission uses previous knowledge to address modern water concerns, thereby contributing to water availability and drought resilience.

Source: Fieldwork at Various Districts of Haryana, 2022.

Plate 1: Haryana: Images of Various Activities Carried Out Under JJHM

Reuse and Recharge Structures

The JJHM encourages the construction of reuse and recharge infrastructure in order to maximise water consumption. Artificial recharge wells, recharge pits, and the construction of tiny reservoirs to store extra water during the rainy season are examples of these constructions. The saved water can be used for irrigation, groundwater replenishment, and meeting water needs during times of scarcity. The mission guarantees that extra rainwater is gathered and utilised successfully by strategically situating these buildings, reducing runoff and improving the overall water balance in the region.

Conclusion and Suggestions

This study emphasises the considerable strides made by the Jal Jivan Haryali Mission (JJHM) in several Haryana districts. The mission's complete approach to water conservation, sustainable agriculture, and community

engagement is seen in the large number of projects that have been initiated. While completion rates vary by district, there is convincing evidence that the mission is having a positive impact in Haryana in terms of preventing potential droughts and improving water resilience.

It is essential to prioritize increasing work completion rates in districts where the disparity between work started and completed is large, such as Bhiwani and Karnal. Identifying and addressing bottlenecks, whether they are connected to resources, logistics, or local difficulties, should be a top concern. Ambala and Fatehabad, for example, have greater completion rates and might serve as models for other locations. These districts could share their best practices, lessons learned, and success stories with other districts, giving useful insights for more effective implementation in other areas. The JJHM has the greatest impact when local communities are actively involved. The mission's long-term effectiveness will be enhanced by increasing community participation through capacity-building, awareness campaigns, and fostering ownership of the works. Establish a strong monitoring and evaluation system to track the consequences of finished projects. This data can assist in guiding future decision-making, enhance strategy, and allocate resources more effectively.

Given the growing climate variability, incorporating climate-resilient strategies into mission activities is critical. Drought-tolerant agricultural types, weather forecasting, and adaptive water management measures could all fall under this category. Create a feedback loop in which stakeholders, including local communities, may provide feedback on the effectiveness of the works and make suggestions for improvements. This participative method improves accountability and ensures that the mission's aims are in line with local needs. By implementing these recommendations, the Jal Jivan Haryali Mission would be able to build on its successes, overcome obstacles, and increase its positive influence in preventing potential droughts, conserving water, and fostering sustainable development in Haryana.

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