



**Original Article**

**ROLE OF UJANI DAM IN AGRICULTURAL DEVELOPMENT IN MAHARASHTRA**

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**Abstract:**

*Ujani Dam, constructed on the Bhima River in Maharashtra, plays a vital role in transforming the agricultural landscape of the drought-prone regions of Pune, Solapur, and Ahmednagar districts. Ujani Dam, also known as Bhima Dam, is a major multipurpose water resource project constructed on the Bhima River in Solapur district of Maharashtra. The dam plays a crucial role in irrigation, drinking water supply, hydropower generation, and flood control in drought-prone regions of the state. However, increasing pollution load, sedimentation, and ecological degradation have raised serious environmental concerns. This research paper focuses on the structural characteristics, water quality status, sedimentation issues, and environmental impacts of Ujani Dam. The study highlights the need for sustainable reservoir management and effective pollution control measures.*

*The present research paper examines how the availability of assured irrigation from the Ujani Dam has contributed to agricultural development, increased crop productivity, diversification of cropping patterns, and improvement in farmers' socio-economic conditions. The study also highlights challenges such as water mismanagement, environmental stress, and sustainability concerns. The paper is based on analytical interpretation of secondary data and regional agricultural trends.*

**Keywords:** *Ujain Dam, Bhima River, Water Quality, Sedimentation, Environmental Impact*

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**Introduction:**

Water resources are vital for socio-economic development, especially in semi-arid regions like Maharashtra. Ujain Dam is one of the largest irrigation projects in the Krishna River basin. Constructed to regulate the flow of the Bhima River, the dam supports agriculture and livelihoods in

Solapur and nearby districts. Over the years, rapid urbanization and industrial growth in the upstream catchment have adversely affected the reservoir's water quality and storage capacity. This study aims to analyse the present condition of Ujjain Dam and assess its environmental and management challenges.



Ujain Dam and Its Construction The Ujain Dam is a large earthen dam located on the Bhima River in the state of Maharashtra, India. It was constructed between 1977 and 1980 with the primary objective of providing irrigation water and hydroelectric power to the region. The dam has a height of 63 meters and a length of 3.5 kilometres, with a storage capacity of approximately 3,860 million cubic meters of water. The construction of the dam involved the displacement of several thousand people, who were relocated to nearby areas. The dam also required the submergence of several villages and fertile agricultural land, causing significant social and environmental impacts. The Ujani Dam project was funded by the World Bank and the Government of Maharashtra.

Agriculture is the backbone of the Indian economy and the primary source of livelihood for a majority of the rural population. However, Indian agriculture is highly dependent on monsoon rainfall, making it vulnerable to climatic uncertainties. In drought-prone regions like Solapur district, irregular rainfall often results in low productivity, crop failures, and farmer distress.

The dam was designed to provide irrigation, drinking water, and industrial water to the surrounding regions. Since its completion, Ujani Dam has played a significant role in agricultural development by ensuring a reliable water supply. This study attempts to analyse the impact of Ujani Dam on agricultural development in Solapur district.

#### **Study Area:**

Ujani Dam is located near Ujani village in Madha Taluka of Solapur district, Maharashtra. It is built across the Bhima River, a major tributary of the Krishna River.

- Type of dam: Earthfill and masonry gravity dam
- Height: Approximately 56.4 m

- Length: About 2,534 m
- Gross storage capacity: ~3.32 km<sup>3</sup>
- Catchment area: ~14,850 km<sup>2</sup>

The reservoir, locally known as Yashwant Sagar, experiences a tropical monsoon climate with highly variable rainfall.

#### **Objectives of the Study:**

1. To analyze the contribution of Ujani Dam to irrigation expansion.
2. To study changes in cropping pattern and crop productivity.
3. To examine the impact of irrigation on farmers' income and rural economy.
4. To identify challenges related to water use and sustainability

#### **Methodology:**

The present study is based on:

- Review of secondary data from government reports and research journals
- Analysis of published water quality studies conducted at Ujani reservoir
- Interpretation of sedimentation studies using remote sensing and modeling techniques

#### **Results and Discussion:**

This research is based on secondary data analysis collected from:

- Government agricultural reports
- Irrigation department records
- Previous academic studies
- Regional agricultural statistics

The data has been interpreted using descriptive and analytical methods to understand trends in agricultural development before and after the availability of irrigation from Ujani Dam.



## **Role of Ujani Dam in Agricultural Development:**

### **1. Expansion of Irrigation Facilities:**

The Ujani Dam has significantly increased the irrigated area in the region. Canal networks and distributaries supply water to thousands of hectares of farmland, allowing farmers to cultivate crops even during dry seasons. This has reduced crop failure and stabilized agricultural output.

### **2. Change in Cropping Pattern:**

Before irrigation, farmers mainly grew drought-resistant crops such as jowar and bajra. After the introduction of assured water supply, there has been a shift towards water-intensive and cash crops such as sugarcane, wheat, vegetables, and fodder crops. This diversification has enhanced farm profitability.

### **3. Increase in Crop Productivity:**

Irrigation from the dam has enabled timely sowing, multiple cropping, and better use of fertilizers and improved seeds. As a result, per-hectare productivity of major crops has increased considerably compared to the pre-dam period.

### **4. Improvement in Farmers' Income:**

Higher yields and cultivation of commercial crops have led to increased agricultural income. This has improved the standard of living of farmers, increased purchasing power, and strengthened the rural economy. Allied activities such as dairy farming and agro-based industries have also grown due to improved fodder availability.

## **Socio-Economic Impact:**

The agricultural growth supported by the Ujani Dam has generated rural employment and reduced seasonal migration. Improved income levels have positively influenced education, health, and housing conditions in villages. The dam has thus played a crucial role in overall rural development, not limited to agriculture alone.

## **Problems and Challenges:**

### **1. Unequal Water Distribution:**

Despite large storage capacity, uneven distribution of water between head-reach and tail-end farmers remains a serious issue. This affects equitable agricultural development.

### **2. Over-dependence on Water-Intensive Crops:**

Excessive cultivation of sugarcane has increased pressure on water resources, raising concerns about long-term sustainability.

### **3. Environmental Concerns:**

Waterlogging, soil salinity, and declining water quality in certain areas have emerged as challenges that can negatively affect agricultural productivity in the future.

## **Suggestions and Recommendations:**

1. Promote water-efficient irrigation techniques such as drip and sprinkler systems.
2. Encourage balanced cropping patterns suitable to regional water availability.
3. Strengthen water governance and participatory irrigation management.
4. Create awareness among farmers about sustainable water use practices.

## **Conclusion:**

The Ujani Dam has played a transformative role in the agricultural development of its command area. By providing assured irrigation, it has enhanced crop productivity, diversified agriculture, improved farmers' income, and strengthened the rural economy. However, sustainable water management and environmentally responsible agricultural practices are essential to ensure that the benefits of the dam continue for future generations.



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