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A Study of Irrigation Development and Regional Distribution in the Tehsils of Kolhapur District

Snehal Shivaji Patil¹, Dr. C. U. Bhore²

Abstract

The spatial and temporal variations in irrigation development in Kolhapur district from 2001 to 2021 are the focus of this study. Irrigation is essential for increasing agricultural productivity, particularly in regions with irregular or insufficient rainfall. Kolhapur district, located in the southwestern region of Maharashtra, is distinguished by its diverse physical characteristics. The western hilly region experiences heavy rainfall, while the eastern region is characterized by fertile plains that are sustained by river and canal irrigation systems. The study's objective is to compare the irrigation coverage across the years 2001, 2011, and 2021, analyze the tehsil-wise distribution of irrigated areas, and classify regions into high, medium, and low irrigation categories. In order to evaluate regional disparities and trends, comparative methods and percentage analysis were implemented. The findings suggest that the irrigated area has experienced a consistent and substantial increase over the past two decades. In 2001 and 2011, the distribution of irrigation was irregular, with tehsils such as Shirol, Karvir, and Panhala exhibiting higher coverage. In contrast, Shahuwadi and Ajara remained less developed and more reliant on rainfall. In 2021, irrigation expansion became more pronounced, notably in Hatkanangale, Shirol, and Kagal, as a result of improvements in irrigation infrastructure and water management practices. In general, the research indicates that there has been significant progress in the development of irrigation. However, regional imbalances continue to exist, underscoring the necessity of sustainable and balanced water resource planning.

Keywords: Irrigation, Agricultural Development, Tehsil-wise Distribution, Kolhapur District, Irrigation Growth.

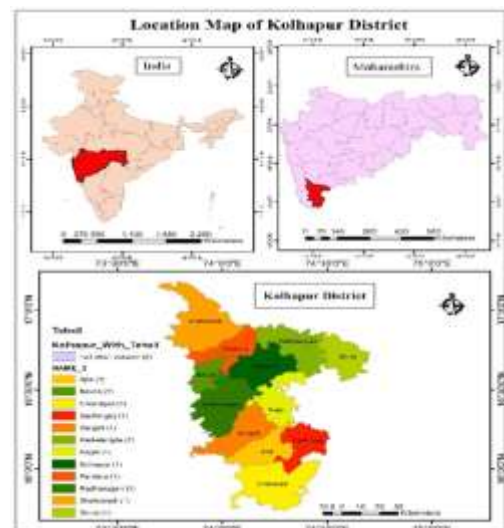
Introduction

Irrigation is the artificial process of providing water to crops and agricultural lands to support their growth when natural rainfall is insufficient. It plays a vital role in agriculture by ensuring a regular water supply throughout the crop-growing season. Through irrigation, farmers can cultivate crops even in dry regions or during periods of low rainfall. It helps maintain soil moisture, improves crop yield, and ensures food security for the growing population.

There are several methods of irrigation such as canals, wells, tube wells, sprinklers, and drip systems. Canal irrigation uses water from rivers, while wells and tube wells draw groundwater for farming. Modern methods like sprinkler and drip irrigation help save water and increase efficiency by delivering water directly to plants. Overall, irrigation not only enhances agricultural productivity but also supports rural livelihoods and the development of the agricultural sector.

Study Area:

The district of Kolhapur lies in the south-west of Maharashtra between 15°43' to 17° 17' North latitude and 73°40' to 74° 42' East longitude and spreads across the Deccan Plateau in the rain shadow region of the Sahyadri mountain ranges on the southernmost tip of the state of Maharashtra. The Sangli district lies to the north, the Belgaum district of Karnataka State is to the east and south, Ratnangiri and Sindhudurg districts of Maharashtra are to the West. To the west, we have the Sahyadri ranges and the river Warana is to the north which forms the natural boundaries to the district.



Kolhapur District is situated in the south-western part of Maharashtra. The district comprises tehsils such as Shahuwadi, Panhala, Hatkanangale, Shirol, Karvir, Gaganbavda, Radhanagari, Kagal, Bhudargad, Ajara, Gadhinglaj, and Chandgad. The western part receives heavy rainfall and is characterized by hilly terrain, while the eastern part has fertile plains supported by irrigation from rivers and canals, encouraging intensive agriculture.

Objectives of the Study

1. To analyze the tehsil-wise distribution of irrigated area in Kolhapur district.
2. To compare irrigation coverage in 2001, 2011, and 2021.
3. To identify high, medium, and low irrigation regions.

Data and Methodology

The study is based on secondary data of cultivated and irrigated areas for the years 2001, 2011, and 2021. Tehsil-wise percentage of irrigated area was calculated and categorized into three groups:

High Irrigation: Above 30% (2001, 2011) and Above 60% (2021)

Medium Irrigation: 15–30% (2001, 2011) and 30–60% (2021)

Low Irrigation: Below 15% (2001, 2011) and Below 30% (2021)

Comparative analysis was conducted to observe temporal changes.

Irrigation Pattern in 2001

In 2001, the irrigation pattern in Kolhapur district showed clear variation among its tehsils. The high irrigation group (above 30%) included Panhala (40.74%), Hatkanangale (40.09%), Shirol (34.59%), and Karvir (30.07%). The medium group (15%–30%) consisted of Gaganbavda (23.58%), Kagal (20.43%), and Radhanagari (15.99%). The low irrigation group (below 15%) included Gadhinglaj (13.77%), Ajara (10.63%), Chandgad (8.73%), Bhudargad (7.82%), and Shahuwadi (6.05%). Panhala had the highest irrigated area (40.74%), while Shahuwadi had the lowest (6.05%), reflecting uneven irrigation development across the district.

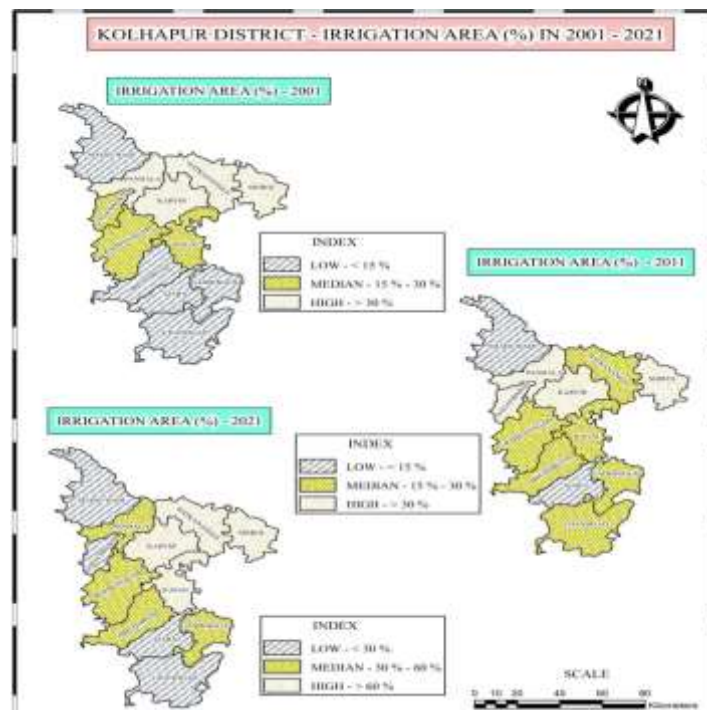
Irrigation Pattern in 2011

In 2011, the irrigated area shows clear variation among the talukas. High irrigated area (above 30%) was observed in Shirol (45.91%), Karvir (39.54%), Gaganbavda (39.26%), and Panhala (33.53%), indicating better availability of irrigation facilities such as canals, rivers, and wells. The medium irrigated area group (15–30%) included Hatkanangale (30.29%), Kagal (27.18%), Radhanagari (23.43%), Gadhinglaj (20.74%), Chandgad (18.53%), and Bhudargad (16.06%), where irrigation facilities were moderate and unevenly distributed. In contrast, low irrigated area (below 15%) was found in Shahuwadi (10.15%) and Ajara (11.62%), suggesting limited irrigation infrastructure and greater dependence on rainfall.

Irrigation Pattern in 2021

In 2021, the irrigation pattern in Kolhapur district showed significant improvement compared to 2001. The high irrigation group (above 60%) included Hatkanangale (86.83%), Shirol (81.82%), Karvir (68.96%), and Kagal (65.43%). The medium group (30%–60%) comprised Panhala (50.73%), Radhanagari (36.41%), Bhudargad (35.61%), and Gadhinglaj (34.78%). The low irrigation group (below 30%) included Shahuwadi (24.14%), Gaganbavda (25.14%), Ajara (24.49%), and Chandgad (25.63%). Overall, irrigation coverage increased markedly, though regional disparities still remained.

Map No. 1



Conclusion

The study concludes that irrigation development in Kolhapur district has significantly improved from 2001 to 2021. The irrigated area in Kolhapur district increased noticeably, reflecting major improvements in water resource management and agricultural development. The highest growth in irrigation was observed in Shirol (47.23%), followed closely by Hatkanangale (46.74%) and Kagal (45%), indicating significant expansion of irrigation networks and modern techniques in these tehsils. Moderate improvement was seen in Radhanagari (20.42%), Gadhinglaj (21.01%), Shahuwadi (18.09%), Chandgad (16.9%), and Ajara (13.86%), where irrigation development was steady but slower. However, Gaganbavda (1.56%) showed the least increase.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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