



Original Article

Water Conservation and Sustainable Farming Practices for Agricultural Development in Dhule District, Maharashtra

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Manuscript ID:

IBMIRJ -2026-030303

Submitted: 07 Feb. 2026

Revised: 12 Feb. 2026

Accepted: 05 Mar. 2026

Published: 31 Mar. 2026

ISSN: 3065-7857

Volume-3

Issue-3

Pp. 9-11

March 2026

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Quick Response Code:



Web: <https://ibrj.us>



DOI: 10.5281/zenodo.20663109

DOI Link:

<https://doi.org/10.5281/zenodo.20663109>



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Abstract

Water scarcity and irregular rainfall are major challenges affecting agricultural productivity in semi-arid regions of India. Sustainable agricultural practices and effective water conservation strategies are essential for improving agricultural development in such regions. This study examines the role of major water conservation initiatives and sustainable farming practices implemented in Dhule district, Maharashtra. The research focuses on programmes such as the Jalyukta Shivar Abhiyan, Shirpur Pattern water conservation project, watershed development programmes, dryland farming techniques, organic farming, mixed farming, and dairy development. The study is based on secondary data obtained from government reports, district irrigation plans, and academic literature. The findings indicate that these initiatives have significantly improved groundwater recharge, irrigation potential, and crop productivity in the region. However, challenges such as limited adoption of soil testing, fragmented landholdings, and inadequate awareness among farmers continue to hinder agricultural development. The study concludes that integrated water resource management and sustainable farming practices are essential for long-term agricultural sustainability in Dhule district.

Keywords: Water conservation, Dry-land farming, Organic farming, Watershed management, Dhule district

Introduction

Agriculture in semi-arid regions is highly dependent on rainfall and water availability. In India, several regions experience irregular rainfall patterns, which create significant challenges for agricultural production. Dhule district in Maharashtra is one such region where rainfall variability and drought conditions frequently affect crop yields. Water conservation has therefore become a critical component of agricultural development strategies in such regions. The Government of Maharashtra has implemented several programmes aimed at improving water management and enhancing irrigation potential.

Among these initiatives, the Jalyukta Shivar Abhiyan and the Shirpur Pattern water conservation project have gained significant attention due to their success in improving groundwater recharge and irrigation facilities.

In addition to water conservation programmes, sustainable farming practices such as dryland farming, organic agriculture, and mixed farming have been promoted to enhance agricultural productivity while maintaining environmental sustainability. The objective of this study is to examine the role of water conservation initiatives and sustainable farming practices in promoting agricultural development in Dhule district.

Study Area:

Dhule district is located in the northern part of Maharashtra state spread between 20° 38'N to 21°39'N latitudes and 73° 50'E to 75°13' E longitudes. It encompasses an area of 8061sq.km. It covers in Survey of India degree topo sheet Numbers 46G, H, K, L and O. It is bounded by Nanded District of Madhya Pradesh state to the north, Jalgaon District to the east, Nandurbar District to the west and north west and Surat district of Gujarat State to the west. Dhule, the district headquarters lies on trijunction of national highways No.3,6 and 211, connecting Mumbai-Agra and Surat-Nagpur-Hawara and Dhule-Solapur, respectively.

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How to cite this article:

Nikumbh, P. D. (2026). Water Conservation and Sustainable Farming Practices for Agricultural Development in Dhule District, Maharashtra. *InSight Bulletin: A Multidisciplinary Interlink International Research Journal*, 3(3), 9–11. <https://doi.org/10.5281/zenodo.20663109>

National and state highways, district roads and many fair weather roads provide a good road transport network to the district as a whole. Two separate railway lines i.e. Chalisgaon-Dhule (Branch of Central railway) and Surat – Bhusawal (Western railway line) pass through the district. Sakri, Pimpalner, Nijampur, Shirpur, Thalner, Boradi, Holnanthe, Shindkheda, and Dondaicha are some of the important settlements developed in the district. For the smooth administration, the whole district is divided into 39 revenue circles in which 674 inhabited and 4 uninhabited villages are included. These villages are distributed among four tahsils namely Sakri, Dhule, Shindkheda and Shirpur. The villages in Satpuda upland and southern hilly parts are very small in size and are least important from agricultural point of view. The area of Dhule tahsil is divided into twelve circles namely Dhule Urban, Dhule rural, Shirud, Borkund, Arvi, Songir, Nagaon, Phagne, Mukati, Kusumba, Ner, Lamkani. Shirpur tahsil comprises of seven circles i.e. Shirpur, Boradi, Arthe, Jawkhede, Holnanthe, Thalner, Songir. There are ten circles in Shindkheda tahsil namely, Shindkheda, Chimthane, Shewade, Khalane, Nardane, Betawad, Warshi, Dondaicha, Vikharan, Virdel. Sakri tahsil Divided into ten circles namely Sakri, Kasare, Mhasadi, Dusane, Nijampur, Brahmvel, Pimpalner, Kudashi, Umarpatta, Dahivel.

The headquarters of Dhule district are located at Dhule, a city with population of 571036 as per census 2011 census record. Dhule city is situated on the southern bank of river Panjhra and connected by railway and national highway to the important cities of India. The district has occupied an area of 8061sq.km.with population of 2050862. The district has covered 2.6% of the total area of the Maharashtra state. It ranks 19th in case of area and 22nd in case of population. The density of population is 285 persons per sq.km. But it varies from place to place. In general, the density of population increases towards central Tapi valley region. The study area is mainly rural in nature about 72.2 % people reside in rural areas while 27.8 % people live in urban centres. Agriculture and its allied activities are playing an important role in the economy of Dhule district.

Methodology

This study is based on secondary data sources including government reports, agricultural statistics, and academic literature. Data were obtained from the District Irrigation Plan (2016–2021), publications of the Department of Agriculture, and research studies related to agricultural development.

A qualitative analytical approach was adopted to evaluate the effectiveness of water conservation programmes and sustainable farming practices in improving agricultural productivity.

Water Conservation Initiatives

1. Jalyukta Shiwar Abhiyan

The Jalyukta Shiwar Abhiyan is a major water conservation programme launched by the Government of Maharashtra to make the state drought-free. The programme focuses on creating water storage structures, improving groundwater recharge, and increasing irrigation potential.

In Dhule district, approximately 504 villages were selected under the scheme between 2015 and 2019. During this period, irrigation potential was created for more than 120,000 hectares of agricultural land.

The programme involves the construction of various structures such as:

Earthen and cement nala bunds

Continuous contour trenches

Gabion structures

Loose boulder structures

Compartment bunding

These measures help in conserving rainwater and increasing groundwater recharge.

2. Shirpur Pattern Water Conservation Project

The Shirpur Pattern is an innovative water conservation model implemented in Shirpur and Shindkheda tehsils of Dhule district. The project involves widening and deepening streams to enhance groundwater recharge.

Approximately 30 kilometers of streams were widened and deepened, and several cement plugs were constructed to retain water. This project has significantly improved groundwater levels and increased irrigated areas.

Sustainable Farming Practices

1. Dryland Farming

Dryland farming techniques are widely practiced in Dhule district due to low and irregular rainfall. These techniques focus on conserving soil moisture and reducing water loss.

Common practices include:

Mulching, Crop rotation, Mixed cropping, Soil moisture conservation

Crops such as bajra, jowar, and green gram are commonly cultivated under dryland farming systems.

2. Organic Farming

Organic farming has gained increasing importance due to growing concerns about soil degradation and environmental sustainability.

In Dhule district, approximately 1250 farmers from 161 villages have adopted organic farming practices covering more than 14,000 acres of land.

Organic crops cultivated in the district include cotton, pulses, onion, chili, and papaya.

3. Mixed Farming and Dairy Development

Mixed farming involves the integration of crop cultivation with livestock rearing. This system provides farmers with additional sources of income and improves farm sustainability.

Dhule district has a substantial livestock population, including cows, buffaloes, goats, and sheep. Dairy farming has become an important supplementary occupation for farmers in the region.

Discussion

Water conservation initiatives and sustainable farming practices have significantly improved agricultural prospects in Dhule district. The success of programmes such as the Jalyukta Shivar Abhiyan and the Shirpur Pattern demonstrates the importance of community participation and integrated water resource management.

However, several challenges remain. Limited awareness among farmers, lack of financial resources, and fragmented landholdings continue to restrict the adoption of sustainable agricultural practices.

Therefore, government agencies must focus on promoting farmer education, improving access to credit, and strengthening agricultural extension services.

Conclusion

The study highlights the importance of water conservation and sustainable farming practices in promoting agricultural development in semi-arid regions such as Dhule district. Programmes such as the Jalyukta Shivar Abhiyan and the Shirpur Pattern have significantly improved irrigation potential and groundwater availability.

For sustainable agricultural development, it is essential to strengthen watershed management, promote organic farming, and encourage farmer participation in water conservation initiatives.

Acknowledgment

I express my sincere gratitude to all those who have supported and guided me in the completion of this research work on “Water Conservation and Sustainable Farming Practices for Agricultural Development in Dhule District, Maharashtra.”

I am especially thankful to the management and Principal of S. Zulal Bhilajirao Patil College, Deopur, Dhule, for providing the necessary academic environment and encouragement to carry out this study. I extend my heartfelt thanks to my colleagues in the Department of Geography for their valuable suggestions and constant support.

Financial support and sponsorship

Nil.

Conflicts of interest

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

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