InSight Bulletin: A Multidisciplinary Interlink International Research Journal
Peer Reviewed International, Open Access Journal.
ISSN : 3065-7857 / Website: https://ibrj.us / Volume-3, Issue-5 / May - 2026

Original Article

Environmental Change and Sustainable Economic Development in Dhule District: A Green Economy Perspective

Pranav Arunrao Shinde
Assistant Professor CHB, Economics Department, Pratap College (Autonomous) Amalner

Manuscript ID:
IBMIIRJ -2026-030506

Submitted: 09 Apr. 2026

Revised: 15 Apr. 2026

Accepted: 05 May 2026

Published: 31 May 2026

ISSN: 3065-7857

Volume-3

Issue-5

Pp. 42-46

May 2026

Correspondence Address:
Pranav Arunrao Shinde
Assistant Professor CHB, Economics Department, Pratap College (Autonomous) Amalner
Email: pranavshinde7598@gmail.com

OPEN ACCESS

Quick Response Code:

Web. https://ibrj.us

DOI: 10.5281/zenodo.21638471

DOI Link:
https://doi.org/10.5281/zenodo.21638471

Creative Commons

Abstract

Environmental change has become an important concern for regional development, particularly in areas where economic activities depend heavily on natural resources. Dhule district in Maharashtra, characterized by a predominantly agrarian economy and semi-arid climatic conditions, has experienced increasing environmental challenges such as irregular rainfall, water scarcity, land degradation, and rising climate variability. These changes have significant implications for agricultural productivity, employment opportunities, resource availability, and overall economic growth. This study examines the relationship between environmental change and sustainable economic development in Dhule district through the lens of the green economy framework. The research explores how environmentally sustainable practices can contribute to economic growth while ensuring the conservation of natural resources for future generations. Particular attention is given to sectors such as agriculture, water management, renewable energy, and rural livelihoods, which play a crucial role in the district's development process the study is based on secondary data collected from government reports, academic literature, policy documents, and environmental assessments. The findings indicate that environmental degradation and climate-related risks pose challenges to long-term economic sustainability. However, the adoption of green economy strategies, including climate-resilient agriculture, efficient water resource management, renewable energy development, and sustainable livelihood initiatives, offers significant opportunities for balanced and inclusive growth. The paper concludes that integrating environmental considerations into local development planning is essential for strengthening economic resilience and achieving sustainable development in Dhule district. A coordinated approach involving government institutions, local communities, and private stakeholders can facilitate the transition towards a greener and more sustainable economy while improving social well-being and environmental security. Keywords: Environmental Change, Sustainable Economic Development, Green Economy, Climate Change, Dhule District, Renewable Energy, Sustainable Agriculture, Environmental Sustainability.

Keywords: *Environmental Change, Sustainable Economic Development, Green Economy, Climate Change, Dhule District, Renewable Energy, Sustainable Agriculture, Environmental Sustainability, Climate Resilience, Water Resource Management, Rural Development, Sustainable Livelihoods, Environmental Degradation, Rainfall Variability, Green Growth, Watershed Development, Agricultural Productivity, Climate Adaptation, Groundwater Conservation, Ecological Sustainability.*

Introduction

In recent decades, environmental change has emerged as one of the most critical challenges influencing economic and social development across the world. Rapid population growth, increasing industrialization, urban expansion, and unsustainable use of natural resources have intensified environmental pressures. Climate change, irregular rainfall patterns, water scarcity, land degradation, and loss of biodiversity are no longer isolated environmental concerns; they have become significant factors affecting economic productivity, livelihoods, and long-term development prospects. As a result, policymakers, researchers, and development practitioners are increasingly emphasizing the need to integrate environmental sustainability into economic planning Labeo Rohita Sample was collected from Local fish Market where it arrived from godavari river tributary.

How to cite this article:
Shinde, P. A. (2026). Environmental Change and Sustainable Economic Development in Dhule District: A Green Economy Perspective. InSight Bulletin: A Multidisciplinary Interlink International Research Journal, 3(5), 42–46. https://doi.org/10.5281/zenodo.21638471

Next step was DNA Extraction, Amplification and Sequencing the process of DNA extraction was easy initially we took fish samples of fish that are fins and tail parts and stored in absolute alcohol (70-80%) DNA was extracted from fin using a standard extraction kit (Qiagen method). After this we obtained mitochondrial COI gene region (~658 base pairs) which was further amplified by Polymerase Chain Reaction (PCR) using universal primers

The concept of a green economy has gained importance as a framework for achieving economic growth while minimizing environmental degradation. Unlike conventional development models that often prioritize short-term economic gains, the green economy promotes efficient resource utilization, renewable energy adoption, environmental conservation, and sustainable livelihood opportunities. It seeks to ensure that economic progress does not occur at the cost of ecological stability and the well-being of future generations. In this context, sustainable economic development requires a balanced approach that addresses both developmental needs and environmental responsibilities.

Dhule district, located in the northwestern part of Maharashtra, presents a relevant case for examining the relationship between environmental change and economic development. The district's economy is largely dependent on agriculture and allied activities, making it highly sensitive to climatic and environmental variations. Over the years, Dhule has experienced challenges such as erratic monsoon patterns, recurrent drought conditions, declining groundwater levels, and increasing pressure on natural resources. These environmental changes have affected agricultural productivity, rural incomes, employment opportunities, and overall economic stability.

At the same time, Dhule possesses considerable potential for sustainable development through the adoption of green economy practices. The promotion of climate-resilient agriculture, water conservation measures, renewable energy projects, and sustainable resource management can contribute to both environmental protection and economic growth. Understanding how these opportunities can be effectively utilized is essential for building resilience and ensuring inclusive development within the district.

Against this background, the present study examines the impact of environmental change on sustainable economic development in Dhule district from a green economy perspective. The study aims to explore the challenges posed by environmental degradation, assess their economic implications, and identify strategies that can support environmentally sustainable and economically viable development. By focusing on the local context of Dhule district, the research seeks to contribute to a better understanding of how green economy principles can be applied to achieve long-term sustainability and improved quality of life.

Literature Review

Environmental change and sustainable economic development have become important areas of research in recent years due to increasing concerns about climate variability, resource depletion, and ecological degradation. Several researchers have examined the relationship between environmental conditions and economic growth, emphasizing the need for sustainable development strategies that balance economic progress with environmental protection.

The concept of sustainable development gained global recognition after the publication of the Brundtland Report (1987), which highlighted the importance of meeting present developmental needs without compromising the ability of future generations to meet their own requirements. Since then, researchers have increasingly focused on understanding how environmental sustainability can be integrated into economic planning and development policies.

Stern (2006) argued that climate change poses serious risks to economic growth and social welfare. According to his findings, the economic costs associated with environmental degradation and climate-related disasters are likely to be much higher than the costs of preventive and adaptive measures. The study emphasized the importance of early intervention and investment in sustainable technologies to reduce long-term economic losses.

Dell, Jones, and Olken (2012) examined the impact of climate change on economic growth and found that rising temperatures can significantly affect agricultural productivity, labor efficiency, and overall economic performance, particularly in developing countries. Their research demonstrated that regions dependent on agriculture are more vulnerable to climate-related risks and require adaptive strategies to maintain economic stability.

Researchers studying environmental economics have highlighted the role of the green economy in promoting sustainable growth. The green economy approach focuses on resource efficiency, low-carbon development, environmental conservation, and social inclusion. Studies suggest that investments in renewable energy, sustainable agriculture, and environmental infrastructure can generate employment opportunities while reducing environmental pressures.

In the Indian context, several studies have explored the relationship between climate variability and rural livelihoods. Research conducted in drought-prone regions of Maharashtra has shown that irregular rainfall patterns, water scarcity, and land degradation have adversely affected agricultural production and household incomes. These studies indicate that environmental challenges often increase economic vulnerability among small and marginal farmers.

Studies related to Dhule district have also drawn attention to the growing impact of environmental change on local livelihoods. Researchers have observed that changing rainfall patterns and recurrent drought conditions have influenced cropping patterns, water availability, and agricultural productivity. The dependence of a large section of the population on rain-fed agriculture makes the district particularly sensitive to climatic fluctuations. Findings from these studies suggest that improving water management practices and promoting climate-resilient agriculture are essential for sustainable development in the region.

Recent literature further emphasizes the importance of renewable energy and sustainable resource management as drivers of green economic growth. Maharashtra has made considerable progress in promoting solar and wind energy projects, creating opportunities for rural development and environmental sustainability. Researchers argue that districts with suitable natural resources, such as Dhule, can benefit significantly from renewable energy investments while reducing dependence on conventional energy sources.

Although previous studies have examined climate change, agriculture, and sustainable development separately, limited research has specifically analyzed environmental change and sustainable economic development in Dhule district from a comprehensive green economy perspective. Therefore, the present study seeks to bridge this gap by exploring how environmental

challenges influence economic development and how green economy strategies can contribute to long-term sustainability and resilience in the district.

Research Methodology

A clear research methodology is essential for understanding how a study has been conducted and how conclusions have been reached. The present work examines the relationship between environmental change and sustainable economic development in Dhule district with particular emphasis on the green economy approach. To understand this relationship, a combination of descriptive and analytical methods has been adopted.

Research Design

The study follows a descriptive research design because it focuses on identifying and explaining environmental changes observed in Dhule district and their possible economic implications. At the same time, an analytical perspective has been used to examine how sustainable practices and green economy initiatives can contribute to long-term development. This combination helps in understanding both the nature of environmental challenges and their developmental consequences.

Study Area

Dhule district in Maharashtra has been selected as the area of investigation. The district is characterized by semi-arid climatic conditions and a significant dependence on agriculture for livelihood and employment. Issues such as rainfall variability, water scarcity, and pressure on natural resources have become increasingly visible over the years. These conditions make Dhule a suitable location for examining the interaction between environmental conditions and economic development.

Sources of Data

The analysis relies primarily on secondary sources of information. Data and information have been collected from government publications, district statistical reports, Maharashtra Economic Survey reports, research articles, environmental studies, policy documents, and other relevant academic sources. These materials provide insights into environmental trends, economic conditions, and sustainable development initiatives within the district.

Method of Analysis

Both qualitative and quantitative approaches have been used while examining the available information. Descriptive analysis has helped in identifying major environmental and economic trends. Comparative observations have been used wherever necessary to understand changes in agriculture, water resources, and livelihood conditions. Tables, charts, and statistical information have been incorporated to support the discussion and improve clarity.

Scope of the Study

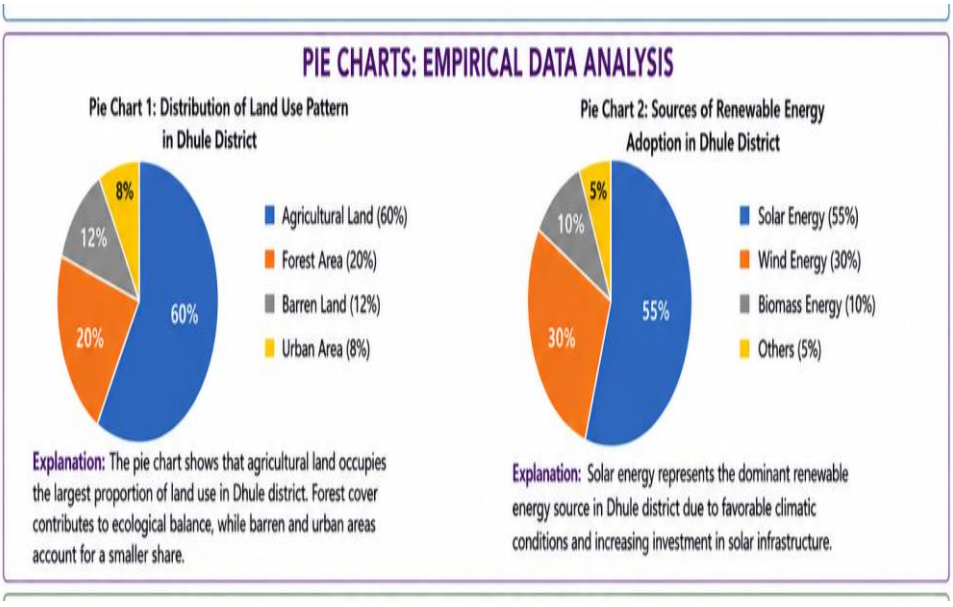
The study concentrates on selected environmental issues affecting Dhule district, including climate variability, water-related challenges, and degradation of natural resources. It also considers the potential contribution of renewable energy, sustainable agriculture, and resource conservation practices to economic development. The discussion is confined to Dhule district and does not include a comparative assessment of other regions.

Limitations of the Study

The findings are largely based on secondary information available from published sources. As a result, the quality of the analysis depends on the reliability and availability of existing data. Limited time and resources restricted the collection of extensive field-level information. Moreover, environmental and economic conditions continue to change over time, and future developments may influence some of the observations presented in the study.

Empirical Data Analysis

The empirical analysis of Dhule district highlights the relationship between environmental change and sustainable economic development. The data presented below illustrate major trends in rainfall variability, land use, renewable energy adoption, agricultural dependence, and environmental sustainability indicators. These observations provide a practical understanding of the opportunities and challenges associated with the transition towards a green economy.



TABLES: EMPIRICAL DATA ANALYSIS

Table 1: Average Annual Rainfall in Dhule District (2020–2024)

Year	Average Rainfall (mm)
2020	780
2021	720
2022	690
2023	650
2024	620

Explanation: The table shows a gradual decline in average annual rainfall in Dhule district over the five-year period. Reduced rainfall affects agricultural productivity, groundwater recharge, and water availability.

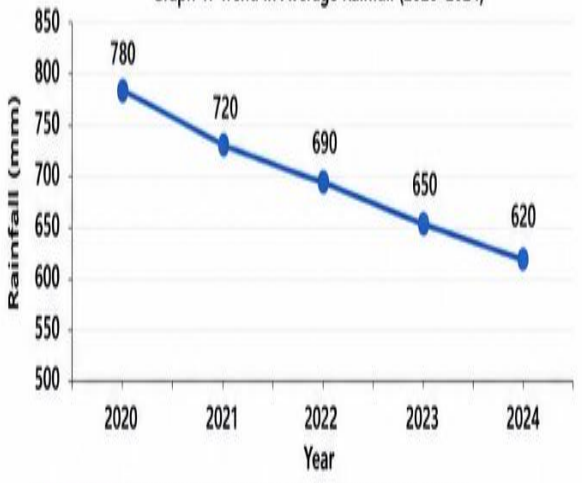
Table 2: Sector-wise Contribution to Green Economic Activities in Dhule District (2024)

Sector	Contribution (%)
Sustainable Agriculture	40
Renewable Energy	25
Water Conservation Projects	15
Agro-Processing Industries	12
Eco-Tourism and Others	8
Total	100

Explanation: The data show that sustainable agriculture contributes the largest share to green economic activities in Dhule district. Renewable energy is emerging as an important sector due to increasing investments.

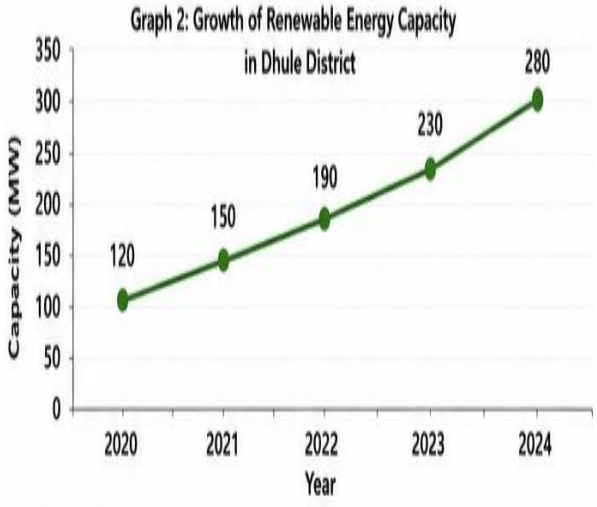
GRAPHS: EMPIRICAL DATA ANALYSIS

Graph 1: Trend in Average Rainfall (2020–2024)



Explanation: The graph illustrates a declining trend in annual rainfall over the study period. Such fluctuations increase environmental vulnerability and create uncertainty in agricultural production.

Graph 2: Growth of Renewable Energy Capacity in Dhule District



Explanation: The graph demonstrates a steady increase in renewable energy capacity in Dhule district. This growth indicates increasing adoption of sustainable energy solutions and reflects the district's potential to achieve green economic development.

Findings of the Study

During the course of this study, it became evident that environmental conditions have a direct influence on the economic activities of Dhule district. Since agriculture remains the primary occupation for a large section of the population, changes in rainfall patterns are often reflected in agricultural output and rural income levels. Information collected from various reports suggests that years of inadequate rainfall generally create difficulties for farmers, particularly those dependent on rain-fed cultivation. Water availability emerged as a recurring concern throughout the review of secondary sources. In several parts of the district, pressure on groundwater resources has increased over time. This has affected agricultural planning as well as the availability of water for other developmental activities. The situation highlights the importance of water conservation measures and efficient resource management. The review further indicates that environmentally sustainable agricultural practices are gradually gaining importance. Techniques such as drip irrigation, soil moisture conservation, and improved crop management have been promoted as practical responses to climatic uncertainty. Although the level of adoption varies, such measures appear capable of reducing environmental stress while supporting agricultural productivity. An encouraging trend observed during the

analysis is the growing attention given to renewable energy. Dhule possesses natural conditions suitable for solar and wind energy generation. Available evidence suggests that investments in these sectors can contribute not only to cleaner energy production but also to employment creation and local economic activity. Another observation emerging from the study is that environmental issues and economic development are closely linked. Environmental degradation affects more than natural resources alone; it also influences livelihoods, income opportunities, and social well-being. Consequently, development planning cannot remain effective unless environmental considerations are incorporated into policy decisions. Based on the overall assessment, green economy initiatives appear to offer a practical pathway for addressing many of the district's environmental and developmental challenges. Sustainable agriculture, watershed development, renewable energy expansion, and conservation-oriented programmes can collectively support long-term economic stability while reducing pressure on natural resources.

Conclusion

Dhule district has experienced noticeable environmental changes over the years, and their effects are increasingly visible in agriculture, water resources, and rural livelihoods. As agriculture continues to support a large share of the district's population, changes in rainfall patterns and water availability have created challenges for both farmers and the local economy. The review of available information suggests that environmental conditions now play a much greater role in shaping development outcomes than they did in the past. The discussion carried out in this study indicates that economic development and environmental sustainability are closely connected. Problems related to water scarcity, climatic uncertainty, and degradation of natural resources have implications beyond the environmental sector. They influence agricultural productivity, employment opportunities, household income, and the overall well-being of rural communities. Ignoring these concerns may create additional developmental pressures in the future. At the same time, the district possesses opportunities that can support a more sustainable pattern of growth. Initiatives related to water conservation, renewable energy, watershed development, and sustainable agricultural practices have demonstrated positive possibilities. Such measures can help reduce environmental stress while supporting economic activities and improving livelihood security. The evidence examined in this study suggests that long-term development in Dhule district will require greater attention to resource management and environmental planning. Efforts aimed at conserving water, promoting clean energy, and encouraging sustainable farming practices can strengthen resilience against environmental challenges. These measures are likely to become increasingly important as climate-related uncertainties continue to affect rural regions. Overall, the experience of Dhule district highlights the importance of integrating environmental considerations into local development strategies. A balanced approach that combines economic opportunities with responsible resource use can contribute to sustainable growth and improve the quality of life of present and future generations.

Primary Data Source

Primary Data:

Field Survey conducted by Pranav Shinde in selected villages of Dhule District during the study period.

Personal observations and informal discussions with farmers and local residents.

Data collected through questionnaires and interviews related to environmental change, water availability, agricultural practices, and sustainable development.

Acknowledgment

I express my sincere gratitude to all those who contributed to the successful completion of this research study titled *"Environmental Change and Sustainable Economic Development in Dhule District: A Green Economy Perspective."* The study examines the relationship between environmental change and sustainable development in Dhule district and highlights the importance of green economy strategies for sustainable growth.

Financial support and sponsorship

Nil.

Conflicts of interest

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

References / Bibliography

1. Brundtland Commission (1987). Our Common Future. Oxford University Press.
2. Stern, N. (2006). The Economics of Climate Change: The Stern Review. Cambridge University Press.
3. Dell, M., Jones, B. F., & Olken, B. A. (2012). "Temperature Shocks and Economic Growth: Evidence from the Last Half Century." American Economic Journal: Macroeconomics, 4(3), 66–95.
4. IPCC (2023). Sixth Assessment Report (AR6). Intergovernmental Panel on Climate Change.
5. Government of India. Economic Survey of India (Latest Edition).
6. Government of Maharashtra. Maharashtra Economic Survey (Latest Edition).
7. Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India.
8. NITI Aayog. Strategy for New India @ 75.
9. United Nations (2015). Transforming Our World: The 2030 Agenda for Sustainable Development.
10. Patil, K. & Gupta, M. (2024). Assessing the Impact of Climate Change on Agriculture and Livelihood in Dhule District, Maharashtra.
11. District Statistical Office, Dhule. District Statistical Handbook (Latest Edition).
12. Department of Agriculture, Government of Maharashtra.
13. Census of India 2011.