

ECONOMICS OF CLIMATE CHANGE: PROBLEMS AND CHALLENGES IN KARNATAKA

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ABSTRACT

Climate change has emerged as one of the most pressing global challenges, with significant economic, social, and environmental consequences. Karnataka, owing to its diverse climatic zones, is particularly vulnerable to rising temperatures, erratic monsoons, recurring droughts, floods, and extreme weather events. These climatic disturbances have adversely affected agriculture, water resources, energy production, health outcomes, and overall economic growth.

This study examines the economics of climate change in Karnataka by analysing impacts, policy responses, adaptation challenges, and long-term sustainability implications. Using secondary data, case studies, and empirical findings from government and academic sources, this report identifies key problems, their economic dimensions, and suggests policy interventions for resilience-building.

1. INTRODUCTION

Karnataka's economy is deeply dependent on climate-sensitive sectors such as agriculture, horticulture, forestry, water resources, and energy. Over the last two decades, climate change has intensified droughts in north Karnataka, caused recurring floods in coastal and Malnad regions, disrupted rainfall patterns, and reduced groundwater availability.

The economic impacts are far-reaching—crop losses, rising input costs, reduced labor productivity, damage to infrastructure, increased public expenditure on disaster relief, and health burdens. The Karnataka State Action Plan on Climate Change (KSAPCC) outlines various vulnerabilities, but practical implementation remains a challenge.

2. HYPOTHESIS

H1: Climate change has a significant negative economic impact on Karnataka's agriculture, water resources, and overall economic development.

H2: Adaptation and mitigation policies implemented in Karnataka are insufficient to address climate-related economic losses effectively.

3. OBJECTIVES OF THE STUDY

1. To examine the economic impacts of climate change in Karnataka.
2. To analyse sector-wise challenges and vulnerabilities.
3. To study climatic trends such as temperature rise and rainfall variability.
4. To evaluate current government policies and adaptation measures.
5. To provide recommendations for climate-resilient development.

4. METHODOLOGY

Research Design: Descriptive, analytical, and qualitative research.

Data Sources: Secondary data from Government of Karnataka, IMD, IPCC, Economic Survey.

Research papers, journals, books, KSNDMC climate data. Case studies and district-level reports.

5. LIMITATIONS OF THE STUDY

1. Based primarily on secondary data due to limited access to real-time datasets.
2. Climatic impacts vary between districts, making generalization challenging.
3. Lack of long-term micro-level empirical data.
4. Policy documents are evolving and subject to change.

6. REVIEW OF LITERATURE

1. IPCC (2021): Climate change will disproportionately affect developing regions like South Asia due to temperature rise and monsoon variability.
2. KSAPCC (Karnataka, 2015): Identified water scarcity, drought, and energy challenges as major risks for Karnataka.
3. Economic Survey of Karnataka: Reports indicate frequent crop losses due to droughts and floods.
4. World Bank (2020): Highlights climate-induced economic losses in agriculture and infrastructure.
5. Indian Agricultural Research Institute: Noted that climate change reduces yields of major crops like ragi, paddy, and pulses.
6. These studies collectively highlight that climate change has multi-dimensional impacts on Karnataka's economic landscape.

7. CASE STUDY ANALYSIS

Case Study 1: North Karnataka Drought Belt

Districts: Vijayapura, Kalaburagi, Raichur, Ballari

60%+ rainfall deficit observed in drought years. Ground water over-extraction led to severe shortages. Crop losses pushed farmers into debt cycles. Increased rural migration to cities like Bengaluru.

Case Study 2: Kodagu & Coastal Karnataka Floods

Recurring landslides (2018–2022). Damage to coffee plantations and the tourism sector. Major loss of public infrastructure (roads, bridges). Estimated economic losses > Rs. 10,000 crores in three years.

8. POLICY IMPLICATIONS

1. Reduced agricultural productivity increases government expenditure on relief packages.
2. Higher energy demand due to heatwaves increases fiscal pressure on the power sector.
3. Infrastructure rehabilitation costs rise after floods and droughts.

4. Water conflicts (inter-state and intra-state) intensify.
5. Climate-induced migration impacts urban planning and labor markets.
6. Health system burden increases due to vector-borne diseases.

9. SUGGESTIONS

1. Promote climate-resilient agriculture—drought-resistant crops, precision farming.
2. Expand renewable energy: solar parks, rooftop solar.
3. Strengthen watershed management in drought-prone areas.
4. Improve urban flood management infrastructure.
5. Expand rainwater harvesting statewide.
6. Invest in early warning systems through KSNDMC.
7. Promote public awareness and community-level adaptation.

10. RECOMMENDATIONS

1. Integrate climate budgeting in all government departments.
2. Strengthen state-level climate data monitoring.
3. Increase funding for climate-resilient infrastructure.
4. Encourage PPP models for green growth in Karnataka.
5. Provide incentives for climate-smart technology adoption.
6. Enhance disaster management capabilities at district level.

CONCLUSION

Climate change presents a severe challenge to Karnataka's long-term economic stability. The impacts on agriculture, water resources, infrastructure, and health are already visible and likely to intensify. While Karnataka has initiated several policies, the scale of adaptation required is much greater. Integrating climate resilience into all sectors, encouraging sustainable development, and improving data-driven policymaking can mitigate economic losses and secure a sustainable future for the state.

REFERENCES

1. IPCC Sixth Assessment Report (2021)
2. Karnataka State Action Plan on Climate Change (KSAPCC)
3. Government of Karnataka – Economic Survey (2020–2024)
4. KSNDMC Climate Reports
5. World Bank Climate Change Profiles
6. IARI Climate Impact Reports
7. Peer-reviewed journals on climate economics