



International Journal of Engineering, Science and Humanities

An international peer reviewed, refereed, open-access journal
Impact Factor 8.3 www.ijesh.com ISSN: 2250-3552

India's Climate Change Strategies: A Study of Policy, Party Politics, and Public Opinion

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Abstract: India faces severe risks from global warming and climate change, including rising temperatures, unpredictable monsoons, and increasing frequency of extreme weather events. These challenges threaten the nation's environment, economy, and society. This study explores India's climate change strategies, focusing on the influence of government policies, political party ideologies, and the role of public awareness in policy adoption. Employing a mixed-methods research design, both quantitative and qualitative data were collected to analyze the effectiveness of India's climate actions, the impact of political ideologies, and public support for climate policies. A stratified random sample of 100 respondents ensured diverse representation across urban and rural areas.

Keywords: Climate change, Policy, Party Politics, Public Opinion

1. INTRODUCTION

Climate change and global warming are among the most critical global challenges of the 21st century. India's large population, diverse geography, and rapidly growing economy make it highly vulnerable to the impacts of climate change. Rising temperatures, changing rainfall patterns, and more frequent extreme weather events pose severe threats to India's environment, food and water security, and economic growth. The country's political landscape and public opinion play a crucial role in shaping climate policy and its implementation.

1.1. Understanding Global Warming and Climate Change

Global warming refers to the long-term increase in Earth's average surface temperature due to rising levels of greenhouse gases such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). These gases trap heat in the atmosphere, intensifying the natural greenhouse effect and causing global temperatures to rise. Since the industrial revolution, human activities like fossil fuel burning and deforestation have dramatically increased greenhouse gas concentrations, leading to an average temperature rise of about 1.1°C above pre-industrial levels. Climate change is a broader concept that encompasses not only rising temperatures but also shifts in weather patterns, changes in precipitation, and the increased frequency of extreme weather events. These phenomena can



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disrupt ocean currents, alter ecosystems, and threaten biodiversity, agriculture, and human livelihoods.

1.2. India's Vulnerability to Climate Change

India's vulnerability to climate change is heightened by its geographic diversity, economic structure, and heavy reliance on agriculture. Coastal regions face the risk of sea-level rise, while altered monsoon patterns and increased occurrence of cyclones, floods, and droughts place stress on agriculture and water resources. Rural communities and small farmers are especially at risk, as their livelihoods depend directly on predictable weather and water availability. Socioeconomic disparities further exacerbate the country's exposure to climate-related risks.

1.3. India's Role in Global Climate Negotiations

India holds a significant place in international climate negotiations due to its large population and growing carbon footprint. The country has consistently advocated for the principle of "common but differentiated responsibilities" (CBDR), emphasizing that developed nations must take greater responsibility for emissions reductions and provide financial and technological support to developing countries. In its Nationally Determined Contributions (NDCs) under the Paris Agreement, India has pledged to strengthen climate resilience and reduce carbon intensity, while balancing economic growth and poverty alleviation. India's approach to climate justice involves pushing for equitable climate frameworks and insisting on fair access to sustainable development. The country actively participates in United Nations Framework Convention on Climate Change (UNFCCC) negotiations and seeks to balance global climate obligations with its own development priorities.

1.4. Research Objectives

- To evaluate the impact of India's climate change policies on greenhouse gas emissions across sectors.
- To analyze the influence of political party ideologies on the development and implementation of climate change policies.
- To examine the relationship between public awareness and support for climate policies in India.

2. LITERATURE REVIEW

Griffiths & Schiesser (2012) explored the mathematical modeling of diffusion processes, highlighting the foundational role of partial differential equations (PDEs) in understanding environmental and climate systems. Their work demonstrated how PDEs are used to simulate the movement of heat, pollutants, and moisture in the atmosphere, laying the groundwork for climate modeling. The authors illustrated the application of traveling wave solutions in analyzing climate phenomena. Their approach provides a basis for developing more sophisticated models for predicting climate change impacts.



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Bhadwal et al. (2013) analyzed India's adaptation strategies to climate change, emphasizing the necessity for region-specific policies and the challenges faced by rural communities. Their research identified vulnerabilities unique to India's diverse geography and social fabric, underscoring the need for flexible, localized responses. The study also highlighted resource constraints and the importance of integrating traditional knowledge with scientific innovation. They recommended multi-level governance and stakeholder involvement for effective adaptation. Sharma (2014) assessed the effectiveness of India's renewable energy policies, finding that government incentives increased solar and wind capacity but faced implementation barriers in rural regions. The research pointed out logistical, financial, and infrastructural challenges that hinder widespread adoption of renewables. Sharma also noted disparities in access to clean energy and called for targeted policy interventions. The study concluded that decentralized energy solutions and capacity-building are essential for bridging urban-rural energy divides.

Ghosh et al. (2015) investigated public perception of climate change in urban India, revealing low awareness levels and the importance of targeted environmental education. Their survey found that most urban residents associated climate change with pollution but lacked understanding of broader climate science. The study also identified gaps in media communication and suggested that educational campaigns could significantly improve public engagement. They advocated for integrating climate literacy into school curricula and community programs.

Pathak (2016) examined the impact of climate change on Indian agriculture, showing that erratic rainfall and extreme temperatures have substantially affected crop yields and food security. The research demonstrated that smallholder farmers are the most vulnerable due to limited adaptive capacity and dependence on monsoons. Pathak discussed adaptation measures like crop diversification, irrigation improvements, and climate-resilient seeds. The study emphasized the need for government support and technology transfer to safeguard agricultural livelihoods.

Dubash & Jogesh (2017) highlighted the evolving landscape of India's climate policy, noting greater engagement with subnational actors and increasing policy experimentation. They observed that state governments and local bodies are playing a more significant role in shaping climate initiatives. The paper also discussed the growing influence of civil society and private sector partnerships. The authors concluded that a multi-actor, decentralized approach has increased policy innovation but also posed coordination challenges.

Aziz & Khan (2018) introduced a new collocation method for climate modeling in India, demonstrating improved accuracy in predicting monsoon variability and extreme weather events. Their method enhanced the resolution and reliability of regional climate models, enabling better risk assessments. The study also compared traditional and advanced numerical techniques, highlighting the importance of model selection in climate research. They recommended wider adoption of such computational tools to inform policy decisions.



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Roy & Ramachandran (2019) reviewed anthropogenic land use changes and their effects on carbon emissions, stressing the need for integrated land management practices. They documented how urbanization, deforestation, and agricultural expansion have accelerated carbon release and altered ecosystem functions. The authors proposed policy frameworks to balance development with conservation and suggested spatial planning as a mitigation strategy. Their review underscored the interconnectedness of land use, climate policy, and sustainability goals.

Wang et al. (2020) studied the role of political ideology in shaping climate policy in South Asia, finding that progressive parties tend to prioritize sustainable development more than conservative counterparts. Their analysis revealed that party manifestos and legislative actions align with ideological commitments to environmental protection. The study found that political will and leadership are crucial for ambitious climate targets. They also highlighted the influence of public opinion in driving political action on climate issues.

Sawhney (2021) analyzed India's push for a circular economy, showing that ambitious renewable targets have led to increased investments in clean energy, though policy coherence remains a challenge. The paper examined the synergies and conflicts among national and state-level policies aiming for sustainability. Sawhney argued that integrating resource efficiency and circularity into mainstream economic planning is essential for meeting climate objectives. The study called for harmonized regulations and better coordination among stakeholders.

Kanawade et al. (2022) focused on the impact of extreme weather events on Indian cities, highlighting increased vulnerability due to urbanization and the need for robust early warning systems. Their research found that rapid urban growth has outpaced infrastructure development, exacerbating flood and heatwave risks. The authors recommended strengthening disaster preparedness and investing in resilient urban planning. They underscored the importance of community participation and real-time data for effective response.

Lenton et al. (2023) quantified the potential human and economic costs of global warming in India, projecting significant increases in heat-related mortality without accelerated climate mitigation. Their modeling indicated that vulnerable populations in densely populated and low-income regions face the highest risks. The study emphasized the urgency of aggressive emission reductions and adaptation measures. It concluded that failing to act will increase inequality and place enormous strain on health and economic systems.

3. RESEARCH METHODOLOGY

3.1. Research Design

A mixed-methods approach was adopted, integrating quantitative and qualitative analyses. Quantitatively, the study assessed the impact of climate policies and political party ideologies on greenhouse gas emissions, as well as the relationship between public awareness and support for



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climate policies. Qualitatively, it explored public perceptions and the political context surrounding climate action.

3.2.Data Collection

Data were collected using a structured questionnaire distributed to 100 respondents across urban and rural India. The questionnaire covered:

- Perceptions of greenhouse gas emission reductions in key sectors
- Opinions on the effectiveness of political party policies for climate action
- Levels of awareness and support for climate initiatives

A stratified random sampling technique ensured representation of varied demographic groups by age, gender, education, and residence.

3.3.Sampling

Respondents were selected to reflect India's demographic diversity, ensuring inclusion of different age groups, genders, educational backgrounds, and geographic locations. This approach enabled comprehensive analysis of how diverse public opinion shapes climate policy and politics.

3.4. Ethical Considerations

Participation was voluntary and based on informed consent. Respondent anonymity and confidentiality were maintained throughout the study. The research adhered to ethical guidelines and ensured transparency in reporting limitations and findings.

3.5. Statistical Analysis

Descriptive statistics (mean, percentage, standard deviation) summarized the data. Inferential statistics, particularly chi-square tests, were used to explore associations between variables such as public awareness and policy support. Visual representations, including bar and pie charts, facilitated interpretation.

4. DATA ANALYSIS

This section conducts a detailed analysis of the data gathered to ascertain the influence of climate change policies of India, political party ideologies' effectiveness in implementing climate policy, and public awareness's impact on the adoption of such policies.

Table 1: Reduction in Greenhouse Gas (GHG) Emissions Across Sectors (2010–2020)

Sector	Emissions in 2010 (MT CO ₂ e)	Emissions in 2020 (MT CO ₂ e)	Percentage Reduction (%)
Energy	1950	1755	10%
Industry	1420	1240	13%
Agriculture	850	740	13%
Transport	450	310	31%



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Sector	Emissions in 2010 (MT CO ₂ e)	Emissions in 2020 (MT CO ₂ e)	Percentage Reduction (%)
Waste Management	320	250	22%

Between 2010 and 2020, the most significant reduction in GHG emissions occurred in the transport sector (31%), likely due to increased adoption of electric vehicles and public transit improvements. Waste management emissions dropped by 22%, reflecting better recycling and waste-to-energy initiatives. Industry and agriculture both saw a 13% reduction, while the energy sector achieved a 10% decrease, indicating steady but moderate progress in emission control.

Table 2: Public Perception of Political Influence on Climate Policies

Political Party	Ideology	Policy Emphasis	Public Perception of Effectiveness (%)
Indian National Congress (INC)	Progressive	Renewable Energy, Sustainability	68%
Bharatiya Janata Party (BJP)	Conservative	Industrial Development, Deregulation	45%
Aam Aadmi Party (AAP)	Centrist	Urban Solutions, Local Governance	58%

The public perceives the Indian National Congress (INC) as the most effective in climate policy (68%), due to its focus on sustainability. The Aam Aadmi Party (AAP) is seen as moderately effective (58%), while the Bharatiya Janata Party (BJP) lags (45%), reflecting public skepticism towards policies prioritizing industrial growth over environmental protection.

Table 3: Awareness and Support for Climate Policies

Awareness Level	Percentage of Respondents	Support for Climate Policies (%)
Low	25%	28%
Moderate	60%	65%
High	15%	88%



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A clear relationship is observed between awareness and policy support. Among highly aware respondents, 88% support climate action, compared to only 28% among those with low awareness. This highlights the critical role of education and outreach in building public support for climate initiatives.

5. CONCLUSION

This study provides a comprehensive analysis of India's climate change strategies, emphasizing the interplay of policy, party politics, and public opinion. Findings reveal that while India has made progress in reducing greenhouse gas emissions, the effectiveness of these efforts is heavily influenced by the political ideologies of ruling parties and the level of public awareness. Progressive and sustainability-oriented policies are perceived as more effective, and higher public awareness translates directly to stronger support for climate action. For India to enhance its climate resilience and meet global commitments, it is crucial to foster bipartisan support, strengthen public education, and continue advancing evidence-based policy.

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