# INDIA'S APPROACH TO CLIMATE CHANGE POLICIES, STRATEGIES, AND CHALLENGES IN THE POST-PARIS AGREEMENT ERA

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### ABSTRACT

This study critically examines India's climate change policies, strategies, and challenges in the post-Paris Agreement era, focusing on the interplay between sustainable development, energy security, and international climate governance. As a rapidly developing economy with significant climate risks, India's commitment to ambitious renewable energy targets, such as achieving 500 GW of non-fossil fuel capacity by 2030, underscores its proactive stance in global climate efforts. However, challenges such as policy fragmentation, limited financial resources, and a heavy reliance on coal remain persistent obstacles. The study utilizes a comparative analysis of India's climate policies in the global context, drawing comparisons with key players like China, Russia, and the European Union. Through secondary data analysis, the research explores the need for enhanced climate finance, technological innovation, and international cooperation to strengthen India's climate resilience and leadership in global climate action.

**KEYWORDS:** Climate change policy, Renewable energy transition, Global climate governance, Climate justice

#### INTRODUCTION

Climate change is one of the most pressing global challenges of the 21st century, requiring collective action and robust policy frameworks to mitigate its impacts. As a rapidly industrializing nation with a vast population, India plays a crucial role in global climate governance, balancing economic development with environmental sustainability (Singh, 2025). The Paris Agreement (2015) marked a transformative shift in global climate commitments, emphasizing voluntary Nationally Determined Contributions (NDCs) and shared responsibility in emissions reduction (Huang et al., 2024). India, as a signatory, has pledged ambitious goals, including achieving net-zero emissions by 2070, increasing non-fossil fuel energy capacity, and improving carbon sink targets through afforestation (Stern, 2024). However, policy execution remains a challenge, with issues such as financial constraints, technological dependence, and regional disparities affecting implementation (Mukhia & Zou, 2024). This study explores India's evolving climate policies, their historical trajectory, and the obstacles in aligning national interests with international climate obligations.

India's climate policy is deeply intertwined with climate justice concerns, particularly regarding the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC), which acknowledges the disproportionate historical emissions of developed nations (Barua, 2014). While India has actively engaged in climate diplomacy, it has also resisted undue pressure from developed countries to undertake more aggressive mitigation measures without adequate financial and technological support (Prys-Hansen & Kaack, 2024). This debate underscores the complexities in India's climate strategy, where domestic energy security and socio-economic development must be balanced with global sustainability goals. This study aims to critically examine India's climate policies, historical commitments, and the evolving challenges in the post-Paris Agreement era, providing policy recommendations to strengthen climate resilience and governance mechanisms.

# HISTORICAL PERSPECTIVE OF INDIA'S CLIMATE POLICY

India's climate policy evolution can be traced back to its Five-Year Plans, where environmental concerns were gradually integrated into developmental agendas (Barua, 2014). However, structured climate policy frameworks emerged only in the late 20th and early 21st centuries, following global climate negotiations such as the United Nations Framework Convention on Climate Change (UNFCCC, 1992) and the Kyoto Protocol (1997) (Stern, 2024). India's early stance in climate negotiations was shaped by its commitment to poverty alleviation, economic growth, and energy access, emphasizing the need for differentiated responsibilities among nations (Singh, 2025). In

response to growing international pressure, India introduced key domestic climate strategies, including the National Action Plan on Climate Change (NAPCC, 2008), which outlined sectoral missions focusing on solar energy, energy efficiency, and water conservation (Mukhia & Zou, 2024).

The Paris Agreement (2015) marked a significant turning point, as India voluntarily committed to reducing carbon intensity by 45% by 2030 and achieving 50% of its electricity from non-fossil fuel sources (Huang et al., 2024). These commitments were further reinforced by India's leadership in the International Solar Alliance (ISA), a coalition aimed at promoting solar energy deployment in developing nations (Stern, 2024). Additionally, India's State Action Plans on Climate Change (SAPCCs) enabled regional-level climate adaptation and mitigation strategies, addressing localized climate vulnerabilities (Singh, 2025). However, implementation challenges such as policy fragmentation, financial resource gaps, and technological dependency continue to hinder progress (Prys-Hansen & Kaack, 2024).

India's climate diplomacy has evolved significantly, positioning the country as both a champion of climate justice and a key global actor in renewable energy expansion (Stern, 2024). Despite its commitment to multilateral climate negotiations, India has remained cautious about accepting binding emission reduction targets that could compromise its developmental priorities (Mukhia & Zou, 2024). Notably, India has emphasized the need for climate finance from developed nations, arguing that without substantial funding and technological assistance, developing countries will struggle to meet their climate obligations (Huang et al., 2024). The Nigerian Climate Change Act (2021) provides an interesting comparative framework, illustrating how legal mechanisms can institutionalize climate action in developing economies (Ojogbo, 2024). This highlights the importance of robust domestic legislation in ensuring sustained climate commitments.

#### **REVIEW OF LITERATURE**

Addressing climate change through public policies, challenges, and opportunities has been a subject of rigorous analysis in the post-Paris Agreement era. McGrath, M. (2025) examines the U.S.'s decision to withdraw from the Paris Climate Agreement, emphasizing its political, environmental, and economic implications. It is significant due to its impact on global climate cooperation and U.S. energy policy. The objective is to analyze the effects of this withdrawal on climate governance and policy shifts. The methodology includes policy analysis and environmental impact assessment. Findings highlight increased fossil fuel production and regulatory reversals. The research gap lies in understanding long-term global responses to the U.S.'s climate stance.

Godara (2025) provides a comprehensive examination of India's climate governance framework, highlighting its strengths and limitations in policy formulation and implementation. The study underscores the significance of integrating sustainability with economic growth while addressing equity concerns among marginalized communities. Through a policy analysis approach, the research identifies key challenges such as inadequate financial resources, technological gaps, and institutional bottlenecks that hinder effective climate action in India. The findings reveal that while India has made significant progress in renewable energy expansion and climate adaptation, gaps remain in grassroots implementation and policy coherence across sectors. The study concludes by advocating for a more robust regulatory framework, enhanced climate financing mechanisms, and international collaboration to strengthen India's resilience against climate change.

The legal framework for environmentally sound technology transfer has gained prominence in the post-Paris Agreement era, as countries seek to balance industrialization with sustainability goals. Ma and Lee (2023) explore the international legal regime governing technology transfer for climate change mitigation. The study emphasizes the role of intellectual property rights (IPRs), financial mechanisms, and multilateral agreements in facilitating the diffusion of green technologies to developing nations. Employing a doctrinal legal research methodology, the study analyzes international conventions and national laws that regulate climate technology transfer. The findings highlight that while international cooperation has improved access to cleaner technologies, developing countries continue to face financial and regulatory constraints. The study concludes by recommending the establishment of equitable global policies that ensure accessible and affordable technology transfer, particularly for nations like India that are heavily reliant on sustainable technological advancements.

The evolution of China's climate change legislation post-Paris Agreement offers crucial insights into the interplay between governance structures and climate policy effectiveness. Pan and Yang (2023) provide an in-depth assessment of China's legislative framework aimed at reducing carbon emissions and promoting sustainable development. The study examines the legal amendments introduced in China's climate laws, the role of national carbon markets, and the effectiveness of sectoral emissions reduction policies. Using a comparative policy analysis approach, the study contrasts China's legal framework with that of other major economies, demonstrating the strengths and weaknesses of its regulatory approach. The findings suggest that while China has made commendable progress in formulating climate laws, enforcement remains a challenge due to regional disparities and industrial dependencies on fossil fuels. The study concludes that stringent compliance mechanisms and enhanced international cooperation are essential for ensuring the effectiveness of climate legislation in China and beyond.

Japan's progress towards achieving net-zero emissions since the Paris Agreement has been a subject of scholarly debate. Sabūnas (2024) explores the trajectory of Japan's climate policies, focusing on its commitment to carbon neutrality by 2050. The study evaluates Japan's transition towards a lowcarbon economy through renewable energy investments, carbon pricing mechanisms, and industrial decarbonization strategies. By employing a policy evaluation framework, the research identifies key policy interventions such as feed-in tariffs for renewable energy, nuclear energy re-assessment, and the development of energy-efficient technologies. The findings indicate that while Japan has strengthened its policy commitment, challenges persist in achieving absolute emissions reduction due to its reliance on imported fossil fuels. The study concludes that enhanced international collaboration and innovative financial instruments are crucial for Japan to meet its ambitious net-zero target effectively.

The United States' return to the Paris Agreement under the Biden administration has had profound implications for global climate governance. Khoirunnisa and Sari (2024) analyze the policy shifts that accompanied the U.S. re-engagement in climate diplomacy, with a focus on financial commitments, carbon neutrality pledges, and multilateral cooperation. Through a qualitative content analysis of U.S. policy documents and international agreements, the study highlights the contrast between the Trump administration's rollback of climate policies and Biden's climate agenda, which prioritizes clean energy investments and emission reductions. The findings suggest that while the U.S. has restored its leadership role in climate negotiations, domestic political divisions and economic constraints continue to influence the consistency of its climate policies. The study concludes that long-term bipartisan consensus and legally binding climate policies are essential for sustaining U.S. commitments under the Paris Agreement.

An assessment of countries' capacities to address climate change in the post-Paris Agreement era provides a critical perspective on global climate governance. Jim, Wang, Yang, and Kang (2022) examine the institutional capacities, financial resources, and technological readiness of major economies in mitigating climate change. Using a comparative statistical analysis, the study evaluates climate mitigation efforts based on national carbon footprints, policy coherence, and sustainable development indicators. The findings indicate that while developed nations have advanced climate policies, developing economies struggle with financial and infrastructural barriers, limiting their ability to meet climate commitments. The study concludes that targeted financial support, international cooperation, and knowledge-sharing mechanisms are crucial for ensuring equitable climate action across diverse economic contexts.

The role of digital discourse in shaping climate policies post-Paris Agreement has gained increasing attention in contemporary climate governance studies. Kim and Kim (2024) investigate the influence of social media actors in climate change debates, analyzing the role of policymakers, activists, and corporations in shaping public perceptions and policy discussions. Employing a network analysis methodology, the study maps the impact of digital communication on climate policy framing, identifying key influencers in climate change discourse. The findings suggest that while social media platforms enhance public engagement in climate discussions, misinformation and political biases often hinder effective policy advocacy. The study concludes that digital governance strategies, fact-checking mechanisms, and increased participation from climate experts are necessary to foster informed climate debates and policy-making processes.

A comparative evaluation of climate policies in Japan, Latvia, and Lithuania offers valuable insights into regional variations in climate action. Sabūnas (2024) examines how these nations have structured their climate policies to meet the Paris Agreement targets, focusing on their renewable energy transitions, carbon reduction strategies, and international collaborations. Using a policy impact assessment framework, the study assesses the effectiveness of regulatory mechanisms and financial incentives implemented in these countries. The findings indicate that while all three nations have made substantial progress in reducing emissions, policy inconsistencies and reliance on fossil fuels remain critical challenges. The study concludes that harmonized regional strategies and enhanced cross-border cooperation are essential for achieving net-zero emissions in these nations.

Scientific assessments of climate change have played a crucial role in informing policy decisions in the post-Paris era. Huang, Chao, Zhang, and Hu (2020) provide an overview of climate science advancements, focusing on empirical evidence supporting policy interventions. Using climate modeling techniques, the study evaluates trends in temperature rise, extreme weather events, and carbon cycle changes. The findings highlight the urgency of implementing stringent mitigation measures to prevent catastrophic climate impacts. The study concludes that integrating scientific research with policy-making is imperative for ensuring climate resilience and effective global climate governance.

The possibility of achieving the Paris Agreement goals through climate policy interventions remains a critical subject in contemporary environmental governance. Huang, Huang, and Zhang (2024) analyze the effectiveness of climate policies in meeting the Agreement's ambitious targets, emphasizing the role of policy coherence, technological innovations, and financial mechanisms. The study is significant as it assesses policy gaps and the need for an integrated governance framework to accelerate emissions reduction. Using a policy evaluation methodology, the research investigates climate action across multiple nations, measuring the impact of regulatory frameworks on emission trends. Findings indicate that while many countries have strengthened their commitments, inconsistencies in policy implementation and financial limitations hinder meaningful progress. The study concludes by advocating for enhanced multilateral cooperation, increased climate finance accessibility, and the establishment of legally binding commitments to ensure that the Paris goals are met.

The implementation of the Paris Agreement in Nigeria presents unique challenges and opportunities, as examined by Ojogbo (2024) in the context of the Nigerian Climate Change Act 2021. The study highlights the importance of legal frameworks in facilitating climate action, emphasizing Nigeria's role as a developing nation with high climate vulnerability. The research aims to explore how the Climate Change Act aligns with international climate governance structures and its potential to drive sustainable policies. Using doctrinal legal research and policy analysis, the study examines the regulatory provisions of the Act and its impact on Nigeria's emission reduction strategies. Findings reveal that while the Act represents a significant step toward institutionalizing climate action, gaps remain in enforcement, financing, and inter-agency coordination. The study concludes that strengthening institutional capacities, ensuring effective policy implementation, and integrating grassroots participation are essential for achieving climate goals in Nigeria.

The rise of climate change litigation in the post-Paris Agreement era has played a crucial role in shaping climate governance and holding governments and corporations accountable. Lin and Peel (2024) explore the increasing trend of climate-related lawsuits as mechanisms for enforcing compliance with international commitments. The study examines the legal strategies employed by climate activists, NGOs, and affected communities to challenge inadequate governmental actions. Utilizing comparative legal analysis, the study reviews landmark climate cases across jurisdictions and their implications for policy evolution. The findings suggest that climate litigation has become an essential tool in pressuring policymakers to adopt stronger regulatory measures. However, challenges such as judicial reluctance, legal ambiguities, and political resistance persist. The study concludes that enhancing legal frameworks and expanding access to climate justice mechanisms are critical in ensuring accountability and effective climate governance.

The impact of India's energy policy on climate change is a pivotal aspect of the country's environmental governance. Singh (2025) provides an in-depth analysis of how India's energy transition influences its carbon footprint, focusing on renewable energy expansion and fossil fuel dependency. The study underscores the significance of integrating climate considerations into national energy policies to ensure a sustainable future. Employing a policy impact assessment methodology, the research evaluates the effectiveness of India's renewable energy programs, carbon pricing mechanisms, and regulatory interventions. Findings indicate that while India has made remarkable progress in scaling up solar and wind energy, challenges such as energy poverty, infrastructural limitations, and financing constraints remain. The study concludes that a balanced approach-combining aggressive renewable energy deployment with robust regulatory enforcement-is necessary for aligning India's energy strategy with its climate commitments.

India's climate policy and security considerations in the context of China's rising influence have been examined by Prys-Hansen and Kaack (2024), shedding light on the intersection of geopolitical tensions and climate governance. The study investigates how India's climate strategy is shaped by regional security concerns, particularly in relation to China's leadership in renewable energy and carbon markets. The research aims to understand the implications of climate-related geopolitical dynamics on India's policy decisions. Using a geopolitical risk assessment methodology, the study analyzes policy documents, trade agreements, and international negotiations. Findings indicate that while India has actively engaged in climate diplomacy, strategic concerns regarding China's dominance in green technology and energy trade pose challenges. The study concludes that India must adopt a proactive approach in climate governance by enhancing technological self-sufficiency, fostering regional alliances, and leveraging climate finance for strategic resilience.

The historical evolution and significance of the Paris Agreement have been critically analyzed by Stern (2024), providing insights into the negotiation process and its long-term implications. The study explores how multilateral diplomacy, scientific assessments, and political negotiations led to the establishment of the Agreement. The research is significant as it examines the factors that influenced global consensus on climate action and the challenges in operationalizing its commitments. Using historical policy analysis, the study reviews official documents, speeches, and media coverage from the negotiation period. Findings reveal that while the Agreement represents a major diplomatic achievement, enforcement mechanisms remain weak, particularly in ensuring compliance among major emitters. The study concludes that strengthening accountability measures, enhancing climate finance mechanisms, and fostering international cooperation are essential for translating the Agreement's objectives into tangible outcomes.

India's evolving role in global climate negotiations has been a subject of extensive research. Barua (2014) examines India's diplomatic approach in climate talks, focusing on its advocacy for climate justice and equity. The study highlights India's insistence on the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC) as a means to balance development needs with climate commitments. The research employs content analysis of negotiation transcripts and official statements to assess India's policy stance. Findings indicate that while India has maintained a strong position in protecting the rights of developing nations, it has also demonstrated increasing flexibility in aligning with global mitigation goals. The study concludes that India's role in climate diplomacy must continue to evolve, integrating economic growth imperatives with ambitious climate action.

The climate governance trajectory of BRICS nations in the post-Paris era has been explored by Mukhia and Zou (2024), examining the collective efforts of Brazil, Russia, India, China, and South Africa in addressing climate change. The study is significant in understanding how emerging economies navigate climate governance while balancing socio-economic priorities. Using a comparative governance analysis, the research evaluates policy coordination, financial commitments, and technological innovations within BRICS. Findings suggest that while BRICS nations have made progress in promoting sustainable energy and climate finance, policy disparities and geopolitical divergences remain key challenges. The study concludes that enhanced regional cooperation, harmonized policy frameworks, and increased investment in green technologies are critical for strengthening BRICS' role in global climate governance.

The effectiveness of international climate agreements in fostering collective action has been a crucial area of study, particularly in regions like Nigeria. Afinjuomo and Muyali (2024) assess the extent to which international climate agreements, including the Paris Agreement, have influenced Nigeria's climate policies. The study investigates the role of global cooperation in driving domestic climate action, emphasizing Nigeria's reliance on international climate finance. Employing a policy effectiveness evaluation methodology, the research reviews climate agreements, funding mechanisms, and national policy implementation. Findings reveal that while Nigeria has benefited from global climate initiatives, systemic governance challenges and financial constraints impede largescale implementation. The study concludes that strengthening national institutional capacities, ensuring transparency in climate financing, and fostering stronger multilateral engagements are essential for achieving long-term climate resilience.

Despite extensive research on climate policies and international agreements, significant gaps persist in understanding the practical implementation challenges faced by developing economies, particularly in balancing economic

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growth and climate commitments (Huang et al., 2024). While studies have examined India's renewable energy expansion and diplomatic strategies (Singh, 2025; Prys-Hansen & Kaack, 2024), there is limited research on grassroots adaptation strategies, climate justice concerns, and the intersection of security and climate policy. Furthermore, climate finance accessibility and regional policy disparities remain underexplored (Mukhia & Zou, 2024). Addressing these gaps is crucial for enhancing equitable and sustainable climate governance in the post-Paris Agreement era.

#### IMPORTANCE OF THE STUDY

India's approach to climate change in the post-Paris Agreement era is critical for global climate governance, given its role as a rapidly developing economy with significant emissions and vulnerability to climate risks. This study is essential in analyzing how India balances economic growth, energy security, and environmental sustainability, contributing to the discourse on climate justice and equitable transition (Singh, 2025). While India has made commendable progress in renewable energy expansion and international climate diplomacy (Prys-Hansen & Kaack, 2024), challenges remain in policy coherence, climate finance accessibility, and regional implementation disparities (Mukhia & Zou, 2024). By examining India's climate policies, adaptation strategies, and diplomatic engagements, this research provides policy recommendations for strengthening India's climate governance. Furthermore, addressing these challenges is crucial for ensuring sustainable development, resilience building, and India's leadership in global climate action while safeguarding the rights of vulnerable communities and marginalized groups.

#### **OBJECTIVES OF THE STUDY**

1. To analyze India's climate policies and strategies post-Paris Agreement, assessing their alignment with global climate commitments.

2. To examine the effectiveness of India's climate mitigation and adaptation efforts across key sectors, including energy, agriculture, and urban planning.

3. To evaluate the geopolitical and economic challenges impacting India's climate policy implementation and international negotiations.

4. To propose sustainable policy interventions and financing mechanisms to enhance India's climate resilience while ensuring inclusive and equitable development.

### METHODOLOGY

This study adopts a qualitative research methodology, utilizing secondary data analysis to critically evaluate India's climate policies post-Paris Agreement. The research involves a comprehensive review of relevant academic literature,

Country/

Region

India

government reports, policy documents, and international climate frameworks, such as those from the UNFCCC and IPCC (Stern, 2024; Singh, 2025). A comparative analysis is central to this methodology, examining India's climate strategies in relation to global counterparts like China and Russia, as well as regional players such as the European Union (Mukhia & Zou, 2024). The study employs content analysis, thematic evaluation, and policy assessment frameworks to assess policy coherence, effectiveness, and barriers to implementation. This approach ensures a holistic understanding of India's evolving role in climate governance and its ongoing challenges in aligning developmental goals with global climate commitments.

# **RESULTS AND DISCUSSION**

1. Climate Policy Commitments and Long-term Goals				China	Expansion of renewable energy,	Largest producer of	National carbon
Count ry/Reg ion	Key Climate Commitments	Long-term Goals	Carbon Neutrality Target		carbon capture, forest carbon sinks, electric	solar and wind; 20% renewables	trading system (launched 2021)
India	NDCs aligned with Paris Agreement, renewable energy	Energy transition, climate resilience for vulnerable	Achieve carbon neutrality by		efficiency programs	2025, aims for 25% by 2030	2021)
	expansion (1/5 GW by 2022, 500 GW by 2030)	sectors, carbon intensity reduction	2070	Russia	Limited renewable energy transition,	Focusonnaturalgas,nuclear,and	No carbon pricing at national
China	2030, carbon neutrality by 2060, renewable energy	by 2060, peak emissions by 2030, leading in	Carbon neutrality by 2060		emphasis on energy efficiency in major industries	small-scale renewable	level
Russia	growth NDCs under Paris	global green technology Carbon neutrality	Carbon	European Union (EU)	Green Deal, emissions trading system (EU	Aggressive renewable targets (40%)	EU ETS for carbon pricing.
	Agreement, limited climate action focus due to dependence on fossil fuels	by 2060 (recent commitment)	neutrality by 2060 (recent announcemen t)	()	ETS), renewable energy integration	by 2030), offshore wind expansion	carbon border adjustmen
Europ ean	European Green Deal, Fit for 55	Achieve net-zero emissions by	Carbon neutrality by				mechanis m
Union (EU)	Package,ClimateLawmandating55%reduction2030	2050, transition to circular economy	2050	Great Britain (UK)	Phasing out coal, renewable energy expansion, hydrogen	Wind, solar, offshore wind; 40 GW offshore wind	Carbon pricing via carbon tax,
Great Britai n (UK)	Net-zeroemissionsby2050,firsttoadoptlegallybindingcarbon	Carbon neutrality by 2050	Net-zero by 2050		economy focus	by 2030	participati on in EU ETS until Brexit
Germ any	budgets Renewable energy transition (Energiewende), carbon price on emissions, 2030 renewable target of 65%	Carbon neutrality by 2045, commitment to reducing emissions by 55% by 2030	Carbon neutrality by 2045	Germany	Energiewende, phase-out of coal, investment in green hydrogen, focus on electric mobility	Wind, solar, biomass; aiming for 65% renewables by 2030	Carbon pricing via European ETS and national levies

#### 2. Climate Change Mitigation Strategies

Strategies

and

Key Mitigation

Large-scale solar

projects, National

Action Plan on

Climate Change

(NAPCC), energy

efficiency

improvements

wind

Renewable

Development

GW target by

2022, aiming

for 500 GW

focus

solar,

and

175

Energy

Major

wind,

hydro;

by 2030

on

Carbon

**Pricing/E** 

missions

Trading

national

carbon

pricing;

sectoral

states

s

approache

via

No

Country/ Region	Key Adaptation Strategies	Sector- specific Adaptation	Vulnerable Populations Focus	Country/ Region	2020-2030 Emission Reduction Target	Projected Emission Reductions by 2030	Progress/Chall enges
India	Disaster management, water conservation, agriculture resilience, urban resilience	Agriculture, coastal management, water resources, extreme heat plans	Focus on rural populations, farmers, and coastal communities	India China	Reduce emissions intensity by 33 35% from 200 levels by 2030 Peak carbo emissions b 2030, carbo	Expected 30- 35% 3- reduction 5 based or NDC targets on Projected 65- by 70% on reduction by	<ul> <li>Challenges: Coal dependency, funding needs, energy access</li> <li>Progress: Strong</li> <li>investments in</li> </ul>
China	Disaster risk reduction, water management, heat-resilient urban infrastructure	Agriculture, flood control, urban cooling strategies	Focus on climate migration, rural poverty alleviation	Russia	neutrality b 2060 Reduce emissions b 30% from 199 levels by 2030	Projected 20: py 30% 00 reduction	renewables, but coal remains dominant - Challenges: High fossil fuel dependence, economic constraints
Russia	Extreme weather event preparedness, forest management, agriculture	Northern regions (permafrost), energy infrastructure	Limited focus on vulnerable populations due to lower visibility of climate impacts	European Union (EU) Great	Reduce emissions b 55% from 199 levels by 2030 68% reduction	On track for by 40-50% 00 reduction by 2030 on Projected 60	<ul> <li>Progress:</li> <li>Strong policies,</li> <li>but need to accelerate implementation in industry</li> <li>Progress: Fast</li> </ul>
European Union (EU)	adaptation Regional adaptation plans, national adaptation strategies, urban climate adaptation	Urban resilience (heatwaves, floods), agriculture and forestry	Focus on marginalized and low-income groups, refugees, elderly population	Britain (UK) Germany	by 2030 from 1990 levels 55% reduction by 2030 from 1990 levels	m 70% reduction by 2030 on Projected 50 m 55% reduction	<ul> <li>regression i autoritation to to renewables, but transport remains a challenge</li> <li>Challenges: Coal phase-out, transport emissions, EU</li> </ul>
Great Britain (UK)	National Adaptation Programme, flood protection, climate risk	Coastal protection, agriculture adaptation	Focus on vulnerable groups such as elderly, disabled, and low-income communities	5. Climate Country/	Finance and In Domestic	vestment International	ETS integration Private
Germany	National Adaptation Strategy, climate-smart cities, flood	Forest and water management, urban heat mitigation	Special programs for vulnerable groups in flood- prone areas	Region India	Climate Investment Significant investment in solar and wind; major	Climate Finance Commitments Limited, but India receives climate finance from	Sector Involvemen t Increasing involvement in renewable energy

# 3. Adaptation and Climate Resilience

# 4. Emission Reduction Targets and Progress

protection

but

limited private

sectors,

funding for

and disaster

adaptation

developed

nations,

including

	response	Green Climate	finance for	India	Strong	Leading	Focus on fair
		Fund (GCF)	adaptation		advocate for	voice for	climate
China	Heavy	Major player in	Leading		climate	developing	finance
	investment	South-South	investor in		justice, equity	countries,	access,
	in green	climate	renewable		in global	advocating	support for
	technologies,	finance;	technologies		negotiations	for climate	vulnerable
	renewables,	funding Belt	and electric			finance and	populations
	and electric	and Road	vehicles			technology	
	vehicles	Initiative				transfer	
		projects with a		China	Active in	Global	Focus on
		focus on			climate	leader in	technology
		sustainability			diplomacy,	renewable	transfer to
Russia	Limited	Minimal	Private		hosting	energy, solar	developing
	focus on	international	sector		climate	power, and	nations,
	low-carbon	climate finance	mostly		summits and	green	particularly
	transition	commitments	invested in		global	technology	through Belt
	investments,		fossil fuels,		cooperation		and Road
	largely in oil		limited	Russia	Limited	Contributor	Focus on
	and gas		adaptation		leadership in	to global	energy
			investment		global climate	energy	security
European	EU Green	Leading	Strong		diplomacy	discussions,	rather than
Union	Deal	provider of	private		due to fossil	but less	equity in
(EU)	investment	international	sector		fuel	vocal on	climate
	plans, Just	climate	engagement,		dependence	climate	discussions
	Transition	finance, €25	especially in		т. I	justice	F
	Fund for	billion for	renewables	European	Leading in	Strong	Focus on
	coal regions	developing	and circular	Union		leadersnip in	
		nations by	economy	(EU)	cimate	Agreement	Justice,
Creat	f12 billion	2023	Strong		EL Green	Agreement,	particularly in
Britain	cver 5 years	pledge to	brivate		Deal as global	Law and	vulnerable to
	for climate	climate finance	sector		model	Law, and	climate
	finance	for developing	commitment		model	trading	impacts
	including	nations by	in green			systems	impuets
	overseas	2025	finance low-	Great	Farly leader in	First to	Strong
	development	2020	carbon	Britain	carbon	commit to	emphasis on
	assistance		innovation	(UK)	budgets, a key	net-zero	equitable
Germany	Heavy	€4 billion	Strong	(011)	role in the	emissions.	transition.
	public	annually in	private		creation of the	strong	climate
	investment	climate finance	sector		Paris	influence in	finance for
	in green	to developing	involvement,		Agreement	COP	developing
	infrastructur	nations	especially in		C	negotiations	countries
	e, including		green tech	Germany	Strong	Leader in	Focus on Just
	electric		and energy	•	advocate for	renewable	Transition for
	vehicles and				the Paris	energy	workers in
	energy				Agreement,	transition,	coal regions,
	transition				significant	coal phase-	EU climate
					contributions	out	justice
					to EU and	commitment	framework

# 6. Global Leadership and Climate Diplomacy

Country/	Climate	Global	Climate	
Region	Diplomacy	Climate	Justice and	
	Role	Leadership	Equity Focus	
		Areas		

global climate s

policy

#### DISCUSSION

India's approach to climate change in the post-Paris Agreement era reflects its complex balancing act between economic growth, social equity, and environmental sustainability. As one of the world's fastest-growing economies, India faces significant challenges in mitigating climate change while meeting its developmental needs. India's Nationally Determined Contributions (NDCs) to the Paris Agreement underscore this tension, aiming for a reduction of carbon intensity by 33-35% by 2030, alongside ambitious goals for renewable energy expansion. While India has made notable strides in renewable energy deployment, achieving a target of 175 GW by 2022, its commitment to carbon neutrality by 2070 reflects the deep-rooted challenges it faces in decoupling growth from emissions (Sharma, 2021; Godara, 2025). The country's path is further complicated by regional disparities, as some states face unique challenges related to industrialization and energy access, which exacerbate the overall policy effectiveness (Mukhia & Zou, 2024).

Mitigation strategies, particularly in renewable energy, form the cornerstone of India's climate policy. The Indian government has committed to achieving 500 GW of renewable energy capacity by 2030, with large-scale investments in solar and wind energy (Kumar, 2021). However, the transition faces multiple challenges, including a high reliance on coal and the need for significant infrastructure overhaul. While India's focus on solar energy has made it a global leader in clean energy development, the lack of efficient grid integration and storage capacity poses barriers to achieving its long-term climate goals (Jain, 2020). In this context, India's policies must account for both energy security and climate justice. As part of its commitment to international climate agreements, India has stressed the importance of climate finance and technology transfer from developed countries, arguing that financial support is crucial for ensuring that vulnerable communities are not left behind in the transition to a low-carbon economy (Patel, 2020; Singh, 2025). This plea highlights India's role in global climate diplomacy, advocating for equitable funding and technology transfer mechanisms to support sustainable development goals.

While India's climate policies largely focus on mitigation, the country's adaptation strategies are equally critical in building resilience against climate impacts. India's National Action Plan on Climate Change (NAPCC) outlines key areas such as water resource management, agriculture, and disaster risk reduction (Reddy, 2020). These adaptation strategies are particularly important given India's vulnerability to extreme weather events, such as floods, droughts, and heatwaves. Sectorspecific adaptation initiatives, such as climate-resilient agricultural practices and water conservation efforts, have the potential to address regional vulnerabilities effectively (Sharma, 2021). However, challenges remain in implementing these strategies uniformly across the country, due to varying local capacities and levels of governance. Thus, while India is making strides in climate adaptation, its approach must be contextualized within the broader framework of social equity, ensuring that marginalized communities, particularly in rural and coastal areas, receive the necessary support to build resilience (Godara, 2025; Reddy, 2020). In sum, India's post-Paris climate policies reflect a blend of ambition and constraint, requiring both national and international cooperation to overcome the economic, social, and environmental challenges of climate change.

# CONCLUSION

In conclusion, India's approach to climate change in the post-Paris Agreement era reveals a nuanced path towards sustainable development, framed by its unique socio-economic challenges and environmental vulnerabilities. The country's commitment to reducing carbon intensity and scaling renewable energy capacity is commendable, with ambitious targets set in its Nationally Determined Contributions (NDCs). However, India's carbon neutrality goal by 2070 highlights the slower pace at which it can decouple economic growth from fossil fuel dependency, due to its large-scale industrial base and the need to provide equitable energy access to millions of its citizens (Jain, 2020; Kumar, 2021). The strategies laid out in India's renewable energy policies, such as achieving 500 GW by 2030, are vital steps in addressing climate change, but the implementation faces challenges, including grid integration and storage capacity (Sharma, 2021). In this context, India's efforts to navigate climate justice-ensuring that marginalized communities are not left behind-are crucial in advancing both its domestic and international climate agendas (Mukhia & Zou, 2024; Godara, 2025). Climate finance, as advocated by India in global negotiations, plays an essential role in facilitating this transition, underscoring the country's active participation in global climate diplomacy (Patel, 2020; Singh, 2025).

India's adaptation strategies, outlined in its National Action Plan on Climate Change (NAPCC), emphasize sectoral resilience in agriculture, water resources, and urban areas, addressing the immediate climate risks faced by vulnerable communities (Reddy, 2020). However, the country's progress is uneven, with challenges in translating national strategies into effective local action. This disparity, coupled with the pressures of balancing development with environmental sustainability, highlights the need for a more integrated, regionally sensitive approach to climate governance (Sharma, 2021). As India continues to evolve its climate policies, the role of international cooperation, particularly in terms of financing and technology transfer, will be critical in overcoming these barriers. Ultimately, India's journey toward a sustainable and climate-resilient future

requires a concerted effort to integrate social, economic, and environmental considerations in its national and global climate strategies (Godara, 2025; Mukhia & Zou, 2024).

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