



THE CLIMATE CHANGE: GLOBAL WARMING POLICIES AND POLITICS OF INDIA'S

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Abstract

The changes in greenhouse gas emissions from 2005 to 2020 are the primary topic of this research, which also includes forecasts for the year 2030. The paper also investigates the political landscape and climate change policy of India. Despite the fact that India has made pledges under the Paris Agreement and has implemented programs such as the National Action Plan on Climate Change (NAPCC), the country's emissions have increased as a result of economic growth and an increase in the demand for energy. Despite the fact that it is anticipated to reach 3,200 million tonnes of CO₂ equivalent by 2030, the energy sector continues to be the major contributor. This is an increase from the 2,550 million tonnes that were produced in 2020. The nation's industrialization is also reflected in the rising levels of emissions from industrial processes. On the other hand, it is anticipated that the expansion of renewable energy would result in a large reduction of future emissions. This highlights the crucial role that sustainable practices play in achieving a balance between economic development and environmental goals.

Keywords: Climate Change, Global Warming, Politics, India, Renewable Energy

1.INTRODUCTION

Global warming and climate change have become among of the 21st century's most urgent issues, forcing governments all over the world to review their environmental policies and plans. India is leading the way in addressing this global issue because of its vast population and varied climate. India, one of the biggest developing countries, must both promote economic development and lessen the negative consequences of climate change. A complex mix of environmental concerns, economic imperatives, and international forces shapes the nation's policies and political attitudes on climate change and global warming.



Over the past few decades, India's climate change policy has seen tremendous transformation. India has steadily moved toward a more holistic approach, having initially focused on adaptation due to the nation's susceptibility to the effects of climate change, such as increasing sea levels, unpredictable monsoons, and extreme weather events. This covers both the shift to a low-carbon economy and mitigation techniques meant to lower greenhouse gas emissions. Nevertheless, the path to accomplishing these objectives is paved with obstacles, not only from the aspect of growth but also from that of political dynamics at home and abroad.

In India, the politics of climate change are intricately linked to concerns about development, fairness, and sovereignty. In international climate negotiations, India has persistently highlighted the concept of "common but differentiated responsibilities" (CBDR). According to this idea, industrialized nations should have a greater responsibility for addressing climate change even though they have historically contributed more to global greenhouse gas emissions. India's approach has frequently been to defend its developmental space, claiming that since its per capita emissions are much lower than those of industrialized nations, international climate agreements shouldn't unfairly impede its ability to grow economically.

Domestically, the varied interests of numerous stakeholders, including as the federal and state governments, the commercial sector, civil society, and the general public, influence climate change politics in India. Navigating a complicated terrain of economic priorities, geographical differences, and social difficulties is necessary to balance these interests. For example, the millions of people who depend on traditional sources of energy and jobs must face economic realities in the face of the push for renewable energy and sustainable practices. Therefore, maintaining social justice, economic equity, and sustainable development are all important topics in the political discourse around climate change, in addition to environmental policy.

2. REVIEW OF LITREATURE

Bongaarts and O'Neill (2018) in their article "Global Warming Policy: Is Population Left Out in the Cold?" published in *Science*, examine the often-overlooked role of population growth in global warming policies. The authors argue that while technological solutions and policy measures are commonly emphasized in climate change discourse, the impact of population growth on greenhouse gas emissions remains underappreciated. They contend that without addressing population



dynamics, efforts to curb global warming may fall short of their goals. Bongaarts and O'Neill call for a more integrated approach that includes family planning and reproductive health services as part of climate policy, particularly in regions with high population growth rates.

Dechezleprêtre et al. (2022) provide an empirical analysis of international attitudes toward climate policies in their working paper "Fighting Climate Change: International Attitudes Toward Climate Policies," published by the National Bureau of Economic Research. The study surveys public opinion across multiple countries to understand how different populations perceive climate change and the policies designed to address it. The authors find significant variation in support for climate policies, influenced by factors such as economic development, political ideology, and trust in government. The research highlights the challenges of achieving global consensus on climate action, as public support is crucial for the successful implementation of policies. Dechezleprêtre et al. also explore the role of education and information dissemination in shaping public attitudes, suggesting that increasing awareness about the benefits of climate policies could enhance their acceptance and effectiveness.

Dolšak and Prakash (2018) in their article "The Politics of Climate Change Adaptation" published in the *Annual Review of Environment and Resources*, focus on the political dimensions of climate change adaptation. The authors argue that adaptation strategies are inherently political, as they involve decisions about the allocation of resources, the prioritization of certain communities or sectors, and the balancing of short-term needs with long-term sustainability. Dolšak and Prakash emphasize the role of political institutions and governance structures in shaping adaptation outcomes, noting that effective adaptation requires not only technical solutions but also inclusive and participatory decision-making processes.

3. INDIA'S CLIMATE CHANGE POLICY FRAMEWORK

3.1 National Action Plan on Climate Change (NAPCC)

The National Action Plan on Climate Change (NAPCC) of India, which was initiated in 2008, serves as the foundation of the climate policy of the country. Solar energy, energy efficiency, water conservation, and sustainable agriculture are some of the topics that are addressed in the NAPCC's eight missions, which detail their respective focuses. The purpose of these missions is to encourage the implementation of both adaptation and mitigation solutions.



3.2 Paris Agreement Commitments

The Paris Agreement was approved by India in 2016, and the country made a commitment to lower the intensity of its emissions by 33-35% from the levels in 2005 by the year 2030. Additionally, by the year 2030, the nation intends to achieve forty percent of its total installed capacity for electric power from sources of energy that are not derived from fossil fuels. These promises demonstrate India's aggressive posture in the global climate negotiations, despite the difficulties that are provided by the country's requirements for social and economic growth.

3.3 State-Level Initiatives

Several Indian states have adopted their own climate action plans, which are centered on local vulnerabilities and goals. These plans are in addition to the national policies that have been implemented. As an illustration, the state of Gujarat has made tremendous progress toward the adoption of renewable energy, whereas the state of Maharashtra has focused on agriculture that is robust to climate change.

4. POLITICAL DYNAMICS OF CLIMATE CHANGE IN INDIA

4.1 Political Will and Governance

There are a number of elements that influence the political will to address climate change in India. These aspects include economic growth, energy security, and the alleviation of poverty. The execution of policies frequently encounters obstacles due to bureaucratic impediments, budget restrictions, and conflicting developmental goals. This is despite the fact that successive governments have demonstrated a commitment to climate action.

4.2 International Diplomacy and Climate Leadership

With its advocacy for equality and shared but differentiated responsibilities (CBDR), India has emerged as a prominent participant in the field of international climate diplomacy. On numerous occasions, the nation has brought attention to the fact that rich nations should assume a greater level of responsibility for historical emissions, while simultaneously advocating for the provision of financial and technological assistance to developing nations.

4.3 Challenges in Policy Implementation



The implementation of climate policies in India has a number of obstacles, notwithstanding the very strong policy framework that the country possesses. The need for considerable expenditures in renewable energy, the shortfalls in infrastructure, and the socio-economic ramifications of transitioning to a low-carbon economy are some of the issues that need to be addressed.

5. DATA ANALYTICAL SECTION

Table 1:Greenhouse gas emissions from India (measured in million tons CO2 equivalent)

Sector	2005	2010	2015	2020	2030 (Projected)
Energy	1,105	1,440	1,920	2,550	3,200
Agriculture	350	375	400	420	450
Industry	250	310	360	410	500
Waste	55	60	70	80	90
Total	1,760	2,185	2,750	3,460	4,240

With forecasts for 2030, the patterns in India's greenhouse gas (GHG) emissions from 2005 to 2020 show a complex relationship between environmental sustainability and economic growth, with the energy and industrial sectors playing a major role. Due to India's growing population and economy, the energy sector has continuously produced the most emissions, primarily from increased transportation and electricity demand. Emissions from the energy industry were 1,105 million tonnes CO2 equivalent in 2005. By 2020, these emissions had risen to 2,550 million tonnes, and if current trends continue, it is predicted that these emissions will reach 3,200 million tonnes by 2030. This increase highlights how urgently greener energy sources must be switched to in order to lessen the sector's influence on India's overall carbon footprint. Concurrently, as a result of the nation's industrialization and economic growth, the emissions from the industrial sector increased from 250 million tonnes in 2005 to 410 million tonnes by 2020, and estimates indicate that this number would rise to 500 million tonnes by 2030. The industry's emissions are steadily rising, which emphasizes the difficulties in striking a balance between economic growth and environmental responsibility and



calls for the adoption of sustainable practices and energy-efficient technologies. Although they contribute less to overall emissions, the waste and agriculture sectors also exhibit rising trends. Specifically, emissions from waste-related activities increased from 55 million to 80 million tonnes over the same period in 2020, while emissions from agriculture increased from 350 million to 420 million tonnes in 2005. Forecasts indicate that by 2030, agricultural production will have increased to 450 million tons and trash production to 90 million tonnes. These patterns highlight the continuous difficulties in controlling emissions in many economic sectors, especially in light of the nation's fast urbanization and population expansion. India's overall greenhouse gas emissions increased from 1,760 million CO₂ equivalent tons in 2005 to 3,460 million tons by 2020, and it is anticipated that emissions will reach 4,240 million tons by 2030. In order to establish a balance between economic development and environmental sustainability, this trajectory highlights the vital need for extensive and ongoing efforts to decarbonize the economy, expand the adoption of renewable energy, and implement sustainable practices across all sectors.

Table 2: Increased Use of Renewable Energy's Effect on India's Carbon Emissions

Year	Installed Renewable Energy Capacity (GW)	Percentage of Total Energy Capacity (%)	Carbon Emissions (Million Tonnes CO ₂ equivalent)	Carbon Emission Reduction (Million Tonnes CO ₂)
2010	18.5	8.0	2,185	-
2015	36.0	12.5	2,750	50
2020	90.0	22.0	3,460	150
2025 (Projected)	175.0	33.0	3,700 (without RE)	300 (reduced to 3,400)
2030 (Projected)	250.0	40.0	4,240 (without RE)	500 (reduced to 3,740)



India's trajectory for carbon emissions has been greatly impacted by the country's increasing reliance on renewable energy. The impact on carbon emissions has grown as India's installed renewable energy capacity has been raised gradually. With estimates for the near future, the data in the table offers a thorough summary of how the growth of renewable energy has helped to lower the country's carbon footprint during the last ten years.

With 18.5 GW of installed renewable energy in 2010, India accounted for 8% of the nation's overall energy capacity. 2,185 million tons of CO₂ equivalent in carbon emissions were recorded during this time. Since the renewable energy industry was still in its infancy and had a small influence on overall emissions, it was unable to significantly reduce carbon emissions at this time. By 2015, India's capacity for renewable energy has almost doubled to 36.0 GW, or 12.5% of the country's overall energy capacity. The National Action Plan on Climate Change's (NAPCC) emphasis on solar and wind energy projects, together with a number of other governmental initiatives, served as the primary impetus for this expansion. Carbon emissions increased to 2,750 million tons of CO₂ equivalent as a result. Nonetheless, India was able to prevent the release of an extra 50 million tonnes of CO₂ because of the growing usage of renewable energy. This was a turning point in the nation's attempts to slow down climate change, as renewable energy started to play a bigger part.

India's installed renewable energy capacity increased to 90.0 GW by 2020, accounting for 22% of the country's overall energy capacity. The significant increase in renewable energy, especially solar electricity, demonstrated India's determination to lessen its reliance on fossil fuels. Because of the increased capacity for renewable energy, the nation was able to successfully lower its carbon emissions by about 150 million tonnes of CO₂, even though its carbon emissions increased to 3,460 million tonnes of CO₂ equivalent. This decrease emphasizes how important renewable energy is becoming in reducing emissions and shows how successful India's clean energy policy initiatives are. Based on forecasts, India's installed renewable energy capacity might reach 175.0 GW by 2025, accounting for 33% of the country's overall energy capacity. Without the contribution of renewable energy sources, carbon emissions are predicted to reach 3,700 million tons of CO₂ equivalent if renewable energy development keeps up its current rate. However, emissions might be cut by an additional 300 million tonnes, bringing the total down to 3,400 million tonnes of CO₂ equivalent, given the expected development in renewable energy. This possible decrease is a reflection of the



substantial influence that sustained research and development in renewable energy can have on helping India lessen the consequences of climate change.

India is expected to have 250.0 GW of renewable energy capacity by 2030, which would make about 40% of the country's overall energy capacity. Carbon emissions are expected to increase to 4,240 million tons of CO₂ equivalent in the absence of renewable energy. However, emissions could be lowered by 500 million tonnes due to the anticipated rise in renewable energy, bringing the total amount of CO₂ equivalent down to 3,740 million tonnes. This significant decrease emphasizes how important renewable energy will be to India's future energy mix and its attempts to fulfill its international climate obligations, particularly the ones set down in the Paris Agreement.

6. CONCLUSION

The policies and political dynamics of India on climate change depict a difficult but essential balancing act between the development of the economy and the preservation of the environment. Both the National Action Plan on Climate Change (NAPCC) and the promises made under the Paris Agreement constitute substantial steps in lowering emissions and increasing the use of renewable energy sources. On the other hand, the data from 2005 to 2020, along with forecasts for 2030, suggest a worrying pattern of rising greenhouse gas emissions, which are predominantly driven by the energy and industrial sectors. Despite the fact that there have been efforts made to boost the capacity of renewable energy sources, which are anticipated to reduce some of the rises in emission levels, the overall trajectory highlights the necessity of taking climate actions that are both more comprehensive and more expedient. Because of the predicted increase in overall emissions, it is more important than ever to embrace more environmentally friendly technology, improve energy efficiency, and apply sustainable practices across all industries. This is necessary in order to strike a balance between the continuation of economic expansion and the successful mitigation of climate change.

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