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# The Role of Climate Change Policies in Promoting Sustainable Development in India

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**ABSTRACT:** India is susceptible to wide scale climate change-related risks due to its various climate zones, topography, and ecosystems. The Global Climate Risk Index 2021<sup>i</sup> calls India the 7th most affected nation due to climate change. As per the State of India's Environment in Figures 2022<sup>ii</sup> India reported 280 heatwave days (the highest in 12 years) between the period 11th March – 18th May 2022.

Climate change exposes vulnerable communities to dangers like disasters, diseases, loss of livelihoods, crop failures, poverty and displacement, threatening loss of biodiversity and food security<sup>iii</sup>.

International pressure for urgent climate action heightened when the first legally binding international treaty, the Kyoto Protocol containing the GHG reduction targets, came into effect in 2005. Thereafter, increased emphasis was laid upon domestic policy for climate change both at the national and state government levels along with private and civil society groups

**KEYWORDS:** climate change, policies, India, sustainable, development

## I. INTRODUCTION

Climate change policies in India have primarily focused on supporting synergies between development and outcomes for the climate. India was one of the few countries that passed the Energy Conservation Act in 2001 which underwent an amendment in August 2022. Some changes include consumers meeting their energy needs from non-fossil sources, application of the Energy Conservation Building Code (ECBC) to office and residential buildings for loads equal to or more than 100 KW, and specification of energy consumption standards for ships and vehicles.

India has developed its policy response through missions and programmes to reduce its climate vulnerability. On 30th June 2008, the National Action Plan on Climate Change (NAPCC)<sup>v</sup> was released. It is a national strategy of 8 sub-missions to help adapt and magnify ecological sustainability in India's development path. These are National Solar Mission (NSM), National Mission for Enhanced Energy Efficiency (NMEEE), National Mission on Sustainable Habitat (NMSH), National Water Mission (NWM), National Mission for Sustaining the Himalayan Ecosystem (NMSHE), National Mission on Strategic Knowledge for Climate Change (NMSKCC), National Mission for a Green India (GIM), and National Mission for Sustainable Agriculture (NMSA).[1,2,3]

On 3 August 2022, the Union Cabinet under the Chairmanship of the Prime Minister passed the updated Nationally Determined Contribution (NDC) for consideration by the United Nations Framework Convention on Climate Change (UNFCCC) under the Paris Agreement, to reach India's goal of net zero emissions by 2070. This was a translation of the Panchamrit (five nectar elements) – India's action plan against climate change, announced at COP 26 in Glasgow, United Kingdom.

Quantified Goals	Non-Quantified Goals
To reduce the emissions intensity of its GDP by 45 per cent by 2030, from the 2005 level.	To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for 'LIFE' – 'Lifestyle for Environment' as a key to



	combating climate change.
To achieve about 50 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, with the help of the transfer of technology and low-cost international finance including from the Green Climate Fund (GCF).	To adopt a climate-friendly and cleaner path than the one followed hitherto by others at the corresponding level of economic development.
To create an additional carbon sink of 2.5 to 3 billion tonnes of CO <sub>2</sub> equivalent through additional forest and tree cover by 2030.	To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, the Himalayan region, coastal regions, and health and disaster management.
	To mobilize domestic and new & additional funds from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.
	To build capacities, create a domestic framework and international architecture for quick diffusion of cutting-edge climate technology in India and joint collaborative R&D for such future technologies.

Source: PIB, Government of India

The updated NDCs give the country clear instructions on how to separate economic growth from greenhouse gas emissions. The changes are made given the national scenario and the fundamentals of common but differentiated responsibilities along with corresponding competencies. It is possible to achieve the Sustainable Development Goals (SDGs) as well as a reduction in carbon emissions by implementing the NDC.

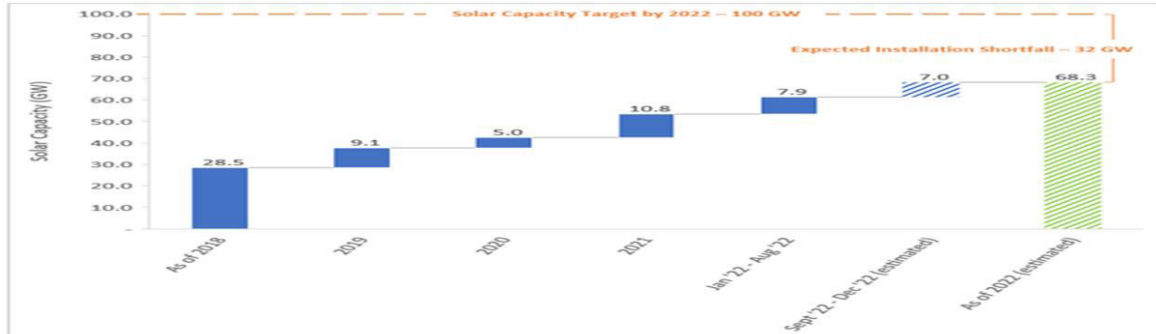
#### Current challenges in India’s climate policy

For the Energy Conservation (Amendment) Bill 2022<sup>vi</sup>, the Ministry of Power (MoP) is appointed as the nodal Ministry and the Bureau of Energy Efficiency (BEE) as the implementing agency. However, the question arises whether the MoP will be the right body to regulate the scheme. As per the Business Allocation Rules, it is the MoEFCC that looks into climate change matters and environmental norms. In countries such as the UK and the US, it is the Environment Ministry that implements the schemes as proposed by the Bill. There is no clarity as to who will regulate the carbon credit certificates as mentioned in the Act. The interchangeability of certificates is not clearly defined as the same activity may be applied to energy savings, renewable energy, and carbon credits.

Till now, India has installed 6.7 GW of solar rooftop panels<sup>vii</sup> which is quite less compared to its target of 40 GW in 2022<sup>viii</sup>. An overall shortfall of 32 GW is expected in reaching the target of 100 GW solar capacity by 2022. As per the report, The State of Renewable Energy in India 2019 by the Center for Science and Environment, New Delhi, inconsistent policies, [4,5,6] underperformance of distribution companies, rise in subsequent tariffs, and more interest towards large-scale renewable energy are some of the reasons for this failure. The slow pace is a result of more preference being given to industrial and commercial sectors over the residential domain.



Progress in India’s solar power capacity’



Source: Economic Times

The Green India Mission meant to revive forests through afforestation activities has fallen short of its objectives by 30% from 2015-16 to 2020-21. States like West Bengal, J&K, and Himachal Pradesh have not yet become a part of this scheme.

State-wise targets and achievements under Green India Mission from FY 2015-16 to FY 2020-21

S.No.	States	Advance Target (ha)	work	Creation of Achievement (ha)	Plantation
1.	Andhra Pradesh	2737		1433	
2.	Chhattisgarh	20191		19128	
3.	Himachal Pradesh	5480		–	
4.	Jammu & Kashmir	5680		–	
5.	Karnataka	1920		1920	
6.	Kerala	12298		9015	
7.	Madhya Pradesh	23358		19470	
8.	Maharashtra	6766		5224	
9.	Manipur	16920		11740	
10.	Mizoram	19643		19643	
11.	Odisha	16634		16634	
12.	Punjab	4304		4304	
13.	Sikkim	1509		1509	
14.	Uttarakhand	11045		7483	



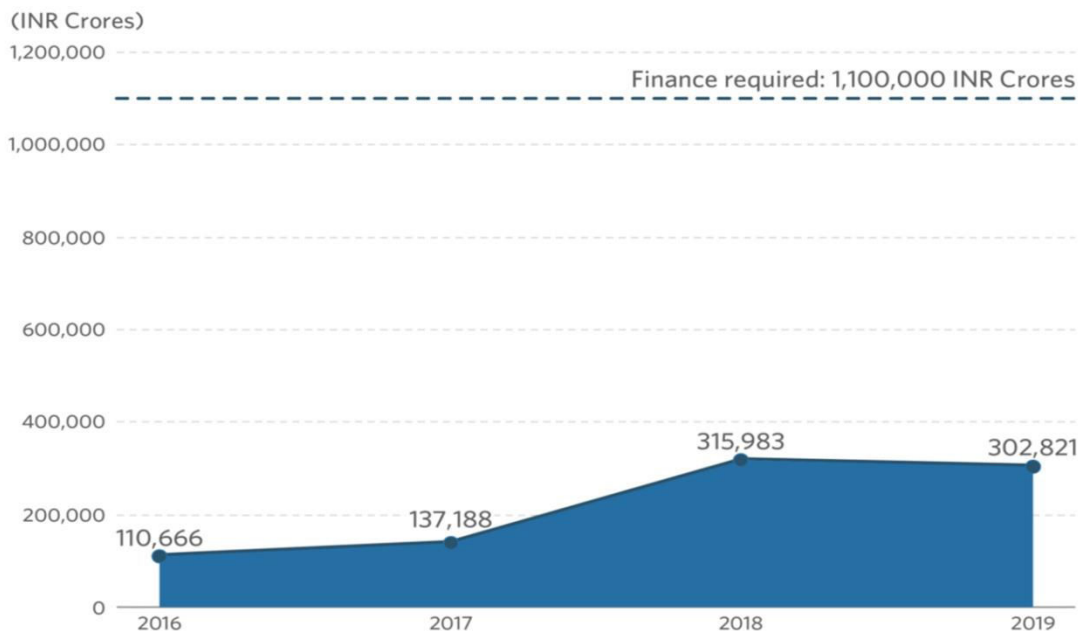
15.	West Bengal	18666	–
Total		167151	117503

## II. DISCUSSION

The NWM does not address the issue of equity as the demand for water among affluent people is more, which has reduced the per capita availability of water for lower sections. Furthermore, NMSHE faces major challenges like shortage of manpower, financial constraints, technical issues, and lack of coordination among research institutions and ministries. In the case of NMSKCC, the involved states are yet to set up nodal agencies, climate networks, capacity-building initiatives, and data-sharing systems. A secure payment mechanism remains absent for such institutions which host energy efficiency projects. NMEEE also suffers from poor knowledge exchange between energy suppliers and consumer sectors<sup>ix</sup>

New schemes such as AMRUT, HRIDAY, Smart City Mission, National Urban Livelihood Mission, and Swachh Bharat focus on concentrated areas with their objectives overlapping with the National Mission for Sustainable Habitat. These new schemes have drawn more attention than the NMSH. A few main guidelines for transport, energy efficiency, and sustainable habitat are yet to be incorporated into the urban planning process. There are major gaps in the National Mission for Sustainable Agriculture (NMSA) which includes less focus on small and marginal farmers for climate change resilience and less attention to adaptation scenarios. Also, the success of NMSA depends upon its integration with other national programmes on agriculture, development, and food security like MNREGA, National Food Security Mission, and Farm Management Mission among others. It is a long and tedious task as most of these fall under different ministries, making coordination difficult.[7,8,9]

According to the Economic Survey 2020-21<sup>x</sup>, to achieve India’s Nationally Determined Contribution goals, a financial resource of USD 2.5 trillion (INR 11 lakh crores) at 2014-15 prices is needed. The graph below clearly depicts the gap in obtaining climate finance for NDC on India’s part.



Climate finance is necessary to fulfil NDC targets. By 2020, developed nations were to provide USD 100 billion to developing countries which did not happen. Moreover, IFSCA Expert Committee on Sustainable Finance estimated that India needs investments of \$10 trillion to make the carbon neutrality story a success by 2070. However, the Climate Policy Initiative (CPI) reported that India could raise only \$44 billion<sup>xi</sup> (25% of the total target required each year) in FY 2019-20. The international investment was 13% and 17% in 2019 and 2020 respectively which is less due to the 5%

hedging cost in the region. Due to the absence of a proper green finance taxonomy and casual reporting of data, domestic entries are tagged arbitrarily and are subject to the user's discretion.

India, as one of the largest and fastest-growing economies in the world, plays a crucial role in the global fight against climate change and sustainability. The country has recognized the importance of sustainable development and has taken proactive measures to address climate change concerns. These measures include the introduction of the National Action Plan on Climate Change, which focuses on balancing development and combatting climate change through various national missions. India has also established a dedicated ministry for new and renewable energy, highlighting its commitment to promoting clean and sustainable sources of energy. India's active participation in international climate negotiations further demonstrates its determination to contribute to global efforts in tackling climate change.

India's climate diplomacy and its engagement with the United Nations Framework Convention on Climate Change have shown a shift in its foreign policy agenda towards becoming a leader in global governance and a key player in global climate politics. Furthermore, India's role in international climate negotiations has been pivotal, with the country emphasizing the disproportionate impact of climate change on developing nations.

While India's efforts in climate change and sustainability are commendable, some critics argue that the country's rapid economic growth and industrialization have contributed significantly to global carbon emissions. The focus on economic development has often led to a prioritization of short-term economic gains over long-term environmental concerns.

Critics also point out that India's continued reliance on coal as a major source of energy has hindered significant progress in reducing greenhouse gas emissions. Despite the establishment of the Ministry for New and Renewable Energy and the National Solar Mission, the share of renewable energy in India's total energy mix remains relatively low compared to that of fossil fuels.[10,11,12]

India's efforts in promoting renewable energy sources and implementing strategies to mitigate climate change cannot be overlooked. India's role in the global fight for climate change and sustainability is significant. India's role in the global fight for climate change and sustainability can be seen through its various national missions, dedicated ministry for new and renewable energy, and promotion of solar energy and enhanced energy efficiency.

Some of the steps taken by the Indian Government are :

- Encouraging investments in renewable energy projects to increase the share of renewable energy in India's total energy mix.
- Implementing policies and regulations to support the growth of renewable energy industries and facilitate the transition towards a low-carbon economy.
- Implementing energy efficiency measures in various sectors, such as buildings, transportation, and industries , to reduce energy consumption and greenhouse gas emissions.
- Supporting research and development initiatives in clean technologies to further advance sustainable energy solutions.
- Collaborating with international partners and participating actively in global climate negotiations to advocate for the rights of developing nations and push for ambitious climate action to combat climate change and ensure a sustainable future for all.

India's efforts to promote renewable energy and sustainability are deeply entwined with its ambitious national missions. The country's dedication to sustainable development is evident in the comprehensive approach taken by the National Action Plan on Climate Change, which addresses key sectors through its "National Missions." These missions, including the promotion of solar energy, sustainable agriculture, and enhanced energy efficiency, represent a strategic and integrated effort to combat climate change and promote sustainable development.

Furthermore, the establishment of a dedicated ministry for new and renewable energy underscores India's commitment to advancing clean and sustainable sources of energy. The National Solar Mission, a cornerstone of India's renewable energy policy, exemplifies the country's proactive approach to harnessing solar power [13,14,15]and reducing its reliance on fossil fuels.

Despite India's progress in promoting renewable energy, challenges remain, particularly in balancing economic growth with environmental sustainability. Critics raise concerns about the continued reliance on coal as a major energy source and the need to accelerate the transition to renewable energy. The trade-off between economic development and environmental conservation underscores the complex decisions that India faces in its pursuit of sustainability.

India's active participation in global climate negotiations and its advocacy for the rights of developing nations contribute to shaping the international discourse on climate change. The country's position reflects a nuanced understanding of the differentiated responsibilities of developed and developing countries in addressing climate change and underscores the need for collaborative action on a global scale.

As India continues to navigate the complexities of sustainable development and climate change mitigation, the convergence of policy initiatives, technological innovation, and international collaboration will be crucial in advancing the country's sustainability goals and contributing to the global fight against climate change.

It is important to consider these opposing viewpoints to have a comprehensive understanding of India's role in global climate change and sustainability. India plays a significant role in the global fight for climate change and sustainability through its comprehensive policy initiatives, such as the National Action Plan on Climate Change and the promotion of renewable energy sources such as solar and wind power.

India has the potential to lead the world in the transition towards green energy and sustainable economic development. By capitalizing on its vast renewable energy resources and investing in innovative technologies, India can not only address its own energy needs but also contribute to global efforts to reduce GHG emissions. Overall, our proactive approach in being climate conscious will make us the leaders in the near future. The building blocks are already there in our cultural ecosystem and society. We as a society, have always been conscious about avoiding waste and utilizing every resource to the fullest extent. India's unique position as a developing nation with a rapidly growing economy gives it an opportunity to adopt sustainable practices and technologies from the outset, rather than relying on outdated and unsustainable methods. India's approach to climate change is indeed multifaceted, encompassing both domestic policy and international diplomacy. It is important to recognize that India's efforts in promoting renewable energy and sustainability stem from a complex balance between economic growth and environmental conservation. While the country has made significant strides in advancing clean energy sources, critics have raised valid concerns about its continued reliance on coal and the need for a more rapid transition to renewable energy.

In addition to domestic initiatives, India's active participation in global climate negotiations and its advocacy for the rights of developing nations are crucial in shaping the international discourse on climate change. The country's stance reflects a nuanced understanding of the differentiated responsibilities of developed and developing countries in addressing climate change and emphasizes the need for collaborative action on a global scale.

Looking ahead, India has the potential to lead the world in the transition towards green energy and sustainable economic development. By leveraging its vast renewable energy resources and investing in innovative technologies, India can not only address its own energy needs but also contribute to global efforts to a better planet.

### III. RESULTS

India's commitments made under the United Nations Framework Convention on Climate Change (UNFCCC) and its Paris Agreement, reflect the principles of equity, common but differentiated responsibilities and respective capabilities in the light of national circumstances. India's climate vision is also integrally linked to India's vision of development that foregrounds the goals of poverty eradication and guaranteeing basic well-being as an immediate necessity to meet the challenge of global warming. India submitted its Nationally Determined Contribution (NDC) under the Paris Agreement on a "best effort basis" keeping its developmental imperatives in mind. India committed to (i) reduce the emission intensity of GDP by 33 to 35 per cent by 2030 as compared to 2005 level; (ii) create an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through additional forest and tree cover by 2030; and (iii) achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel energy resources by 2030. Against these targets, India's third Biennial Update Reports (BUR) submitted to the UNFCCC in 2021 reports that during 2005-2016, the country had reduced emission intensity of its GDP by 24 per cent. According to the India State of Forest Report 2021 released in January 2022, the total carbon stock in the country's forests is estimated to be 7,204 million tonnes, and the carbon stock in forest has increased by 79.4 million tonnes as compared to the last assessment of 2019.

According to the Central Electricity Authority, as on 31st December 2021, the share of non-fossil sources in installed capacity of electricity generation was 40.20 per cent. The Hon'ble Prime Minister of India, as a part of the national statement delivered at the 26th Conference of the Parties (COP 26) in Glasgow in November 2021, announced ambitious targets to be achieved by 2030 to enable further reduction in emissions. In order to coordinate India's response on climate change, an institutional framework of a high-level inter-ministerial Apex Committee for the Implementation of Paris Agreement (AIPA) has been created. The Committee reflects India's whole-of-government approach towards climate action. The purpose of AIPA is to generate a coordinated response on climate change and ensure that India is on track towards meeting its obligations under the Paris Agreement. Year 2021 marks the beginning of the implementation phase of the Paris Agreement and constitution of AIPA is central to strengthening the institutional arrangements for implementation and monitoring of climate actions[16,17,18]

#### IV. CONCLUSION

India's performance on the NITI Aayog SDG India Index has improved from an overall score of 60 in 2019-20 to 66 in 2020-21. India has also been making significant strides in increasing its forest area, ranking third globally in net gain in forest area during the decade (2010-20). Much of India's increase in forest cover during 2011-21 is attributed to enhancement in very dense forest cover, which rose by approximately 20 per cent during the period.[19] Open forest cover also improved by seven per cent during the period. Going forward, there is need to further improve forest and tree cover. Social forestry could also play a significant role in this regard. States/UTs need to improve management of its ground water resources through improving its recharge and by stemming its over-exploitation, and to prevent the critical and semi-critical assessment units from further worsening. There is a greater thrust on climate action following the announcement of India's target of becoming Net Zero by 2070. Climate finance will remain critical to successful climate action by developing countries, including India.[20]

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