Asian And Pacific Economic Review
ISSN: 1000-6052

INDIA'S CLIMATE ACTION STRATEGY: A POLICY EVALUATION FRAMEWORK ALIGNED WITH SDG 13

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Abstract

Climate change is happening rapidly, which affects sustainable development. The world is trying to have a balance between development and the environment. There are various strategies adopted by India that have the purpose of achieving goals suggested by United Nations Sustainable Development Goal 13 (SDG 13) – Climate Action. India worked on different parameters for attaining these goals. The main concern is understanding the impact of these policies with reference to the National Action Plan on Climate Change (NAPCC) and its subsidiary goals, as well as recent state-level and sectoral initiatives. This paper adopted a conceptual research design and utilized secondary data. India achieved a great height in the development of renewable energy, financing for renewable energy sources, how these regulations are implemented, and the information needed for renewable energy. SDG 13 is essential for developing the country in a holistic way. International collaboration is required for achieving SDG 13. Policy integration is also required for developing countries in a complete way. In this conceptual work, the existing situation was analyzed using secondary data. The government is also playing an important role because government support is required for formulating essential policies. Expert guidance, climate expert knowledge, strategist, policy maker and people need to come together to achieve SDG 13. This paper also gave a discussion and social implications, which in turn prove beneficial to society. The findings of this study gave directions to the researchers and policymakers.

Keywords: Sustainable development goal, SDG, climate action, India

Introduction

With the profound impact on the ecological system, financial markets, and the lives of people, limate change is one of the 21st century's major obstacles (Arora & Mishra, 2023; Shahid et al., 2025). Sustainable Development Goal 13: Climate Action, which encourages urgent action in the face of its consequences, was adopted in the 2030 Agenda for Sustainable Growth by the United Nations to acknowledge this worldwide urgency. ("European Floods Are Latest Sign of a Global Warming Crisis" 2021). SDG13 highlights a significant value in boosting the capacity of institutions, promoting awareness, and implementing climate measures into policies (Raman et al., 2024; Varriale et al., 2025). Global greenhouse gas (GHG) emissions remain on the increase, regardless of strengthening commitments; local as well as global action needs to be accelerated.(Prandelli et al., 2025; Shahid et al., 2025; Wang et al., 2025). Climate change express in every action of nature. It's the midst of 2021, Germany experienced one of the deadliest and most destructive disasters from natural causes throughout its turbulent past, with history–breaking rainfall levels not seen in 500 to even 1000 years in some regions (The largest sign of a global crisis of 2021 is the European floods). On top of it, in 2021, wildfires grabbed attention worldwide, particularly in Siberia, Mediterranean countries and Canada. Since 1888, the driest weather has been experienced by Yakutia, whose temperature reached at its peak point of 39 °C in spite of the cold climate of Russia in its northern regions, causing enormous smoke and an uncommon temperature rise (Magany 2021). The death toll, vandalism, forced migration, scarcity of essential utilities, denudation and high carbon footprint stipulated that to manage with the uncommon climate disaster the mankind was not yet prepared (Die Welt 2021). By 2030, dynamically, the planning done by the UN to manage huge tragedies in each country from the consequences like Death, injuries, internal mobility or housing insecurity caused by calamity should be minimised with full potential (United Nations 2021b).

Literature review

Technology like the utility of satellite navigation is a very important capacity when faced with instances of limited water by furnishing timely information to acknowledge the keys like rainfall, transpiration of water, moisture levels in the soil, and the general wellness of the greenery. While conventional sole parameter index such as the standardised precipitation index (SPI), Normalised Difference Vegetation Index (NDVI), etc., have been in use, their constraint gave rise to the development of composite indices which present the complete alert by combining various sources of data through new weighting techniques. In addition, predicting the process of a precipitation deficit spreading through the environment and causing progressively more severe impacts on crops and vegetation. Numerous regions of the world, like the U.S. Drought Monitor, the South Asia Drought Monitoring System, etc., examine various universal agricultural dry spells and provide advanced notice. India also executes its own dry spell monitoring and a declaration system that utilises scientifically based parameters and a decision tree approach. Although India still misses its well-made agricultural dry shell prediction system, fit to its specified needs for various regions. Demonstrating one example of such a system is critical to offering prompt notifications and holding up its administration plan.

eventually strengthening the ability to withstand agricultural drought.

Integrating Climate Action with Other SDGs

TABLE 1. SDG 13 interconnects with almost all other goals:

Related SDG	Connection with SDG 13
SDG 1 (No Poverty)	Vulnerable populations are dragged into poverty by climate shocks.
SDG 2 (Zero Hunger)	Crop yield and food security have been influenced by climate variability.
SDG 7 (Affordable and Clean Energy)	Emissions are minimised shifting to sustainable energy.
SDG 11 (Sustainable Cities and Communities)	Resilient living is guaranteed by urban climate adaptability.
SDG 15 (Life on Land)	Carbon sequestration is made feasible by ecosystem preservation.

Research Methodology

Sustainable development is severely hampered by climate change, especially for emerging nations like India that must maintain equilibrium between environmental preservation and economic growth. India has implemented several policies and efforts to promote resilience building, adaptation, and mitigation with the United Nations Sustainable Development Goal 13 (SDG 13) – Climate Action. According to Sustainable Development Goal 13 of the UN Goal 13 (SDG 13)—Climate Action—India has implemented several policies and initiatives aimed at resilience-building, adaptation, and mitigation. This paper is conceptual in nature. Secondary data, government reports and related articles are utilized for analyzing the impact of policies adopted by the world for achieving SDG 13.

India's environmental legislation theory has switched from one of structural instability to one of underlying liberal regulation.

Over time, India's method for handling climate policy has altered. The country was operating in an ideological confrontation mode at the beginning of its history, as illustrated by its staunch detractors to internationally coordinated climate conference discussions and action. This lack of agreement illustrates that Indian diplomats seemed fiercely centred around domestic demands and hesitated to give in to unreasonable demands from overseas supporters to alter their positions. This shift in behaviour illustrates India's preparedness to readily adjust to climate change on its own time frame, while assuring that its intended objectives for sustainable growth were not negatively impacted. Beginning in the 1990s until 2007, India reached agreements on climate change by applying an ecological conflict mitigation method of

negotiation. India and other nations with poor infrastructure argued in the very beginning stages of the sustainability talks that nations with advanced economies were obliged to encourage struggling territories and acknowledge wholehearted accountability for previous greenhouse gas emissions. This was established on the assumption that underdeveloped nations' emissions nonetheless remained relatively low and that advanced economies were principally to be held accountable for worldwide greenhouse gas emissions. More importantly, they were required to mature according to social and developmental prerequisites for development (Ghosh 2011; Gupta, Kohli, and Ahluwalia 2015). India resisted extensive locally caused climate changes in spite of constant encouragement brought about by industrialised countries. As an illustration, economically disadvantaged countries were encouraged to hand over responsibility for future Dioxide in the atmospheric during the period of the Kyoto Protocol's period of implementation (1997–2005), but members of the G77 and China strongly refrained from this. Indian negotiation teams adopted suggestions concentrated on equity and fairness throughout worldwide climate exchanges, which called for nations with advanced economies to contribute to a large portion of the financial costs of dealing with environmental change and helping those in developing countries in their endeavours to do the similar things (Mukherji and Jha 2022).
India had the opportunity to create a ripple effect on the central tenets of the UNFCCC and its enforcement mechanisms (Rajamani 2017; Rastogi 2011). The legally binding commitment that countries that are developing would receive technological and financial backing for tackling climate change has been contained in the UNFCCC (UNFCCC 1992).
Table illustrates certain ones of the most significant events that contributed to global climate politics between 1995 and 2009. Indigenous attitudes towards climate action have been influenced by certain global developments.
Since 2007, India's involvement towards international climate talks has undergone changes. Comprehensive engagement with and backing for environmentally friendly efforts has been caused by the shift in the climate policy conceptual framework towards an incorporated liberal order. The nation showcased its intention to use its own financial assets to make noteworthy climate improvements. For example, Dr Manmohan Singh, who was the prime minister at that period, made an obvious nationwide climate campaign to lower carbon footprints per individual by 2030. India, nevertheless, was committed to the freely agreed-upon cutting of emissions.

TABLE 2. EVENTS

Period	Event	Development	India’s feedback
1995	COP 1 held at Berlin	Highly developed countries recommended that nations with developing economies set emission reduction ambitions. (Gupta, Kohli, and Ahluwalia 2015; Sengupta 2019).	China, India, and the members of the Group of 77 (G77) were unrelentingly in opposition to any free-market or brought in donations on countries that are underdeveloped. (Sengupta 2019).

1997–2001	Kyoto Protocol establishment and subsequent adoption	The subject matter among the global climate Exchange of ideas has been redirected to hold underdeveloped nations—such as China and India—responsible for their potential emissions in the United States	India's declaration was always categorical: it was unwilling to agree to any binding on the law decreasing emission levels goals.
Period	**Event**	**Development**	**India's feedback**
2005–2007	Discussions on the course of action after the 1st phase of the Kyoto Protocol (KP)	The government of India was nevertheless unambiguous, as it would not consent to the establishment of legally enforceable emissions reduction targets. (in 2012). The international talk expanded to claims that nations with developing economies would make significant contributions to carbon dioxide emissions and that developing nations like China and India needed to be held accountable for their actions. Techniques for negotiating action after 2012 had been created (Rajamani 2017; Sengupta 2019). At COP 11 (in Montreal, 2005), it was established to commence 2 tracks: one for Annexe I countries (those with legally-enforceable emission-lowering standards) and another for non-Annexe I countries (those without).	India was not prepared to consent to any legally-enforceable vows for lowered exhaust (Gupta, Kohli, and Ahluwalia 2015; Rajamani 2017).
2007	G8+5 Summit at Heiligendamm	"India's average monthly emissions are unlikely to exceed the levels of industrialised nations while applying agendas related to development and growth in GDP," announced Prime Minister	India pointed out distributive obligations while expressing its refusal to adhere to constitutionally legally-enforceable binding agreements.

Period	Event	Development	India's feedback
		Dr Manmohan Singh." (Singh 2007).	
2007	Initial meetings regarding the formation of BASIC (Brazil, South Africa, China & India)	The primary responsibility for a spike in global emissions was being put on substantial countries that were developing. For the initially time, countries outside of the G20, MEF, and G77 enrolled in BASIC as affiliates. China's climate action proposal was also unveiled.	Preservation of humanitarian requirements and certifying access to financial resources and technological resources for climate action from industrialised countries are two mutual goals that India, as an integral part of BASIC, defended. India also used the NAPCC to communicate its climate obligations as a consequence of this.
2009	COP 15 at Copenhagen	There was no favourable conclusion from the bargaining. India and other BASIC nations made sure that the gap between advanced and developing nations was maintained while emphasising the fact that economically prosperous countries had the ability to acquire technology and financing. According to a concluded announcement, nations would "work jointly on establishing a global goal of minimising emissions by 2050", and the increase in worldwide temperatures	The two countries, India and China, were willing to intentionally cut the level of emissions by 25–45% (Gupta, Kohli, and Ahluwalia 2015; ENB 2009). India's initial placement evolved over time in supporting self-imposed pollution reduction commitments.

Period	Event	Development	India's feedback
		should remain below 2°C (Sengupta 2019).	

About the NAPCC

In order to steer within-country Mitigation and adaptation to climate efforts, the first encompassing weather plan, the national climate action plan, was put forward. With emphasis on the agricultural sector, energy, water, forests, cities, the Himalayas, and critical scientific understanding, the proposal uses the mission-oriented methodology in order to focus on the most critical problems (GoI, undated). besides that, the NAPCC has been established to address India's economic growth and climate issues (Byravan and Rajan 2012; GoI 2008a; GoI, undated; Gupta and Mandal 2015; Nachmany et al. 2015; Rattani 2018; Teri 2008; 2015; Venkataramani et al. 2015).

The plan's strategies are accompanied by domestic resources; if foreign assistance were made accessible, then domestic attempts would be improved (Saran 2019). The Indian government had previously begun directing over 2.6% of its GDP to adaptation efforts that were predominantly related to food production, water resources, health and sanitation, forests, coastal zone infrastructure, and adverse weather conditions, according to the climate action plan (GoI, undated). The NAPCC is an extensive framework that includes mitigation and adaptation techniques designed to tackle environmental effects and preserve the nation's renewable energy base, in contradiction to previous legislation (like as the Integrated Energy Policy 2006) (GoI 2008a; 2009; 2014).

The management framework encountered many adjustments with the official launch of the NAPCC. A handful of key ministries at the national level partnered with the effort to help implement the plan. In addition, the nodal department appointed to handle oversight of the actualisation of the climate action roadmap was the Ministry of Environment and Forests (MoEF). The Indian authorities started providing funding for climate conservation efforts as part of the Five-Year Plans. Afterwards, the inauguration of the NAPCC. subsequently, after 2008, the MoEF gained a considerable rise in financial resources, as demonstrated by the 11th Five-Year plan (which climbed by 57.86 per cent between 2007 and 12) (GoI 2008b) and the 12th plan (which increased by 109.17 per cent between 2012 and 17) (GoI 2013). Another benefit is that India's Five-Year Plans (GoI) stipulated an entirely separate section on climate change.

Climate Change and Global Impact

Increased temperatures, unpredictable weather, diminished biodiversity, and inadequate nutrition are all indicative of climate change. Without substantial downfalls in emissions, **the UN Intergovernmental Panel on Climate Change (IPCC)** points out it global warming could rise above critical limits in a matter of decades.

Effects on the Environment

- Sea levels are increasing as a consequence of thawing polar ice caps and glaciers, hazardous coastal environment.
- Water supplies and agriculture have been negatively impacted by an upsurge in the occurrence of floods and droughts.
- Coral reefs and aquatic creatures are being endangered by the acidification of the seafloor.

Socio-economic Impacts

- For the reason that they have inadequate ability for adaptation, nations that are developing have become more dependent on vulnerability.
- Health outcomes, food systems, and labour productivity are all influenced by excessive heat.
- More sociopolitical tensions are triggered by migration brought on by climate change.

Findings

Global emissions are still rising; current policies and pledges are insufficient for 1.5°C.

Global GHG emissions set a new record in 2023 (approximately 57.1 $GtCO_2e$), and despite ambition and fulfilment drastically increasing, projected warming under current legislation and NDCs remains well above the 1.5°C target. The UNEP Emissions Gap Report 2024 underscores how urgent and significant further mitigation is.

There is a persistent implementation gap between NDCs (pledges) and realised action.

surprisingly, multiple countries have submitted more ambitious NDCs. Analyses illustrate a quantifiable implementation gap: enacted measures and policy coverage fall short of what is needed to meet both unconditional and conditional NDC commitments for 2030. This gap is acknowledged in the UNFCCC NDC synthesis and recent assessments, which point out the urgent need for heightened policy delivery at the national and subnational levels.

Adaptation remains under-measured and under-funded; monitoring frameworks are immature.

The adaptation process lacks trustworthy monitoring systems and globally recognised indicators, in contrast to mitigation (where emissions are quantified). Weak M&E systems for adaptation have been criticised in technical papers and reviews (UNFCCC guidance, academic assessments), which call for standardised, contextually appropriate indicators.

Climate finance has improved, but shortfalls and access barriers persist — the $100 billion goal is a partial benchmark, not a full solution.

In spite of pledges and approvals from developed nations and multilateral funds (like the GCF) that have increased overall finance flows, allocation of mitigation and adaptation funds, certainty, and accessibility to local resources are still insufficient in comparison to needs, in particular for LDCs and SIDS. Progress may have been made, but there has also been volatility

and unequal access, according to data from the OECD, GCF, and media.

Local and community-based adaptation shows promising results, but evidence on long-term effectiveness and scalability is limited.
Several pilot projects (climate-smart agriculture, early warning systems, and ecosystem-based adaptation) are advantageous regionally, but comprehensive long-term impact evaluations and adaptable methods are scarce. In the literature from 2024–2025, new frameworks (like SCALE-up) and demands for longitudinal impact evaluation are becoming more prevalent.

Discussion

A. Signification: The logic underlying these patterns

Complexity in government as well as time lag: It takes time and coordination among ministries, municipalities, and private actors to turn diplomatic pledges (NDCs) into national laws, budgets, and projects. This translation gets slowed down via limitations on capacity, especially in LDCs/SIDS.
Finance + delivery mismatch: Due to transaction costs, co-financing requirements, and complex application procedures, aggregate finance pledges might rise while the quantity of funds that goes to implementers (local governments, community organizations) remains small.
In contrast to adaptation (measured in resilience outcomes), mitigation is easier to measure (measured in tonnes of CO_2e). As a result, adaptation is inadequately funded and does not have sufficient proof, all while mitigation is held more accountable.

B. Policy implications (practical priorities)

Close the implementation gap with targeted governance reforms:

In contrast to adaptation (measured in resilience outcomes), mitigation is easier to measure (measured in tonnes of CO_2e). As a result, adaptation is lacking in funding and does not have sufficient proof, while mitigation is held more accountable. making sure that there are now distinct lines of duties and budget commitments at the national and subnational levels, as well as enhancing the MRV and enforcement mechanisms for NDCs. (Use the UNFCCC NDC outcomes as an indicator of progress.)
Make climate finance simpler to obtain and more readily available:

Donors and multilateral funds need to make it simpler to get funds, ease rigid funding requirements for SIDS and LDCs, provide preference to grants, and support locally led, adaptation-focused initiatives.

Advance adaptation measurement and evidence-building:

To shift adaptation from project anecdotes to solid proof, invest in standardised—but flexible—adaptation indicators, mixed methods (remote sensing + community monitoring), and longitudinal impact evaluations.

Invest funds in standardised but versatile adaptation indicators, a number of methods (such as community monitoring and remote sensing), and long-term effects assessments with the goal of transforming adaptation from project narratives to solid proof.
Promote integrated planning to manage trade-offs:

Find trade-offs and synergies (like energy vs. land) through integrating SDG co-benefit analyses into national development plans and NDC updates by means of the use of systems models and spatial planning.
Emphasise just and equitable transitions:

participatory governance so that transitions are politically feasible and socially inclusive.

In order to make transitions socially inclusive and politically feasible, policies ought to combine mitigation/adaptation with social protection, retraining, and participatory governance.
C. Research & practice priorities (what scholars and funders should target)

comprehensive evaluation of adaptation efforts (cross-site, long-term comparisons) to identify local practices that can be financially scaled.
Close the evidence disconnect between finance and access through tracking actual disbursements, absorptive capacity, and outcomes at the national and subnational levels in alongside pledges.
Mixed-methods research that links policy design to reality and political economy constraints is referred to as translational research on NDC implementation.
Develop helpful adaptation indicators and open data platforms that combine administrative records, citizen science, and satellite data for continuous monitoring.

Social Implications of SDG 13: Climate Action

Inequality and Human Vulnerability: Current social and economic disparities have been exacerbated by climate change.
Disproportionate effects: Extreme weather, droughts, and food insecurity disproportionately affect poor, isolated, and indigenous communities, who comprise the smallest portion of worldwide carbon emissions.
Concern for climate justice: The global demand for "climate justice," which promotes equal treatment in both obligations and results, is a result of unequal danger exposure and remodelling capacity. For example, smallholder farmers in South Asia and Sub-Saharan Africa are experiencing an increase in crop losses and displacement, whereas wealthy countries are better equipped to adapt.
Health and Well-being

Direct effects: Millions of lives are at risk due to the rise in extreme temperatures, air pollution, and diseases transmitted by insects like dengue and malaria.
Indirect effects: dehydration, food and water insecurity, and mental health disorders like "eco-anxiety" and post-disaster trauma are all manifestations of climate stress.
Healthcare systems: There is pressure on developing nations to improve their infrastructure

and healthcare systems to be more climate resilient.

Migration and Displacement: Displacement imposed by warming temperatures is getting worse because of catastrophic events, expanding deserts, and surges in sea levels. Without substantial action, the World Bank anticipates that over 200 million individuals around the globe may become climate migrants by 2050.

Goals and Targets

Sustainable Development Goal 13 (SDG 13) aim to address climate change and take immediate action to solve it. It's analysed that climate change is not just an atmosphere issuing but an important warning of a sustainable development, prudential value and cosmic stability. Rise in global temperature, rapid changes in weather, rise in sea level, and species loss reflect a climate emergency that affects all actions. Especially the indigent and unprotected populations.

SDG13 thus look to combine climate action into every detail of setting guidelines and creating a detailed strategy. The goal strongly associated with the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement (2015), which combine to form international climate governance. Controlling global warming below 2°C to 1.5°C above levels prior to industrialization, by lessening, modifying, and providing financial backing mechanisms - **The Paris Agreement**.

To make in action these objectives, SDG 13 highlights five main targets (13.1- 13.b) which lead global and national efforts:

Target: build up flexibility and a versatile range to natural disasters and climate-related risks

This goal highlights the privilege of developing flexibility- the capability of groups, environment, and finance, commerce, and political economy that cope with and recover from climate-related disasters.

Flexible – building involves combining disaster risk reduction (DRR) into nationwide and localised approaches. Developing early warning systems and enhancing emergency response mechanisms.

Countries are motivated to accept climate–flexibility infrastructure, protect negative environments like mangroves and wetlands, and improve water and agricultural management practices to resist drought, cyclones and floods

For example, structures such as the Sendai Framework, which stands for the Prevention of Disasters (2015-2030), promote SDG13 by highlighting awareness and flexibility.

By nourishing flexible capacity, societies can reduce by vulnerability, safeguard livelihoods, and decelerate economic losses from climate disasters.

Target: combining measures of utilising climate change in national planning, legislation, and techniques

This target calls to render mainstreaming consideration of climate change in every level of public law and planning development.

It includes implementing climate objectives into national development agendas, regional policies (like energy, transport, agriculture, and health), and financial processes.

The goal is to make sure that climate reduction (minimise the discharge of greenhouse gases) and adaptation (adjusting to climate impacts) are not considered as remote issues but instead treated as the main components of sustainable development.

For example, many countries have undertaken Nationally Determined Contributions (NDCs) under the Paris Agreement, which highlight specific measures and aims to decrease emissions and intensify flexibility.
In India, the National Action Plan on Climate Change (NAPCC) and Strategies for state-based climate action represent this inclusion, a focus in on environmentally friendly growth, conservation of energy, and clean energy use of land. Such actions make sure that climate policies are standardised and executed through long-term national strategies.
Target: enhance learning, consciousness raising, human and organisational capability, on climate change, lightning and habituation
This target centres on the learning strength of climate action.

It was analysed that informed citizens, skilled professionals, and capable institutions are required to achieve relevant changes.
Education systems should comprise climate learning, which helps people understand the impact, causes and solutions related to climate change.
Populations can be empowered to embrace beneficial environmental behaviours like waste elimination, energy conservation, and sustainable consumption by enhancing the public's understanding.
To implement adaptation and mitigation projects, institutions make sure that capable building like local government, NGOs, and community organisations, are equipped with the skills and resources.
The UNESCO Global Action Programme on Education for Sustainable Development (ESD) supports this target by promoting climate education and environmental awareness worldwide.

Conclusion

The most important component of worldwide efforts to promote sustainability is Sustainable Development Goal 13: Climate change. With the goal of effectively tackle climate change and the profound impact it has on the environment, the economy, and society, it urges immediate, integrated, and revolutionary change. Although international frameworks like the Paris Agreement & subsequent Nationally Determined Contributions (NDCs) have solidified global devotion, the pace of their implementation is still lacking for sustaining global change to 1.5 °C, compared to the reviewed evidence. Three critical holes must be eliminated in order to accomplish SDG 13: the carrying out gap, which decouples policy commitments from actual action; the funding gap, which limits the capacity of nations that are developing to adapt; and the gap in expertise, which prevents efficient monitoring of resilience and adaptation results. Transparent governance, proportionate usage of carbon financing, and cohesive planning will be vital to address those issues. Equally vital are the social components of climate action. The most vulnerable populations have been particularly impacted by climate change, which exacerbates extreme poverty, food insecurity, gender inequality, and displacement. To make certain that no one is left excluded in a shift to a future that is resilient to climate change and carbon-free interventions must be equitable, participatory, and justice-oriented. Long-term success depends on empowering local communities, enhancing understanding and instruction, and mainstreaming gender and equity issues. SDG 13 is a moral and developmental imperative besides to an environmental target. It stipulates that the present actions sustain the planet for

future generations to come, demonstrating a notion of generations sharing an obligation. Whether humanity is able to turn this decade into one of achievable climate resilience and sustainable progress will depend on accelerated implementation, sustained financing, and socially inclusive strategies.

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