India's Climate Actions: Driving a Low-Carbon, Climate-Resilient Development Pathway

India, home to over 1.4 billion people and one of the world's fastest-growing economies, occupies a critical position in the global response to climate change. Despite having relatively low per capita emissions, India is the third-largest emitter of greenhouse gases in absolute terms. The country faces a complex dual challenge of sustaining economic development while addressing the adverse impacts of climate change ranging from extreme weather events from water stress to extreme heatwaves, and biodiversity loss. Over the past decade, India's climate response has evolved into a comprehensive, multi-pronged strategy, integrating mitigation and adaptation efforts with sustainable development goals, technological innovation, and international partnerships. Guided by its Nationally Determined Contributions (NDCs) under the Paris Agreement, India aims to reduce emissions intensity, enhance non-fossil fuel energy capacity, and create significant carbon sinks through afforestation. As it navigates the delicate balance between growth and sustainability, India's climate actions are increasingly seen as a blueprint for emerging economies, grounded in equity, inclusivity, and a long-term vision for planetary well-being. This article delves into India's evolving climate governance landscape, its global commitments, policy frameworks, sectoral initiatives, and international collaborations. It highlights how India is aligning its development trajectory with low-carbon, climate-resilient goals while advocating for global cooperation and equitable climate finance to ensure a sustainable future for all.

The Roadmap: Global Commitments from Paris Agreement to Net-Zero

India's international climate journey is firmly rooted in the principles of equity and Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC). Guided by these principles, India has laid out an ambitious and evolving climate roadmap spanning from the **Paris Agreement** to its **Net Zero by 2070** vision. India laid the foundation of its climate commitment with the submission of its first Nationally Determined Contributions (NDCs) at COP21 in Paris (2015), and significantly elevated its ambition at COP26 in Glasgow (2021) with the announcement of the landmark Panchamrit pledges. The Hon'ble Prime Minister of India announced the **Panchamrit**, a five-point climate pledge that serves as India's cornerstone for climate action.

These commitments were integrated into India's Updated Nationally Determined Contributions (NDCs), submitted to United Nations Framework Convention on Climate Change (UNFCCC), in August 2022. The revised NDCs align India's national development priorities with the global climate goal of limiting temperature rise to well below 2°C, preferably 1.5°C.

In November 2022, India submitted its **Long-Term Low-Carbon Development Strategy (LT-LEDS)** to the UNFCCC at COP27 in Sharm El-Sheikh. The LT-LEDS outlines India's vision for a **low-emission, climate-resilient economy** through sectoral transformations.

India's **Net Zero by 2070** target balances developmental priorities with long-term climate ambition. Together, the Paris Agreement, Panchamrit, Updated NDC, and LT-LEDS form a coherent strategic framework that positions India as a key player in global climate governance while remaining firmly anchored in national priorities.

Policy Framework for Climate Governance

India's climate action framework is guided by its National Action Plan on Climate Change (NAPCC) to address climate-related challenges while promoting sustainable development. Recognizing the importance of region-specific strategies, the Government of India mandated the formulation of State Action Plans on Climate Change (SAPCCs) to integrate climate considerations into sub-national planning and policy frameworks. These SAPCCs align with the objectives of the NAPCC while addressing the unique vulnerabilities and priorities of each state.

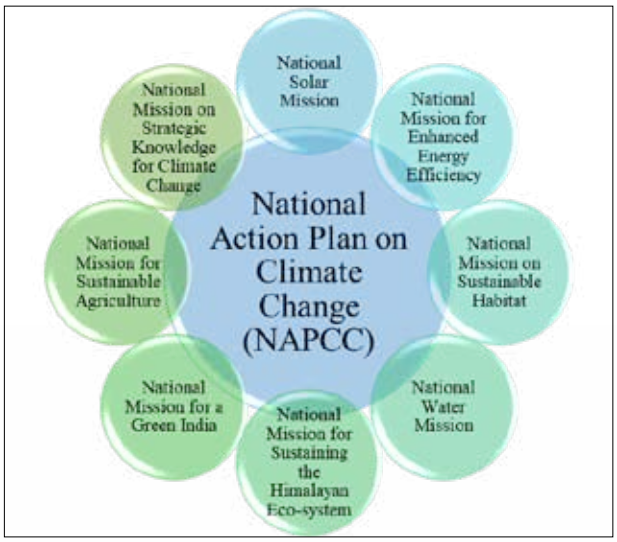
National Action Plan on Climate Change (NAPCC)

The National Action Plan on Climate Change was launched by our hon'ble Prime Minister formally on June 30th, 2008, comprehensive framework to address climate change through **mitigation and adaptation strategies** while promoting sustainable development. This comprehensive plan outlines a strategic approach for the nation to effectively respond to climate change and improve India's ecological sustainability as it pursues development. The NAPCC is guided by the principles of ecological sustainability, inclusive growth, and climate justice, emphasizing the co-benefits of climate action and economic development. The NAPCC emphasizes the importance of maintaining a robust economic growth rate to elevate the living standards of most of India's population and reduce their susceptibility to the adverse effects of climate change. NAPCC is governed by the Ministry of Environment, Forest and Climate Change (MoEFCC). The NAPCC aligns with India's commitments under the Paris Agreement and its Nationally Determined Contributions (NDCs), aiming to:

Reduce **emission intensity** of GDP

Enhance **renewable energy** capacity

Strengthen **climate adaptation** in agriculture, water, and urban sectors.



India continues to evolve its climate policies by integrating emerging concerns like **circular economy, resource efficiency, and just transitions** into its climate strategies.

At its core, **the NAPCC comprises eight "National Missions"** that are pivotal to its implementation. These missions are dedicated to advancing awareness and knowledge about climate change, implementing strategies for adaptation and mitigation, enhancing energy efficiency, and conserving natural resources.

State Action Plan on Climate Change (SAPCC)

The State Action Plans on Climate Change (SAPCCs) emerged from a top-down approach initiated in 2009, when the Prime Minister of India directed state governments to develop comprehensive plans aligned with the national framework, while addressing state-specific vulnerabilities. The State Action Plans on Climate Change (SAPCCs) serve as a framework for state-level responses to climate change, following a uniform structure that outlines each state's vulnerabilities and adaptation strategies. As per the directives of the central government, most State Action Plans on Climate Change (SAPCCs) primarily emphasize adaptation, with limited attention to mitigating greenhouse gas (GHG) emissions. However, some SAPCCs include a GHG inventory and examine the potential of renewable energy and other clean technologies. Most states completed their plans between 2010 and 2011, often with the assistance of consultants provided by development agencies. State action plans address key economic and livelihood sectors such as agriculture, water, energy, transport, and forestry, detailing proposed actions, timelines, and budgets. 34 states and union territories prepared State Action Plans on Climate Change, the focus now shifts to overcoming implementation challenges and leveraging opportunities for effective climate action.

Sector-Wise India's Climate Actions

India's climate actions are not limited to the NAPCC and SAPCCs; rather, they extend beyond the scope of the NAPCC and SAPCCs, covering a broad spectrum of policies, sectoral initiatives, and international commitments that collectively advance the country's low-carbon and climate-resilient development agenda. India has undertaken a range of climate actions to address the challenges of climate change and promote sustainable development. These actions align with India's global commitments, including the Paris Agreement, and these initiatives span various sectors, including renewable energy, energy efficiency, afforestation, water conservation, and international cooperation.

Below are some of the key actions and programmes driving climate mitigation and adaptation across various sectors:

States and Union Territories prepared their State Action Plans on Climate Change (SAPCC) across India

S. No.	State/Union Territory	S. No.	State/Union Territory
1	Assam	18	Madhya Pradesh
2	Andaman and Nicobar	19	Maharashtra
3	Andhra Pradesh	20	Manipur
4	Arunachal Pradesh	21	Meghalaya
5	Bihar	22	Mizoram
6	Chandigarh	23	Nagaland
7	Chhattisgarh	24	Odisha
8	Dadra & Nagar Haveli and Daman & Diu	25	Puducherry
9	Delhi	26	Punjab
10	Gujarat	27	Rajasthan
11	Haryana	28	Sikkim
12	Himachal Pradesh	29	Tamil Nadu
13	Jammu & Kashmir	30	Telangana
14	Jharkhand	31	Tripura
15	Karnataka	32	Uttar Pradesh
16	Kerala	33	Uttarakhand
17	Lakshadweep	34	West Bengal

International Alliances

International Solar Alliance (ISA):

The International Solar Alliance (ISA) is an s an initiative proposed by our hon'ble Prime Minister it's an intergovernmental coalition initiated by India and France during COP21 in 2015, designed to promote solar energy deployment across solar-rich countries, especially those lying between the Tropics of Cancer and Capricorn. The ISA is headquartered in Gurugram, India, and aims to mobilize $1 trillion in solar investments by 2030. Following a 2020 amendment to its Framework Agreement, all UN member states are now eligible to join ISA. At present, 116 countries are signatories to the ISA Framework Agreement, of which 94 countries have submitted the necessary instruments of ratification to become full members of the ISA. Its mission is to unlock $1 trillion in solar investments by 2030 while reducing technology and financing costs.

Coalition for Disaster Resilient Infrastructure (CDRI):

The Coalition for Disaster Resilient Infrastructure (CDRI) – established in 2019 under the leadership of the Government of India and with the support UNDRR is a multi-stakeholder global partnership. CDRI aims to support countries in developing infrastructure that is sustainable, resilient, and adaptable to future hazards, particularly in sectors such as energy, transport, telecommunications, and water. It facilitates technical expertise, research, capacity building, and policy dialogue to integrate disaster resilience into infrastructure planning and implementation. By fostering collaboration among governments, multilateral agencies, private sector entities, and research institutions, CDRI helps strengthen global efforts toward climate adaptation and disaster risk reduction.

Leadership Group for Industry Transition (LeadIT):

The **Leadership Group for Industry Transition (LeadIT)** is a global initiative launched by Sweden and India in 2019 at the UN Climate Action Summit, with support from the World Economic Forum. LeadIT aims to accelerate the low-carbon transition of hard-to-abate industrial sectors such as steel, cement, and chemicals by fostering collaboration between governments and businesses. It provides a platform for knowledge sharing, policy dialogue, and

innovation to drive industry-wide decarbonization while ensuring economic growth and job creation. By uniting public and private stakeholders, LeadIT helps develop pathways for net-zero emissions in industries critical to global sustainability goals.

Energy Transition and Renewable Energy Expansion

National Green Hydrogen Mission:

The National Green Hydrogen Mission, launched by the Government of India in 2023, aims to position India as a global hub for the production, targeting 5 MMT by 2030. With an initial outlay of ₹19,744 crore, the mission seeks to develop a robust green hydrogen ecosystem by promoting research, infrastructure development, and policy support. Its key objectives include reducing dependence on fossil fuels, enhancing energy security, and contributing to India's target of net-zero emissions by 2070. By fostering innovation and investment, the initiative is expected to drive industrial decarbonization, create green jobs, and strengthen India's leadership in the global clean energy transition.

Faster Adoption and Manufacturing of (Hybrid) and Electric Vehicles (FAME):

The Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) launched by the **Government of India in 2015**, aims to promote the adoption of **electric and hybrid vehicles** to reduce dependence on fossil fuels and curb vehicular emissions. Implemented in multiple phases, **FAME-I (2015-2019)** focused on demand incentives, charging infrastructure, and technology development, while **FAME-II (2019-present)** significantly expanded support with an outlay of ₹10,000 crore. The scheme provides financial incentives for electric vehicles to support the transition towards cleaner mobility solutions. By supporting infrastructure development and policy measures, FAME plays a crucial role in India's push towards sustainable and green transportation.

Afforestation and Biodiversity Conservation

National Afforestation Programme (NAP):

The National Afforestation Programme (NAP) is a flagship initiative of the Government of India aimed at restoring degraded forest lands and enhancing afforestation efforts across the country. Implemented by the **MoEFCC**, NAP follows a participatory approach by involving local communities through **Joint Forest Management Committees (JFMCs)**. The program focuses on **eco-restoration, biodiversity conservation, and improving livelihoods** for forest-dependent communities. By promoting sustainable forest management practices, NAP contributes to **carbon sequestration, climate resilience, and ecological balance**, aligning with India's commitments under various international environmental agreements.

Water Resource Management

Jal Shakti Abhiyan:

The **"Jal Shakti Abhiyan: Catch the Rain"** is a nationwide water conservation campaign launched by the Government of India in 2019 to address water scarcity and promote sustainable water management. Led by the **Ministry of Jal Shakti**, the initiative focuses on **rainwater harvesting, watershed development, rejuvenation of water bodies, afforestation, and efficient water use**. Implemented in **water-stressed districts** across the country, Jal Shakti Abhiyan actively involves government agencies, local communities, and stakeholders to ensure long-term water security. By emphasizing participatory groundwater management and sustainable agricultural practices, the campaign supports India's goal of **water conservation and resilience against climate change**.

Namami Gange Programme:

The Namami Gange Programme, launched in 2014 by the Government of India, is an integrated **river rejuvenation initiative** aimed at restoring the ecological and cultural significance of the **Ganga River**. Implemented by the **National Mission for Clean Ganga (NMCG)** under the **Ministry of Jal Shakti**, the program focuses on **sewage treatment infrastructure, riverfront development, afforestation, biodiversity conservation, and public awareness**. With a budget of ₹20,000 crore, it seeks to control pollution, promote sustainable water use, and improve the livelihoods of communities dependent on the river.

Waste Management and Circular Economy

Swachh Bharat Mission:

The Swachh Bharat Mission (SBM), launched on October 2, 2014, by the Government of India, is a nationwide sanitation campaign aimed at achieving

a **clean and open defecation-free (ODF) India**. Implemented in two phases, SBM-Urban and SBM-Gramin, the mission focused on constructing toilets, promoting waste management, and raising awareness about hygiene and sanitation. The first phase (2014-2019) successfully achieved India's ODF status by building over **100 million toilets**, while the second phase (2020-2025) emphasizes solid and liquid waste management, faecal sludge treatment, and sustainable sanitation practices. Led by the **Ministry of Housing and Urban Affairs** and the **Ministry of Jal Shakti**, SBM has transformed public health, reduced waterborne diseases, and instilled a culture of cleanliness, aligning with the vision of a "**Garbage-Free India.**"

Plastic Waste Management Rules:

The Plastic Waste Management Rules, first introduced in 2016 and later amended in 2022 by the MoEFCC, aim to regulate **plastic waste generation, collection, recycling, and disposal** in India. The rules mandate the phasing out of identified single-use plastics (SUPs), promote Extended Producer Responsibility (EPR) for plastic producers, importers, and brand owners, and encourage the use of recycled plastic in manufacturing. The **2nd amendment** introduced stricter regulations, including **minimum thickness requirements for plastic carry bags (increased to 120 microns by 2022)** and India **banned** the manufacture, distribution, stocking, sale and use of selected 19 **Single-Use Plastic (SUP)** items with effect from **July 1, 2022**.

Waste-to-Energy Projects:

The Waste to Energy Programme, implemented under the Ministry of New and Renewable Energy (MNRE), Government of India, promotes the generation of **energy from urban, industrial, and agricultural waste**. The program supports **biogas, bio-CNG, and power generation projects** by providing **financial assistance, technical support, and policy incentives**. It converts municipal solid waste into energy, reducing landfill use and methane emissions. It encourages the adoption of **advanced waste treatment technologies** like **anaerobic digestion, incineration, and gasification** to convert organic and non-recyclable waste into renewable energy sources.

Sustainable Infrastructure and Urban Climate Initiatives

Smart Cities Mission:

The Smart Cities Mission, launched by the Government of India in 2015, aims to develop 100 smart cities that are sustainable, technology-driven, and citizen-friendly. Implemented by the **Ministry of Housing and Urban Affairs (MoHUA)**, the mission focuses on improving urban infrastructure,

enhancing service delivery, promoting digital governance, and ensuring environmental sustainability. Key initiatives include smart mobility, energy-efficient buildings, waste and water management, urban green spaces, and ICT-based governance solutions. The mission follows an area-based development approach, integrating **public-private partnerships (PPP)** and innovative financing mechanisms.

Atal Mission for Rejuvenation and Urban Transformation (AMRUT):

The Atal Mission for Rejuvenation and Urban Transformation (AMRUT), launched in 2015 by the Government of India, aims to improve urban infrastructure and enhance the quality of life in **500 cities** across the country. Implemented by the **Ministry of Housing and Urban Affairs (MoHUA)**, AMRUT focuses on providing universal water supply, improved sewage and drainage systems, non-motorized urban transport, and green spaces. The mission follows a decentralized approach, empowering **states and urban local bodies (ULBs)** to plan and execute projects based on local needs. In **2021, AMRUT 2.0** was launched to ensure universal water supply coverage and promote circular economy practices in wastewater and sanitation.

Climate Finance and Market-Based Instruments

National Adaptation Fund for Climate Change (NAFCC):

The National Adaptation Fund for Climate Change (NAFCC), launched in 2015 by the Government of India, is a **centrally sponsored scheme** aimed at supporting **climate adaptation projects** in vulnerable sectors and regions. A dedicated fund supporting climate adaptation projects in sectors vulnerable to climate change. Implemented by the **MoEFCC**, the fund provides **financial assistance to state and union territory governments** for initiatives that enhance **climate resilience in agriculture, forestry, water resources, and ecosystems**. Projects under NAFCC focus on **capacity building, infrastructure development, and sustainable livelihood practices** to help communities cope with the impacts of **climate change**.

India's Climate Finance Taxonomy:

The Government of India is developing a Climate Finance Taxonomy to channel climate finance for enhancing the availability of capital for climate adaptation and mitigation. Aimed at supporting India's net-zero vision by 2070 and the broader goal of Viksit Bharat by 2047, the taxonomy will help identify projects aligned with national climate commitments and just transition pathways. A Draft Framework has been prepared, outlining the objectives, guiding principles, and methodology for classifying adaptation and mitigation actions. This framework will inform sectoral annexures that specify climate-supportive and transition activities. The taxonomy is a strategic tool to enhance access to sustainable finance and accelerate India's green and resilient growth.

Conclusion

India's climate journey reflects a dynamic blend of ambition, pragmatism, and equity. As a rapidly developing economy with vast socio-economic diversity, India has crafted a unique climate action model, rooted in its developmental priorities, committed to international obligations, and responsive to emerging global and domestic challenges. Through a robust policy ecosystem, far-reaching sectoral interventions, and global climate leadership, India has demonstrated its commitment to transitioning toward a low-carbon, climate-resilient future. Looking ahead, India's climate vision will depend on sustained political will, effective policy implementation, scalable technologies, and inclusive stakeholder engagement. The focus on Just Transition and Nature-based Solutions (NbS) signals a shift towards more socially inclusive and ecologically sensitive strategies. However, achieving India's long-term goals like Net Zero by 2070 will require enhanced climate finance, technology transfer, and global cooperation. In essence, India is not only navigating its own low-carbon, climate-resilient path but also shaping the global narrative on sustainable development. As climate impacts intensify, India's experience offers valuable insights for other emerging economies striving to harmonize growth and environmental stewardship in the age of climate change.