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GREEN JUSTICE FOR CLIMATE CHANGE - A STUDY OF INDIA'S CARBON FOOTPRINT REGULATION

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I. ABSTARCT

This paper examines India's regulatory framework for carbon footprint management through the lens of environmental justice, analyzing the constitutional foundations, statutory mechanisms, and judicial responses to climate change governance. Despite being the third-largest greenhouse gas emitter globally while contributing only 3% of historical emissions, India faces the dual challenge of sustainable development and environmental protection. The research identifies significant gaps in India's climate governance, including the absence of comprehensive carbon-specific legislation, fragmented policy implementation, and weak enforcement mechanisms. Through analysis of landmark judicial interventions, international commitments under the Paris Agreement, and domestic policies like the National Action Plan on Climate Change, the paper evaluates the effectiveness of India's current regulatory approach. The study of emerging climate litigation, particularly Ridhima Pandey's petition, reveals the evolving judicial recognition of climate rights. The research concludes with recommendations for a dedicated Carbon Regulation Act, strengthened carbon pricing mechanisms, expanded judicial review of climate commitments, and rights-based approaches to climate justice that would align India's domestic framework with global climate governance standards.

II. KEYWORDS

Carbon footprint regulation, Environmental justice, Climate litigation, Paris Agreement, Constitutional environmental rights.

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III. INTRODUCTION

A. Background and Rationale

Climate change is no longer a distant environmental concern. It has become an immediate crisis affecting economies, ecosystems, and human rights globally. India's position as the third-largest emitter of greenhouse gases places it at the forefront of international climate dialogue.³ Despite contributing only around 3% of cumulative emissions since the industrial era, India faces significant pressure to align its development trajectory with sustainable environmental practices.⁴ This juxtaposition of development needs and environmental responsibility frames the essence of India's climate challenge.

Carbon footprint regulation emerges as one of the primary mechanisms for addressing this challenge. The term "carbon footprint" signifies the total greenhouse gas emissions caused directly or indirectly by individuals, organizations, products, or nations. It encapsulates a range of sectors, from energy production, manufacturing, transport, agriculture, to urban development. For India, regulating this footprint is not only about reducing emissions but also ensuring equitable access to resources for its population, thus intertwining environmental justice with climate action.⁵ This legal research paper, therefore, seeks to explore how India's regulatory framework governs its carbon footprint while advancing the principles of green justice.

Environmental justice, particularly green justice, has deep constitutional roots in India. The right to a clean environment has been read into Article 21 of the Constitution of India, which guarantees the right to life and personal liberty.⁶ Judicial interpretations, starting from "*Subhash Kumar v. State of Bihar*," have consistently recognized environmental

³ Ministry of Environment, Forest and Climate Change, India: Third Biennial Update Report to the UNFCCC (2021).

⁴ R. Ganesan, India's Climate Change Policy: National Strategy and International Diplomacy, 56 Econ. & Pol. Wkly. 45, 46 (2021).

⁵ S. Ghosh, Environmental Justice and Carbon Regulation in India, 12 Indian J. Env'tl. L. 78, 79 (2020).

⁶ INDIA CONST. art. 21.

quality as integral to the right to life.⁷ The expansion of this jurisprudence into the realm of climate change and carbon regulation brings forth questions about adequacy, enforcement, and equity. The regulatory framework must balance environmental protection with developmental imperatives, particularly in a nation with widespread poverty and economic disparity.

India's climate governance rests on multiple pillars. The Environment (Protection) Act, 1986, forms the bedrock, empowering the central government to undertake measures for environmental protection, including setting emission standards.⁸ Other statutes like the Air (Prevention and Control of Pollution) Act, 1981, and the Energy Conservation Act, 2001, also play significant roles in regulating sectors contributing to the national carbon footprint.⁹ Yet, the absence of a unified carbon regulation law leaves India reliant on a fragmented legal regime. This paper argues for the consolidation of India's carbon footprint governance under a comprehensive legal framework that incorporates carbon trading, taxation, and compliance mechanisms.

India's international commitments have a significant bearing on its domestic carbon footprint regulations. As a party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, India has pledged to reduce its emissions intensity by 33-35% by 2030 from 2005 levels.¹⁰ The Nationally Determined Contributions (NDCs) submitted by India outline its strategy, relying heavily on renewable energy adoption, energy efficiency improvements, and forest carbon sinks. However, these commitments are voluntary, non-binding, and largely dependent on policy implementation rather than enforceable legal standards. This paper seeks to evaluate whether India's legal framework is sufficiently robust to meet these

⁷ Subhash Kumar v. State of Bihar, AIR 1991 SC 420, 424.

⁸ Environment (Protection) Act, 1986, § 3, No. 29, Acts of Parliament, 1986 (India).

⁹ Energy Conservation Act, 2001, § 14, No. 52, Acts of Parliament, 2001 (India).

¹⁰ United Nations Framework Convention on Climate Change, India's Nationally Determined Contributions (2015), <https://unfccc.int/sites/default/files/NDC/2022-06/INDIA%20INDC%20TO%20UNFCCC.pdf> (last visited on April 21, 2025).

international obligations and how it integrates principles of environmental justice in doing so.

India's National Green Tribunal (NGT) has been pivotal in enforcing environmental compliance. The NGT, through cases like "*Samir Mehta v. Union of India*," Original Application No. 29/2013, has addressed issues of air pollution, industrial emissions, and environmental impact assessments.¹¹ Yet, its role in carbon footprint regulation remains underexplored. Judicial interventions have largely focused on local environmental degradation rather than the broader implications of carbon emissions. This paper aims to fill this gap by analyzing judicial trends and exploring the potential for climate-related litigation in India.

B. Research Questions

1. How does India's current legal and policy framework for carbon footprint regulation balance environmental protection with development needs, and to what extent does it incorporate principles of environmental justice?
2. What role have the Indian judiciary and specialized tribunals played in enforcing climate obligations, and how has judicial interpretation expanded the scope of constitutional environmental rights to address climate change?
3. What are the key implementation gaps in India's carbon governance architecture, and what legal reforms are necessary to align domestic regulatory mechanisms with India's international climate commitments?

C. Objectives of the Study

1. To critically analyze the constitutional and statutory framework governing carbon footprint regulation in India, evaluating its effectiveness in addressing both environmental protection and developmental imperatives.

¹¹ *Samir Mehta v. Union of India*, Original Application No. 29/2013, National Green Tribunal.

2. To examine the role of judicial intervention in shaping climate governance in India, with specific focus on landmark cases and the emerging jurisprudence on climate rights.
3. To identify implementation gaps in India's carbon regulatory framework and propose legal reforms that would strengthen climate action while advancing principles of environmental justice.

D. Research Methodology

This research employs a doctrinal and analytical approach to examine India's carbon footprint regulatory framework through legal and policy analysis. The study undertakes a comprehensive review of primary sources including constitutional provisions, statutes, judicial decisions, and policy documents related to climate governance in India. Secondary literature comprising scholarly articles, books, and reports supplements this analysis to provide theoretical context. A comparative method is applied to evaluate India's regulatory model against international best practices, particularly in jurisdictions with established carbon markets and climate legislation. Case law analysis focuses on landmark environmental judgments and emerging climate litigation to trace the judicial evolution of climate rights and obligations. Additionally, the research adopts a gap analysis framework to identify inconsistencies between policy objectives and implementation mechanisms. This mixed methodological approach enables a holistic assessment of India's carbon footprint regulation, providing the foundation for evidence-based recommendations aimed at strengthening the legal architecture for climate governance.

IV. THEORETICAL FOUNDATIONS OF ENVIRONMENTAL JUSTICE AND CLIMATE CHANGE LAW

Environmental justice rests on fairness in distribution of environmental benefits and burdens. It promotes inclusion of marginalized groups in decision-making. Its origins trace back to civil rights movements in the United States, challenging disproportionate

pollution in minority communities.¹² The concept matured into international legal discourse through Rio Declaration, Principle 10, which emphasizes access to information, participation, and justice in environmental matters.¹³ In India, this framework connects with Article 21 of the Constitution, which guarantees the right to life, interpreted expansively by courts to include environmental protection.¹⁴

Climate change law is intertwined with environmental justice. It seeks to regulate greenhouse gas emissions, ensure adaptation strategies, and hold polluters accountable. Developed countries carry historical responsibility for emissions, while developing nations like India face the burden of mitigation without equivalent culpability. This imbalance fuels debates on climate equity and the Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC) principle, embedded in the United Nations Framework Convention on Climate Change (UNFCCC).¹⁵ India's climate policy reflects this principle, balancing domestic developmental needs with global environmental commitments.

Environmental justice has evolved to incorporate distributive, procedural, and corrective dimensions. Distributive justice addresses unequal environmental burdens across regions and populations. Procedural justice emphasizes fair access to environmental decision-making. Corrective justice ensures accountability for environmental harm caused. Indian courts have embraced these principles, notably in the *"Vellore Citizens' Welfare Forum v. Union of India,"* where the Supreme Court applied the Precautionary Principle and Polluter Pays Principle to industrial pollution cases.¹⁶ These doctrines became cornerstones of India's environmental jurisprudence, later extended to climate regulation.

¹² Robert D. Bullard, *Environmental Justice: Grassroots Activism and Its Impact on Public Policy Decision Making*, 63 J. Soc. Issues 37, 39 (2007).

¹³ Rio Declaration on Environment and Development, Principle 10, U.N. Doc. A/CONF.151/26 (1992).

¹⁴ Subhash Kumar v. State of Bihar, AIR 1991 SC 420, 424.

¹⁵ United Nations Framework Convention on Climate Change, art. 3, para. 1, May 9, 1992, 1771 U.N.T.S. 107.

¹⁶ *Vellore Citizens' Welfare Forum v. Union of India*, (1996) 5 SCC 647, 658.

The Polluter Pays Principle holds that the party causing pollution bears the cost of managing it. The Supreme Court, in *“Indian Council for Enviro-Legal Action v. Union of India,”* reinforced this principle, directing industries to pay for environmental restoration.¹⁷ This doctrine, when applied to climate change, supports carbon pricing mechanisms such as carbon taxes and cap-and-trade systems. Procedural justice underlines access to information, public participation, and access to justice in environmental matters. The National Green Tribunal (NGT), established under the National Green Tribunal Act, 2010, ensures these rights by providing an accessible forum for environmental disputes.¹⁸

The Public Trust Doctrine is another pillar of environmental justice. It mandates the state to hold natural resources in trust for the benefit of the public. In *“M.C. Mehta v. Kamal Nath,”* the Supreme Court declared rivers and forests as public trust resources, restricting their alienation for private profit.¹⁹ This doctrine aligns with climate change law by reinforcing state accountability in managing carbon sinks like forests. Inter-generational equity, as discussed in *“A.P. Pollution Control Board v. Prof. M.V. Nayudu,”* obliges present generations to preserve environmental resources for future generations.²⁰ It adds a moral dimension to carbon footprint regulation, ensuring sustainable use of environmental assets.

International legal principles shape India's climate change law. The UNFCCC and the Paris Agreement represent the core legal frameworks. The Paris Agreement commits India to reduce its emissions intensity and enhance forest cover, among other targets.²¹ India's Nationally Determined Contributions (NDCs) under the Paris Agreement reflect its commitment to climate action while asserting its developmental priorities. Yet, India's climate law remains fragmented. It relies on sectoral regulations like the Energy

¹⁷ *Indian Council for Enviro-Legal Action v. Union of India*, (1996) 5 SCC 281, 295.

¹⁸ National Green Tribunal Act, 2010, No. 19, Acts of Parliament, 2010 (India).

¹⁹ *M.C. Mehta v. Kamal Nath*, (1997) 1 SCC 388, 395.

²⁰ *A.P. Pollution Control Board v. Prof. M.V. Nayudu*, (1999) 2 SCC 718, 732.

²¹ Paris Agreement, Dec. 12, 2015, U.N. Doc. FCCC/CP/2015/L.9/Rev.1.

Conservation Act, 2001, and policy instruments like the National Action Plan on Climate Change (NAPCC).²²

Carbon trading and offset mechanisms derive legitimacy from the Polluter Pays Principle and market-based approaches to environmental regulation. The Clean Development Mechanism (CDM) under the Kyoto Protocol allowed Indian industries to trade emission reduction credits internationally, fostering investment in renewable energy.²³ However, India lacks a domestic carbon market. Legislative initiatives like a carbon tax or emissions trading scheme remain limited. Comparative studies of the European Union Emissions Trading System (EU ETS) and China's National Carbon Market highlight institutional frameworks India could adapt.²⁴

V. CONSTITUTIONAL AND STATUTORY FRAMEWORK ON CLIMATE CHANGE IN INDIA

A. Environmental Jurisprudence under the Indian Constitution (Articles 21, 48A, 51A(g))

Article 21 of the Constitution of India guarantees the fundamental right to life and personal liberty. This right has been interpreted expansively by the Supreme Court to include the right to a wholesome environment. In the case of *"Subhash Kumar v. State of Bihar,"* the Court held that the right to live with human dignity includes the right to pollution-free water and air, essential for life.²⁵ This interpretation laid the foundation for incorporating environmental protection within the constitutional framework of India.

Article 48A, a Directive Principle of State Policy, mandates the State to endeavor to protect and improve the environment and to safeguard forests and wildlife. Although non-justiciable, the courts have repeatedly invoked this Article to reinforce the State's

²² Energy Conservation Act, 2001, No. 52, Acts of Parliament, 2001 (India).

²³ Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 2303 U.N.T.S. 162.

²⁴ David Driesen, Designing the Carbon Market: Lessons from the European Union Emissions Trading System, 40 *Env'tl. L. Rep. News & Analysis* 10517, 10520 (2010).

²⁵ *Subhash Kumar v. State of Bihar*, AIR 1991 SC 420, 424.

duty towards environmental conservation. In *"M.C. Mehta v. Union of India,"* the Court directed the closure of hazardous industries near the Taj Mahal, invoking the State's duty under Article 48A.²⁶ This reflects the symbiotic relationship between constitutional mandates and judicial activism in fostering environmental protection.

Article 51A(g) imposes a fundamental duty on every citizen of India to protect and improve the natural environment including forests, lakes, rivers, and wildlife, and to have compassion for living creatures. This provision underscores the participatory role of citizens in environmental governance. In the case of *"T.N. Godavarman Thirumulpad v. Union of India,"* the Supreme Court expanded the scope of forest conservation, emphasizing the shared responsibility between the State and citizens under Articles 48A and 51A(g).²⁷ This duty bridges the gap between legal obligations and public participation in environmental protection.

In *"A.P. Pollution Control Board v. Prof. M.V. Nayudu,"* the Court further elaborated on the role of scientific expertise in environmental decision-making, asserting that environmental justice forms a part of the fundamental right to life under Article 21.²⁸ The Court emphasized that environmental issues are inherently complex and require a balance between ecological protection and economic development.

The Public Trust Doctrine, another cornerstone of environmental jurisprudence, has been integrated into constitutional interpretation. In *"M.C. Mehta v. Kamal Nath,"* the Supreme Court held that the State is the trustee of all natural resources, which are meant for public use and enjoyment. This doctrine ensures that the government acts as a steward of the environment, preventing privatization or exploitation of natural resources for commercial gains.²⁹ This doctrine aligns with the broader objectives of Articles 48A and

²⁶ *M.C. Mehta v. Union of India*, (1987) 1 SCC 395, 401.

²⁷ *T.N. Godavarman Thirumulpad v. Union of India*, (1997) 2 SCC 267, 272.

²⁸ *A.P. Pollution Control Board v. Prof. M.V. Nayudu*, (1999) 2 SCC 718, 730.

²⁹ *M.C. Mehta v. Kamal Nath*, (1997) 1 SCC 388, 395.

51A(g), reinforcing the constitutional obligation to preserve natural assets for the benefit of present and future generations.

The National Green Tribunal (NGT), established under the National Green Tribunal Act, 2010, derives its legitimacy from this constitutional framework. The NGT has applied these constitutional principles in climate-related cases. In *Himachal Pradesh Bus Stand Management and Development Authority v. Central Empowered Committee*, Appeal No. 44/2014, the Tribunal emphasized the need to balance development with environmental sustainability, reinforcing the applicability of Articles 21, 48A, and 51A(g).³⁰ The NGT ensures that the right to a clean environment is upheld in practice, not just theory.

The constitutional commitment to inter-generational equity further strengthens the climate change jurisprudence. In *State of Himachal Pradesh v. Ganesh Wood Products*, (1995) 6 SCC 363, the Court upheld the ban on felling trees in ecologically sensitive areas, recognizing the rights of future generations.³¹ This principle, embedded within Article 21, ensures that the environmental rights of unborn generations are safeguarded, aligning with global commitments like the Paris Agreement.

B. Legislative Framework: Environment Protection Act, 1986; Air (Prevention and Control of Pollution) Act, 1981

The Environment Protection Act, 1986, stands as India's umbrella legislation for environmental management. Enacted in the wake of the Bhopal Gas Tragedy, this Act empowers the central government to undertake any measure necessary to protect and improve the environment.³² Section 3 grants the government wide powers to establish standards for emissions, discharge of pollutants, and to regulate industrial operations

³⁰ *Himachal Pradesh Bus Stand Management and Development Authority v. Central Empowered Committee*, Appeal No. 44/2014, National Green Tribunal.

³¹ *State of Himachal Pradesh v. Ganesh Wood Products*, (1995) 6 SCC 363, 377.

³² Environment (Protection) Act, 1986, § 3, No. 29, Acts of Parliament, 1986 (India).

impacting the environment. This provision forms the legislative backbone for India's environmental regulation, including carbon footprint control.

The Act's definition of environment in Section 2(a) is comprehensive. It includes water, air, land, and the inter-relationship between these components and human beings, other living creatures, plants, micro-organisms, and property. This wide ambit allows for the integration of climate change considerations within its framework. Section 5 enables the central government to issue directions to any person, officer, or authority, which has been employed extensively to regulate emissions from industries and vehicles.³³ This provision provides statutory authority to implement India's climate-related commitments under international treaties such as the Paris Agreement.

The Environment (Protection) Rules, 1986, framed under this Act, prescribe standards for ambient air quality, including permissible limits for greenhouse gases like carbon dioxide, methane, and nitrous oxide. Though indirect, these standards aid in the regulation of India's carbon footprint. The Act also empowers the government to establish environmental laboratories and appoint analysts under Section 12 and Section 13, ensuring scientific scrutiny of pollution control measures.³⁴ However, the absence of specific provisions on carbon trading, carbon offsets, or direct emission caps reflects a legislative gap in addressing climate change exclusively.

The Air (Prevention and Control of Pollution) Act, 1981, predates the Environment Protection Act but remains a crucial tool for managing air pollution. The Act defines air pollutant broadly under Section 2(a) to include any solid, liquid, or gaseous substance in the atmosphere, which may harm the environment, human health, or property. This definition accommodates greenhouse gases, though it does not explicitly mention carbon dioxide or other climate pollutants.³⁵ The Act established Central and State Pollution Control Boards, which monitor air quality and enforce standards.

³³ Id. § 5.

³⁴ Id. §§ 12-13.

³⁵ Air (Prevention and Control of Pollution) Act, 1981, § 2(a), No. 14, Acts of Parliament, 1981 (India).

Under Section 16, the Central Pollution Control Board (CPCB) is tasked with advising the central government on matters concerning air pollution and coordinating state-level efforts. The CPCB sets emission standards for industries, vehicles, and other pollution sources, including thermal power plants, which are significant contributors to India's carbon emissions.³⁶ Section 19 of the Act allows State Governments to declare air pollution control areas, where stricter standards can be enforced. This mechanism has been utilized to address urban air quality issues but lacks a targeted approach towards carbon footprint management.

Both the Environment Protection Act and the Air Act rely heavily on criminal sanctions to enforce compliance. Section 15 of the Environment Protection Act prescribes penalties for violations, including imprisonment and fines. Similar provisions exist in the Air Act under Section 37. These punitive measures are essential but insufficient for fostering proactive climate action. Regulatory strategies need to incorporate market-based mechanisms and incentives for emission reductions.

The Environment Protection Act, under Section 6, authorizes the central government to make rules on various environmental matters, including waste management, hazardous substances, and bio-medical waste. This rule-making power has been used to introduce the Environment Impact Assessment (EIA) Notification, 2006, which mandates assessment of environmental impacts for certain projects.³⁷ While the EIA process considers emissions, its focus remains local and project-specific, not systemic to the broader carbon footprint. Its effectiveness in addressing cumulative climate impacts is limited.

³⁶ Id. § 16.

³⁷ Environment Impact Assessment Notification, 2006, Gazette of India, Extraordinary, Part II, Section 3(ii), S.O. 1533(E) (India).

C. Climate-Specific Policies and Regulations: National Action Plan on Climate Change (NAPCC) and State Action Plans (SAPCCs)

The National Action Plan on Climate Change (NAPCC), launched in 2008, represents India's primary climate policy framework. It aligns national development objectives with climate mitigation and adaptation. NAPCC rests on eight core missions, each targeting key sectors. These missions focus on solar energy, energy efficiency, sustainable habitat, water, Himalayan ecosystems, afforestation, sustainable agriculture, and strategic climate knowledge.³⁸ The framework integrates India's constitutional duty under Article 48A, emphasizing environmental protection.

The National Solar Mission aims for solar capacity expansion. Initially targeting 20 GW by 2022, this was later raised to 100 GW under the broader renewable energy goals.³⁹ This mission aligns with India's Nationally Determined Contributions (NDCs) under the Paris Agreement. By reducing dependency on fossil fuels, it directly impacts carbon emissions. The National Mission for Enhanced Energy Efficiency establishes the Perform, Achieve, and Trade (PAT) scheme. This market-based mechanism incentivizes industries to reduce energy consumption and trade excess energy efficiency certificates. This mechanism reflects the polluter pays principle and promotes carbon footprint reduction in energy-intensive sectors.⁴⁰

The National Water Mission seeks to enhance water use efficiency by 20%. Water and climate change are interlinked, with climate variability affecting water resources. This mission introduces adaptive measures, ensuring resource resilience against climate-induced stress.⁴¹ The National Mission on Sustainable Habitat promotes energy efficiency in urban planning. It supports the use of public transport and energy-efficient buildings,

³⁸ Ministry of Environment, Forest and Climate Change, National Action Plan on Climate Change (2008).

³⁹ Ministry of New and Renewable Energy, National Solar Mission (2022), <https://mnre.gov.in/en/solar-overview/> (last visited on April 21, 2025).

⁴⁰ Bureau of Energy Efficiency, Perform Achieve and Trade (PAT) Scheme (2023), <https://beeindia.gov.in/en/programmes/perform-achieve-and-trade-pat> (last visited on April 21, 2025).

⁴¹ Ministry of Water Resources, National Water Mission (2022), <https://jalshakti-dowr.gov.in>.

addressing emissions from urban areas. This mission overlaps with India's commitments to the United Nations Sustainable Development Goals (SDGs), particularly Goal 11 (Sustainable Cities and Communities).⁴²

The Green India Mission, another pillar, enhances forest-based carbon sinks. It targets afforestation of 5 million hectares and improving the quality of existing forests over another 5 million hectares. This strengthens India's capacity to sequester carbon, a vital climate mitigation strategy. It echoes inter-generational equity, ensuring natural resources for future generations.⁴³ The National Mission for Sustainable Agriculture focuses on climate-resilient farming. It promotes adaptive practices such as drought-resistant crops and efficient irrigation, safeguarding food security amidst climate change. This mission addresses both mitigation and adaptation, bridging gaps between policy and practice in rural sectors.⁴⁴

The National Electric Mobility Mission, although not part of the eight original missions, complements NAPCC objectives. It promotes electric vehicles (EVs) to reduce vehicular emissions. The Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) scheme falls under this broader mission.⁴⁵ NAPCC lacks statutory status. It functions as a policy document, implemented through executive orders, rules, and guidelines. Its non-binding nature creates enforcement challenges. However, the Environment Protection Act, 1986, offers the legal base for many missions. For instance, emissions standards for industries and vehicles derive authority from this Act. This linkage allows NAPCC policies to be enforced indirectly through existing environmental laws.⁴⁶

⁴² Ministry of Urban Development, National Mission on Sustainable Habitat (2021), <https://mohua.gov.in>.

⁴³ Ministry of Environment, Forest and Climate Change, Green India Mission (2022), <https://moef.gov.in>.

⁴⁴ Ministry of Agriculture, National Mission for Sustainable Agriculture (2022), <https://agricoop.nic.in>.

⁴⁵ Ministry of Heavy Industries, FAME India Scheme (2023), <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1942506>.

⁴⁶ Environment (Protection) Act, 1986, § 3, No. 29, Acts of Parliament, 1986 (India).

State Action Plans on Climate Change (SAPCCs) extend NAPCC objectives to sub-national levels. States, as per their environmental jurisdiction under the Constitution's Seventh Schedule, draft SAPCCs aligned with regional priorities. SAPCCs reflect India's environmental federalism, allowing states to address unique climate vulnerabilities. For example, Himachal Pradesh focuses on glacial melt, while Tamil Nadu prioritizes coastal erosion and cyclones.⁴⁷ The SAPCCs follow a consultative process, involving local stakeholders. This enhances procedural environmental justice. However, SAPCCs also lack statutory backing, depending on administrative execution. Their integration with state budgets remains inconsistent. The Ministry of Environment, Forest and Climate Change (MoEFCC) reviews these plans, but enforcement is weak, leading to gaps between policy and implementation.⁴⁸

D. Energy Conservation Act, 2001 and the Carbon Footprint Nexus

The Energy Conservation Act, 2001, provides the statutory base for India's energy efficiency and conservation framework. It establishes legal authority to regulate energy consumption across industries, transport, and infrastructure. Section 3 of the Act empowers the Central Government to specify energy consumption standards for appliances, vehicles, and industrial units.⁴⁹ This regulatory power directly impacts carbon emissions since energy efficiency leads to reduced fossil fuel use.

The Bureau of Energy Efficiency (BEE), formed under Section 2(b) of the Act, serves as the nodal agency for implementation. BEE's mandate includes formulating policies, setting benchmarks, and monitoring compliance. The Perform, Achieve, and Trade (PAT) mechanism, introduced by BEE, is a flagship program under this Act. It allows designated consumers in energy-intensive sectors to improve efficiency or trade excess

⁴⁷ Himachal Pradesh State Action Plan on Climate Change (2012); Tamil Nadu State Action Plan on Climate Change (2015).

⁴⁸ Ministry of Environment, Forest and Climate Change, SAPCC Guidelines (2022), <https://moef.gov.in>.

⁴⁹ Energy Conservation Act, 2001, § 3, No. 52, Acts of Parliament, 2001 (India).

savings with others. This market-based approach indirectly reduces carbon emissions and creates economic incentives for industries to optimize energy use.⁵⁰

PAT operates through assigning specific energy reduction targets to sectors like cement, iron and steel, thermal power, and textiles. Entities surpassing their targets earn tradable Energy Saving Certificates (ESCerts), while those failing must purchase them. This mechanism aligns with the polluter pays principle and integrates climate mitigation through efficiency enhancement. The first cycle of PAT (2012-2015) reported savings of approximately 8.67 million metric tonnes of oil equivalent, translating to a significant carbon reduction of about 31 million metric tonnes of CO₂ emissions.⁵¹

The Standards & Labeling Program under the Act is another critical tool. It mandates energy efficiency labeling for electrical appliances, such as refrigerators, air conditioners, and fans. These labels inform consumers and drive market demand toward efficient products. The scheme impacts household and commercial energy consumption, indirectly regulating carbon footprint at the micro level.⁵²

Section 14 of the Act obligates designated consumers to adhere to prescribed energy consumption norms. Non-compliance invites penalties under Section 26, which include fines and legal proceedings. Though the penalties ensure compliance, the focus remains on encouraging voluntary participation. The flexibility of mechanisms like PAT offers industries a cost-effective pathway for emission reduction without heavy-handed regulation.⁵³

The linkage between energy conservation and carbon footprint regulation arises from India's reliance on coal-based thermal power for electricity generation. About 70% of India's electricity derives from coal, making energy efficiency measures pivotal in carbon mitigation. By reducing the energy intensity of production, the Act directly contributes

⁵⁰ Bureau of Energy Efficiency, Perform Achieve and Trade (PAT) Scheme (2023), <https://beeindia.gov.in>.

⁵¹ Ministry of Power, PAT Cycle-I Achievements Report (2016), <https://powermin.gov.in>.

⁵² Bureau of Energy Efficiency, Standards & Labeling Program (2023), <https://beeindia.gov.in>.

⁵³ Energy Conservation Act, 2001, §§ 14, 26, No. 52, Acts of Parliament, 2001 (India).

to lowering India's emissions intensity, as committed under its Nationally Determined Contributions (NDCs) to the Paris Agreement.⁵⁴

The Act also extends its scope to the transport sector. The Fuel Efficiency Standards for vehicles, notified under the Act, regulate carbon emissions from the automotive industry. These standards mandate improvements in fuel efficiency of passenger vehicles by specifying targets for CO₂ emissions per kilometre. This regulatory measure addresses emissions from the rapidly growing transport sector, integrating climate considerations into energy governance.⁵⁵

Amendments to the Energy Conservation Act, introduced through the Energy Conservation (Amendment) Bill, 2022, further strengthen this nexus. The amendments propose the introduction of carbon trading markets in India. This framework will allow trading of carbon credits among entities exceeding their emission reduction targets and those requiring offsets. This marks a strategic shift from energy savings to carbon pricing, bringing India's regulatory regime closer to global standards like the EU Emissions Trading System (EU ETS).⁵⁶

E. Role of the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs)

The Central Pollution Control Board (CPCB) serves as India's principal environmental regulatory authority. Established under Section 3 of the Air (Prevention and Control of Pollution) Act, 1981, its statutory mandate includes advising the central government on air and water pollution control and coordinating with State Pollution Control Boards (SPCBs).⁵⁷ The CPCB's role extends beyond pollution control, as it now addresses

⁵⁴ Ministry of Environment, Forest and Climate Change, India's Nationally Determined Contributions (2015), <https://moef.gov.in/uploads/2017/08/INDIA-INDC-TO-UNFCCC.pdf> (last visited on April 21, 2025).

⁵⁵ Ministry of Road Transport and Highways, Fuel Efficiency Standards Notification (2017), <https://morth.nic.in>.

⁵⁶ Energy Conservation (Amendment) Bill, 2022, Gazette of India, No. 125-C, Acts of Parliament, 2022 (India).

⁵⁷ Air (Prevention and Control of Pollution) Act, 1981, § 3, No. 14, Acts of Parliament, 1981 (India).

climate-related issues by regulating emissions and supporting compliance with national climate objectives.

Section 16 of the Air Act empowers CPCB to lay down standards for the quality of air and emissions. These standards encompass industrial discharges, vehicular emissions, and power plant outputs, all of which directly impact India's carbon footprint.⁵⁸ Although the Act predates global climate agreements, CPCB integrates climate considerations into its regulatory framework, aligning with India's commitments under the Paris Agreement.

The Environment (Protection) Act, 1986, further expands CPCB's jurisdiction. Under Section 5, the central government, through CPCB, can issue directions to industries for emission reductions, including orders to shut down or regulate polluting units. These powers extend to greenhouse gas (GHG) emissions, positioning CPCB as a key player in India's carbon governance.⁵⁹ The Board periodically revises emission standards, incorporating climate-relevant pollutants like carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

CPCB's 2019 notification on emission standards for coal-based thermal power plants exemplifies its climate regulatory function. It mandates limits on particulate matter, sulfur dioxide, nitrogen oxides, and mercury emissions. Although CO₂ is not directly capped, these standards indirectly influence carbon output by encouraging cleaner technologies.⁶⁰ Such regulatory interventions align with India's Nationally Determined Contributions (NDCs) to reduce the emission intensity of its GDP.

SPCBs operate at the state level, mirroring CPCB's functions but focusing on localized implementation. Section 17 of the Air Act empowers SPCBs to set and enforce pollution control measures within their respective jurisdictions.⁶¹ SPCBs play a critical role in

⁵⁸ Id. § 16.

⁵⁹ Environment (Protection) Act, 1986, § 5, No. 29, Acts of Parliament, 1986 (India).

⁶⁰ CPCB, Emission Standards for Thermal Power Plants Notification (2019), <https://cpcb.nic.in>.

⁶¹ Air (Prevention and Control of Pollution) Act, 1981, § 17, No. 14, Acts of Parliament, 1981 (India).

monitoring industries, issuing consent to operate, and prosecuting violators under the Water Act, 1974, and Air Act, 1981. Their enforcement ensures that national climate policies, such as the National Action Plan on Climate Change (NAPCC), are translated into action at the regional level.

In *M.C. Mehta v. Union of India*, the Supreme Court directed CPCB and SPCBs to implement vehicular emission norms in Delhi. This judgment highlights the Boards' joint responsibility in enforcing standards that affect air quality and indirectly regulate carbon emissions.⁶² The case also underlines the role of judicial activism in reinforcing the regulatory functions of these boards.

CPCB monitors air quality through the National Air Quality Monitoring Programme (NAMP). This includes parameters like PM_{2.5}, PM₁₀, SO₂, NO₂, and CO, but not CO₂, revealing a gap in direct carbon monitoring. However, the Air Quality Index (AQI), published by CPCB, influences policy shifts toward cleaner fuels and renewable energy, indirectly addressing carbon emissions.⁶³ SPCBs contribute data to this program, ensuring that regional variations in air quality inform national strategies.

VI. INTERNATIONAL FRAMEWORK AND INDIA'S COMMITMENTS

The United Nations Framework Convention on Climate Change (UNFCCC) forms the cornerstone of international climate governance. Adopted in 1992, it establishes a framework for stabilizing greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system. India ratified the UNFCCC in 1993, signaling its commitment to global climate cooperation.⁶⁴ The Convention enshrines the principle of Common but Differentiated Responsibilities and

⁶² *M.C. Mehta v. Union of India*, (1999) 6 SCC 9, 14.

⁶³ CPCB, National Air Quality Index (2023), <https://cpcb.nic.in>.

⁶⁴ United Nations Framework Convention on Climate Change, May 9, 1992, 1771 U.N.T.S. 107.

Respective Capabilities (CBDR-RC), acknowledging that developed countries bear greater historical responsibility for climate change.

The Kyoto Protocol, adopted in 1997 under the UNFCCC, introduced legally binding emission reduction targets for developed nations. India, categorized as a non-Annex I country, was not required to commit to emission cuts but benefited from mechanisms like the Clean Development Mechanism (CDM). CDM allowed developed countries to invest in emission-reduction projects in developing nations, earning carbon credits in return. India emerged as a leading host country for CDM projects, particularly in renewable energy and industrial efficiency sectors, generating substantial Certified Emission Reductions (CERs).⁶⁵

The Paris Agreement, adopted in 2015 at the 21st Conference of the Parties (COP21), marked a paradigm shift. It replaced the Kyoto Protocol's top-down emission targets with a bottom-up approach where countries submit Nationally Determined Contributions (NDCs). India's NDC, submitted in 2015, commits to reducing the emission intensity of its GDP by 33-35% by 2030 from 2005 levels. It also pledges to achieve about 40% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030 and create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through forest and tree cover.⁶⁶

India's ratification of the Paris Agreement in 2016 further reinforced its climate commitments. Article 4 of the Agreement requires all Parties to undertake and communicate ambitious efforts, with the aim of achieving a balance between anthropogenic emissions by sources and removals by sinks in the second half of this century.⁶⁷ Although the Agreement lacks binding enforcement mechanisms, the principle of progression mandates countries to enhance their commitments over time.

⁶⁵ Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 2303 U.N.T.S. 162.

⁶⁶ Ministry of Environment, Forest and Climate Change, India's Nationally Determined Contributions (2015), <https://unfccc.int>.

⁶⁷ Paris Agreement, Dec. 12, 2015, U.N. Doc. FCCC/CP/2015/L.9/Rev.1.

The Intergovernmental Panel on Climate Change (IPCC) reports influence India's climate policy. The IPCC's Sixth Assessment Report highlights the urgent need to limit global warming to 1.5°C above pre-industrial levels. This scientific consensus pressures countries, including India, to scale up mitigation and adaptation measures. India's updated NDC, submitted in 2022, reflects this shift, committing to reduce the emissions intensity of GDP by 45% by 2030 from 2005 levels and achieve about 50% cumulative electric power installed capacity from non-fossil fuel-based sources.⁶⁸

India participates in various multilateral initiatives complementing the UNFCCC. The International Solar Alliance (ISA), co-founded by India and France, promotes solar energy deployment globally. ISA aligns with India's NDC goals and amplifies its leadership in renewable energy. India is also a member of the Coalition for Disaster Resilient Infrastructure (CDRI), which fosters climate-resilient infrastructure systems worldwide.⁶⁹ These alliances enhance India's global climate profile and create synergies with domestic policies like the National Action Plan on Climate Change (NAPCC).

India's engagement with global carbon markets remains complex. Under the Kyoto Protocol's CDM, India capitalized on international investment in renewable and energy efficiency projects. However, with the advent of the Paris Agreement, the transition to new carbon market mechanisms under Article 6 remains unresolved. Article 6 provides for cooperative approaches, including internationally transferred mitigation outcomes (ITMOs) and a new sustainable development mechanism, but operational rules are still evolving. India's future participation hinges on ensuring environmental integrity and avoiding double counting of emission reductions.⁷⁰

India's climate commitments intersect with global climate finance mechanisms. The Green Climate Fund (GCF), established under the UNFCCC, provides financial support

⁶⁸ Ministry of Environment, Forest and Climate Change, Updated NDC of India (2022), <https://moef.gov.in>.

⁶⁹ International Solar Alliance, Framework Agreement (2021), <https://isolaralliance.org>.

⁷⁰ Article 6, Paris Agreement, Dec. 12, 2015, U.N. Doc. FCCC/CP/2015/L.9/Rev.1.

to developing countries for mitigation and adaptation projects. India has accessed GCF funding for projects like enhancing climate resilience in coastal communities. However, developed countries' failure to meet the \$100 billion per year climate finance commitment remains a contentious issue. India consistently advocates for predictable and adequate financial flows to support its climate actions.⁷¹

VII. JUDICIAL RESPONSES TO CLIMATE CHANGE AND CARBON EMISSIONS IN INDIA

A. Landmark Judgments on Environment and Climate Change (MC Mehta cases, Vellore Citizens' Welfare Forum, etc.)

"M.C. Mehta v. Union of India," set the tone for India's environmental jurisprudence. The Supreme Court directed closure and relocation of hazardous industries from the vicinity of the Taj Mahal to protect it from acid rain caused by sulfur dioxide emissions. This ruling marked the judicial recognition of air pollution's impact on cultural heritage. The Court linked industrial pollution directly to environmental degradation, reinforcing Article 21's right to life.⁷²

In "M.C. Mehta v. Union of India," addressing vehicular emissions in Delhi, the Supreme Court ordered a phased conversion of public transport vehicles to Compressed Natural Gas (CNG). This case established judicial oversight over government agencies to implement emission control measures. The Court invoked the precautionary principle, affirming its role in climate-sensitive governance. Though carbon dioxide was not directly addressed, the judgment significantly reduced urban air pollutants, indirectly cutting carbon emissions.⁷³

"Vellore Citizens' Welfare Forum v. Union of India" expanded the jurisprudence further. The Court dealt with pollution from tanneries in Tamil Nadu and introduced two pivotal

⁷¹ Green Climate Fund, Projects in India (2023), <https://www.greenclimate.fund/countries/india> (last visited on April 21, 2025).

⁷² M.C. Mehta v. Union of India, (1987) 1 SCC 395, 400.

⁷³ M.C. Mehta v. Union of India, (1999) 6 SCC 9, 14.

principles Precautionary Principle and Polluter Pays Principle into Indian environmental law. It emphasized sustainable development as a balance between environmental protection and economic growth. The judgment underscored that economic activities must integrate ecological considerations, forming the legal foundation for climate-related adjudication.⁷⁴

Indian Council for “*Enviro-Legal Action v. Union of India*,” concerned chemical industries discharging untreated waste, contaminating soil and water. The Supreme Court applied the Polluter Pays Principle robustly. The Court held that the polluting industries must pay for the environmental restoration, reaffirming accountability for environmental harm. This principle is now pivotal in carbon emission regulation debates, as it supports mechanisms like carbon taxes and trading.⁷⁵

“*M.C. Mehta v. Kamal Nath*,” established the Public Trust Doctrine. The Court restrained private exploitation of natural resources, holding the government accountable for preserving environmental assets. This doctrine strengthens state obligations in carbon governance, requiring stewardship over forests and carbon sinks vital for climate mitigation.⁷⁶

In “*A.P. Pollution Control Board v. Prof. M.V. Nayudu*,” the Supreme Court recognized the complexity of environmental disputes, stressing scientific expertise’s role. The Court acknowledged the inter-generational equity principle, binding present generations to preserve environmental resources for future generations. This principle resonates strongly with climate justice, linking today’s carbon emissions with tomorrow’s rights.⁷⁷

⁷⁴ Vellore Citizens’ Welfare Forum v. Union of India, (1996) 5 SCC 647, 658.

⁷⁵ Indian Council for Enviro-Legal Action v. Union of India, (1996) 5 SCC 281, 295.

⁷⁶ M.C. Mehta v. Kamal Nath, (1997) 1 SCC 388, 395.

⁷⁷ A.P. Pollution Control Board v. Prof. M.V. Nayudu, (1999) 2 SCC 718, 732.

B. Application of Public Trust Doctrine and Precautionary Principle in Climate Litigation

The Public Trust Doctrine, as articulated by the Supreme Court in “*M.C. Mehta v. Kamal Nath*,” anchors the State as a trustee of natural resources. The Court restrained private encroachment over the Beas riverbed, ruling that natural resources are not private property but held in trust for the public. This doctrine requires the State to protect environmental assets for present and future generations, directly linking it to climate mitigation. Carbon sinks like forests and wetlands fall under this doctrine, compelling the State to safeguard them against degradation that worsens climate change.⁷⁸

The doctrine's application extends to judicial scrutiny of government policies. In “*T.N. Godavarman Thirumulpad v. Union of India*,” the Supreme Court restricted the diversion of forest land for non-forest purposes without clearance under the Forest (Conservation) Act, 1980. The Court emphasized the State's fiduciary responsibility in forest conservation, vital for carbon sequestration and regulating the national carbon footprint.⁷⁹

The Precautionary Principle complements the Public Trust Doctrine by shifting the burden of proof to developers or polluters. First introduced in India through “*Vellore Citizens' Welfare Forum v. Union of India*,” the Court held that environmental measures must anticipate, prevent, and attack the causes of environmental degradation. It ruled that lack of scientific certainty is no excuse for postponing measures to prevent environmental harm. This principle is particularly relevant in climate litigation, where scientific uncertainties around carbon emissions and climate impacts are common.⁸⁰

In “*A.P. Pollution Control Board v. Prof. M.V. Nayudu*,” the Supreme Court reinforced the Precautionary Principle. The Court acknowledged that environmental risks, especially those with complex scientific assessments, should err on the side of caution. It underlined

⁷⁸ *M.C. Mehta v. Kamal Nath*, (1997) 1 SCC 388, 395.

⁷⁹ *T.N. Godavarman Thirumulpad v. Union of India*, (1997) 2 SCC 267, 272.

⁸⁰ *Vellore Citizens' Welfare Forum v. Union of India*, (1996) 5 SCC 647, 658.

the role of scientific expertise in judicial decision-making, relevant for climate cases where emission thresholds and carbon budgets require technical evaluations.⁸¹

The National Green Tribunal (NGT) has applied both principles in recent climate-related rulings. In *"Shailesh Singh v. Hotel Holiday Regency"*, OA No. 176/2015, the Tribunal invoked the Precautionary Principle to prevent groundwater extraction for commercial purposes, protecting aquifers as part of the climate-adaptive ecosystem. It extended the logic that resource conservation under these principles also mitigates local climate risks.⁸²

The Tribunal applied the Public Trust Doctrine in the matter of *"Ridhima Pandey v. Union of India."* The petitioner, a minor, sought action against the government for failing to implement effective climate policies under the Paris Agreement. Though dismissed on procedural grounds, the Tribunal recognized the State's trust responsibility in climate governance. It held that public interest in environmental protection, including climate change, falls within the ambit of judicial oversight, reinforcing the relevance of these doctrines in future climate litigation.⁸³

C. Role of the National Green Tribunal (NGT) in Carbon Footprint Regulation

The National Green Tribunal (NGT), established under the National Green Tribunal Act, 2010, plays a pivotal role in enforcing environmental rights and ensuring compliance with environmental laws. Section 14 of the Act empowers the Tribunal to adjudicate substantial questions relating to the environment, including climate-related disputes, directly linking it with carbon footprint regulation.⁸⁴ Its jurisdiction extends to the enforcement of any legal right related to the environment, encompassing air and water pollution, forest conservation, and emissions control.

In *"Almitra H. Patel v. Union of India,"* the NGT addressed issues of municipal solid waste management. The Tribunal issued binding directions for waste segregation and landfill

⁸¹ A.P. Pollution Control Board v. Prof. M.V. Nayudu, (1999) 2 SCC 718, 732.

⁸² Shailesh Singh v. Hotel Holiday Regency, OA No. 176/2015, National Green Tribunal.

⁸³ Ridhima Pandey v. Union of India, OA No. 187/2017, National Green Tribunal.

⁸⁴ National Green Tribunal Act, 2010, § 14, No. 19, Acts of Parliament, 2010 (India).

management. Although not directly regulating carbon dioxide, the decision impacts methane emissions from landfill sites, contributing to the regulation of short-lived climate pollutants, integral to carbon footprint governance.⁸⁵

The Tribunal reinforced its climate role in the matter of “*Vikrant Tongad v. Union of India*,”. The case challenged the Environmental Clearance granted to a coal-based power plant. The NGT scrutinized the Environmental Impact Assessment (EIA) report and ordered stringent compliance measures. This judgment reflected the Tribunal’s active oversight on industrial emissions, indirectly regulating carbon footprints by ensuring environmental due diligence in high-emission sectors like energy production.⁸⁶

In “*Vardhaman Kaushik v. Union of India*,” the NGT intervened during the Delhi air pollution crisis. The Tribunal imposed restrictions on diesel vehicles and construction activities to curb air pollution. Though primarily addressing local air quality, the measures reduced carbon emissions from transportation and construction sectors. This case exemplifies the Tribunal’s proactive role in enforcing emission control that intersects with carbon footprint reduction.⁸⁷

The NGT applied the Precautionary Principle and Polluter Pays Principle in these rulings. It extended liability to polluters for remediation and prevention, vital in regulating carbon-intensive activities. The Tribunal’s jurisdiction also includes oversight over renewable energy transitions. In “*Gauri Maulekhi v. Union of India*,” the Tribunal directed the phasing out of biomass burning, reducing black carbon emissions, a significant climate forcing agent.⁸⁸

The Tribunal’s power to issue binding directions under Section 15(1) of the Act allows it to impose penalties and restitution costs on violators. This authority strengthens carbon footprint regulation as it enforces accountability for non-compliance with emission

⁸⁵ Almitra H. Patel v. Union of India, Original Application No. 199/2014, National Green Tribunal.

⁸⁶ Vikrant Tongad v. Union of India, OA No. 384/2016, National Green Tribunal.

⁸⁷ Vardhaman Kaushik v. Union of India, OA No. 21/2014, National Green Tribunal.

⁸⁸ Gauri Maulekhi v. Union of India, OA No. 561/2018, National Green Tribunal.

standards. The NGT's decisions, while framed under traditional pollution laws, contribute directly to India's climate goals by addressing sectors contributing to greenhouse gas emissions.

D. Climate-Related Public Interest Litigations (PILs): Trends and Outcomes

Public Interest Litigations (PILs) in India have driven environmental jurisprudence, evolving to encompass climate concerns. PILs have served as catalysts for policy enforcement, judicial intervention, and regulatory accountability, impacting carbon emissions indirectly. The landmark M.C. Mehta series, initiated as PILs, shaped air and water pollution control. These cases expanded the scope of Article 21, embedding environmental rights into the fundamental right to life, thereby providing a constitutional basis for future climate-related litigation.⁸⁹

In the "*Ridhima Pandey v. Union of India*," a climate-centric PIL, a minor petitioner approached the National Green Tribunal (NGT) demanding accountability for India's Paris Agreement commitments. Though dismissed on procedural grounds, the case underscored the legal potential of invoking international climate commitments in domestic courts. The NGT acknowledged India's responsibility under global climate frameworks, hinting at the Tribunal's willingness to entertain future climate-specific disputes.⁹⁰

In *Court on its "Own Motion v. Union of India"*, concerning vehicular emissions in Delhi, the judiciary responded to rising pollution levels. The Supreme Court directed phasing out of old commercial vehicles and mandated conversion to Compressed Natural Gas (CNG). This PIL, though framed under air pollution, had a climate-positive outcome by reducing carbon emissions from urban transport. It demonstrated the judiciary's readiness to use PILs for enforcing emission reductions in high-pollution sectors.⁹¹

⁸⁹ M.C. Mehta v. Union of India, (1999) 6 SCC 9, 14.

⁹⁰ Ridhima Pandey v. Union of India, OA No. 187/2017, National Green Tribunal.

⁹¹ Court on its Own Motion v. Union of India, WP(C) No. 13029/1985, Supreme Court of India.

“Gauri Maulekhi v. Union of India,” before the NGT, dealt with stubble burning in North India, a major contributor to seasonal air pollution and black carbon emissions. The Tribunal directed states to implement crop residue management measures, linking air pollution controls with carbon mitigation strategies. This case highlighted the emerging trend of PILs addressing non-CO₂ climate pollutants like black carbon.⁹²

E. ANALYSIS OF RIDHIMA PANDEY’S PETITION

Ridhima Pandey’s climate litigation presents a compelling narrative of green justice. It situates India’s carbon footprint regulation within the contours of constitutional environmental rights, administrative accountability, and climate governance. The petition, in its dual manifestation before the National Green Tribunal (NGT) and the Supreme Court of India interrogates the adequacy of India’s climate action in light of international commitments, particularly the Paris Agreement.

In the 2022 proceedings before the NGT, the focus rested on illegal mining activities in Uttarakhand’s reserved forests, framed under Original Application No. 429/2022. Here, Ridhima, a minor climate activist, invoked the Tribunal’s jurisdiction via a letter petition alleging ecologically destructive mining in the Haldwani Forest Division. The Tribunal’s response was procedural yet significant. It constituted a Joint Committee comprising regulatory and administrative bodies like MoEF & CC, CPCB, State PCB, SEIAA, and district magistrates to investigate the matter. This highlighted institutional engagement with environmental governance. However, the NGT’s interim directives, including a temporary halt on commercial mining in specified river stretches, underscored the Tribunal’s reliance on procedural environmentalism rather than systemic reform.⁹³

The Supreme Court proceedings in Civil Appeal No. 388/2021, adjudicated in February 2025, elevated the discourse. The appellant sought judicial scrutiny of India’s climate

⁹² Gauri Maulekhi v. Union of India, OA No. 561/2018, National Green Tribunal.

⁹³ Ridhima Pandey v. State of Uttarakhand & Ors., Original Application No. 429/2022, National Green Tribunal, Principal Bench, New Delhi (Dec. 19, 2022), available at <http://indiankanoon.org/doc/159336822/>.

policies and emissions control mechanisms. The Court, while recognizing the gravity of climate change as an existential threat, identified institutional fragmentation and weak regulatory frameworks as critical hurdles. The Court's emphasis on converging key ministries, such as Power, Petroleum, Renewable Energy, Transport, and Urban Development, for coordinated climate governance, spotlighted a systemic lacuna in India's climate institutional architecture. The need for inter-ministerial synergy resonated deeply with the Paris Agreement's implementation philosophy, marking a shift from fragmented policy mandates to holistic state accountability.⁹⁴

The Supreme Court's orders reflected a sophisticated appreciation of climate jurisprudence. It did not limit itself to policy assessment but ventured into suggesting institutional reforms, including stronger statutory mandates and collaborative governance frameworks. The Court's invitation to *Amici Curiae* to recommend legal reforms reflected its intent to bridge the policy-enforcement divide. This legal positioning aligns with the global shift towards embedding enforceability within climate action frameworks, echoing principles from instruments like the UNFCCC and the Paris Agreement, where national obligations are increasingly seen as justiciable.⁹⁵

In the NGT's analysis, the enforcement trajectory remained confined within the procedural domain of environmental impact assessments (EIA), forest clearances, and pollution control. While necessary, this limited lens ignored the macro-level governance gaps underscored in the Supreme Court proceedings. The NGT's directives largely operated within the National Green Tribunal Act, 2010, particularly Sections 19(j) and 20, which focus on environmental restitution but stop short of comprehensive climate action enforcement.⁹⁶ Conversely, the Supreme Court's approach embraced the larger canvas of

⁹⁴ *Ridhima Pandey v. Union of India & Anr.*, Civil Appeal No. 388/2021, Supreme Court of India (Feb. 21, 2025) (unpublished).

⁹⁵ *Id.*

⁹⁶ National Green Tribunal Act, No. 19 of 2010, India Code (2022), §§ 19(j), 20.

climate governance, pressing for legislative reforms, institutional accountability, and policy convergence elements pivotal for long-term carbon regulation.

The petition's broader significance lies in framing climate inaction as a potential breach of constitutional rights. This strategic litigation channels doctrines such as the right to life under Article 21, read with environmental jurisprudence evolved through landmark judgments like "*M.C. Mehta v. Union of India*". By framing carbon footprint regulation as an enforceable right, the petition challenges the state's omissions in mitigating emissions and protecting ecological rights. The Supreme Court's acknowledgment of climate change's socio-economic dimensions public health, agricultural productivity, and energy security expands this rights-based framework, marrying environmental and developmental justice.⁹⁷

The Court's references to existing statutes the Environment Protection Act, 1986, and the Air (Prevention and Control of Pollution) Act, 1981 underscore the legal vacuum in India's climate regulatory space. These statutes, though foundational, lack climate-centric mandates and enforceable emission targets. The Court's suggestion for statutory recalibration implies a move towards embedding climate responsibilities in binding law. This would align India's domestic framework with international practices, where climate change laws, such as the UK's Climate Change Act, 2008, enforce national carbon budgets and institutional oversight.⁹⁸

Institutional barriers surfaced prominently in both the Tribunal and Court proceedings. While the NGT focused on localized compliance, the Supreme Court exposed systemic inertia lack of jurisdictional clarity, poor data access, and fiscal constraints crippling bodies like the CAQM and CPCB. The Court's order to implead multiple ministries reflects its insistence on an integrated climate governance model. It points to a need for

⁹⁷ *M.C. Mehta v. Union of India*, (1987) 1 SCC 395 (India).

⁹⁸ Climate Change Act, 2008, c. 27 (U.K.).

legislative action, possibly through a standalone Climate Change Act for India, integrating emission targets, adaptive frameworks, and institutional mandates.⁹⁹

The petition also signals the rise of climate constitutionalism in India. By positioning emissions control as a justiciable matter, it pushes the judiciary into the domain of climate accountability a trend witnessed globally, as in *Urgenda Foundation v. State of Netherlands*, where courts compelled governments to adopt stronger emission targets. The Indian Supreme Court's cautious yet affirmative steps towards this direction, such as demanding inter-ministerial coordination and suggesting statutory revisions, mark a departure from purely declaratory environmental judgments towards enforceable climate governance.¹⁰⁰

Notably, Ridhima Pandey's petition also amplifies intergenerational equity as a core tenet of environmental justice. This principle, recognized in Indian jurisprudence through cases like *Vellore Citizens' Welfare Forum v. Union of India*, underscores the state's duty to preserve the environment for future generations. By foregrounding a minor petitioner, the case imbues the legal process with moral urgency, stressing the state's obligations towards younger and unborn citizens. This resonates with international legal principles enshrined in instruments like the Stockholm Declaration, 1972, and the Rio Declaration, 1992.¹⁰¹

In sum, the dual trajectory of Ridhima Pandey's petition procedural enforcement at the NGT and constitutional climate accountability at the Supreme Court illuminates the evolving contours of Indian climate jurisprudence. It demands a recalibration of regulatory frameworks, institutional coordination, and enforceable climate mandates, aligning India's carbon footprint regulation with global climate justice imperatives.

⁹⁹ Ridhima Pandey v. Union of India & Anr., Civil Appeal No. 388/2021, Supreme Court of India (Feb. 21, 2025) (unpublished).

¹⁰⁰ Urgenda Foundation v. State of Netherlands, Case No. C/09/456689 / HA ZA 13-1396 (Hague District Court, June 24, 2015).

¹⁰¹ Vellore Citizens' Welfare Forum v. Union of India, (1996) 5 SCC 647 (India).

VIII. CARBON FOOTPRINT REGULATION IN INDIA - POLICY ANALYSIS AND IMPLEMENTATION GAPS

India's carbon footprint regulation operates within a fragmented policy framework. No standalone legislation governs carbon emissions directly. The Environment (Protection) Act, 1986, provides the primary legal foundation, but its focus remains pollution control, not carbon-specific mitigation. The Air (Prevention and Control of Pollution) Act, 1981, regulates air pollutants broadly. Carbon dioxide, the principal greenhouse gas, remains outside its direct regulatory scope. This regulatory vacuum weakens India's carbon governance architecture.¹⁰²

The National Action Plan on Climate Change (NAPCC) serves as India's flagship climate policy. Launched in 2008, it outlines eight missions targeting renewable energy, energy efficiency, sustainable habitat, and forest-based carbon sinks. These missions align with India's Nationally Determined Contributions (NDCs) under the Paris Agreement. However, NAPCC lacks statutory backing. It operates through executive orders and policy directions, leaving enforcement mechanisms weak. The absence of legal mandates for compliance limits its effectiveness in carbon footprint regulation.¹⁰³

State Action Plans on Climate Change (SAPCCs) localize NAPCC's objectives. States like Maharashtra, Tamil Nadu, and Himachal Pradesh tailor SAPCCs to regional climate vulnerabilities. Yet, these plans face budgetary constraints and institutional inertia. SAPCCs lack integration with state-level economic planning. Carbon emissions from key sectors like energy, transport, and agriculture remain unaddressed systematically. This disjointed implementation erodes the impact of sub-national climate governance.¹⁰⁴

¹⁰² Environment (Protection) Act, 1986, No. 29, Acts of Parliament, 1986 (India).

¹⁰³ Ministry of Environment, Forest and Climate Change, National Action Plan on Climate Change (2008), <https://moef.gov.in>.

¹⁰⁴ Himachal Pradesh State Action Plan on Climate Change (2012); Maharashtra State Action Plan on Climate Change (2017), <https://moef.gov.in>.

India's Perform, Achieve, and Trade (PAT) scheme represents the most structured market-based mechanism for energy efficiency. It mandates energy reduction targets for high-emission industries. PAT's contribution to carbon footprint reduction is indirect but significant. It fosters emission reductions through efficiency, not direct carbon caps. Compliance reporting under PAT remains self-regulatory. Independent audits face inconsistencies, undermining the credibility of emission reduction claims. The absence of a legal framework for carbon trading restricts market expansion beyond energy efficiency sectors.¹⁰⁵

Carbon taxation in India is limited to the coal sector. The Clean Energy Cess, introduced in 2010, levied a tax on coal production and imports. In 2017, this cess was subsumed into the Goods and Services Tax (GST) Compensation Cess. Its revenue now funds GST shortfalls, not climate mitigation. The lack of earmarked funds for climate action weakens the fiscal framework for carbon regulation. Comprehensive carbon pricing across sectors, such as transport or cement, remains absent.¹⁰⁶

Monitoring and verification of carbon emissions lack uniform standards. The Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) oversee air quality and pollution control. Their mandates extend to monitoring industrial emissions but exclude CO₂ and other greenhouse gases explicitly. Air Quality Index (AQI) reports cover pollutants like PM_{2.5}, PM₁₀, SO₂, NO₂, and CO, but omit CO₂. This omission limits the Boards' role in carbon footprint regulation. Climate-specific monitoring remains fragmented across agencies without centralized oversight.¹⁰⁷

The National Green Tribunal (NGT) plays a key role in enforcing environmental laws but faces limitations in climate litigation. Its jurisdiction extends to environmental rights under pollution statutes. Climate-related claims, especially those invoking carbon

¹⁰⁵ Bureau of Energy Efficiency, Perform Achieve and Trade (PAT) Scheme (2023), <https://beeindia.gov.in/en/programmes/perform-achieve-and-trade-pat> (last visited on April 21, 2025).

¹⁰⁶ Ministry of Finance, Union Budget 2017-18, Clean Energy Cess Details, <https://indiabudget.gov.in>.

¹⁰⁷ CPCB, National Air Quality Index (2023), <https://cpcb.nic.in/National-Air-Quality-Index/> (last visited on April 21, 2025).

emissions, often fall outside its direct mandate. Judicial interventions in climate matters remain indirect, addressing air pollution or deforestation without explicit carbon regulation. The lack of statutory linkage between carbon footprint and environmental rights narrows the scope of judicial oversight.¹⁰⁸

India's renewable energy policies, such as the National Solar Mission, significantly reduce carbon footprints in the power sector. The target of achieving 500 GW of non-fossil fuel capacity by 2030 aligns with global climate commitments. However, regulatory frameworks for integrating renewable energy into the grid remain inconsistent across states. Issues like grid stability, pricing mechanisms, and renewable purchase obligations (RPOs) affect renewable energy deployment. Weak enforcement of RPOs dilutes the policy impact on carbon footprint reduction.¹⁰⁹

Carbon markets under Article 6 of the Paris Agreement present new opportunities for India. The operationalization of Internationally Transferred Mitigation Outcomes (ITMOs) remains in negotiation. India's participation in global carbon markets requires robust domestic legal frameworks to ensure environmental integrity and avoid double counting. The lack of legal instruments to recognize and trade carbon credits domestically hampers India's readiness for these emerging markets.¹¹⁰

IX. CONCLUSION AND RECOMMENDATIONS

India's carbon footprint regulation remains embedded within a fragmented policy framework. No consolidated legal instrument governs carbon emissions directly. The reliance on environmental statutes like the Environment (Protection) Act, 1986, and Air (Prevention and Control of Pollution) Act, 1981, leaves gaps in climate-specific governance. These laws focus on pollutants broadly without addressing greenhouse

¹⁰⁸ National Green Tribunal Act, 2010, No. 19, Acts of Parliament, 2010 (India).

¹⁰⁹ Ministry of New and Renewable Energy, Renewable Energy Targets (2022), <https://mnre.gov.in/en/year-wise-achievement/> (last visited on April 21, 2025).

¹¹⁰ Paris Agreement, Article 6, Dec. 12, 2015, U.N. Doc. FCCC/CP/2015/L.9/Rev.1.

gases explicitly.¹¹¹ Market-based mechanisms like the Perform, Achieve, and Trade (PAT) scheme contribute to emission reductions, but their scope remains sectoral. The absence of a formal carbon pricing regime, such as carbon taxes across sectors or emissions trading, limits systemic mitigation efforts.¹¹²

Judicial interventions have advanced environmental justice but remain indirect in carbon regulation. Landmark cases like *M.C. Mehta v. Union of India*¹¹³ and *Vellore Citizens' Welfare Forum v. Union of India* incorporated doctrines like the Polluter Pays Principle and Precautionary Principle.¹¹⁴ Yet, these principles apply within traditional pollution control contexts. Emerging doctrines such as ecocentrism and Rights of Nature, while progressive, have not fully permeated carbon-specific litigation. The National Green Tribunal (NGT) plays a key enforcement role under existing statutes, but lacks jurisdictional clarity over climate obligations tied to India's Nationally Determined Contributions (NDCs).

India's international commitments under the Paris Agreement, including its pledge to achieve net-zero by 2070, require robust domestic legal frameworks. The National Action Plan on Climate Change (NAPCC) and State Action Plans on Climate Change (SAPCCs) function as policy roadmaps but lack enforceability. These plans operate without statutory mandates, undermining accountability. Energy efficiency programs under the Bureau of Energy Efficiency (BEE), particularly PAT, have contributed significantly to emissions reductions. However, broader carbon regulation, including transport, agriculture, and urban development, remains outside their ambit.¹¹⁵

India's renewable energy trajectory offers significant mitigation potential. The target of 500 GW of non-fossil fuel capacity by 2030 aligns with global climate ambitions. Yet,

¹¹¹ Environment (Protection) Act, 1986, No. 29, Acts of Parliament, 1986 (India).

¹¹² Bureau of Energy Efficiency, Perform Achieve and Trade (PAT) Scheme (2023), <https://beeindia.gov.in/en/programmes/perform-achieve-and-trade-pat> (last visited on April 21, 2025).

¹¹³ *M.C. Mehta v. Union of India*, (1999) 6 SCC 9, 14.

¹¹⁴ *Vellore Citizens' Welfare Forum v. Union of India*, (1996) 5 SCC 647, 658.

¹¹⁵ Bureau of Energy Efficiency, Perform Achieve and Trade (PAT) Scheme (2023), <https://beeindia.gov.in/en/programmes/perform-achieve-and-trade-pat>.

enforcement of Renewable Purchase Obligations (RPOs) and grid integration of renewables vary across states. Fiscal instruments like the Clean Energy Cess, initially aimed at taxing coal use, have been diluted after integration into the Goods and Services Tax (GST) framework. This diversion of funds away from climate mitigation weakens fiscal backing for India's energy transition.

A coherent legal framework for carbon footprint regulation is required. A dedicated Carbon Regulation Act should be introduced. It must set sector-wise emission caps, establish carbon markets, and ensure compliance with NDC targets. The Act should empower regulators like CPCB and SPCBs to monitor, verify, and enforce carbon emissions data. Standardized carbon accounting methodologies, aligned with international norms, must be instituted across sectors.

India must reintroduce carbon taxation mechanisms across high-emission sectors beyond coal. A comprehensive carbon pricing framework, blending taxes and market mechanisms, will create economic incentives for emission reductions. This system should integrate with emerging global carbon markets under Article 6 of the Paris Agreement. India's legal architecture must ensure environmental integrity and prevent double counting of emission reductions.¹¹⁶

Judicial review of climate commitments should be institutionalized. Expanding the jurisdiction of the NGT to explicitly cover climate obligations under the Paris Agreement would bridge the current legal void. Courts and tribunals should recognize NDCs as enforceable commitments. Climate-related Public Interest Litigations (PILs) must be mainstreamed, enabling civil society to hold governments accountable for policy lapses in carbon regulation.

Rights-based approaches to climate justice must be fortified. The Supreme Court should formally recognize the right to a stable climate as a derivative of Article 21 of the Constitution. This recognition would empower citizens to challenge carbon-intensive

¹¹⁶ Paris Agreement, Dec. 12, 2015, U.N. Doc. FCCC/CP/2015/L.9/Rev.1.

policies and projects that threaten ecological balance. The integration of eco-centric doctrines, like Rights of Nature, into climate litigation can create new avenues for protecting carbon sinks like forests and rivers.

Institutional capacities at the state level require strengthening. SPCBs must be equipped with technical expertise to monitor greenhouse gas emissions alongside conventional pollutants. Capacity-building initiatives, supported by the central government and international agencies, should focus on carbon accounting, verification, and reporting.¹¹⁷ Financial mechanisms for climate action must be reinforced. The revival of a ring-fenced Clean Energy Fund, independent of GST mechanisms, is critical. Such a fund should channel revenues from carbon taxes or emissions trading into renewable energy, energy efficiency, and climate-resilient infrastructure.¹¹⁸

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