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IMPACT OF CLIMATE CHANGE ON THE ENVIRONMENT

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Abstract

Climate change represents a serious and escalating global environmental emergency with profound legal, constitutional, and regulatory implications, particularly in a country like India with extreme vulnerability to the adverse impacts of climate change and constitutional responsibilities concerning the protection of the environment and sustainable development. In the realm of law, climate change cuts across fundamental constitutional rights in India, especially Article 21's right to life, which has been interpreted expansively by the Supreme Court to include the right to a clean and healthy environment, vide, a series of cases identifying the State's obligation to protect environmental resources resting on public trust doctrine, the directive principles in Articles 48A and 51A(g) that impose both a governmental duty and a citizen's duty to protect the environment. Since India is one of the countries most vulnerable to climate related impacts including extreme heat waves, erratic monsoons, melting of glacial, rising sea level and loss of biodiversity; there is need of putting comprehensive legal and policy framework for the protection of climate, although India has its own legal framework like the Environment (Protection) Act of 1986, Air (Prevention and Control of Pollution) Act of 1981, Water Act of 1974 that deal with the issues of environment, but there is gap regarding dedicated law on climate change that would directly or indirectly address mitigation, adaptation and just transition principles based on its international commitments made under the Paris Agreement. The NAPCC, with its spectrum of policies, is still non-binding and unenforceable; there are lacunae in legal obligations to comply, enforce, and remedy; and increasingly, climate litigation, including that based on constitutional writs, public interest litigation, and environmental tort, is said to be a bona fide option to enforce compliance and responsibility of governments and corporations with whom it acts or fails to act with respect to climate. As a result, India's climate change legal architecture needs to evolve, inter alia, including the principles of climate justice, intergenerational equity, and environmental rule of law in it, so that climate responses by the nation are soundly based on science, economically frugal, legally defensible, just, and constitutionally grounded.

Keywords: Climate Change, Environmental Protection, Indian Constitutional Law, Climate Policy, Sustainable Development.

WHAT IS THE ENVIRONMENT?

The environment encompasses the complex system of physical, chemical, and biological factors that surround and influence living organisms, including air, water, soil, flora, fauna, and their intricate interactions within ecosystems.¹ The country's abundance of different plants and animals makes its environment very important, India stores about 8% of global biodiversity, but it occupies only 2.4% of the world's land, inhabiting places around the world, going from the Himalayan areas to the coasts. There are mangroves, tropical rainforests in the Western Ghats, and arid deserts in Rajasthan in India.² According to Article 48A of the Constitution, protecting the environment is a main task. Article 51A(g), which compels the government and citizens to take care of the environment and try to improve it. The Environment Protection Act from 1986 outlines how environmental laws work and the way India deals with governance after the Bhopal disaster.³ Issues such as severe pollution in cities such as Delhi and Mumbai, polluted water problems with scarcity affecting more than 600 million people, pollution causing deforestation, and the effects of climate change lower the output of crops and affect those who live by. Without conservation and innovation, sustainable development and protecting India's billion-person population cannot make it a nation.⁴

WHAT IS CLIMATE CHANGE?

Climate change means changes in the climate that happen over time across regions or the entire globe. Mostly caused by higher greenhouse gas levels in the atmosphere as a result of human activities. Starting in the mid-20th century⁵, the phenomenon refers to more worldwide higher temperatures, odd rainfall changes, thawing ice caps and glaciers, and a climb in sea level. There is now a higher likelihood of hurricanes

and heatwaves due to climate change.⁶ The overwhelming evidence from temperature records and ice cores shows that scientists believe greenhouse gases are responsible for global warming. Evidence from science shows that the main cause of climate change is human activities, especially burning. Since 1950, the main causes of climate change have been fossil fuels, deforestation, and processes from industry, as confirmed by the Intergovernmental Panel on Climate Change (IPCC)⁷. They call it a change in the climate that can be seen by shifts in the mean and/or changes in properties, properties that are likely to keep occurring for years or even decades longer, which differs from natural climate change because of its human influence. contribution to disturbing how energy is distributed on Earth⁸.

INDIA'S CLIMATE CHANGE FRAMEWORK

India has created a complete system for managing climate issues based on its constitution, which includes Article 48A that requires environmental protection and Article 51A(g) that makes it a duty for every citizen to protect the environment, as well as international commitments, from joining the UNFCCC to the Paris Agreement. The policy regime is comprised of the National Action Plan on Climate Change (NAPCC), launched in 2008, that outlines eight sectoral missions that include a mission to develop solar power; to intensify energy efficiency; water, that is, water resource management; to protect the Himalayan ecosystem; to expand the forest; to move towards organic farming and sustainable agriculture; and to build a strategic knowledge mission.⁹ In addition to this federal structure, the states of India have prepared State Action Plans on Climate Change (SAPCC) focusing on state-specific vulnerabilities, e.g., agriculture resilience activities in Punjab and Haryana under regional policy dialogues.¹⁰ However, these instruments lack statutory codification, leading to gaps in regulation

¹ Ministry of Environment, Forest and Climate Change, Government of India, "National Environment Policy 2006," New Delhi, 2006, p. 2

² Biodiversity International, "India's Biodiversity at a Glance," Ministry of Environment, Forest and Climate Change, Government of India, 2019, <https://www.moef.gov.in/en/divisions/biodiversity/>

³ The Constitution of India, Articles 48A and 51A(g); Environment Protection Act, 1986, Act No. 29 of 1986, Government of India

⁴ NITI Aayog, "Composite Water Management Index: A Tool for Water Management," Government of India, 2019; Central Pollution Control Board, "National Air Quality Index," Ministry of Environment, Forest and Climate Change, 2020

⁵ NASA, "Climate Change and Global Warming," NASA Climate Change, accessed 2024, available at <https://climate.nasa.gov/evidence/>.

⁶ National Oceanic and Atmospheric Administration (NOAA), "Climate Change Impacts," NOAA [Climate.gov](https://www.climate.gov/news-features/understanding-climate/climate-change-impacts), 2024, available at: <https://www.climate.gov/news-features/understanding-climate/climate-change-impacts>

⁷ IPCC, "Climate Change 2021: The Physical Science Basis," Sixth Assessment Report, Working Group I, Cambridge University Press, 2021, pp. 3-32.

⁸ IPCC, "Annex VII: Glossary," in Climate Change 2013: The Physical Science Basis, Fifth Assessment Report, Cambridge University Press, 2013, p. 1450

⁹ Government of India, "National Action Plan on Climate Change (NAPCC)," Ministry of Environment, Forest and Climate Change, 2008.

¹⁰ The Times of India, "Punjab, Haryana Focus on Climate-Resilient Agriculture," May 2023.

with respect to enforcement, accountability, and regulatory coherence.¹¹

The move to renewables is a key mitigation action, with 36 Chapter 6 revised, increased, and realigned nationally determined contributions. In general, the 175 GW target for 2022 and a goal of 500 GW by 2030 (up from the previous) loosen the pollutant-specific levels for many stations in most areas, including the National Capital Territory of Delhi.¹² Supporting this progress is the International Solar Alliance (ISA), formed by France to focus on renewable energy in tropical countries, as well as existing rules like the Electricity Act of 2003 and the Energy Conservation Act of 2001 that support the Central Electricity Regulatory Commission (CERC) in imposing renewable energy policies.¹³ The National Mission for a Green India (GIM) wants to create 5 million hectares of new forests and 5 million hectares of improved forests for the purpose of storing carbon. However, they have to be careful not to violate the rights of local communities, who are protected by the Forest Rights Act 2006. This can be hard because of issues with government rules and locals.¹⁴ The Disaster Management Act (DMA) 2005 made it possible to set rules for how to deal with heatwaves, floods, droughts, and cyclones using forecasts from the Indian Institute of Tropical Meteorology (IITM) and the India Meteorological Department (IMD). This was done by creating the National Disaster Management Authority (NDMA).¹⁵ Because these requirements are enforceable, sub-national governments need to implement them, although some experts say the lack of 'national' climate change laws can make it challenging for local areas to set up strong standards for infrastructure and governance planning.¹⁶

IMPACT OF CLIMATE CHANGE ON THE ENVIRONMENT OF INDIA

India's climate has been changing significantly during the last century, with an average temperature rise of about 0.7°C observed due to the release of

anthropogenic greenhouse gases, and this increase is predicted to continue.¹⁷ These temperature elevations have manifested as more frequent, longer, and hotter heatwave episodes, particularly in the northern and central areas, where the IMD termed 2015 as one of the worst years to date, with temperatures exceeding 45°C in several states, resulting in more than 2,000 heat-related deaths.¹⁸ These weather events attract constitutional duties under Article 21 to protect the right to life and right to health with a clear direction to the regulatory agencies and the state for appropriate regulation and proactive measures for heatwave management according to the Disaster Management Act, 2005. A parallel loss in glacial coverage, Himalayan glaciers in India are receding at a faster rate due to warmer temperatures (and ISRO studies indicate that at least 75% of Himalayan glaciers are receding at some rate), means less water for the substantial river systems of the Ganges, Yamuna, and Brahmaputra, carrying a threat to the water security of millions of people.¹⁹ This glacial melt leads to a higher likelihood of GLOFs, which move both legal and ecological concerns under the EIA process, as well as in violation of the constitutional obligation of sustainable development prescribed under Articles 48A and 51A(g), which impose a duty to protect the environment not only on the state but also on the citizens.

Climate variability has significantly altered traditional monsoon patterns, producing extreme precipitation events exemplified by the 2018 Kerala floods caused by 116% excess rainfall within a two-week period, consistent with Intergovernmental Panel on Climate Change findings regarding increased South Asian monsoon volatility attributable to climate change.²⁰ Similarly, the 2020 Assam and Bihar floods resulted in widespread displacement and destruction, underlining the legal requirement to include adaptation measures in urban planning laws, construction codes, and land management laws, with the National Disaster Management Authority and state governments being legally responsible for integrating climate scenarios into flood management and preparedness, according to the Disaster Management Act, 2005. Since more than half of India depends on agriculture for their main source of income, the impact of climate vulnerability on this sector is very significant, with studies indicating that

¹¹ Shibani Ghosh, *Climate Change Law in India: Emerging Developments and Challenges*, Centre for Policy Research, 2020.

¹² Ministry of New and Renewable Energy (MNRE), "Renewable Energy Targets and Achievements," 2022.

¹³ International Solar Alliance, *Founding Framework Agreement*, 2015.

¹⁴ Ministry of Environment, Forest and Climate Change, "Green India Mission: Objectives and Progress Report," 2022.

¹⁵ National Disaster Management Authority (NDMA), "Guidelines for Heat Wave Management," 2019.

¹⁶ Bharat H. Desai, *Institutionalizing Climate Governance in India*, *Indian Journal of International Law*, Vol. 58, 2020.

¹⁷ Indian Institute of Tropical Meteorology (IITM), "Climate Change over India: Projections and Impact," Ministry of Earth Sciences (2020).

¹⁸ India Meteorological Department (IMD), "Climate of India—Annual Summary 2015," Government of India.

¹⁹ ISRO Report, "Monitoring of Himalayan Glaciers," National Remote Sensing Centre (2020).

²⁰ IPCC Sixth Assessment Report, "Regional Impacts of Climate Change," Chapter 10: Asia, 2021.

if current weather patterns continue, yields of the two main crops (wheat and rice) could drop by 6% to 25% by 2100.²¹ These agricultural disturbances endanger food security and undermine livelihood rights safeguarded by Article 21, amounting to the state's duty to ensure agricultural sustainability via the formulation of climate-resilient farming policies, provision of subsidies for climate-smart practices, and implementation of international commitments under the United Nations Framework Convention on Climate Change (UNFCCC) & Paris Agreement.

The increasing sea levels caused by melting polar ice and the seas being warmer are bad for India's shore. The Intergovernmental Panel on Climate Change (IPCC) states that a one-meter increase in sea level would inundate many coastal towns.²² The Sundarbans, a UNESCO World Heritage site and highly sensitive biodiversity area, has already been losing land due to the effects of marine intrusion, leading to population displacement.²³ These scenarios raise legal questions regarding environmental displacement categorized as "climate-induced migration," which at present does not get adequate recognition under Indian refugee or disaster legislation and, at the same time, leads to states' responsibilities imposed under Article 48A of the Indian Constitution to protect and improve the environment and safeguard forests and wildlife through comprehensive coastal regulation, climate risk zoning, and legal protections for vulnerable communities.

CONCLUSION

Since climate change is affecting India greatly, it must rely on well-organized laws and policies to deal with the harm from rising temperatures and damage to nature. Legal obligations now require governments to create plans that address climate issues, including temperature changes, variations in monsoons, coastal erosion, and declining biodiversity, by involving all segments of society in these efforts. The constitution and international treaties say that the government must plan with climatic variables in mind. This is because of Article 21 (the right to life) and Article 48A (the protection of the environment). The public and private sectors, climate finance programs, and new financial strategies all need to work together to put more money into green technologies and strong climate structures. These efforts should also help smallholder farmers, indigenous communities, and

cities that are dealing with climate change issues. Governments of all levels are advised to join forces and form reliable rules with effective bodies to uphold the environment, also gathering support from citizens' groups in cases such as *Puttaswamy (2017)* and *Vellore Citizens' Welfare Forum (1996)* and committing to further actions that benefit people. So, because India needs to improve its efforts against climate change, it should adopt sustainability in every activity, grow its economic and organizational power, and back equal and active rights for all to ensure both its future and the environment are protected.

²¹ Indian Council of Agricultural Research (ICAR), "Impact of Climate Change on Indian Agriculture," Ministry of Agriculture (2021).

²² Intergovernmental Panel on Climate Change (IPCC), "Special Report on the Ocean and Cryosphere in a Changing Climate," 2019.

²³ World Wildlife Fund (WWF), "Sundarbans: A Climate Crisis in the Making," 2022.