Public Lecture
on the occasion of
World Environment Day

Climate Justice in India: Perspective from the Global South

By

Dr. Sunil Nautiyal

(Alexander von Humboldt Fellow)

Professor, Centre for Ecological Economics and Natural Resources (CEENR),

Institute for Social and Economic Change (ISEC),

Bengaluru-560072, Karnataka, India

JUNE 05, 2026

ESTD. 1981

विकास अध्ययन संस्थान

INSTITUTE OF DEVELOPMENT STUDIES, JAIPUR

Institute of Development Studies

The Institute of Development Studies, Jaipur (IDS) was established in 1981 at the initiative of a group of academicians, scholars, and administrators from Rajasthan. The Indian Council of Social Science Research (ICSSR) and the Government of Rajasthan (GoR) are the two main supporting agencies of the Institute. Being an autonomous organisation registered under the Societies Registration Act of 1958, the main objectives of the institute include: (a) contributing to the understanding of development processes and problems; (b) carrying out studies on contemporary issues; (c) contributing to the policy discourse through theoretical and empirical research; (d) carry out empirical and policy research on the local area and marginalised communities; and (e) providing a forum for intellectual debate and discussions on issues of contemporary relevance.

The Institute is a multi-disciplinary research organisation. It takes cognizance of the macro environment, planning processes, and strategies, including their socio-economic dimensions, and attempts to make interventions through research and dialogues. the Institute is specifically concerned with regional issues related to Rajasthan and western India. In addition to research, the institute believes in collaborative work and policy advocacy. As an ICSSR State Government-supported institute since its inception. It aims to promote research, training, consultation, and information dissemination in the state and beyond.

Public Lecture
on the occasion of
World Environment Day

Climate Justice in India:
Perspective from the Global South

By

Dr. Sunil Nautiyal

(Alexander von Humboldt Fellow)
Professor, Centre for Ecological Economics and Natural Resources (CEENR),
Institute for Social and Economic Change (ISEC),
Bengaluru-560072, Karnataka, India

JUNE 05, 2026

ESTD. 1981
विकास अध्ययन संस्थान

Institute of Development Studies, Jaipur

An Autonomous Research Institute under Indian Council of Social Science Research (ICSSR) and Government of Rajasthan

8B, Jhalana Institutional Area Jaipur-302 004 (India)

Tel: 91-141-270 5726

E-mail: contact@idsj.org.; visit us at www.idsj.org

Climate Justice in India: Perspective from the Global South

Dr. Sunil Nautiyal
(Alexander von Humboldt Fellow)
Professor, Centre for Ecological Economics and Natural Resources (CEENR),
Institute for Social and Economic Change (ISEC), Bengaluru-560072, Karnataka, India
Email: sunil@isec.ac.in

Abstract

The phenomenon of climate change is neither sudden nor unexpected; rather, it is the result of long-term historical actions that are now imposing unprecedented catastrophes on socio-ecological systems worldwide. This global problem has emerged from the mistakes humanity has made in the name of development. The pursuit of development has been relentless, particularly in the global North. While the impact of climate change is felt everywhere, it is disproportionate: those most responsible for the problem suffer less than those who contributed least. All of humanity has the right to develop and meet the aspirations of its people within their respective political boundaries. Highly developed regions tend to view luxury as a right, while people in low-income countries and the developing world seek basic infrastructure to lead safe, secure lives. This paradox lies at the heart of the current climate change debate.

As climate disasters become increasingly severe worldwide, efforts are underway to safeguard the environment and minimise their impact through various mitigation measures. However, the Global South is still seeking more viable options to mitigate climate change while also developing essential infrastructure. To address both needs, there is an urgent requirement for the global North to provide funding and technological support to the global South. This demands an ethical approach and justice for victims of contemporary climate-related problems. This article explores climate justice in India from the perspective of the Global South and highlights its importance in relation to climate finance and technology transfer from the developed world. While global think tanks have made several promises, it is crucial that these are realised on the ground to secure human rights and sustain the global environment for future generations.

Keywords: Climate Change – Finance - Justice; Global North-South; COPs; NDC; NAPCC; Sustainable Future

---

I warmly welcome the Chairperson of the Institute of Development Studies (IDS), Jaipur, Dr. Arvind Mayaram; Director (I/c), IDS, Dr. Motilal Mahamallik; Secretary (I/c), IDS, Dr. Varinder Jain; faculty members Dr. Harchand Ram, Dr. Golam Rabbani, and Dr. Premkumar A; staff; invited guests; participants; students; and representatives from the press and media to this academic programme at IDS, Jaipur. My special thanks and gratitude to the Chairperson and Director (I/c) of IDS for inviting me to this distinguished gathering of scholars, held in celebration of World Environment Day 2026. IDS excels in producing scientific outcomes that enhance our understanding of developmental processes and challenges. The institution conducts rigorous research on issues affecting marginalised groups and less developed regions, and adopts a multidisciplinary approach to address complex societal concerns. IDS provides a scholarly platform for stakeholders to discuss contemporary developmental issues, cultivating a dynamic environment in which scholars across disciplines and institutions can initiate, strengthen, and sustain research collaborations. In this context, I am pleased to acknowledge the collaborative partnership between IDS, Jaipur, and the Institute for Social and Economic Change (ISEC), Bengaluru, and the support of the heads of both organisations in advancing these scientific initiatives.

• Introduction

There has been sufficient knowledge generation on climate change and its associated aspects that link the environment, development, and livelihood security, as well as the responsibilities to act to mitigate climate-related threats, across the globe. The first global discussion on climate change took place in 1979 in Geneva, at the first World Climate Conference. Since then, within the UNFCCC framework, 30 Conference of the Parties (COP) meetings have been held since 1995; the 31st COP is scheduled to be held in Turkey in 2026. In addition to the main COP meetings, Bonn organises mid-year sessions that focus on the challenges of implementing climate policies.

Over the last three decades, the United Nations Climate Change Conferences (COPs) have evolved into several actionable frameworks for reducing human impacts on the global environment. These include emissions reductions through legally binding international agreements and nationally developed climate policies. Major milestones include the Kyoto Protocol, the Paris Agreement, carbon budget estimation, and the grouping of nations by their per capita emissions and historical emissions trajectories. This framing has shaped the protocols governing climate finance mechanisms, including the establishment of the Green Climate Fund and the Loss and Damage Fund, to meet the development needs of poor and developing countries. The recent COPs (29 and 30) have emphasised the need to take

priority actions seriously, with increased accountability and substantial financial commitments. COP30 in particular categorically emphasised implementing past pledges and tracking progress toward achieving climate goals.

Within the climate change debate, fundamental ethical questions remain unanswered: should vulnerable countries and underprivileged societies claim an equal right to pollute, or should rich countries argue for their right to maintain luxury lifestyles built on historical resource extraction? These converging debates on global environmental change raise questions about how to address historical responsibilities in a prioritised and just manner. This leads directly to the debate on climate justice, which argues for a strong human rights-based approach to address the unequal historical responsibilities for CO_2 emissions and the disproportionate impacts of climate change on marginalised, low-income, and vulnerable communities, mainly across the global south. Low emitters are scientifically shown to suffer the most, as their livelihoods are centred on climate-sensitive activities such as marginal agriculture, animal husbandry, and non-timber forest product (NTFP) collection. Their logical demand is for equitable burden-sharing and fair access to climate solutions, one that does not compromise the right to develop while also pursuing mitigation efforts to keep global temperature rise below 1.5 degrees Celsius.

• Climate Change: Effects on the Economy and Society

Climate change has had a serious impact on developing and low-income countries. Recent data show that countries in the Global South are the hardest hit, bearing the brunt of climate change-related losses. The USA, the largest cumulative emitter of greenhouse gases from 1990 to 2020, is responsible for more than USD 10 trillion in global harm (Willmoth 2026), which has disproportionately affected the global south. Climate-related losses in Asian countries are also rising: China loses around USD 238 billion annually, followed by India (USD 87 billion) and Japan (USD 83 billion), according to the State of the Climate in Asia 2020 (Pandey 2021). Globally, 92% of cumulative historical emissions have been released by the global north, with the USA and EU each accounting for approximately 29% (Vigliotti 2025).

The irony is that the global north bears the highest historical responsibility for cumulative greenhouse gas emissions, yet people in the global south face disproportionately higher losses in terms of ecological devastation, forest fires, loss of human lives, and other irreversible threats that amount to an existential crisis (Bandera 2024). This climate injustice demands a fair and equitable share for developing countries in the global south, whose populations seek basic privileges to lead respectable lives while contending with the consequences of development choices made by others. These nations require development

pathways that are not carbon-intensive yet allow their populations to escape poverty and meet basic human aspirations (Sharma et al., online). The world's most affected nations by climate change, in terms of economic liabilities and human lives, are shown in Figure 1.

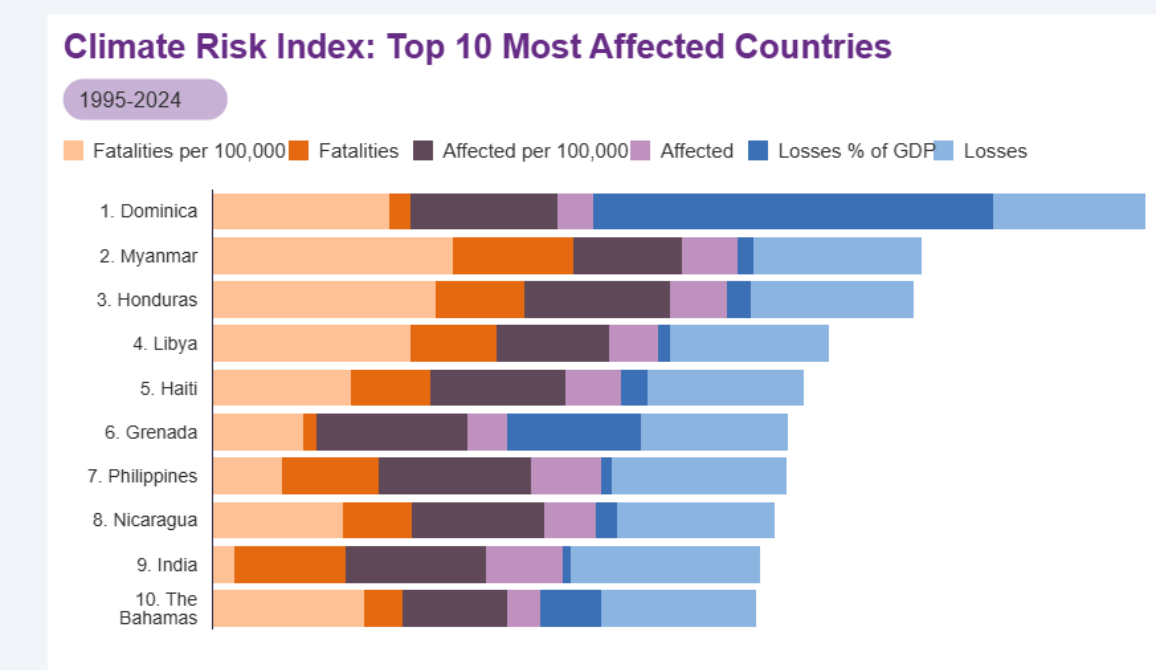

Figure 1: Top 10 most affected countries (Source: CRI, Germanwatch 2025)

Data from the Climate Risk Index (CRI) 2026 (Germanwatch) show that climate disasters have killed approximately 80,000 people and affected 1.3 billion, with India's economic losses totalling USD 170 billion between 1995 and 2024. These figures clearly depict that climate injustice occurs when marginalised and developing communities suffer the most from climate change, even though they contribute the least to the crisis. This unequal burden has given rise to the global climate justice movement, which demands equal rights, fair distribution of environmental protection, and accountability for historical emissions (UNDP, GCP, 2023). Climate justice highlights the disproportionate impacts of climate change on vulnerable countries, regions, and communities, and prioritises protecting their rights and helping them overcome social, ecological, economic, and developmental vulnerabilities.

• Who Owns the Sky?

This is a fundamental ethical question. Table 1 and Figure 2 clearly depict the contrasts between total and per capita emissions of the world's top three emitters. China is the major emitter at approximately 33% of global emissions, followed by the USA at 13% and India at 7%. However, per capita emissions tell a very different story. While India is the third-largest

emitter in absolute terms, it ranks 121st globally, with per capita emissions of less than 1.8 tonnes. The USA and China rank 16th and 27th respectively. The top three nations for per capita emissions are Palau (63 t/capita), Qatar (45 t/capita), and Kuwait (25 t/capita), emitting 13, 9, and 5 times the global average of 4.8 t/capita respectively.

Even at the global average of 4.8 t/capita, current emission levels are far higher than what is required to keep global warming below 1.5°C. Various studies suggest that per capita emissions should ideally be reduced to approximately 1.1 tonnes per person annually. The central question is how to bring about this transformation. Will the wealthiest nations compromise on reducing their carbon footprints by adopting sustainable lifestyles? Will developing and low-income countries be able to achieve their developmental goals through low-carbon-intensive pathways? The debate must focus on climate justice to find feasible solutions towards equitable opportunities for all those who are still behind mainstream development and struggling to meet minimal basic requirements.

Country	Share of Global Emissions	Per Capita Emissions
China	~33%	9.5 t/capita
USA	~13%	16 t/capita
India	~7%	1.8–1.96 t/capita (116th/121st rank)

Table 1: Countries with the highest global emissions and their respective per-capita emissions

Figure 2: Who owns the sky? The contrast between 0.5 t CO_2/year (the poorest) and 15 t CO_2/year (a luxury lifestyle)

The provocative question "Who owns the sky?" is a classic climate justice framing: atmospheric space, the capacity to absorb CO_2, is a shared global common, yet it is being disproportionately occupied by wealthy nations and individuals. To understand this ethically, the debate must centre on climate justice to identify feasible solutions that provide equitable opportunities for all those still behind mainstream development.

• The 1.5°C Carbon Budget

The carbon budget approach was first proposed by the German Advisory Council on Global Change (WBGU) in 2009. It provides a metric for climate justice by calculating a fair per-capita allocation of CO_2: every person on Earth is entitled to emit up to 2.7 tonnes annually (revised downward under the 1.5°C threshold). Applied to major countries, this reveals stark disparities. China emits approximately 9.4 t CO_2 per capita, more than three times its fair share; the United States emits around 13 t CO_2, vastly exceeding its allowance; whereas India, at 1.8 t CO_2 per capita, is nearly compliant. This quantitative basis forms the mathematical core of the global climate justice argument (Kaechele et al., 2011).

To limit warming to 1.5°C, cumulative CO_2 emissions must remain within approximately 790–800 Gt. Of this total budget, 83% is already exhausted. Anthropogenic activities, mainly fossil fuel combustion and deforestation, currently release approximately 45–53 billion tonnes of CO_2 annually (PCCF, 2025). Scientists have estimated that the remaining 130 $GtCO_2$ threshold could be exhausted in just over three years under a business-as-usual scenario (Figure 4). As a result, policymakers and scientists are shifting focus toward preventing the most catastrophic outcomes while aligning with revised thresholds of 1.6°C or 1.7°C (Poynting, 2025). Emissions from aviation account for around 2–3% of total human-induced emissions and have been increasing year by year, though they declined sharply during the COVID-19 pandemic.

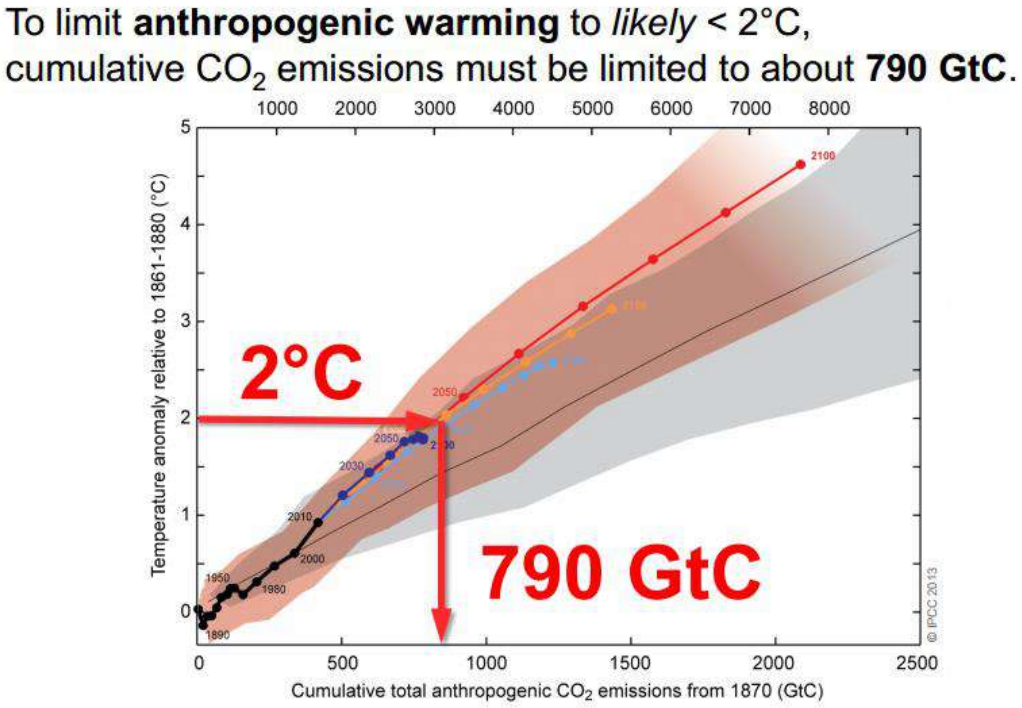

Figure 3: Limiting global warming below 1.5 degrees and anthropogenic emissions (Source: IPCC)

The remaining atmospheric space is scarce, and how it is allocated is fundamentally a question of justice. The main debate centres on the carbon-intensive versus carbon-neutral pathway, and the distinction must be drawn carefully between nations that have made historical mistakes and nations still striving to fulfil the aspirations of their populations.

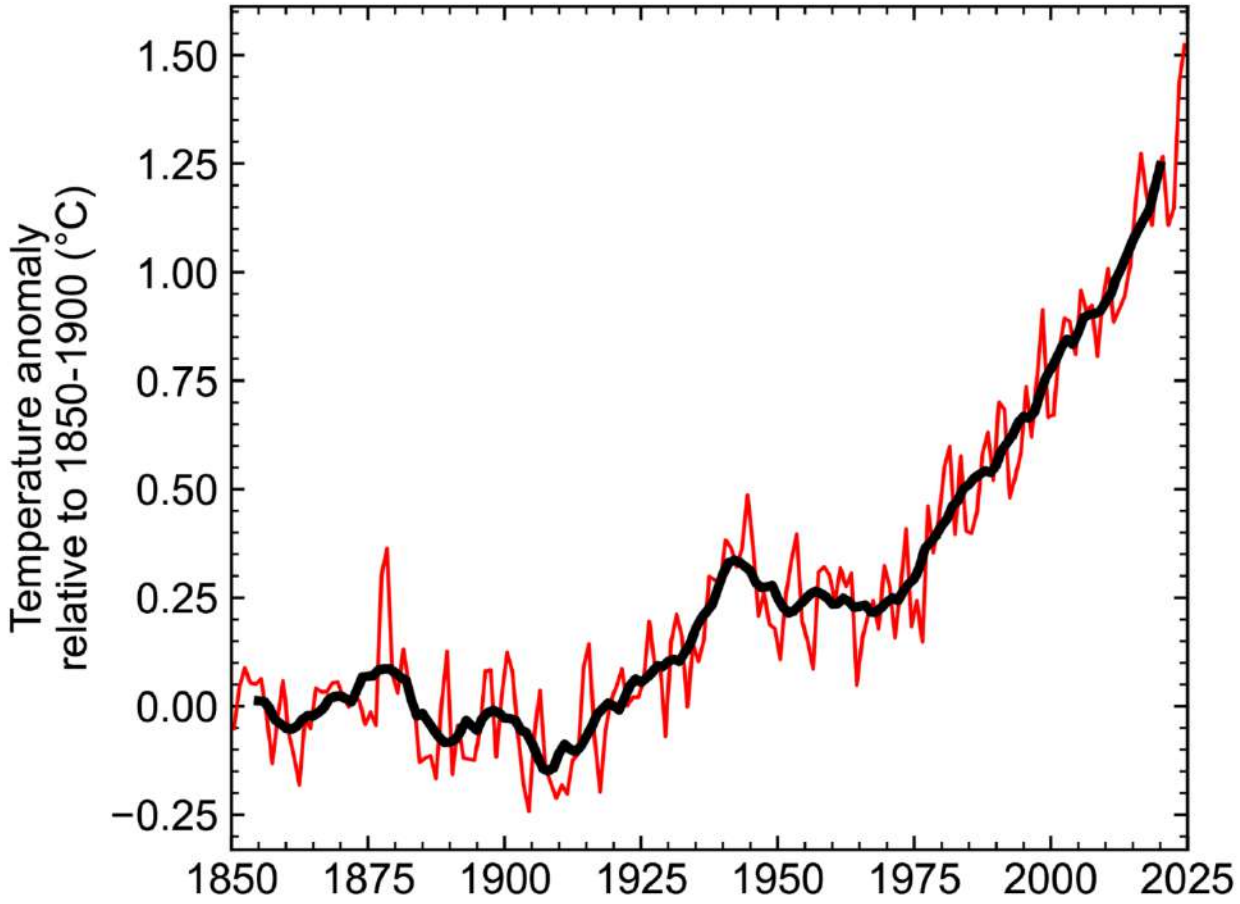

Figure 4: Mean global surface temperature relative to the reference period 1850–1900 (Source: Forster 2025)

Figure 4 indicates a change approaching a new threshold of 1.6 or 1.7°C. At the present emission rate, the remaining budget will be exhausted soon. CO_2 emissions should therefore be understood as a scarce commodity: once it is recognised that atmospheric capacity is finite and shared, the question of who gets to use it, and who has already used it, becomes central to any fair distribution framework and to the debate on climate justice.

• CO_2 Emission Trends by Country

Figure 5 shows CO_2 emission trajectories for the top emitters, the USA, China, Russia, India, and Japan, over five decades. China's emissions rose steeply post-2000, and India's are rising but from a much lower base. The USA has shown a slight decline, though per capita emissions have not fallen drastically. A country like India, with the world's largest population, has not contributed to historical atmospheric accumulation of CO_2, making it only marginally responsible for the contemporary challenges humanity faces from climate change.

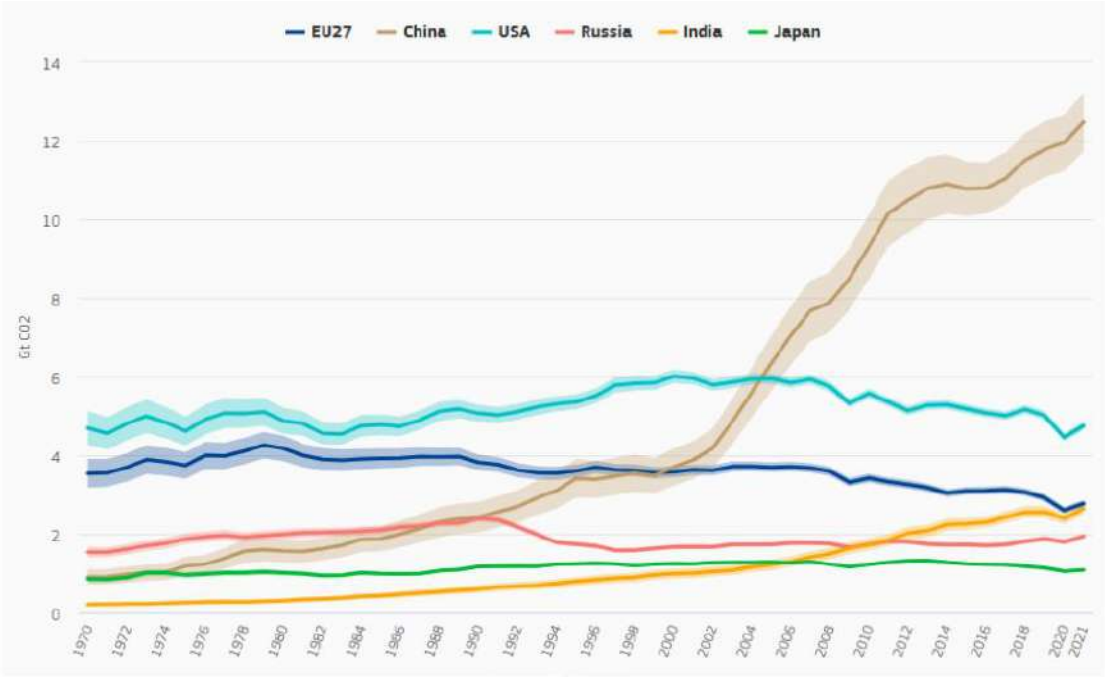

Figure 5: CO_2 Emissions Trends by Country (Crippa et al., 2022)

Table 2 shows percentage changes in CO_2 emissions across countries for the periods 2019–2020, 2020–2021, 2021–2022, and the CAGR for 1990–2021 (Crippa et al., 2022). India's emissions rebounded sharply post-COVID, as expected given its developmental trajectory. Despite the challenges faced by large developing countries, their emissions are not rising as rapidly as those of the developed world did during its own industrialisation phase.

Table 2: CO_2 emissions changes at different points in time and CAGR (1990–2021)

	Share in global	Change 2019-2020	Change 2020-2021	Change 2019-2021	CAGR 1990-2021
China	32.9%	1.5%	4.3%	5.9%	5.4%
United States	12.6%	-10.9%	6.5%	-5.2%	-0.2%
EU27	7.3%	-10.8%	6.5%	-5.0%	-1.0%
India	7.0%	-6.5%	10.5%	3.3%	4.9%
Russia	5.1%	-4.5%	8.1%	3.2%	-0.7%
Japan	2.9%	-7.6%	2.8%	-5.0%	-0.2%
Iran	1.9%	3.1%	2.9%	6.1%	4.1%
South Korea	1.7%	-6.9%	3.5%	-3.6%	2.7%
Indonesia	1.6%	-8.7%	1.9%	-6.9%	4.3%
Saudi Arabia	1.5%	-0.4%	2.0%	1.6%	4.0%
Canada	1.5%	-9.9%	2.8%	-7.4%	0.8%
Brazil	1.3%	-7.7%	11.0%	2.4%	2.5%
South Africa	1.2%	-9.1%	1.8%	-7.4%	1.1%
Turkey	1.2%	-0.1%	8.0%	7.9%	3.6%
Mexico	1.1%	-16.7%	4.3%	-13.1%	1.2%
Australia	1.0%	-7.4%	-2.4%	-9.6%	0.9%
Global		-5.3%	5.3%	-0.4%	1.7%
International aviation	1.0%	-45.3%	15.4%	-36.8%	1.3%
International shipping	1.8%	-2.6%	4.9%	2.2%	2.1%

Source: JRC 2022

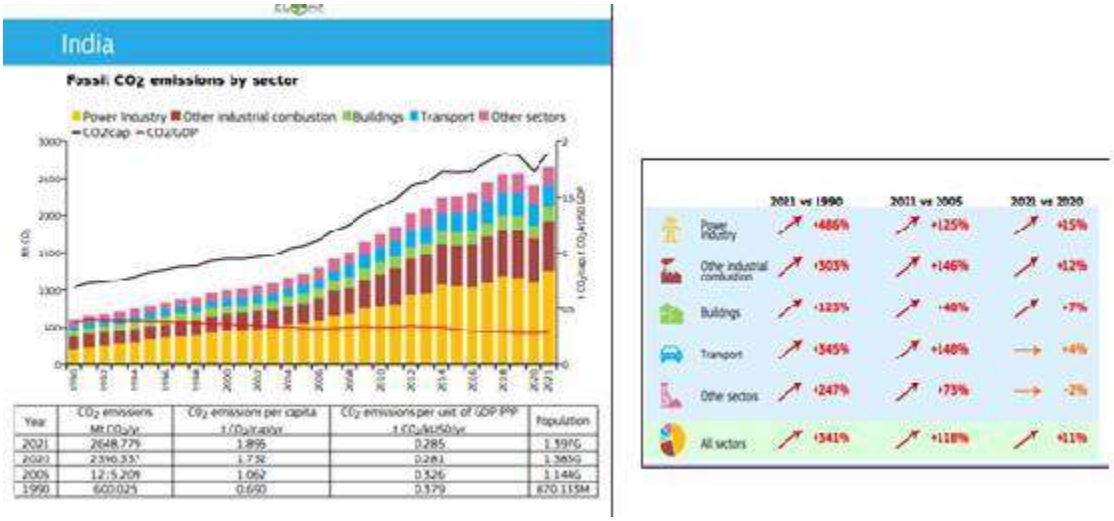

Figure 6: India's role and CO_2 Emissions by Sector in India (Crippa et al., 2022)

India's sectoral emissions over time are dominated by power generation, which is the largest and fastest-growing sector, followed by industrial combustion, transport, and buildings. Figure 6 shows growth projections across three periods: 2005–2010, 2010–2015, and 2015–2020. Crucially, the emissions rise from India is largely driven by poverty alleviation, electrification and industrial growth, rather than luxury consumption. The global south therefore needs substantial support from the global north to cope with climate uncertainties while keeping developmental projects sustainable and meeting the aspirations of its people.

• Climate Justice

Photo-Plate 1 illustrates climate justice in practice, showing how an ecosystem's structure was transformed before and after a climate-driven disaster in Dharali village, Uttarakhand (2025). While climate change played a significant role in this landscape transformation, unregulated human interventions further aggravated the loss, stemming from limited alternative income opportunities, policy failures, and governance gaps at the block, district, or state levels. From a scientific perspective, climate justice can be analysed across three primary dimensions.

1. Resource consumption inequality: Scientific assessments demonstrate that resource consumption, including energy, land, and water, varies significantly between populations and regions. Disparities in per capita resource use contribute to uneven environmental

pressures and ecological footprints. As demonstrated above, per capita emissions in the global north are severalfold higher than in the global south.

2. Emissions contribution inequality: Empirical data show that greenhouse gas emissions are not distributed equally. High-income countries and affluent social classes contribute disproportionately to cumulative emissions, while low-income populations contribute minimally. Nautiyal et al. (2025a) conducted detailed research presenting a sector-wise study of Household Carbon Footprint (HCF) across India, supported by international and national organisations (GIZ and MoEF&CC). The study covers urban, peri-urban, and rural regions, analysing key sectors such as energy, food, waste, and travel across different income groups, across multiple states and 11 ecological zones. The influence of affluence on household emissions is depicted in Figure 7, across seven income brackets. The data reveal a steep increase in carbon footprint with rising income, particularly among the top 2% of Indian households (those earning over Rs 24 lakh/year). This correlation underscores the need for targeted policy interventions addressing high emitters within the country, though it is important to note that the number of high emitters in India is far smaller than in China, the USA, and other top-polluting countries.

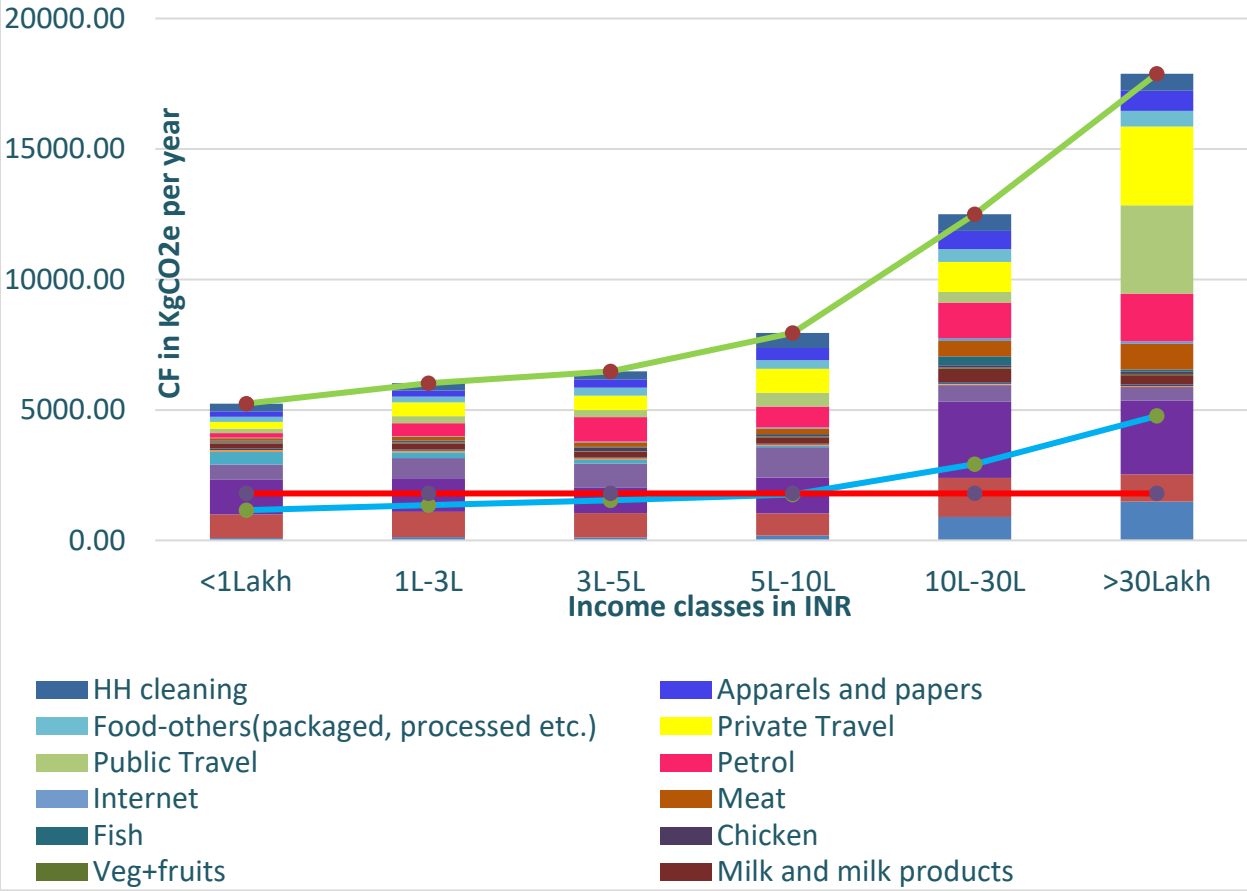

Figure 7: Influence of affluence in India and income-wise disproportionate emissions (Nautiyal et al., 2025a)

3. Climate vulnerability inequality: Scientific studies indicate that vulnerability to climate impacts is unevenly distributed. Geographic factors (such as locations in mountainous, coastal, or arid regions) and socio-economic dependence on climate-sensitive livelihoods (such as agriculture and fishing) amplify risks for populations with limited adaptive capacity. These regions require development to reduce their vulnerability, improve access to modern facilities and health services, provide better schooling, and ensure livelihood security. The central scientific insight is that climate change fundamentally decouples those responsible for emissions from those who bear the consequences. Research shows that climate impacts are geographically concentrated in vulnerable regions, mountains, coasts, and arid zones (Nautiyal et al., 2025a; 2025b; Negi et al., 2025), and that poorer populations lose a greater proportion of their assets. Communities along the Indian coast and in the Himalayan regions disproportionately bear the impacts of emissions from industrialised nations (Biswas and Nautiyal, 2023).

Photo-Plate 1: The impact of climate change, coupled with human-induced factors, in Dharali (Uttarakhand), 2025: before and after the disaster

The framework in Figure 8 illustrates that climate change simultaneously erodes five distinct yet interconnected systems of capital: natural, physical, financial, social, and human. Each represents a foundational asset for societal well-being, and its degradation is both a cause and a consequence of climate injustice. The scientific literature increasingly supports the view that these capital losses are not isolated events but form a complex feedback loop (Nautiyal et al., 2025a).

Natural capital: The stocks of natural resources and environmental services, water springs, glaciers, fertile soils, forests, and ecosystem functions, are foundational for ecological stability. Climate change accelerates glacial melt, disrupts hydrological cycles, and degrades soil and forest health, resulting in loss of ecosystem services that sustain all life forms.

Physical capital: Infrastructure such as housing, roads, and irrigation systems provides the tangible means for human activity and resilience. Increasing frequency and intensity of climate-induced disasters (floods, landslides, storms) damage or destroy physical assets, undermining development gains and increasing vulnerability to future shocks, especially in ecologically sensitive and marginalised regions (Biswas and Nautiyal, 2023).

Financial capital: People in the global south mostly depend on climate-sensitive sectors, agriculture, forest resource collection, animal husbandry, and fishing to sustain their livelihoods. Climate change erodes these sources of income through more frequent crop failures, loss of grazing grounds, reduced forest productivity due to degradation and fire, and damage to aquatic ecosystems. This financial precarity limits adaptive capacity and perpetuates cycles of poverty, particularly among marginalised groups.

Social capital: The networks of relationships and institutional trust that bind communities are strained by climate impacts. Distress migration fragments families and communities, while weakened institutions struggle to coordinate adaptive responses, diminishing collective resilience (Negi et al., 2025).

Human capital: The health, knowledge, and skills of individuals suffer as heat stress and air pollution increase, leading to adverse health outcomes and reduced labour productivity. Displacement and environmental change also accelerate the loss of traditional ecological knowledge, which is crucial for adaptation and survival (Negi et al., 2025).

Climate injustice thus leads to cascading, interconnected losses across all capital assets. The degradation of one type of capital triggers negative feedback loops that accelerate losses in others. For example, the loss of natural capital (such as water sources) undermines physical infrastructure (such as irrigation), reduces financial stability (through crop failure), erodes social cohesion (through migration), and diminishes human well-being (through health impacts). This systemic phenomenon is especially salient for communities in ecologically sensitive regions like the Himalayas, whose livelihoods and knowledge systems are closely tied to intact, functioning ecosystems.

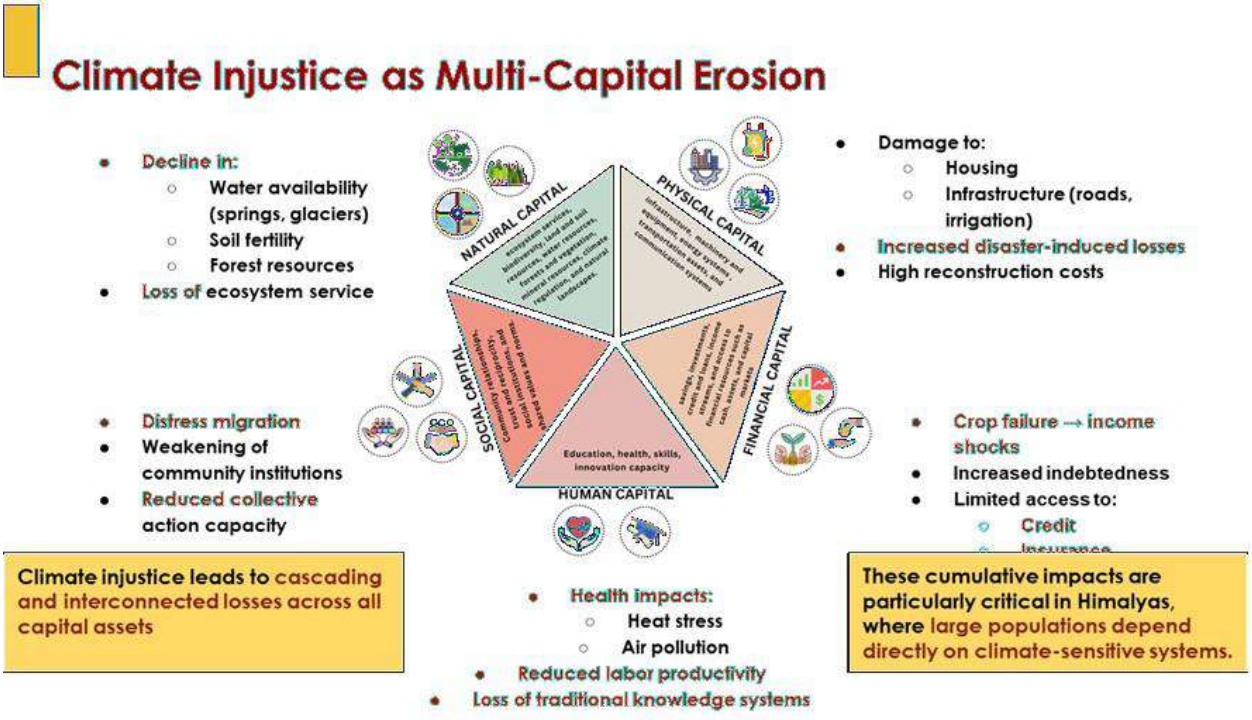

Figure 8: Climate injustice as multi-capital erosion

• Climate Justice: India's Stance and the Vulnerability of Its Ecosystems

Table 3 shows India's position across various dimensions compared to developed nations and highlights the situation of its ecologically sensitive regions. Within India, the most ecologically sensitive regions contribute least to global climate change in terms of per capita emissions and historical contributions, while simultaneously showing high vulnerability, low adaptive capacity, and extreme burden-bearing (Photo-plate 2).

Dimension	Global/Developed	India	Himalayan Region
Per Capita Emissions	10–15 t	~2 t	<1 t
Historical Contribution	~70% cumulative	~4%	~0%
Climate Vulnerability	Low–Moderate	High	Very High
Adaptive Capacity	High	Uneven	Low
Climate Justice Position	High emitter, low burden	Low emitter, high burden	Minimal emitter, extreme burden

Table 3: India's position from the climate change perspective compared to developed nations and its highly ecologically sensitive ecosystems

India has high biodiversity in its natural and socio-ecological systems, yet the majority of its population depends on climate-sensitive activities. Climate change poses three fundamental market failures: (i) a negative externality, as emissions impose unpriced costs on others; (ii) inequality in adaptive capacity, since adaptation is income-dependent and economically costly; and (iii) a public goods failure, since each country's emissions contribute to overall atmospheric concentrations while the costs and benefits of abatement are not borne equally, leading to systematic underinvestment in mitigation.

Kedranath Disaster,2013

Photo-plate 2: Kedarnath disaster – landscape before and after in 2013

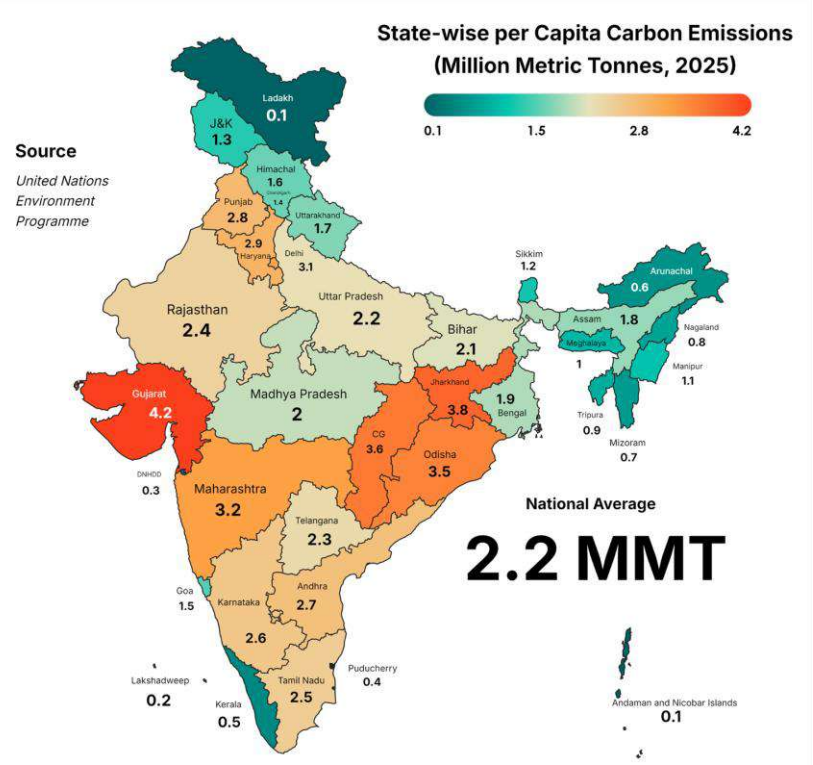

Figure 9: State-wise per capita carbon emissions (Source: UNEP, 2026)

Figure 9 highlights significant internal inequality in India with respect to CO_2 emissions: carbon emissions are concentrated in high-income generating areas, while climate vulnerability is concentrated among low-income populations, a fundamental mismatch

between responsibility and risk within a single country. In light of this disparity, India has made substantial efforts to mitigate climate change at the national level.

• What Actions Is India Taking?

India's climate goals are specified in its Nationally Determined Contributions (NDC) under the Paris Agreement. The country has committed to achieving net-zero by 2070, with a 45% reduction in the emissions intensity of GDP by 2030. India has already achieved a 25–33% reduction in emissions intensity. It has officially achieved its COP26 goal of sourcing 50% of its installed electricity capacity from non-fossil fuels, reaching this milestone five years ahead of its 2030 target (Ministry of Power, GoI). The country aims to generate 500 GW from non-fossil energy sources by 2030, of which 83% has already been achieved. An additional carbon sink equivalent to 2.5–3 $GtCO_2e$ will be generated by 2030, of which approximately 1.97 Gt has been achieved to date. India's eight national missions under the National Action Plan on Climate Change (NAPCC), covering Solar, Energy Efficiency, Water, Agriculture, Himalayan Ecosystem, Green India, Sustainable Habitat, and Strategic Knowledge are progressing with monitored milestones.

India has made significant efforts in climate change mitigation, reducing its emissions intensity, increasing carbon sinks, and contributing to a sustainable development pathway, despite having no role in the historical accumulation of greenhouse gases in Earth's atmosphere. Nevertheless, India expects the global north to support its efforts to achieve climate stability.

• What Is the Required Funding for Climate Justice in India?

Figure 10 provides a detailed breakdown of India's climate finance gap. India requires an estimated USD 2.5 trillion in climate finance to successfully meet its NDC targets under the Paris Agreement by 2030, translating into an annual financing requirement of USD 170–200 billion over the next decade. Currently, India can mobilise only about USD 40–50 billion per year for climate action, leaving a substantial annual funding gap of USD 120–150 billion. Furthermore, less than 25% of available climate finance is allocated to adaptation efforts, and even less reaches vulnerable mountain and rural communities.

This imbalance reflects a broader global challenge: mitigation projects such as renewable energy and electric vehicles attract private investment due to their revenue-generating potential, while adaptation initiatives, such as flood protection and drought-resistant crops,

typically offer no direct financial returns. This market failure underscores the crucial role of public finance and international financial transfers in supporting adaptation and ensuring that funds reach the most at-risk populations (Figure 10).

At the core of this issue is a political economy question: who causes the problem (high emitters)? Who suffers (vulnerable populations)? And who governs the adaptation and response? The people making decisions about climate response are often neither the biggest emitters nor the most vulnerable; they are governments and institutions sitting between these two groups.

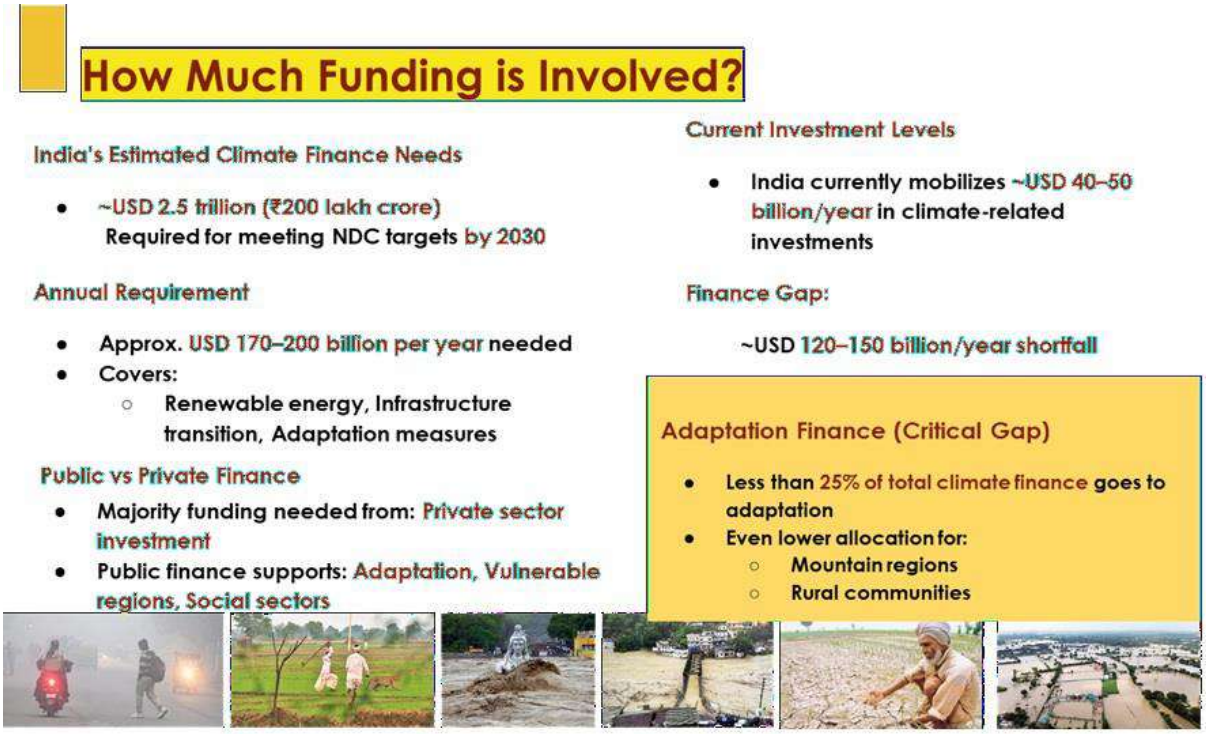

Figure 10: India's requirement for effective climate action under climate justice

What are the gaps in achieving climate targets despite India's substantial efforts?

India faces two major shortcomings in its approach to climate adaptation. First, there are significant governance gaps: adaptation planning is often centralised and led by state or national agencies, with minimal involvement from local communities, indigenous knowledge systems, and Panchayati institutions. Second, access inequality means that vulnerable populations face limited access to climate finance, weak institutional support, and poor inclusion in decision-making processes. Figure 11 illustrates that the regions most at risk, such as the northeast, Himalayas, and coastal areas, are also those with the least institutional

capacity, leading to a troubling conclusion: those most affected by climate change often have the least control over adaptation decisions and resources.

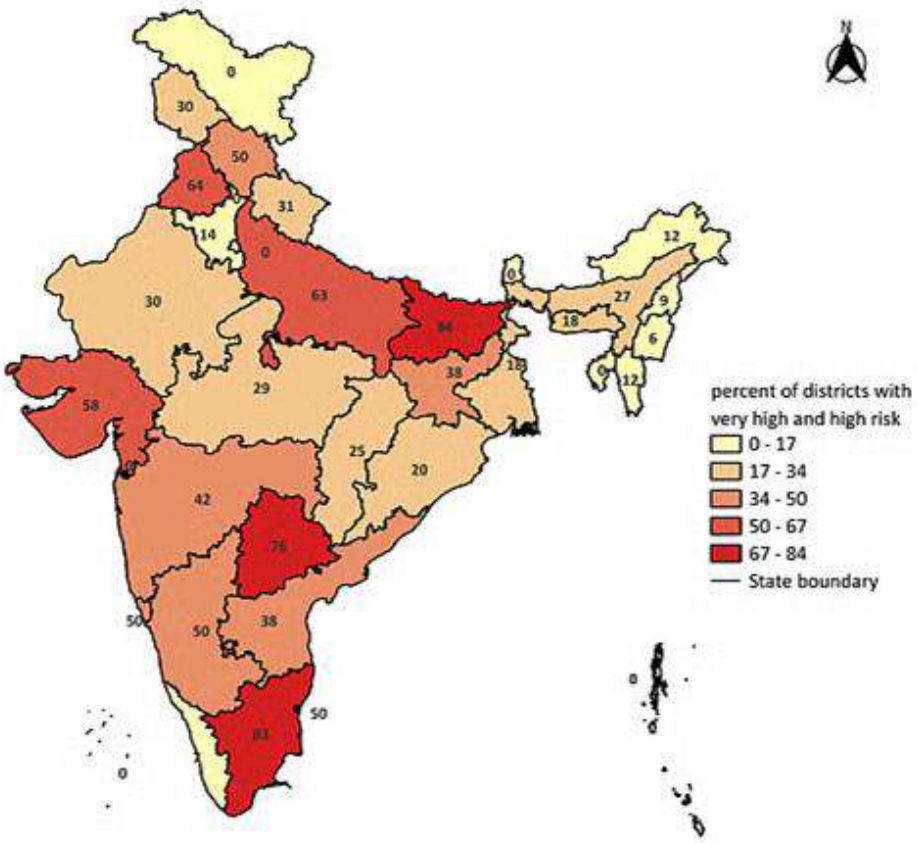

Figure 11: India's map highlighting districts falling under various categories of climate extremes (Source: UNICEF, published by Jain 2026)

• Conclusion

Historical emissions from the global north, combined with the recent rise in emissions, pose a severe and ongoing threat to the structure and functioning of Earth's environment. The impacts of climate change are both irreversible and unprecedented in their effects on economies, ecologies, societies, and the biophysical infrastructure of the natural and built environment. While climate change does not differentiate between the developed and developing worlds, its cascading impacts are deeply unequal, with developing and poor economies suffering disproportionately.

Global constituencies aim to mitigate and minimise the impact of climate change, with each country committing to national actions and targets. In this context, the promises made by

developed countries in 2009, to mobilise USD 100 billion per year for developing countries toward climate adaptation and emissions reduction, are important benchmarks. This target was first met in 2022, with USD 115.9 billion in climate finance provided to developing countries (UN Climate Action). However, this amount falls far short of actual needs, and its distribution was uneven: a smaller share reached low-income countries, while most funds, in the form of loans, were allocated to middle-income countries.

At COP29 in 2025, global constituencies agreed to set a new target of USD 300 billion per year by 2035 under the New Collective Quantified Goal on Climate Finance three times the 2009 pledge. Efforts were further expanded to secure contributions from all entities (public and private) to provide USD 1.3 trillion per year to developing countries by 2035. Current recalculations suggest the actual requirement is USD 2.3–2.5 trillion per year when accounting for emerging market needs, economic flows, and global competition.

The key questions of climate justice remain unresolved: Are the promised funds sufficient to meet the needs of developing countries? Are they being released and delivered on the ground? India's case is instructive: the country requires an estimated USD 2.4–2.5 trillion in climate finance to meet its NDC targets by 2030, requiring USD 170–200 billion annually. Yet India currently mobilises only USD 40–50 billion per year, leaving a structural gap that cannot be bridged without genuine financial and technological support from the global north. If this gap is not addressed, the world's constituencies will continue to revise the guardrail for global temperature rise upward, at the cost of catastrophe and severe devastation.

The theme of World Environment Day 2026, "Inspired by Nature. For Climate. For Our Future," articulates an important reality of contemporary environmental change in two ways: (a) the global North, which is responsible for climate change, and (b) the global South, which suffers its most severe consequences. This article argues that targeted climate funding, technology transfer, and a more nuanced understanding of historical responsibility can make climate action both scientifically adequate and ethically fulfilling.

"प्रकृति से प्रेरित। जलवायु के लिए। हमारे भविष्य के लिए" - विश्व पर्यावरण दिवस 2026 का विषय (Theme), समसामयिक पर्यावरणीय परिवर्तन की एक महत्वपूर्ण वास्तविकता को दो तरीकों से व्यक्त करता है: (क) वैश्विक उत्तर, जो जलवायु परिवर्तन के लिए ज़िम्मेदार है, और (ख) वैश्विक दक्षिण, जो इसके सबसे गंभीर परिणामों से पीड़ित है। यह लेख तर्क देता है कि लक्षित जलवायु निधि, प्रौद्योगिकी हस्तांतरण और एतिहासिक ज़िम्मेदारी की अधिक विवेकपूर्ण समझ, इन प्रयासों को वैज्ञानिक रूप से पर्याप्त और नैतिक रूप से सार्थक बना सकती है।"

• **References**

Bandera, G (2024). How climate colonialism affects the Global South. Fair Planet. https://www.fairplanet.org/story/how-climate-colonialism-affects-the-global-south/

Biswas, S., Nautiyal, S. (2023). A review of socio-economic vulnerability: The emergence of its theoretical concepts, models and methodologies. Natural Hazards Research, 3(3), 563–571. https://doi.org/10.1016/j.nhres.2023.05.005

Climate Risk Index (CRI) 2025, Published by Germanwatch. Who suffers most from extreme weather events? https://www.germanwatch.org/sites/default/files/2025-02/Climate%20Risk%20Index%202025.pdf

Climate Risk Index (CRI) 2026, Published by Germanwatch. https://www.germanwatch.org/en/cri

COP, Conference of the Parties. https://unfccc.int/process/bodies/supreme-bodies/conference-of-the-parties-cop

Crippa, M., Guizzardi, D., Banja, M., Solazzo, E., Muntean, M., Schaaf, E., et al. (2022). CO_2 emissions of all world countries – JRC/IEA/PBL 2022 Report. Publications Office of the European Union, Luxembourg. doi:10.2760/07904, JRC130363

Forster, P.M., Smith, C., Walsh T., et al. (2025). Indicators of Global Climate Change 2024: annual update of key indicators of the state of the climate system and human influence. Earth System Science Data 17(6), 2641–2680. https://doi.org/10.5194/essd-17-2641-2025

Jain, A.V. (2026). Lightning, heat, and floods: How the 16th Finance Commission is rewiring India's disaster science. DownToEarth, 6 Feb 2026.

Kaechele, H., Babu, T.S., Kutter, T., Specht, K., Nautiyal, S., Mueller, K. and Raju, K.V. (2011). Confronting the climate change challenge: discussing the role of rural India under cumulative emission budget approach. Environmental Science and Policy 14(8): 1103–1112.

Ministry of Power, Government of India. https://powermin.gov.in/

Nautiyal, A., Nautiyal, S., Maikhuri, R.K., Sundriyal, R.C., Kuniyal, J.C., Rawat N. (2025b). Indian Himalayan Region: Towards a Sustainable Future, in collaboration with NITI Aayog. Indian Books and Periodicals. ISBN: 978-93-6028-1014. https://www.ibpbooks.in/indian-himalayan-region-towards-a-sustainable-future/p/62317

Nautiyal, S., Goswami, M., Premkumar, A. (2025a). Determinants and Stratification of Household Carbon Footprint: Understanding the Prospect for Climate Change Mitigation and Socioeconomic Co-benefits. Springer Nature Singapore. https://doi.org/10.1007/978-981-96-2739-4

Negi, B., Negi, V.S., Rana, S.K., Bhatt, I.D., Manasi, S., Nautiyal, S. (2025). Role of traditional ecological knowledge in shaping climate resilient villages in the Himalaya. Journal of

Environmental Management, 376, 124325. https://doi.org/10.1016/j.jenvman.2025.124325

Pandey, K. (2021). Asia Climate: India, China, Japan lose billions to extreme weather annually, says WMO report. DownToEarth, 28 October 2021.

Poynting, M., Rivault, E., Dale, B. (2025). 2024 first year to pass 1.5C global warming limit. BBC. https://www.bbc.com/news/articles/cd7575x8yq5o

Priestley Centre for Climate Futures 'PCCF' (2025). Scientists find three years left of remaining carbon budget for 1.5°C. https://climate.leeds.ac.uk/news/scientists-find-three-years-left-of-remaining-carbon-budget-for-1-5c/

Sharma, M., Raj, C., Dube, S. (online). The Unfair Burden: Climate Injustice and the Disproportionate Impact on the Global South. https://iisppr.org.in/the-unfair-burden-climate-injustice-and-the-disproportionate-impact-on-the-global-south/

UN Climate Action (online). https://www.un.org/en/climatechange/raising-ambition/climate-finance

UNDP Global Climate Promise (2023). Climate change is a matter of justice – here's why. https://climatepromise.undp.org/news-and-stories/climate-change-matter-justice-heres-why

UNEP (2026). State-wise Analysis of Carbon Emissions in India. https://indiadatamap.com/2025/11/19/state-wise-analysis-of-carbon-emissions-in-india/

UNFCCC, United Nations Framework Convention on Climate Change, Bonn, Germany. https://unfccc.int/about-us/contact-and-directions/find-contact-by-issue

Vigliotti, F. (2025). The Unequal Costs of Climate Change and Destruction of the Global South: What are the solutions? The University of Manchester (Global Social Challenges). https://sites.manchester.ac.uk/global-social-challenges/2025/01/15/the-unequal-costs-of-climate-change-and-destruction-of-the-global-south-what-are-the-solutions/

WBGU (2009). German Advisory Council on Global Change, Special Report. Berlin.

Wilmoth, H. (2026). The US is now paying more than any other country for climate change damage, study suggests. BBC Science Focus. https://www.sciencefocus.com/news/us-country-climate-loss-damage

Details of Key Lectures organised by the Institute in last twenty-two years:

Sr. No.	Speaker Name	Title of the Lecture	Date and Year
1	**Prof. Brahm Prakash**	India-Higher Education and National Development: The Need for Some Basic Reforms	October 10, 2005
2	**Dr. Ashwini Saith**	Poverty Recognition and Reduction: Critical Reflections on Some Current Practices	December 7, 2007
3	**Prof. Yogesh Atal**	Education: Meeting the Challenge of Social Development	November 12, 2008
4	**Prof. Yoginder K. Alagh**	Planning the Next Phase	March 15, 2010
5	**Prof. Y.K. Alagh**	The Rural–Urban Question and Growth	December 06, 2014
6	**Prof. Rakesh Basant**	Social Ventures and Innovative Entrepreneurial Solution: An exploratory Analysis	April 16, 2021
7	**Prof. Sukhpal Singh**	Contextualising the Repealed 2020 Union Agricultural Market Acts in Farmer Income (Policy) Debate: A Smallholder Perspective	October 21, 2021
8	**Prof. Lakhwinder Singh**	Economic Transformation of the Indian Economy: Retrospect & Prospect	December 15, 2022
9	**Dr. Parmod Kumar**	Land Titles and Agricultural Productivity	March 20, 2023
10	**Prof. Rajeev Bhargava**	Our Constitution's Critical Respect Towards Religion	February 06, 2024
11	**Shri. V. Srinivas**	New Paradigms in Governance: Empowering Citizens and Reaching the Last Mile	March 16, 2024
12	**Prof. K.P. Kannan**	Growth without Decent Employment: How can India Escape this Long-term Trap?	March 22, 2024
13	**Prof. Ved Prakash**	Global Trends in Higher Education in the Backdrop of the NEP 2020	April 30, 2025
14	**Prof. Ramesh K. Arora**	Public Policy Process in India: Issues of Governance	February 26, 2026
15	**Prof. Rayaprolu Nagaraj**	Changes and Changelessness: Long-Term patterns in India's Regional Economies	March 12, 2026

Dr. Sunil Nautiyal

(Alexander von Humboldt Fellow)
Professor, Centre for Ecological Economics and Natural Resources (CEENR),
Institute for Social and Economic Change (ISEC),
Bengaluru-560072, Karnataka, India

Dr. Sunil Nautiyal (AvH-Fellow) is a Professor at the Centre for Ecological Economics and Natural Resources (CEENR), Institute for Social and Economic Change (ISEC), Bengaluru and Honorary Professor at the University of Ladakh. Prof. Nautiyal was formerly served as Director, G.B. Pant National Institute of Himalayan Environment (NIHE), Almora, Uttarakhand, India. His specialization includes areas of Natural Resource Management and Conservation, Protected Area Management and HWC&C GIS and Remote Sensing for Landscape Research, Urban-rural interface and Sustainability, Climate Change, Socio-ecological Development (Socio-Ecologist). Dr. Nautiyal has published over 200 scientific papers/articles and 14 books/monographs. Dr. Nautiyal is a recipient of several national/international prestigious fellowships/awards. He is on the Editorial/Reviewer Board of several international/national journals. Dr. Nautiyal has been working in close coordination with scientists in India, Germany, UK, Australia, Japan, Bangladesh, and the USA. His research contribution has large policy implications in the area of socio-ecological development and biodiversity conservation.