

## **Climate Fallout: How India's Most Vulnerable Lose Land, Livelihood, And Rights**

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### **ABSTRACT**

Climate change has reached a critical juncture, where its implications can no longer be overlooked. It has become a pressing global challenge demanding urgent and equitable responses to safeguard vulnerable populations and human rights. Rising seas, eroding coastlines, extreme heatwaves, and intensifying floods threaten livelihoods, homes, and the basic rights of marginalized communities. Even when environmental degradation affects all, the poor remain least equipped to cope, suffering disproportionately. By examining the interplay of ecological hazards and social vulnerability, this study highlights how India's most affected people and regions are losing land, income, and dignity in ways often invisible to policy and governance. Through this lens, the paper underscores the urgent need for inclusive strategies, equitable resilience, and systemic reform. It offers a critical exploration of the human fallout of climate change, revealing the stakes for those who have contributed least yet bear the heaviest burden.

**Keywords:** Climate Justice, Environmental Human Rights, Environmental Justice, Extreme Weather and Displacement, Right to Healthy Environment

*"Time and Tide wait for no man"*

-Geoffrey Chaucer

### **I. INTRODUCTION**

India has reached its 79th year of independence, and in the twenty-first century, it has emerged as the most populous country of the world.[1] According to the global multidimensional poverty index, in 2019-2021 nearly one sixth of the population is believed to have been living in multidimensional poverty.[2] People living hand to mouth aren't equipped to mitigate the effects of worsening climate change. They are the first to be hit by

extreme weather conditions due to very low adaptability. The National Hydrographic organisation in coordination with survey of India has calculated the Indian coastline just this year to be nearly 11.1 thousand km[3] which is one of the largest coastlines of the world. Along this coastline resides the second such group which is vulnerable to the harshest effects of environmental change. Even nearly eight decades after independence and having the largest population in the world, India has still lagged behind in the issue of environment change in policy making and its effect on human rights. Bharti et al. find that by 2022–23, the top 1% in India held 40.1% of total wealth.[4] Over 5.4 million people in India were internally displaced by climate-related disasters in 2024 alone, particularly from floods and heatwaves impacting rural and coastal communities.[5] Informal labor sectors like brick-kiln workers are enduring extreme heat conditions exceeding 42 °C, risking health and rights as they often can't afford breaks or protective measures.[6] A recent study conducted by researchers from the National University of Singapore coral microatolls coral colonies to reconstruct sea-level changes from 1930 to 2019, has revealed that sea levels around the Maldives, Lakshadweep, and the Chagos Archipelago have been rising faster and earlier than previously believed. Over the past 90 years, sea levels have risen approximately 0.3 meters, with the rate increasing to about 4 mm per year in the last 20–30 years, which is testament to the deteriorating climatic conditions by global warming.[7][8] A similar picture is drawn by the flooding of plains with retreating glaciers,[9] rising mini cloudbursts and extreme rains [10] and rising risk of Glacial Lake Outburst Floods (GLOFs)[11] covering the large geography of Indian subcontinent. This has resulted in rise of instances like Assam's Dhemaji district's flood-induced displacement where significant social disruption happened, with women and children facing increased domestic and emotional burdens.[12] These various isolated events though having different nature of hazard, but the blanket result is shrinking livable safe spaces and rising risk of environmental hazard. The effect is felt more acutely by the natives of each region, and whenever the govt. policies fail to keep up with emerging need of the regions, the frustration is often felt in civil societies.[13] Even without the call from the activists, the issue of deteriorating climate and lack of policies to mitigate it cannot be procrastinated any longer.

## II. ACKNOWLEDGING THE CHANGING ENVIRONMENT

Scientists first linked rising CO<sub>2</sub> levels to global warming in the late 19th century. Tyndall demonstrated that certain gases, including CO<sub>2</sub>, absorb and emit infrared radiation, thereby contributing to the greenhouse effect.[14] Building up on his research, Svante Arrhenius laid the foundation for modern climate science by establishing a clear link between CO<sub>2</sub> levels and global temperatures.[15] Guy Stewart Callendar made the first explicit connection between human activities, rising CO<sub>2</sub>, and global warming thereby estimating that the CO<sub>2</sub> increase could lead to a warming of roughly 0.1–0.3°C per decade if emissions continued. He also predicted that higher concentrations would amplify warming over time, particularly in the Northern Hemisphere.[16] While his conclusions were initially met with skepticism, they laid the foundation for modern climate science and CO<sub>2</sub> monitoring. Revelle and Suess were the first to show that fossil fuel emissions could measurably increase atmospheric CO<sub>2</sub>, and that the oceans would not fully absorb it, laying the foundation for modern concerns about anthropogenic climate change.[17] Since then, the environmental concerns have spread outside the scientific community. The 1972 UN Conference held at Stockholm,[18] and the 1979 World Climate Conference[19] placed environmental change firmly on the global agenda. As the scientific community became more assertive, international policy followed suit.[20] Montreal Protocol that put forward first binding international treaty with enforcement mechanisms to phase out harmful chemicals,[21] the UNFCCC adopted at UNCED which is foundational treaty for almost all global climate policy,[22] Kyoto Protocol which introduced legally binding emissions reductions,[23] and the landmark Paris Agreement that codified the goal to limit temperature rise to well below 2 °C, aiming for no more than 1.5 °C above pre-industrial levels[24] are all subsequent steps taken to collectively counter the climate degradation. Whether these efforts have been fully effective is still debated, given continuing global temperature rises; nevertheless, they signify a growing international recognition of and response to climate change.

In this sequence India has kept up with the global developments, and made several environment preservation laws starting with Forest Act that regulates forest produce, reserves, and forest management.[25] The Act for Wildlife Protection enacted for the protection of endangered species, wildlife sanctuaries, and national parks, that regulates hunting and trade,[26] Water Pollution Act to regulate water pollution and establish State

Pollution Control Boards[27] were among the first to be enacted in independent India in this regard. Later several other legislations were enacted like Forest Conservation Act for regulating diversion of forest land for non-forest purposes,[28] Air Pollution Act to regulate air pollution and empower Pollution Control Boards,[29] Environment Act i.e., main umbrella legislation for environmental protection, empowering the government to regulate pollution, hazardous substances, and set standards,[30] the rules regarding management and handling of hazardous waste[31] and the bio-medical waste[32] for Regulations for disposal of hazardous waste and medical waste respectively, Biological Diversity Act for conservation of biodiversity, sustainable use, and equitable benefit sharing,[33] EIA Notification which mandates environmental clearance for development projects,[34] rules for plastic waste management to regulate production, usage, and disposal of plastic,[35] Wetlands Rules for regulating activities around wetlands[36] and CRZ Notification, 2019 which controls development along the coast to protect ecology.[37] India has also ratified various conventions including CITES that Regulates international trade in endangered species,[38] Ramsar Convention which is for Protection and wise use of wetlands,[39] Montreal Protocol that is to phase out ozone-depleting substances.[21] UNFCCC Framework for global climate action and emissions stabilization,[22] CBD i.e, Conservation of biodiversity and equitable benefit sharing,[40] and Paris Agreement which Limits global temperature rise and sets emission reduction goals[24] as its participation in environmental conservation. NGT was established under the National Green Tribunal Act to provide specialized and expedited resolution of environmental disputes in India.[41]

Time and again Indian judiciary has also upheld the significance of environment preservation and acknowledged harm caused to people in various landmark judgements. In Oleum Gas Leak Case [42] where the hazardous Oleum gas leak in Delhi raised public safety and industrial liability issues, the Supreme Court recognized the principle of “absolute liability”. In the Tanneries Pollution Case,[43] pollution caused by tanneries in Vellore, affecting rivers and public health, was taken seriously. The Supreme Court of India interpreted that the absolute liability for harm to the environment extends not only to compensate the victims of pollution but also the cost of restoring the environment degradation. This judgement played the vital role of linking environmental protection to constitutional rights. In Enviro-Legal Action Case [44] where industrial effluents were found

polluting groundwater and farmlands in Bichhri village in Rajasthan, the Supreme Court reinforced the polluter pays principle and environmental accountability of industries by ordering the polluter to pay remedial amount that was due with interest. MC Mehta v Kamal Nath Case [45] was the first instance where the court recognized public trust doctrine in India. The Court held that natural resources such as water, air, and wetlands belong to the public collectively, and as their custodian, the state has a duty to safeguard and manage these resources responsibly. In N. D. Jayal v. UOI [46] the court recognized the adherence to sustainable development principle is a sine qua non for the maintenance of symbiotic balance between the right to environment and development.

The ICJ's recent advisory opinion, prompted by an initiative from Vanuatu, establishes that all UNFCCC member states bear responsibility for addressing climate change and recognizes it as a human rights issue.[47] The Court clarified that states are accountable for emissions originating within their jurisdictions, including those from private actors such as fossil fuel companies. Failure to prevent significant environmental harm may constitute a wrongful act under customary international law.

### **III. THE HUMAN COST OF CLIMATE CHANGE**

In the beginning of the current decade, the IPCC published its Sixth Assessment Report called AR6.[48] The report warned that unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting global warming to 1.5°C or even 2°C would be beyond reach. With this the targets set by the Paris agreement can be considered a foregone conclusion. The UN secretary general had already called it code red for humanity[49] but the subsequent reports only confirmed the worsening situation. The WMO confirmed that 2024 was the warmest year on record with temperature more than 1.5°C above the 1850-1900 average.[50] EEA has provided projections to the temperature increase until the end of 21st century which shows bleak future prospects. Among multiple scenarios projected, one even expects the temperature to rise by 8.5°C.[51] The only scenario projecting the temperatures aligning to Paris Agreement's assumes a drastic reduction in emissions in the coming decades and hence eliminating net CO<sub>2</sub> emissions by approximately 2050 and subsequently transitioning to a state of net-negative emissions. Reality has however proved the negative net emission scenario to be a pipe dream. As it stands, convenience is

more valuable to states and individuals than this ever growing closer threat to humanity. The US President for instance in his interview in 2018 accepted the existence of climate change but didn't want to prioritize it so as not to be put to disadvantage.[52] Another example is the pollution caused by open fires used for cooking where individuals with no access to cleaner energy sources can't be asked to not cook. Globally, one third population uses open fires or dirty stoves to prepare their meals.[53] In India, 20% to 50% of outdoor pollution could be the result of indoor cooking and heating.[54] This research also estimates the dependency of 70% Indians on solid fuel for cooking which also severely affects their health due to disproportionately higher exposures to air pollutants. On another note, it is observable that such people are often related to weaker socio-economic backgrounds and often less equipped to stand the worsening climate change. Sustainable Energy for All, an independent organization under UNOPS, has tracked global access to cooling for a decade based on the risk profile among 77 countries, among which 54 are high impact countries.[55] The 2023 global data reveal that in excess of 1.12 billion people are highly vulnerable due to a lack of cooling access. This population, which includes both rural and urban poor, is endangered in critical areas including personal thermal comfort, food and agricultural supply chains, and medical products. In India, nearly 22% of its population falls under this high risk category. Additionally in India among both genders in both urban and rural poor, around 20% more women are affected than men. The number however tilted to the other side for the middle income group. A study on the electricity expenditure of households in industrialized countries finds that people respond to unbearable heat by purchasing and using air conditioners which leads them to energy poverty like situation.[56] The low income families even in these countries are found to be hit the hardest. This has created what UNICEF calls a cooling dilemma.[57] Demographic groups with heightened vulnerability to heat-related illness include children, the elderly, outdoor workers, and residents of poorly insulated housing. This risk is compounded in dense urban environments with scant green space, as well as for individuals experiencing limited mobility, social isolation, or a lack of access to effective indoor cooling. The core of the dilemma is that while using air conditioner unit gives relief from heat to the user, the energy supply needed for artificial air-conditioning generates about 4 per cent of GHGs emissions, and the HFC refrigerants used as coolants, which absorb several times more solar energy than CO<sub>2</sub>, also escape into the atmosphere ultimately

worsening the atmospheric heat in two pronged ways. It all boils down to a stark inequity i.e., while everyone feels the effects of a warming climate, the capacity to adapt through cooling is currently a primary driver of its escalation, creating a vicious cycle that ultimately harms the most vulnerable.

#### **A. Concept of Environmental Justice**

There is a profound disparity in both the experience of and contribution to climate change. Vulnerable populations face extreme heat without the means for basic cooling, while the affluent significantly drive the problem through their reliance on energy-intensive air conditioning. This has given rise to the phenomenon of urban heat island effect where urban areas experience significantly warmer temperatures than their surrounding rural areas.[58] Also global heatwave exposure is increasing most rapidly in the lowest-income regions, while their capacity to adapt lags far behind wealthier nations. This combination of delayed adaptation and faster-emerging heat hazards is intensifying global heat-stress inequality.[59] A research conducted in Korea showed that prolonged exposure to heat or cold-related illnesses were more prevalent in people belonging to low income than those with high income.[60] Accordingly as per UNDP, environmental justice fundamentally links human rights to ecological sustainability, demanding the fair allocation of environmental benefits and harms, along with inclusive participation in decision-making for marginalized communities.[61] This inequity operates on a global scale as historically, high-income nations have contributed an estimated 60 percent of cumulative greenhouse gas emissions. Conversely, developing countries, frequently situated in more climate-sensitive regions, experience the most severe and immediate impacts from climate-driven disasters, including severe droughts, floods, and storms. [62] In the same progression the Global South has also championed for CBDR principle.[22] As such international climate policy is caught in a debilitating tug-of-war where the Global South anchors its position in historical responsibility, while the Global North pulls for shared future burdens, resulting in a collective failure to enact sufficient action.[62]

#### **IV. CLIMATE CHANGE AND HUMAN RIGHTS**

Last year, the AIMS documented a related and equally critical indicator of planetary health i.e., the escalating heat stress on coral reefs. Their aerial survey report detailed a devastating

mass bleaching event on the Great Barrier Reef, driven by unprecedented ocean temperatures,[63] which is a clear bio-indicator of extreme thermodynamic stress in the marine environment.[64] Another report followed this year demonstrating how the situation has worsened in western coral reef areas which were previously not harmed by climate change.[65] The situation isn't much different in India's Lakshadweep Islands,[66] though marine litter is also a contributing factor. Still 50% reduction in coral cover over the span of just 24 years is not to be taken lightly.[67] The loss of marine biology aside, this also signifies the rising sea temperatures and contributes to the vulnerability of coastlines to rising water levels.

India's lengthy coastline, spanning over 11,098.81 kms,[68] is a frontline in the climate crisis, where right to life and livelihood, guaranteed under Article 21 of the Indian Constitution [69] is at risk of violation due to sea-level rise and coastal erosion. In the Sundarbans, climate displacement is not a future threat but a historical reality, with islands like Lohachara already submerged and their residents made landless refugees[70] or progressively vanishing, like Ghoramara where loss of home and farmland is eminent.[71] Meanwhile, on the western coast, a different dynamic unfolds in Alappad, Kerala, where intensive sand mining has artificially accelerated natural coastal processes, leading to the catastrophic loss of over 80 square kilometers of land and the displacement of thousands of families.[72] In these instances, while there may be no single prosecutable violator, the fundamental right to security, liberty life, of person, and adequate living standard, as enshrined in Article 3 and 25 of the UDHR, are being systematically denied.[73] The inhabitants are cursed to watch their lands and nearby islands vanish under the sea and forced to flee,[74] which is a direct consequence of the international community's collective failure to uphold its duty to protect the most vulnerable from trans boundary harm.

Environmental degradation manifests not only through the global mechanism of GHGs emissions but also through direct, localized attacks on ecosystems. The right to a clean environment is a well-established facet of the right to life under Article 21 of the Constitution.[69] Furthermore, Article 48A of the DPSP explicitly enjoins the State to protect and improve the environment.[75] This constitutional mandate is breached whenever environmental oversight is sidelined for large-scale development. This is starkly illustrated by the contentious Teesta Dam projects in Sikkim, which faced significant opposition from

Indigenous Lepcha communities over concerns of cultural and environmental impacts.[76][77] These projects have altered river ecology, impacted downstream communities in West Bengal, and raised significant trans boundary disputes with Bangladesh over water sharing.[78] The severe damage caused by bursting of the Teesta III dam in 2023 cannot be solely attributed to GLOF as investigative reports highlighted design and geological concerns, and the event resulted in catastrophic loss of life, livelihood, and infrastructure downstream.[79] Similarly, highway construction in the ecologically fragile Himalayas causes direct harm, as seen from study of the Tanakpur-Rishikesh highway documenting significant deforestation and slope destabilization.[80] This pattern of infrastructure-driven degradation, often for tourism, extends to water contamination and creates systemic environmental risks. Landslides on construction-weakened slopes, like in Katra, are a repeated tragedy fueled by climate-amplified rainfall.[81] The consequences extend beyond immediate disasters to include slow-onset degradation like the erosion linked to deforestation and landslide like in Sikkim.[82] Such projects, often approved despite inadequate impact assessments or by ignoring critical reports, prioritize economic activity over ecological integrity, directly violating the state's duty to safeguard the environment.[83] This regulatory landscape is being reshaped by government initiatives to simplify environmental clearances in an effort to ease business processes.[84] Consequently, marginalized communities in these areas are often silenced by promises of rehabilitation and subsequently neglected after displacement.[85] Furthermore, even structurally sound projects face an escalating threat from the increasing frequency of GLOFs, which challenge their operational viability and safety.[86] Also, the relentless barrage of climate tragedies from the submerged lands of Punjab and Haryana to the devastating landslides in Himachal Pradesh and Uttarakhand, has done more than destroy infrastructure[87][88] by eroding the very foundations of human dignity which is upheld by article 1 of UDHR.[89] Additionally, this devastation which caused loss of life and livelihood constitutes a direct violation of fundamental human rights, specifically the right to life, the right to work, and the right to economic security enshrined in Articles 3, 22 and 23 of the UDHR.[90] Moreover, the crisis is inherently unjust, disproportionately burdening women and children with increased vulnerabilities like health complications, violence, and service deprivation amid climatic shocks[58][91] and systematically impacting Dalit, Muslims and Adivasi communities who

are often forced into the most climate-vulnerable habitats and inadequate record-keeping and lack of tailored policy leaves them without social security or targeted assistance, perpetuating climate injustice.[92] These cascading disasters are urgent warnings from nature, blaring at shorter, more frequent intervals across diverse geographies. They underscore the imperative for the conclusive, wise, and immediate action that must follow.

## **V. CONCLUSION**

Canute the Great, monarch of Denmark and England, once commanded one of the largest armies of the time. No man in the land could defy his orders yet, as by the seashore he commanded the incoming tide to halt, the waves, of course, continued to rise and wet him, demonstrating the futility of humanity trying to bend nature to its will.[93] For centuries, humanity has paid no heed to environmental degradation. It has plundered the planet's resources for its own selfish purposes. Coincidentally, this lack of regard for the environment has exacted its price in the form of global warming and its resulting natural disasters. Today our very survival as a species is under jeopardy from changing climate conditions. Although some efforts have been made domestically and internationally, be it in the form of legislations, judicial precedents or international instruments, it is simply not enough. Global temperatures are still projected to rise well over 2 degrees in the coming decades without a significant increase in mitigation efforts. The marginalized, who are most sensitive to this degradation and possess the least capacity to adapt, find their land, livelihoods, and fundamental human rights physically imperiled. Therefore, deliberating and effectively combating climate change is the imperative of our century. To this end this study would like to point to places where the improvements can be made for the effective mitigation of climate change effects, because after all, nature also waits for no man.

## **VI. SUGGESTIONS**

Based on the foregoing analysis, the following policy and strategic interventions are recommended:

- A. The paramount principle is that environmental degradation cannot be addressed unilaterally. The international community must adopt a cosmopolitan approach, establishing a binding global framework that mandates pollution reduction for all

states. This regime must include punitive measures for non-compliance to guarantee equity and prevent free-riding.

- B. The world must de-escalate international conflicts, as they dangerously divert political focus and material resources away from addressing the paramount crisis of global warming. These assets must be urgently redirected to fund and advance environmental protection.
- C. NGOs should position themselves as impartial facilitators, helping to align and integrate the climate actions of different countries into a cohesive international strategy.
- D. There is a critical gap between technological innovation and market penetration that needs to be addressed. While highly efficient air conditioning technology exists, the average unit available to consumers operates at merely 50% of that potential efficiency.
- E. On a governmental level, effective policy responses must begin by reforming governance frameworks to center equity and inclusivity. This entails a multi-pronged approach:
  - a. *Legislative Modernization*: Updating outdated laws, such as the Coal Bearing Areas Act (1957), to align with modern statutes like the Right to Fair Compensation Act (2013), thereby embedding robust environmental and social safeguards into development processes.
  - b. *Strengthened Adjudication*: The National Green Tribunal (NGT) must be reinforced to deliver legally robust judgments. This requires ensuring its members strictly interpret and apply statutory law, which would build judicial integrity and reduce the volume of cases escalated to the Supreme Court.
  - c. *Stringent Enforcement*: It is imperative that existing laws are religiously implemented to preserve biodiversity and prevent corporations from causing irreversible harm to nature.
- F. To strengthen community resilience against environmental and climatic threats, the following measures are recommended:
  - a. *Expand Environmental Education for All Ages*: Integrate lessons on sustainability and disaster preparedness into school curricula and community

programs, supplemented by nationwide awareness campaigns led by civil society groups.

- b. *Provide Clear, Localised Disaster Guidance*: Ensure that residents have access to tailored information about hazards in their area and practical steps for protection and recovery.
- c. *Strengthen National Early-Warning Systems*: Develop reliable, nationwide mechanisms to rapidly disseminate alerts and guidance when extreme events are imminent.

G. Systemic change must be matched by widespread individual commitment. Alongside structural reforms, everyday choices such as harvesting rainwater, installing solar panels, reducing waste, and opting for public transit constitute a vital pillar of climate action. When practiced collectively by billions, these habits scale into a force capable of reshaping our environmental future.

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