Page 1642 - 1655 **DOI:** *https//doij.org/10.10000/IJLMH.1110573*

INTERNATIONAL JOURNAL OF LAW MANAGEMENT & HUMANITIES

[ISSN 2581-5369]

Volume 8 | Issue 4

2025

Climate Change, Water Pollution, and Health Examining: Legal Responses and Policy Frameworks in India

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ABSTRACT

As climate change intensifies, it exacerbates existing water quality issues and introduces new health risks, particularly in vulnerable communities lacking availability of pure water. The study examines the result of climate-induced changes, such as altered rainfall patterns, increased flooding, and prolonged droughts, which compromise water availability and quality, leading to a rise in waterborne diseases and other health complications. Furthermore, the paper critically assesses India's legal and policy frameworks addressing these interconnected challenges. Despite the establishment of various environmental laws and regulations, significant gaps remain in their enforcement and effectiveness. The analysis highlights the requirement for more robust regulatory frameworks, improved compliance, and community-centric approaches that prioritize health and sustainability. Ultimately, the article aims to provide insights into how India's legal landscape can evolve to better protect water resources and public health in the face of ongoing climate change, advocating for a comprehensive and integrated approach to ensure a sustainable and equitable future for all.

Keywords: *climate change, health risks, impact, waterborne diseases, legal, sustainability, equitable.*

I. INTRODUCTION

Climate change, water pollution, and public health are closely interconnected, requiring urgent attention. Climate change affects water quality through human activity, unpredictable weather, and rising temperatures, which can cause health problems, particularly in poor nations with limited access to clean water. Climate change worsens existing water-related health issues and introduces new ones. Rising temperatures create the perfect environment for illness vectors like mosquitoes, increasing malaria and dengue cases linked to water quality. Outbreaks of harmful algae, which can contaminate drinking water and aquatic food, pose additional risks, causing liver damage, neurological issues, and potentially fatal outcomes. The intersection of climate change, water pollution, and health in India demands a

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 [ISSN 2581-5369]

comprehensive approach. India's legal and policy frameworks address these issues, yet a critical review reveals both achievements and gaps. Stronger regulations, effective law enforcement, and community-focused approaches emphasizing health and sustainability are needed. As climate change reshapes realities, India's legal landscape must adapt to protect water resources and public health, laying the foundation for a sustainable and equitable future.

This article examines the connections between waterpollution, climate change and health in the Indian context, explores the current legal and policy responses, and highlights the gaps and challenges that need to be addressed.

II. THE EFFECTS OF CLIMATE CHANGE ON INDIA'S WATER RESOURCES

In India the threat to water supplies is growing due to climate change day by day, resulting in shrinking rivers, rapidly melting glaciers, and erratic monsoons. With rising temperatures and frequent extreme weather, the country faces an impending water crisis. Rivers like the Ganges and Yamuna, once vital for millions, are becoming seasonal streams. Himalayan glaciers, crucial for sustaining water flow, are disappearing, leading to dry riverbeds during critical periods. Groundwater, essential for agriculture, is depleting rapidly, particularly in drought-prone areas like Rajasthan and Maharashtra, where wells are running dry and crops are failing in the intense heat.

Climate change is disrupting lives, pushing millions toward desperation. Farmers face crop failures and financial ruin, while women and children in rural areas must walk longer distances for scant water supplies. Devastating floods in Assam and Kerala, alongside droughts in Tamil Nadu and Karnataka, reflect a deteriorating environment struggling to sustain life. Water is essential for agriculture, industry, and daily needs, yet climate change disrupts water availability, quality, and distribution across India. This essay explores the extensive consequences of climate change on India's water resources, focusing on issues such as water scarcity, floods, agricultural impacts, and sustainability.

As India is among the most climate-vulnerable countries around the world. Changes in climate are impacting the quantity and quality of water supplies, changing rainfall patterns, and raising the frequency and severity of extreme weather events.

III. CLIMATE CHANGE, WATER POLLUTION, AND HEALTH: THE INTERCONNECTION

Climate change, water pollution, and public health are intricately linked, creating a complex nexus with significant global consequences. Rising temperatures, erratic weather, and

unpredictable water cycles disrupt ecosystems, degrade water quality and strain resources. Increased rainfall and flooding wash agricultural runoff, industrial waste, and untreated sewage entering bodies of water, exacerbating pollution. Contaminated sources harbour harmful pathogens and toxic substances, heightening health risks and posing severe challenges to human health.

1. Waterborne Diseases

Water-borne illnesses like cholera and diarrhoeal illnesses like giardiasis, salmonellosis, and cryptosporidiosis may become more common as a result of a warmer environment.[2]In South Asia, diarrhoeal illnesses already account for a significant portion of morbidity and death, especially in children. According to estimates, diarrhoeal illnesses account for 25% of paediatric fatalities in South Asia.[3]The prevalence of diarrhoeal illnesses may rise further as a result of bacterial survival time and proliferation increasing with increased ambient temperatures.[4]Because inadequate sanitation and contaminated drinking water are major causes of diarrhoeal illnesses, less freshwater resources would probably result in a higher prevalence of these illnesses.[5]Water shortages are already occurring in Bangladesh, India, Pakistan, and Nepal as a result of population increase, rapid urbanisation and industrialisation, and wasteful water usage.[6]The scarcity of fresh water will worsen due to climate change, as many regions see a decline in annual mean rainfall. Hepatitis A, cholera, malaria, typhoid, amoebiasis, and other waterborne illnesses, as well as vector-borne and zoonotic illnesses like dengue and chikungunya, are all major hazards to human life. Furthermore, parasite illnesses such onchocerciasis, lymphatic filariasis, and leishmaniasis increase health hazards, especially for susceptible groups.

2. Food Security

One of the main issues related to climate change is food security. The impact of climate change on food security is multifaceted. Crops, cattle, forests, fisheries, and aquaculture are

[2] Hales S, Edwards SJ, Kovats RS. Impacts on health of climate extremes. In: McMichael AJ, Campbell-Lendrum DH, Corvalan CF, Ebi KL, Githeko A, Scheraga JD, Woodward A, editors. Climate change and human health: Risks and responses. Geneva, Switzerland: World Health Organization; 2003. p. 79-102.last visited on 11.10.24

[3] Zaidi AKM, Awasthi S, deSilva HJ. Burden of infectious diseases in South Asia. BMJ 2004; 328 : 811-5.last visited on 19.10.24

[4] Checkley W, Epstein LD, Gilman RH, Figueroa D, Cama RI, Patz JA, et al. Effects of El Nino and ambient temperature on hospital admissions for diarrheal diseases in Peruvian children. Lancet 2000; 355 : 442-50.last visited on 05.10.24

[5] Ezzati M, Lopez A, Rodgers A, Murray C, editors. Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors, vols. 1 and 2. Geneva: World Health Organization; 2004.last visited on 09.10.24

[6] Available from: http://www.unicef.org/media/media40495 . html, accessed on October 18, 2024.

 [ISSN 2581-5369]

all affected, and it can have serious social and economic repercussions, including lower revenues, diminished livelihoods, disruptions to commerce, and negative health effects.

Given how reliant Indian agriculture is on water, food security is impacted by the water shortage brought on by climate change. When crops are irrigated with polluted water, dangerous compounds can build up and pose further health hazards when ingested. Coastal regions that experience saltwater intrusion also suffer damage to their agricultural grounds, which lowers food production and increases food poverty.

3. Livelihood and Migration

Climate change and water pollution are wreaking irreversible havoc on livelihoods in India, forcing families to leave behind lands cultivated for generations, and pushing entire communities into a cycle of forced migration, desperation, and loss. As temperatures climb, monsoons become more erratic, and droughts grow longer, millions of farmers and fisherfolk find themselves trapped in an escalating struggle to survive. India's agriculture, which sustains nearly half the population, is faltering under the strain of extreme weather; crops that once thrived are wilting, livestock are dying, and vital water sources are drying up. As migration intensifies, cities buckle under the weight, straining already inadequate resources, and creating a heartbreaking irony where the people who fed the nation are now the ones without food, shelter, or security.

IV. LEGAL REACTIONS IN INDIA TO WATER POLLUTION AND CLIMATE CHANGE

The first major worldwide attempt to preserve and safeguard the human environment was the Stockholm Declaration of 1972. States were obliged to enact laws intended to safeguard and enhance the environment as a result of this Declaration. India's international obligations and constitutional framework both place a strong focus on sustainability in the utilisation of natural resources and environmental protection. In particular, every Indian citizen is required under Part IVA of the Constitution (Article 51A on Fundamental Duties) to preserve and improve the country's natural environment, which includes forests, lakes, rivers, and animals, while also demonstrating compassion for all living things.Further, the Constitution of India under Part IV (Art 48A-Directive Principles of State Policies)[7]declares that the state must make every effort to preserve the nation's woods and wildlife as well as to protect and enhance the environment. With more than two hundred laws pertaining to environmental protection, India has a complex legal system. The following paragraphs provide a brief explanation of some significant environmental laws:

[7] Inserted by the Constitution (Forty-second Amendment) Act, 1976.

 [ISSN 2581-5369]

1. The Water (Prevention and Control of Pollution) Act, 1974

This is the main piece of law that controls water pollution in India. In order to regulate water quality and set effluent standards for enterprises, it creates the Central and State Pollution Control Boards (CPCB and SPCBs). The Act was passed in order to prevent and regulate water contamination and to preserve or restore the nation's water's purity. Additionally, in order to accomplish the aforementioned goals, it calls for the creation of boards to prevent and regulate water contamination. However, a lack of agency cooperation and budget limitations make enforcement difficult.

2. The Environment (Protection) Act, 1986

This Act was passed as a general law to preserve the environment, especially water quality, following the Bhopal Gas Disaster. It grants considerable authority to the central government to control companies, enforce sanctions, and take preventative action to lessen environmental risks, such as water contamination. Its provisions, however, do not specifically address the effects of climate change. Environmental protection and enhancement are provided for under the Act. The Environment Protection Act lays up a mechanism for a prompt and sufficient response to environmental threats and provides the foundation for researching, planning, and putting into practice long-term environmental safety criteria.

3. National Action Plan on Climate Change (NAPCC), 2008

The NAPCC describes India's approach to combating climate change, with eight missions that concentrate on various facets of sustainability, such as water management. In the face of climate change, the National Water Mission seeks to guarantee sustainable water usage, fair distribution, and water conservation. However, policies addressing climate change and efforts to reduce water pollution need to work together more closely.

4. The National Green Tribunal (NGT)

The National Green Tribunal Act, 2010 (No. 19 of 2010) (NGT Act) was passed with the intention of offering a specialised forum for resolving environmental disputes, including those involving water pollution and climate change, and establishing a National Green Tribunal (NGT) for the efficient and quick resolution of cases pertaining to environmental protection and forest conservation. Regarding industrial pollution, groundwater contamination, and the implementation of environmental regulations, the NGT has rendered a number of significant rulings.

 [ISSN 2581-5369]

V. JUDICIAL INTERVENTIONS

Judicial activism is the phrase used to describe the Supreme Court's frequent engagement in lawful judicial legislation and judicial administration while carrying out its mandate as the defender of people' basic rights. In addition, Article 142 of the Constitution gives the Supreme Court the authority to issue any ruling required to provide full justice in any case or issue that is now before it.[8]

India's environmental jurisprudence has been greatly influenced by the court, especially the Supreme Court of India, which has interpreted constitutional clauses like Article 21 (Right to Life) to encompass the right to clean water and a healthy environment. Among the important rulings are:

M.C. Mehta v. Union of India (1988)[9]: In this landmark case, the Supreme Court held industries responsible for polluting the Ganges River and ordered the installation of pollution control devices, setting a precedent for environmental accountability. Since all natural resources are by their very nature intended for public use and enjoyment, the state is the trustee of all of them. The seaside, flowing waterways, air, woods, and environmentally delicate territories are all beneficial to the general population. It is not possible to turn these resources into private property.

Vellore Citizens' Welfare Forum v. Union of India (1996)[10]: In order to make companies accountable for cleaning up contaminated ecosystems, the Supreme Court included the precautionary principle and the polluter pays concept into Indian environmental law. Government officials are required by the "precautionary principle" to foresee, stop, and combat the sources of environmental contamination. According to this idea, the developer or industrialist bears the burden of proving that their actions are ecologically friendly.

Subhash Kumar v. State of Bihar (1991)[11]: In accordance with Article 21, the Supreme Court underlined that the right to clean water is a basic right that is closely related to the rights to life and public health. One aspect of the right to life protected by Article 21 of the Indian Constitution is the right to a healthy environment, which is enjoyed by everybody.

Indian Council for Enviro-Legal Action v. Union of India(1996)[12]: Environmental rules must be vigorously enforced by enforcement organisations. A polluter must pay for cleanup or

[8]INDIA CONST. art. 142 § 1 (envisioning the Supreme Court in the exercise of its jurisdiction may pass such enforceable decree or order as is necessary for doing 'complete justice' in any cause or matter pending before it).
[9] 1988 AIR 1115, 1988 SCR (2) 530,last visited on 12.10.24
[10] AIR 1996 SC 2715.
[11] (1991) 1 SCC 598.
[12] 5 SCC 281.

 [ISSN 2581-5369]

remediation expenses as well as the sum owed to compensate pollution victims, according to the "polluter pays" principle, which is a component of the fundamental environmental legislation of the nation. Contumacious defaulters and those who engage in development or industrial activities for financial benefit without considering the purpose of the legislation should face harsh punishment.

VI. CHALLENGES AND THE WAY FORWARD

Public health, livelihood security, and environmental sustainability are all seriously threatened by India's climate change dilemma and water pollution. To successfully alleviate the effects of these difficulties, legal and regulatory frameworks must adopt a more robust and cohesive approach. India has a strong legal system and policy efforts, but there are still a number of obstacles to overcome when tackling the relationship between water pollution, climate change, and health:

Challenges:

1. **Fragmented and Overlapping Legal Frameworks**

Although there are many different environmental laws and regulations in India, authorities sometimes work autonomously with little collaboration. In addition to focussing on particular pollutants or industries, the Environmental Protection Act, the Water (Prevention and Control of Pollution) Act, and the Air (Prevention and Control of Pollution) Act lack a comprehensive plan to address the wider health effects of climate change. Additionally, regulatory bodies such as the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) frequently lack enforcement authority and resources, which results in poor monitoring of industries and urban emissions and inefficient pollution control implementation.

2. **Inadequate Data Collection and Climate-Health Research**

Reliable data relating certain climatic impacts, such heatwaves or water scarcity, to health consequences are hard to come by. It is still difficult to create strategies that effectively meet the distinct climate-health requirements of different locations in the absence of this data. Furthermore, the effects of climate change differ greatly throughout India's varied terrain. A one-size-fits-all strategy that frequently falls short of local demands results from the paucity of research on the effects of certain climate conditions on regional health patterns, such as respiratory sickness in metropolitan regions or vector-borne illnesses in warmer climes.

3. **Resource Constraints and Economic Dependency on High-Emission Industries**

Despite efforts to promote renewables, India remains heavily dependent on coal and other

high-emission industries. The economic and social costs of transitioning away from these industries pose significant challenges, particularly for vulnerable populations dependent on these sectors for employment. Furthermore, Financing sustainable practices, from clean energy to pollution treatment, is often prohibitively expensive. Limited funding for small and medium-sized businesses (SMEs) in high-emission sectors restricts their ability to adopt cleaner technologies, while many rural areas lack the resources to invest in sustainable agriculture or water conservation.

4. **Public Awareness and Community Engagement Issues**

In many communities, awareness of the link between environmental degradation and health remains low, particularly in rural regions where individuals are more vulnerable to climate and pollution-related health risks. Limited understanding weakens community-level advocacy and participation in pollution control measures. On other ends, Cultural practices and traditional farming or waste disposal techniques can contribute to environmental issues. However, changing these practices requires education, incentives, and long-term support, which are often missing in policy design.

5. **Judicial Overreach and Limited Capacity of Environmental Courts**

Environmental safeguards have been actively enforced by Indian courts, such as the National Green Tribunal (NGT). But this dependence on the courts to execute environmental laws highlights the shortcomings of administrative and regulatory agencies and has resulted in judicial overreach, which occasionally runs counter to the government's more general economic aims. In addition, the NGT has too many cases, which hinders its capacity to promptly and efficiently handle environmental concerns. Communities outside of large cities also have limited access to environmental justice due to the absence of regional tribunals.

Way Forward:

1. **Creating a Unified Climate-Health-Environment Framework**

India needs a holistic Climate and Environmental Health Act that consolidates existing environmental laws with climate and health policies, addressing pollution control, water management, and public health as interconnected issues. Developing action plans that focus on climate-sensitive health risks, like heat stroke, respiratory illnesses, and waterborne diseases, can create a targeted approach to public health resilience. This framework should prioritize regions with high climate vulnerability and involve local governments for better implementation.

 [ISSN 2581-5369]

2. **Empowering Regulatory Bodies with Greater Autonomy and Resources**

The Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) should be equipped with more financial resources, technology, and personnel to monitor environmental standards effectively. Special allocations for pollution hotspots and high-risk areas can enable focused, impactful interventions. Establish independent bodies to monitor environmental data collection, enforcement of emissions standards, and public health impacts, reducing bureaucratic bottlenecks and increasing accountability.

3. **Enhanced Climate and Health Data Systems**

Creating surveillance networks that monitor climate-related health impacts, such as asthma incidences during air pollution peaks or cases of heat stroke in drought-prone areas, can provide real-time data, enabling swift government response. Encourage research institutions and universities to conduct region-specific research on how climate change affects health and pollution. Data gathered from this research should be used to inform localized policy interventions, from crop choices in agriculture to air quality guidelines in urban areas.

4. **Community-Led Conservation and Pollution Control Programs**

Educational campaigns should be rolled out across communities, focusing on the health effects of climate change and water contamination and encouraging participation in conservation efforts. Local governing bodies, like Panchayats, should be empowered to lead these programs. Providing incentives for adopting green practices, such as subsidies for rainwater harvesting, organic farming, or solar panels, can ease the financial burden on communities and encourage participation in sustainable development efforts.

5. **Strengthening Financial Mechanisms for Green Transitions**

Increase investment in green finance options, such as green bonds and climate funds, to help industries adopt cleaner practices. Incentivizing carbon trading programs, where industries can earn credits for emission reductions, will promote more environmentally friendly practices. Establish funds specifically aimed at supporting vulnerable populations, such as farmers affected by erratic weather or fishermen impacted by water pollution. These funds can provide financial assistance, access to climate-adaptive technologies, and livelihood training to support resilience and adaptation.

6. **Building Resilient Health Infrastructure**

Ensure healthcare facilities in climate-sensitive regions are equipped to handle extreme weather conditions and climate-related health crises. Infrastructure upgrades, from heat-

 [ISSN 2581-5369]

resistant buildings to flood-proofing, are essential for areas frequently impacted by climate events. Train health workers to address climate-induced diseases, such as respiratory conditions from air pollution or waterborne diseases during floods, enabling them to recognize, treat, and prevent climate-related health impacts effectively.

7. **Collaborative International and Regional Partnerships**

Engage in partnerships with neighbouring countries for managing transboundary water pollution, air quality standards, and sustainable resource management in shared ecosystems like the Himalayas. As one of the most climate-affected nations, India should continue to champion climate action on the global stage, advocating for increased funding and technology assistance from wealthy nations for adaptation and mitigation initiatives.

8. **Enhanced Role of Judiciary with Supportive Legislative Reforms**

The establishment of additional regional tribunals can decentralize environmental justice, making it accessible to rural and remote areas affected by pollution and climate impacts. Judicial support should be complemented by legislative reforms that encourage environmental litigation by lowering procedural barriers and increasing awareness of citizens' rights to a clean environment.

VII. CONCLUSION

The intricate interconnections between climate change, water pollution, and health in India present an urgent challenge that demands comprehensive legal and policy responses. The effects of climate change are tangible realities that have an influence on millions of lives nationwide; they are neither abstract nor remote.

Furthermore, the health implications of water pollution exacerbated by climate change are alarming. The increase in waterborne diseases, the threat to food security, and the impact on vulnerable populations—especially children, the elderly, and marginalized communities—are profound. These groups often bear the brunt of environmental degradation, facing higher rates of illness and mortality due to inadequate access to clean water and sanitation.

The gravity of the issue cannot be emphasised as we look to the future. If bold and revolutionary legal and legislative actions are not taken, the fact is that water pollution and climate change will continue to pose existential dangers. Governments, civic society, and communities must work together to address these urgent problems; the moment to act is now. Our future sustainability, the integrity of our ecosystems, and the well-being of our citizens are all at stake.

 [ISSN 2581-5369]

There is an urgent need for action when considering climate change, water pollution, and health from the perspective of Indian legal remedies and policy frameworks. The interaction of these factors necessitates a strong and comprehensive strategy that puts everyone's health and welfare first, guaranteeing the protection of their rights to clean water and a healthy environment. We can only expect to lessen the negative consequences of climate change, preserve our water supplies, and ensure public health for future generations by making such a concentrated effort.

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 [ISSN 2581-5369]

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 [ISSN 2581-5369]