



INDIAN JOURNAL OF LEGAL REVIEW

VOLUME 5 AND ISSUE 1 OF 2025

INSTITUTE OF LEGAL EDUCATION



INDIAN JOURNAL OF LEGAL REVIEW

APIS – 3920 – 0001 | ISSN – 2583-2344

(Open Access Journal)

Journal's Home Page – <https://ijlr.iledu.in/>

Journal's Editorial Page – <https://ijlr.iledu.in/editorial-board/>

Volume 5 and Issue 1 of 2025 (Access Full Issue on – <https://ijlr.iledu.in/volume-5-and-issue-1-of-2025/>)

Publisher

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THE ROLE OF ENVIRONMENTAL LAW IN CLIMATE CHANGE MITIGATION: A FOCUS ON INDIA

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BEST CITATION – MOHAMMAD UMAR & DR. ARVIND KUMAR SINGH, THE ROLE OF ENVIRONMENTAL LAW IN CLIMATE CHANGE MITIGATION: A FOCUS ON INDIA, *INDIAN JOURNAL OF LEGAL REVIEW (IJLR)*, 5 (1) OF 2025, PG. 1488-1493, APIS – 3920 – 0001 & ISSN – 2583-2344.

Abstract

Climate change is one of the most urgent international challenges of the 21st century, affecting ecosystems, economies, and communities worldwide. The increasing concentration of greenhouse gases (GHGs) in the atmosphere has led to rising global temperatures, unpredictable climate patterns, and devastating environmental failures, including floods, droughts, cyclones, and wildfires. These changes pose a critical threat to biodiversity, food security, water availability, and human health.

India, with its large population, diverse geography, and rapidly growing economy, is particularly prone to the influences of climate change. The country faces severe weather activities, glacier melt in the Himalayas, rising sea levels affecting coastal areas, and intense air pollution in major towns. These environmental challenges endanger the livelihoods of millions, particularly marginalized groups that lack resources to adapt.

Environmental law plays an essential role in addressing climate change by establishing regulations, guidelines, and legal frameworks aimed at reducing emissions, promoting sustainable development, and protecting natural resources. India has enacted several significant environmental laws, including The Environment (Protection) Act, 1986, The Air

(Prevention and Control of Pollution) Act, 1981, and The National Green Tribunal Act, 2010. Moreover, the National Action Plan on Climate Change (NAPCC) offers a comprehensive roadmap for India's climate change mitigation and adaptation strategies.

Despite having a robust legal framework, the implementation of environmental laws remains a primary challenge due to weak enforcement mechanisms, bureaucratic inefficiencies, financial constraints, and conflicts between economic growth and environmental sustainability. Corruption, lack of coordination among government agencies, and insufficient public awareness further hinder effective policy execution.

This paper critically examines India's environmental laws, highlights the key challenges in their enforcement, and explores potential solutions to strengthen their effectiveness in combating climate change. By enhancing governance, ensuring stricter compliance, increasing public participation, and leveraging technological advancements, India can enhance its capability to cope with climate change and work toward a more sustainable and resilient future.

Introduction

Climate change is not just an environmental concern—it is a global crisis with far-reaching effects on human health, agriculture, water resources, biodiversity, and economic stability. Over the last century, rapid industrialization, deforestation, and excessive reliance on fossil fuels have significantly increased the concentration of greenhouse gases (GHGs) in the atmosphere. This has led to global warming, resulting in extreme environmental disruptions, including:

- Rising sea levels
- More frequent and severe natural disasters
- Shifting climate patterns
- Habitat destruction

The consequences of climate change are no longer remote threats but are already affecting communities worldwide, particularly in developing nations with limited resources to adapt.

India, due to its significant geographical range and economic dependence on climate-sensitive sectors such as agriculture, is among the most vulnerable nations to climate change. Millions of farmers rely upon monsoon rains for cultivation, but erratic weather patterns, prolonged droughts, and unseasonal rainfall have made agriculture increasingly unpredictable and unsustainable. Rising temperatures and heatwaves not only reduce crop yields but also contribute to water shortages, affecting both rural and urban populations. Additionally, coastal cities such as Mumbai, Chennai, and Kolkata face the growing risk of flooding due to rising sea levels, threatening infrastructure, livelihoods, and public safety.

Apart from climate-related disasters, environmental degradation in India is further exacerbated by high levels of air and water pollution. Metropolitan areas like Delhi frequently experience hazardous air quality due

to vehicular emissions, industrial pollutants, and crop residue burning. This has severe implications for public health, increasing cases of respiratory diseases, heart conditions, and premature deaths. Furthermore, deforestation, mining, and unregulated industrial growth continue to degrade natural ecosystems, reducing biodiversity and worsening the effects of climate change.

To address these challenges, strong environmental laws and policies are essential. A well-structured legal framework not only helps regulate pollution and control deforestation but also encourages sustainable development and resource conservation. Over time, India has implemented several key environmental laws to address climate change and environmental degradation. However, despite the presence of these laws, enforcement remains weak due to bureaucratic inefficiencies, lack of coordination among government agencies, and competing economic interests. Strengthening environmental governance, improving legal enforcement, and promoting public awareness are crucial to making these laws more effective.

This paper critically examines India's environmental legal framework, evaluates its effectiveness in addressing climate change, and explores potential reforms to strengthen its implementation. By improving legal compliance, encouraging technological advancements, and integrating climate policies with economic planning, India can move toward a more sustainable and resilient future.

Key Environmental Laws and Guidelines in India

1. The Environment (Protection) Act, 1986

The Environment (Protection) Act (EPA), 1986, was enacted in response to the Bhopal Gas Tragedy of 1984, one of the world's worst industrial disasters. The tragedy, resulting from the leakage of toxic methyl isocyanate gas from the Union Carbide pesticide plant in Bhopal, caused thousands of deaths and long-term health complications for survivors. This disaster

highlighted the pressing need for stringent environmental policies, prompting the government to introduce the EPA.

Main Features of the Act:

- Provides the central government the authority to take necessary measures for environmental protection.
- Empowers the government to set environmental quality standards for air, water, and land pollution.
- Allows the government to investigate industries and impose penalties for non-compliance.
- Enables the government to shut down industries causing intense environmental damage.
- Establishes guidelines for dealing with hazardous substances.

Despite its broad scope, the EPA suffers from weak enforcement, lack of public awareness, and inadequate penalties, allowing industries to continue polluting without significant consequences. Strengthening monitoring mechanisms and increasing penalties for violations are important to enhance the law's effectiveness.

2. The Air (Prevention and Control of Pollution) Act, 1981

Air pollution is a major environmental disaster in India, with cities like Delhi, Mumbai, Kolkata, and Bengaluru frequently recording dangerous air quality levels. Vehicular emissions, industrial pollution, crop burning, and construction dust contribute to the problem, leading to respiratory diseases, reduced visibility, and increased mortality rates.

Key Provisions of the Act:

- Establishes air quality standards for different areas.
- Empowers the Central and State Pollution Control Boards (CPCB and SPCBs) to monitor air pollution levels.

- Authorizes regulatory bodies to impose fines, issue warnings, or shut down industries that violate air quality norms.

- Restricts the usage of fuels and technologies that contribute to excessive pollution.

However, despite these provisions, air pollution continues to rise due to weak enforcement, increasing vehicle ownership, and rapid urbanization. Many industries operate without adequate pollution control measures, and compliance checks remain inconsistent. Strict enforcement, promotion of clean energy alternatives, and better urban planning are essential to curb air pollution effectively.

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

Water pollution is another major environmental issue in India. Major rivers, such as the Ganga and Yamuna, suffer from severe contamination due to industrial waste, untreated sewage, and plastic pollution. The Water (Prevention and Control of Pollution) Act, 1974, was introduced to regulate water pollution and ensure clean and safe water for all.

Key Features of the Act:

- Sets standards for water quality and effluent discharge.
- Prohibits industries from dumping untreated waste into water bodies.
- Establishes penalties for individuals and industries violating pollution norms.
- Empowers the Pollution Control Boards to monitor water quality and take action against violators.

Despite its provisions, enforcement remains weak due to inadequate infrastructure, lack of strict penalties, and rapid urban expansion. Large-scale initiatives, such as the Namami Gange Programme, aim to clean major rivers, but long-term success depends on

stricter regulations, public participation, and technological interventions.

4. The National Green Tribunal (NGT) Act, 2010

Recognizing the need for a dedicated legal body to handle environmental disputes effectively, the Indian government passed the National Green Tribunal (NGT) Act in 2010.

The NGT serves as a specialized court that expedites cases related to environmental protection, ensuring that legal disputes do not remain unresolved for years.

Key Functions of the NGT:

- Hears cases related to pollution, deforestation, industrial waste management, and environmental violations.
- Imposes fines and penalties on industries found guilty of violating environmental norms.
- Provides a legal platform for citizens and organizations to challenge environmentally harmful projects.
- Ensures faster resolution of environmental disputes compared to traditional courts.

The NGT has played a significant role in enforcing environmental laws, issuing landmark rulings on pollution control, illegal mining, and deforestation. However, challenges such as resource constraints, resistance from industries, and the influence of powerful corporate entities often limit its impact. Strengthening the NGT by increasing its judicial capacity and ensuring compliance with its rulings can enhance its effectiveness.

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

As climate change became a growing global concern, India launched the National Action Plan on Climate Change (NAPCC) in 2008 to address climate-related challenges and promote sustainable development. The NAPCC

includes eight national missions, each focusing on a specific area of climate action.

Major Missions under NAPCC:

1. National Solar Mission – Encourages solar energy expansion to reduce dependence on fossil fuels.
2. National Water Mission – Focuses on water conservation, efficient irrigation, and sustainable water management.
3. National Mission for a Green India – Aims at afforestation, biodiversity conservation, and ecosystem restoration.
4. National Mission on Sustainable Agriculture – Promotes climate-resilient farming techniques and sustainable agricultural practices.
5. National Mission for Enhanced Energy Efficiency – Works on improving energy efficiency in industries and buildings.
6. National Mission on Strategic Knowledge for Climate Change – Supports climate research and data collection for policy planning.
7. National Mission on Sustainable Habitat – Encourages energy-efficient urban planning and waste management.
8. National Mission on Himalayan Ecosystem – Focuses on protecting the fragile Himalayan ecosystem from climate change impacts.

Challenges and Gaps in Implementation:

- Lack of Coordination: Many state governments and local agencies are unaware of the missions or lack technical expertise to implement them effectively.
- Inadequate Funding: Several missions suffer from insufficient budget allocations, slowing down development.

- **Slow Execution:** Bureaucratic delays and overlapping responsibilities hinder timely implementation.
- **Limited Public Awareness:** Many citizens and stakeholders remain unaware of the NAPCC, reducing its potential impact.

To make the NAPCC more effective, India needs better inter-agency coordination, improved financial support, and stronger policy enforcement at the grassroots level. Expanding public participation and integrating climate action into state policies can further strengthen India's climate resilience.

Challenges in Implementing Environmental Laws in India

Despite having a well-developed legal framework, India faces numerous challenges in enforcing environmental laws effectively.

1. Weak Enforcement and Lack of Resources

- Pollution control agencies often lack funding and staff, making enforcement difficult.
- Corruption and political interference prevent strict action against polluting industries.

2. Poor Coordination Between Agencies

- Different government departments handle environmental issues separately, leading to confusion and inefficiency.
- Better communication between central and state agencies is needed.

3. Economic Growth vs. Environmental Protection

- India's rapid industrialization and urban growth often conflict with environmental conservation.
- Infrastructure projects, including coal mining and deforestation, harm the environment.

4. Low Public Awareness and Participation

- Many people do not know their environmental rights.
- There is little public involvement in environmental decision-making.

5. Outdated Laws and Legal Loopholes

- Some environmental laws were created decades ago and do not address modern-day challenges like climate adaptation and carbon pricing.
- New policies are needed to regulate emerging environmental threats.

Recommendations for Strengthening Environmental Laws

To make India's environmental laws more effective, the following steps should be taken:

1. **Stronger Enforcement** – Increase funding for pollution control agencies, hire more staff, and impose stricter penalties.
2. **Better Coordination** – Improve communication between different government agencies handling environmental issues.
3. **Sustainable Development Policies** – Balance economic growth with environmental protection through green energy investments.
4. **Public Awareness** – Launch training programs and awareness campaigns on climate change.
5. **Updating Legal Frameworks** – Revise outdated laws and introduce new guidelines on climate adaptation and carbon taxes.

Conclusion

Environmental laws are vital in India's fight against climate change. However, having laws alone is not sufficient—proper enforcement, public participation, and government commitment are essential for real impact. By

strengthening its legal framework, enhancing law enforcement, and promoting sustainable development, India can reduce its carbon footprint and build a climate-resilient future.

The fight against climate change is a long one, but with strong laws and responsible action, India can lead the way in global climate protection.

