
Environmental Issues and Movements in India

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Abstract

India's rapid industrialization, urbanization, and population growth have contributed to significant environmental challenges. Major issues include widespread air and water pollution, deforestation, land degradation, biodiversity loss, and the growing impacts of climate change. Cities like Delhi frequently suffer from extreme air pollution, while rivers such as the Ganges are heavily contaminated by untreated sewage, industrial effluents, and agricultural runoff. Additionally, deforestation, especially in regions like the Western Ghats and north-eastern India, has caused severe ecological imbalance and threatened wildlife. In response, several grassroots environmental movements have arisen to address these concerns. The "Chipko Movement" in the 1970s where villagers primarily women embraced trees to prevent deforestation in the Himalayan region, remains a powerful symbol of environmental activism. The "Narmada Bachao Andolan", starting in the 1980s, protested against large dams on the Narmada River, raising concerns about displacement of local communities and ecological damage. In recent years, efforts to combat air pollution in cities, preserve green spaces like Mumbai's Aarey Forest, and youth-led climate movements have gained momentum. While the Indian government has introduced policies such as the National Green Tribunal and stricter environmental regulations, enforcement remains a challenge due to political and economic pressures. The growing environmental movements reflect an increasing public awareness and demand for sustainable practices that prioritize ecological protection alongside development.

Keywords: Environmental issues, pollution, deforestation, biodiversity loss, climate change, Chipko Movement, Narmada Bachao Andolan, grassroots movements, sustainable development, India.

Introduction

Climate change refers to significant and lasting shifts in the Earth's climate, primarily driven by human activities such as burning fossil fuels, deforestation, and industrial processes. These actions increase the concentrations of greenhouse gases, like carbon dioxide and methane, in the atmosphere, resulting in a warming effect known as the greenhouse effect. Key aspects of climate change include rising global temperatures, which lead to more frequent and intense heat waves; altered weather patterns that result in extreme events like heavy rainfall, floods, droughts, and hurricanes; melting glaciers and polar ice caps, contributing to rising sea levels that threaten coastal communities; and ecosystem disruption that affects habitats, wildlife, and plant species, leading to biodiversity loss. Overall, climate change poses serious risks to natural systems, human health, economies, and communities around the world. Climate change is having a profound impact on India, affecting various aspects of life across the nation. India, one of the most diverse countries in terms of geography and biodiversity, is also home to some of the most pressing environmental challenges. With a rapidly growing population and a developing economy, the country has been facing severe consequences of industrialization, urbanization, and unsustainable agricultural practices. Environmental degradation in India is a multifaceted issue, encompassing air and water pollution, deforestation, soil degradation, biodiversity loss, and the increasing impacts of climate change. While the government has implemented various environmental protection measures, grassroots movements have played a pivotal role in

raising awareness and combating these issues. This paper explores the major environmental challenges facing India and the role of environmental movements in addressing them.

Environmental Challenges

1. **Air Pollution** Air pollution is one of the most critical environmental problems in India, particularly in urban areas. According to reports from the World Health Organization (WHO), several Indian cities, including Delhi, consistently rank among the most polluted in the world. The sources of air pollution include vehicular emissions, industrial activities, crop burning, and the use of solid fuels for cooking in rural areas. The widespread use of fossil fuels has led to high concentrations of particulate matter (PM_{2.5} and PM₁₀), nitrogen oxides (NO_x), sulphur dioxide (SO₂), and other harmful pollutants in the atmosphere. Air pollution has significant public health impacts, contributing to respiratory illnesses, cardiovascular diseases, and premature deaths. The Indian government has taken measures to address air pollution, such as the National Clean Air Programme (NCAP), which aims to reduce particulate pollution by 20-30% by 2024. However, enforcement of regulations and the transition to cleaner energy sources remain major challenges.

2. **Water Pollution** Water pollution is another significant environmental issue in India, affecting rivers, lakes, and groundwater. Major rivers such as the Ganges and Yamuna are heavily polluted due to untreated sewage, industrial effluents, and agricultural runoff. Despite being considered sacred, the Ganges River is one of the most polluted water bodies in the world. This contamination threatens not only human health but also aquatic life and ecosystems. The government has launched initiatives like the Namami Gange project, aimed at cleaning and rejuvenating the Ganges River. However, progress has been slow due to infrastructural limitations, inadequate sewage treatment facilities, and industrial non-compliance. Groundwater contamination, particularly from heavy metals such as arsenic and fluoride, is also a growing concern in rural areas, where millions of people rely on groundwater for drinking and irrigation.

3. **Deforestation and Loss of Biodiversity** India's forests and biodiversity are under constant threat from deforestation, habitat fragmentation, and illegal logging. Forests cover approximately 21% of India's total land area, but this figure has been declining due to agriculture, infrastructure development, and mining activities. The loss of forest cover has serious consequences for wildlife, leading to the extinction of species and the disruption of ecosystems. India is one of the world's most bio diverse countries, with several biodiversity hotspots, including the Western Ghats, the Eastern Himalayas, and the Sundarbans. These regions are home to numerous endemic species, but they are also under significant threat from human activities. The loss of biodiversity not only affects the environment but also threatens the livelihoods of indigenous communities that depend on forests for sustenance.

4. **Soil Degradation** Soil degradation, primarily due to unsustainable agricultural practices, is a major environmental issue in India. Overuse of chemical fertilizers and pesticides, excessive irrigation, and deforestation have led to soil erosion, Salinization, and a decline in soil fertility. According to the Indian Council of Agricultural Research (ICAR), approximately 30% of India's land area is affected by land degradation. Soil degradation has long-term consequences for food security, as it reduces agricultural productivity and the ability to sustain crop yields. Addressing this issue requires the adoption of sustainable farming practices, such as organic farming, crop rotation, and afforestation.

5. Climate Change Climate change represents a serious threat to the environment, impacting ecosystems, economies, and communities on a global scale. Human activities, particularly the burning of fossil fuels, deforestation, and industrial emissions, have increased greenhouse gases in the atmosphere, leading to a rise in global temperatures. This warming effect disrupts natural ecosystems, contributing to extreme weather events, sea-level rise, glacier melt, and biodiversity loss. Mitigating these effects demands coordinated international action, which has been the focus of numerous climate summits and agreements. India is highly vulnerable to the impacts of climate change, which are exacerbating existing environmental challenges. Rising temperatures, changing precipitation patterns, and increasing frequency of extreme weather events such as floods, droughts, and cyclones are affecting agriculture, water resources, and public health. Coastal areas, particularly in the states of West Bengal, Odisha, and Gujarat, are at risk of sea-level rise and coastal erosion. The Indian government has committed to climate action through its National Action Plan on Climate Change (NAPCC) and international agreements such as the Paris Agreement. However, balancing economic growth with climate mitigation efforts remains a complex challenge for the country. Other changes effecting environment are:-

- **Heat waves:** These have become more frequent and intense, affecting public health and agricultural productivity.
- **Floods:** Significant rainfall variations lead to severe flooding, causing extensive damage to infrastructure and homes.
- **Unpredictable Monsoons:** Changes in monsoon patterns disrupt farming cycles, which many communities depend on for their livelihoods.
- **Decreasing Groundwater Levels:** Over-extraction and changing weather patterns are leading to declining water supplies, threatening agriculture and drinking water availability.

Economic Impact- The economic implications of climate change are severe:

- In 2022, the damages from floods alone reached about **US\$26.3 billion**, which is more than **0.5%** of India's GDP.
- Experts predict that if climate change remains unaddressed, the total economic and social costs could soar to **US\$35 trillion** over the next 50 years, with health and agriculture being particularly hard hit.

Social Consequences- Communities in the most vulnerable regions, often referred to as “climate frontiers,” are experiencing the worst effects:

- There is an increasing risk of a **climate-induced refugee crisis** from neighbouring countries like Bangladesh and Pakistan, where climate impacts are also severe.
- Internal migration is on the rise as people seek better living conditions due to lost livelihoods and worsening environmental conditions.

Health Concerns- Environmental issues in India, such as air and water pollution, deforestation, and climate change, pose serious health risks to the population. One of the basic concerns is the **air pollution**, especially in urban areas, which contributes to respiratory and cardiovascular diseases, such as asthma, bronchitis, and heart disease. Prolonged exposure to polluted air, especially in cities like Delhi, is harmful, particularly to

children and the elderly. A **2019 study** estimated that poor air quality costs the economy over **US\$36 billion** annually in lost GDP. India consistently ranks low in global air quality assessments, indicating a critical need for improvements. **Water pollution**, largely due to untreated sewage and industrial waste, leads to the spread of waterborne diseases like cholera, typhoid, and dysentery. Contaminated water also threatens rural populations that rely on groundwater, which is often polluted with arsenic and fluoride, leading to serious conditions like cancer and skeletal fluorosis. **Vector-borne diseases** such as malaria and dengue are becoming more prevalent due to environmental changes caused by deforestation and climate change, which create favourable conditions for disease-carrying insects. Similarly, **heat waves**, exacerbated by climate change, increase the risk of heat-related illnesses, including heatstroke and dehydration, especially in vulnerable populations. Environmental degradation also affects **food security** by reducing agricultural productivity, leading to malnutrition, particularly in children. **Mental health** is impacted as well, with natural disasters and pollution-related stress contributing to anxiety, depression, and other psychological issues. Additionally, exposure to toxic chemicals from industrial pollution raises concerns about **cancer** and **reproductive health**, including fertility problems and birth defects.

Summits And Conventions Regarding Climate Change-

1. **Earth Summit (Rio Summit) – 1992**: The United Nations Conference on Environment and Development (UNCED), widely known as the “Earth Summit” or “Rio Summit”, took place in Rio de Janeiro, Brazil, in 1992. This summit was groundbreaking, as it highlighted sustainable development and environmental issues, including climate change, at an unprecedented global level. A major result was the creation of the “United Nations Framework Convention on Climate Change (UNFCCC)”, aiming to stabilize greenhouse gas (GHG) levels to prevent harmful impacts on the climate. Other important outcomes included the “Convention on Biological Diversity” and “Agenda 21”, a detailed action plan promoting sustainable development worldwide.

2. United Nations Framework Convention on Climate Change (UNFCCC) - 1992

The UNFCCC is a foundational international treaty with membership from 197 countries, referred to as "Parties." It established annual “Conference of the Parties (COP)” sessions, where member countries review global progress in addressing climate change.

3. Kyoto Protocol – 1997

Adopted during COP3 in Kyoto, Japan, the “Kyoto Protocol” was the first binding international agreement aimed at cutting greenhouse gas emissions. It required industrialized nations, also known as Annex I countries, to collectively reduce emissions by an average of 5% below 1990 levels during the first commitment period (2008–2012). A later amendment, the “Doha Amendment” (2012), extended the Protocol to a second commitment period (2013–2020), although not all parties participated.

4. UN World Summit – 2005

The 2005 World Summit, held in New York, focused on sustainable development and reinforced the need for commitments to address climate change, poverty, and global health. This summit reiterated the importance of the UNFCCC and Kyoto Protocol goals and encouraged nations to boost efforts to meet climate targets. While

it primarily addressed sustainable development, climate change was emphasized as an interconnected, urgent issue.

5. Paris Agreement - 2015

Signed during COP21 in Paris, France, the Paris Agreement was a landmark in global climate action, aiming to limit global temperature rise this century to well below 2°C, with an aspirational goal of 1.5°C. Countries set their own targets, known as “Nationally Determined Contributions (NDCs)”, which are reviewed every five years to increase ambition. Unlike the Kyoto Protocol, the Paris Agreement includes commitments from both developed and developing countries, creating a globally inclusive framework. The Agreement also stresses climate financing, resilience building, and transparency, with wealthier nations pledging to financially support developing countries in achieving climate goals.

6. Conference of the Parties (COP) Meetings- The annual Conference of the Parties (COP) gatherings, established by the UNFCCC, are critical for ongoing climate negotiations and policy updates. **COP24** in Katowice, **Poland (2018)** resulted in the Katowice Climate Package, which set guidelines for implementing the Paris Agreement. **COP25** in **Madrid (2019)** centered on carbon market mechanisms, although reaching consensus proved difficult.

7. Glasgow Climate Pact - COP26, 2021- The Glasgow Climate Pact was one of the latest major outcomes from COP26. It urged nations to "phase down" coal power and "phase out" inefficient fossil fuel subsidies, marking the first explicit mention of fossil fuels in a UN climate accord. The Pact emphasized doubling adaptation finance by 2025 and recognized "loss and damage" due to climate change, especially for vulnerable countries. It also called on countries to revisit and bolster their 2030 targets, reflecting a heightened urgency for emissions reductions.

8. Upcoming COP28 and Future Summits- Future COPs, such as **COP28** planned for 2023 in the United Arab Emirates, will continue to evaluate and negotiate stronger actions to mitigate climate change. These events aim to achieve the goals set by the Paris Agreement, assess national progress, and potentially establish new standards to tackle evolving climate issues. These summits and agreements mark significant milestones in the global climate response, stressing the importance of inclusivity, adaptation, and fair financing for developing nations. Continuous collaboration and decisive action remain essential to secure a stable climate for future generations.

Environmental Movements In India:- In India there are several movements have been done for protection of environment

- 1. The Silent Valley:** Movement arose as a response to the proposal of constructing a dam on the Kunthipuzha River, nestled in Kerala's Silent Valley in Palghat district, an area known for its rich natural beauty. The idea for the dam dates back to 1929, when it was first suggested by the British. In 1958, a technical survey confirmed its feasibility, and the project was approved by India's Planning Commission in 1973. However, by 1978, resistance to the project began to grow, with people from diverse backgrounds rallying together to protect the region. Initially led by local residents, the movement gained significant momentum under the guidance of the Kerala Sastra Sahitya Parishad

(KSSP) and attracted support from prominent environmental groups like the Narmada BachaoAndolan (NBA), the Bombay Natural History Society (BNHS), and the Silent Valley Action Forum. This united front highlighted the strong determination to safeguard the Silent Valley's fragile ecosystem.

2. **The Chipko Movement:** took root on April 24, 1973, in the village of Mandal, located in Uttarakhand's Chamoli district, Garhwal region. This movement, which became one of India's most iconic environmental efforts, arose out of the growing ecological disturbances in the hills. As forest yields dwindled, local communities were forced to depend more on external market resources, a situation that raised deep concerns among the hill residents. The overexploitation of forests was also seen as a major contributor to natural disasters such as floods and landslides. In response, on March 27, a decision was made to "chipko," or "hug," the trees that were at risk of being cut down. This act of nonviolent resistance led to the birth of the ChipkoAndolan, which successfully prevented private companies from felling ash trees in the area.
3. **The Bishnoi Movement:** led by Amrita Devi in the 1700s, is a remarkable early example of environmental activism in India. In this movement, around 363 people sacrificed their lives to protect their sacred forests in Rajasthan. It was the first of its kind to use the strategy of hugging trees as a means of protecting them, a tactic later echoed in other environmental movements. The protest was sparked when the king ordered the cutting of the village's revered trees to build a new palace. The Bishnoi people, deeply connected to their natural surroundings, stood firm in their commitment to safeguard the trees, with Amrita Devi famously declaring that it was better to die than allow the trees to be destroyed.
4. **The Appiko Movement:** inspired by the Chipko Movement, emerged in the Western Ghats of Karnataka's Uttara Kannada region in September 1983. It was a response to the widespread commercial logging of trees for timber, which caused severe soil erosion and dried up crucial water sources. In the village of Saklani, locals were denied their traditional rights to gather twigs, dried branches, and other non-timber forest products essential for their livelihoods. In response, the women and youth of the region initiated a peaceful protest, similar to the Chipko Movement, to safeguard their forests. Their 38-day agitation compelled the state government to halt the felling of trees. Led by PandurangaHegde and the villagers, the Appiko Movement aimed to prevent the destruction of green trees and protect the vital natural resources of the community.
5. **The Narmada BachaoAndolan (NBA):** started in 1985 as a grassroots movement opposing the construction of large dams on the Narmada River, a major waterway in the Indian Peninsula. At the center of the debate was the SardarSarovar Project in Gujarat, a massive reservoir planned on the Narmada that raised serious concerns about water rights and the displacement of local communities. Led by MedhaPatkar and other activists, the movement challenged the justification behind these large-scale development projects, particularly focusing on the environmental degradation and social upheaval they caused. The NBA brought attention to the displacement of thousands of people, the flooding of vast areas of land, and the long-term ecological consequences across Gujarat, Madhya Pradesh, and Maharashtra.
6. **The Jungle BachaoAndolan:** emerged in the 1980s in the Singhbhum district of Bihar (now Jharkhand) as a response to the government's decision to replace the natural Sal forests with commercial teak plantations. This decision posed a serious threat to the livelihoods and rights of the local Adivasi communities, who relied on the Sal forests for both their survival and cultural heritage. Led by the tribals of Singhbhum, the movement quickly spread to other states such as Bihar, Jharkhand,

and Odisha, uniting indigenous communities in their efforts to protect their forests. Launched in 1982, the Jungle Bachao Andolan focused on preserving the region's natural forest ecosystem and defending the rights of the tribal people who depended on it.

7. **Contemporary Environmental Movements:** In recent years, there has been a rise in environmental activism, particularly among the youth, focused on issues such as climate change, air pollution, and the preservation of urban green spaces. The fight to protect the Aarey Forest in Mumbai from being cleared for a metro project is a recent example of urban environmental activism. Climate change movements, such as the Fridays for Future movement, have also gained momentum in India, with young people demanding stronger action from the government to address the climate crisis.

Suggestions and implications- To effectively tackle the global crisis of climate change and environmental degradation, several key strategies and considerations should be prioritized

Enhancing Policy Ambitions and Implementation: Nations should not only commit to ambitious climate goals but also implement them through rigorous, enforceable policies. This includes setting clear targets, establishing monitoring systems, and introducing repercussions for inaction. Strong domestic laws that align with international agreements like the Paris Agreement can ensure global promises become local actions.

1. **Boosting Investments in Renewable Energy:** Shifting from fossil fuels to renewable sources—such as solar, wind, and hydro—is critical for reducing emissions. Increased investment from both the public and private sectors in renewable technology can make green energy more affordable and widely adopted, significantly cutting down on greenhouse gases.
2. **Expanding Climate Financing:** Many developing countries face the most severe impacts of climate change while lacking adequate resources to adapt. Increased financial support for these nations to fund sustainable development, climate adaptation, and mitigation projects will empower them to participate in global climate solutions.
3. **Supporting Sustainable Land Management and Conservation:** Reducing deforestation and implementing sustainable land management can protect ecosystems while lowering carbon emissions. Reforestation, preservation of natural habitats, and sustainable farming practices are essential for carbon sequestration and biodiversity protection.
4. **Strengthening Global Collaboration and Transparency:** Enhanced international collaboration is needed to achieve unified climate actions. Regular global meetings, such as climate summits, provide platforms for nations to review progress and increase accountability, encouraging each other to enhance commitments and take responsibility.
5. **Investing in Technology and Innovation:** Advancements in technologies, such as carbon capture, storage solutions, and green hydrogen, hold potential for reducing emissions. Increasing investments in research and development can accelerate the discovery of sustainable methods that meet energy needs with minimal environmental impact.
6. **Raising Public Awareness and Encouraging Sustainable Behaviour:** Public engagement is key to encouraging sustainable lifestyle changes, such as reducing waste, conserving energy, and supporting eco-friendly products. Government and educational campaigns can promote environmental stewardship, fostering a culture of conservation and sustainability.

- 7. Developing Resilience and Adaptation Plans:** Communities, particularly those in high-risk areas, require robust adaptation strategies to endure climate impacts, such as resilient infrastructure, climate-adaptive agriculture, and flood defenses. Effective adaptation measures can protect lives, support economic resilience, and strengthen community preparedness for climate challenges.

Implications- Implementing these approaches requires a fundamental shift in economic, social, and environmental policies across sectors. Coordinated global action would lead to more sustainable economies, improved public health by reducing pollution, and stronger ecosystems. Without unified action, societies may face rising inequality, loss of biodiversity, and severe consequences for future generations. These strategies are crucial not only for addressing climate risks but also for establishing a more resilient, equitable, and sustainable world for all.

Conclusion - In summary, environmental degradation in India is directly linked to a wide range of health problems, from respiratory diseases to mental health challenges. Addressing these environmental issues is essential to protect public health and ensure the well-being of future generations. Urgent action is needed to reduce pollution, promote sustainable practices, and enhance public awareness to mitigate these risks. The ongoing clash with nature, characterized by industrial expansion, depletion of natural resources, and a rise in natural disasters, has created significant imbalances in our ecosystems. This situation has sparked a variety of environmental movements in India, driven by several key concerns. These movements advocate for better control over natural resources and criticize ineffective government development policies, while also pushing for fair access to forest resources. There's a strong focus on ensuring that these resources are used for non-commercial purposes, as well as addressing issues of social justice and human rights. Socioeconomic factors further complicate the landscape, as widespread environmental degradation and heightened awareness through media coverage have come to the forefront. Collectively, these factors highlight the critical need for sustainable practices and policies to tackle the urgent environmental challenges facing India today. The combination of environmental, economic, and social challenges highlights the urgent need for decisive action to mitigate climate change in India. Addressing these issues is crucial for protecting public health, ensuring economic stability, and supporting vulnerable communities. The climate summits and conventions form a critical foundation for addressing environmental challenges by fostering international collaboration, shared responsibility, and accountability. Each gathering builds on previous efforts, creating a cumulative framework that strengthens climate policies, promotes cleaner technologies, and sets clearer pathways toward sustainability. By setting binding agreements, providing financial assistance to developing nations, and ensuring countries submit and enhance their targets periodically; these summits encourage nations to make actionable progress. Furthermore, they highlight the importance of adaptation and resilience, particularly for vulnerable regions, helping them prepare for and mitigate the impacts of climate change.

Together, these conventions represent the global commitment needed to transition to sustainable practices, reduce greenhouse gas emissions, and create a resilient, healthier planet for generations to come. The Paris Agreement seeks to limit global warming to "well below 2 degrees," and India's commitments at COP26 in Glasgow in 2021 align with this goal. As a leader for emerging markets and developing economies in the Global South, India will showcase its role during its G20 Presidency in 2023 and through initiatives like the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure. India's strategy for achieving "net zero" emissions is grounded in the principle of Common but Differentiated Responsibilities,

emphasizing that developed countries should support developing nations in transitioning to cleaner energy. As part of the Like-Minded Developing Countries group, India advocates for greater control over climate finance for adaptation and mitigation efforts. India faces a wide range of environmental challenges that threaten its ecosystems, public health, and future sustainability. While the government has made efforts to address these issues through policies and regulations, grassroots environmental movements have played a crucial role in raising awareness and pushing for change. Movements like the Chipko Movement, Narmada Bachao Andolan, and Silent Valley Movement have not only highlighted the environmental and social consequences of development projects but have also empowered local communities to take action in protecting their natural resources. As environmental challenges continue to grow, particularly in the face of climate change, the role of grassroots movements will remain essential in shaping a sustainable future for India. The country's path forward must involve a balance between economic development and environmental protection, with a focus on sustainable practices, conservation, and the active participation of civil society.

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