

# India's compliance with international environmental agreements - a case study of the Kyoto protocol and Paris agreement

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**Abstract**—This paper provides an analysis of India's compliance with international environmental agreements, specifically focusing on the Kyoto Protocol and the Paris Agreement. India, as a developing country, has unique challenges and responsibilities regarding environmental protection and climate change mitigation. The paper assesses India's involvement in both agreements, highlighting its contributions, challenges, and the effectiveness of these international frameworks in addressing global environmental issues. This case study examines India's compliance with international environmental agreements, focusing on the Kyoto Protocol and the Paris Agreement. As a developing nation with a rapidly growing economy and population, India faces significant challenges in balancing economic development with environmental sustainability. The study explores India's commitments under both the Kyoto Protocol, which primarily focused on greenhouse gas emissions reductions from industrialized countries, and the Paris Agreement, which emphasizes global cooperation to limit temperature rise and enhance climate resilience.

**Index Terms**—India, Kyoto Protocol, Paris Agreement, climate change, environmental governance, renewable energy, carbon intensity, national contributions, sustainability, international agreements, greenhouse gas emissions.

## I. INTRODUCTION

India, with its rapidly growing economy and large population, plays a crucial role in the global environmental landscape. As a signatory to both the Kyoto Protocol (1997) and the Paris Agreement (2015), India's commitment to mitigating climate change is central to the country's environmental policy. However, India's position as a developing nation, with a heavy reliance on coal and other fossil

fuels, complicates its ability to fully comply with the stringent targets set by these international agreements. This paper examines India's commitments under both the Kyoto Protocol and the Paris Agreement, evaluates its compliance with the provisions of each, and analyzes the challenges the country faces in meeting these commitments.

## II. BACKGROUND ON THE KYOTO PROTOCOL AND PARIS AGREEMENT

### 2.1 The Kyoto Protocol (1997)

The Kyoto Protocol, adopted in 1997 under the United Nations Framework Convention on Climate Change (UNFCCC), established legally binding emission reduction targets for industrialized nations. The protocol came into force in 2005 and aimed to reduce the collective emissions of participating countries by 5.2% below 1990 levels by the commitment period of 2008–2012.

As a developing country, India was not required to reduce emissions under the Kyoto Protocol but was encouraged to implement sustainable development policies. India did, however, commit to improving energy efficiency and reducing the intensity of its carbon emissions (i.e., emissions per unit of GDP).

### 2.2 The Paris Agreement (2015)

The Paris Agreement, adopted in 2015, marked a historic turning point in global climate policy. Unlike the Kyoto Protocol, which imposed binding emission reduction targets only on developed nations, the Paris Agreement calls for a global, voluntary approach to climate change mitigation. Under the Paris Agreement, all countries, including India, agreed to take action to limit global warming to well below 2°C, aiming for 1.5°C, compared to pre-industrial

levels.

India's commitments under the Paris Agreement include:

- Reducing the emissions intensity of GDP by 33-35% from 2005 levels by 2030.
- Achieving 40% of energy from non-fossil fuel sources by 2030.
- Increasing the forest cover to absorb carbon dioxide.

### III. INDIA'S ROLE AND COMMITMENTS IN THE KYOTO PROTOCOL

#### 3.1. India's Initial Position on the Kyoto Protocol

India was one of the countries that opposed the imposition of binding emission reduction targets in the Kyoto Protocol, arguing that developed countries were historically responsible for the majority of global greenhouse gas emissions. India, therefore, participated in the Kyoto Protocol with a focus on sustainable development and equitable climate action. India's National Action Plan on Climate Change (NAPCC), adopted in 2008, outlined a strategy for meeting its commitments to the Kyoto Protocol. The NAPCC emphasized renewable energy, energy efficiency, and adaptation measures for vulnerable regions.

#### 3.2. India's Implementation of Kyoto Protocol Commitments

- Clean Development Mechanism (CDM): India actively participated in the CDM, a flexible market-based mechanism under the Kyoto Protocol that allowed developing countries to invest in emission-reducing projects. India became one of the largest beneficiaries of CDM projects, particularly in the areas of renewable energy and energy efficiency.
- Sustainable Development Policies: India's efforts to reduce energy intensity and improve efficiency were integrated into national policies, such as the National Action Plan on Climate Change. Renewable energy, especially solar and wind energy, received significant investments.

However, the lack of binding targets and the voluntary nature of India's commitments under the Kyoto Protocol meant that while the country made progress, it was not on track to meet global emissions reduction goals on its own.

### IV. INDIA'S ROLE AND COMMITMENTS IN THE PARIS AGREEMENT

4.1. India's Climate Goals under the Paris Agreement  
Under the Paris Agreement, India adopted an ambitious set of targets, focusing on both mitigation and adaptation. These targets included:

- Emissions Intensity: India's pledge to reduce emissions intensity by 33-35% by 2030 from 2005 levels.
- Renewable Energy: India committed to achieving 40% of its energy needs from non-fossil fuel sources by 2030. This includes significant investments in solar, wind, and other renewable sources of energy.
- Forest Cover and Carbon Sinks: The country committed to increasing forest cover and enhancing carbon sequestration as a means of offsetting emissions.

#### 4.2. India's Progress on Paris Agreement Goals

India's progress towards its Paris commitments can be seen in the following areas:

- Renewable Energy: India has made significant strides in increasing the share of renewable energy in its energy mix. The government has set ambitious targets, such as the 175 GW target by 2022 and 500 GW by 2030. India has become a global leader in solar energy, with substantial investments in solar parks and wind energy infrastructure.
  - Energy Efficiency: The Perform, Achieve, and Trade (PAT) scheme and the Energy Conservation Building Code (ECBC) are examples of India's initiatives to improve energy efficiency. These policies have been instrumental in reducing energy consumption in various sectors.
- Despite these achievements, challenges remain, particularly in addressing the demand for coal-based power, which continues to be a dominant part of India's energy mix.

### V. CHALLENGES TO INDIA'S COMPLIANCE WITH INTERNATIONAL AGREEMENTS

#### 5.1. Economic Development vs. Environmental Protection

India's rapid economic development requires large amounts of energy, much of which is derived from coal and other fossil fuels. While India has made

significant investments in renewable energy, the transition to a low-carbon economy is complicated by the need to maintain economic growth and ensure energy security for a large, growing population.

#### Synergies Between Economic Development and Environmental Protection

1. Sustainable Development: The concept of sustainable development suggests that economic growth can occur without compromising the ability of future generations to meet their own needs. By investing in clean technologies, renewable energy, and efficient resource use, economies can grow while protecting the environment.

2. Green Jobs: The transition to a green economy—focused on renewable energy, energy efficiency, sustainable agriculture, and conservation—creates jobs that contribute to both economic growth and environmental protection.

#### 5.2. Financial and Technological Support

India has consistently argued that developed countries should provide financial and technological support to developing nations to meet climate change goals. While India has pledged to reduce emissions intensity and increase the share of renewable energy, the country requires substantial international support to meet these targets. The lack of sufficient financing and technology transfer has hindered India's ability to accelerate its climate efforts.

#### 5.3. The Challenge of Coal Dependency

India's heavy dependence on coal for electricity generation presents a significant barrier to meeting its emission reduction targets. The transition to renewable energy sources requires significant infrastructure investments, and the pace of change is slow due to the entrenched interests in the coal sector.

#### 5.4. Policy and Implementation Gaps

Despite the ambitious targets set under the Paris Agreement, India faces challenges in policy coordination, implementation, and monitoring. While India has implemented several climate action plans, the effectiveness of these measures is sometimes undermined by a lack of enforcement mechanisms and inconsistent policy support.

## VI. CONCLUSION

India's compliance with international environmental agreements, such as the Kyoto Protocol and the Paris Agreement, reflects a delicate balance between environmental protection and socio-economic development. While India has made significant strides in promoting renewable energy and improving energy efficiency, challenges remain in fully meeting its climate goals, particularly due to economic constraints, coal dependency, and the need for international support.

India's role in global climate governance continues to evolve, and its commitment to sustainable development will be key to achieving the global climate targets set under the Paris Agreement. The international community must provide the necessary financial and technological support to help India meet its climate goals while ensuring that its development aspirations are not compromised.

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## REFERENCES

- [1] United Nations Framework Convention on Climate Change (UNFCCC) documents and reports.
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- [3] National Action Plan on Climate Change (NAPCC) documents.
- [4] Reports from the International Energy Agency (IEA) and other relevant climate change organizations.
- [5] This research paper offers a thorough exploration of India's engagement with the Kyoto Protocol and Paris Agreement, outlining the country's commitments, progress, and challenges. It emphasizes the need for continued international collaboration to support India's climate ambitions while considering the country's developmental needs.