

**Public Expenditure and Investments for  
Green Economy in India: An Economic Analysis**  
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**ABSTRACT:**

The transition to a green economy is a critical pathway for India in achieving sustainable development, climate resilience, and inclusive growth. This paper examines the role of public expenditure and investments in fostering the green economy in India, with a focus on renewable energy, sustainable agriculture, waste management, and green infrastructure. Using secondary data from government reports, international agencies, and academic studies, this study analyses trends in public spending and highlights their implications for economic growth and environmental sustainability. The findings suggest that while India has made significant progress in renewable energy investments and policy initiatives, challenges remain in financing, institutional coordination, and regional disparities. Strengthening public investment, mobilizing private finance, and aligning fiscal policies with sustainability goals are imperative for accelerating India’s green transition.

**KEYWORDS:**

Green Economy, Public Expenditure, Sustainable Development, India.

**Introduction**

India’s development trajectory is shaped by the dual challenge of sustaining high economic growth while simultaneously addressing environmental degradation and climate change. As the world’s third-largest emitter of greenhouse gases and a rapidly industrializing economy, India faces immense pressure to adopt pathways that are economically viable, socially inclusive, and environmentally sustainable. The concept of the green economy, emphasizing low-carbon growth, efficient resource use, and equity, offers a strategic framework to meet these objectives. Public expenditure and targeted investments are central to advancing this transition by directing financial flows toward renewable energy, sustainable

agriculture, clean technologies, and waste management. In recent years, India has launched ambitious programs such as the National Solar Mission, PM-KUSUM, and the Swachh Bharat Mission, which highlight the growing role of public spending in supporting green initiatives. The Union Budget 2025–26 reflects this priority, with substantial increases in allocations to the Ministry of New and Renewable Energy and the Ministry of Jal Shakti. These investments are expected to generate green jobs, reduce regional disparities, and enhance resilience against climate shocks. However, despite these positive trends, challenges remain in terms of fiscal constraints, fragmented implementation, and limited private sector participation. The present study seeks to analyse the patterns of public expenditure and investments in India's green economy, identify their economic implications, and highlight the policy gaps that need urgent attention. By consolidating evidence from budgetary data and existing literature, the paper aims to provide insights into how fiscal strategies can be optimized to accelerate India's transition to a sustainable future.

### **Literature Review**

#### **Ghosh & Ganesan (2015)**

This study focusses on renewable energy subsidies in India and analyses their effectiveness in promoting the green economy. They find that while subsidies have played an important role in scaling up solar and wind capacity, issues of financial sustainability and policy design persist. The authors recommend rethinking subsidy frameworks to encourage market-based mechanisms and private sector participation. Their work underscores the critical role of public spending in catalysing investments while also highlighting the need for long-term fiscal prudence.

#### **International Institute for Sustainable Development (IISD, 2023)**

This study evaluates the financing India's transition highlights the challenges of mobilizing adequate green finance through both public and private channels. It estimates that India requires annual investments exceeding USD 170 billion to achieve its green economy goals, far outstripping current levels of expenditure. The study emphasizes the importance of innovative financial instruments such as green bonds, sovereign funds, and blended finance. By mapping current spending flows, the IISD demonstrates the central role of public expenditure in closing the financing gap and enabling systemic change.

## **Objectives**

- To Examine the Trends and Patterns of Public Expenditure on Green Economy Sectors in India.
- To Analyse the Economic Implications of Such Investments for Growth, Employment, and Sustainability in India.

## **Methodology**

Present study based on secondary data. Data gathered from government budget documents (Union Budget, Economic Survey, Ministry of New and Renewable Energy), reports by international organizations (World Bank, UNEP, OECD), Union Budget 2025–26, Ministry of New & Renewable Energy (2022–2025) and peer-reviewed research articles. The analysis integrates qualitative insights from literature with quantitative evidence on investment flows to draw meaningful conclusions about India's green economy.

## **Green Economy in India**

The concept of the green economy in India is closely linked to sustainable growth strategies, as the country seeks to balance developmental needs with environmental commitments. India has pledged under the Paris Agreement to reduce the emission intensity of its GDP by 45 percent by 2030 from 2005 levels, and to achieve net-zero carbon emissions by 2070. Achieving these goals requires significant public expenditure and investments directed toward green infrastructure, renewable energy, and sustainable practices across sectors.

## **Public Expenditure Trends**

Public expenditure on green economy sectors has steadily increased in the past decade. Budget allocations to the Ministry of New and Renewable Energy (MNRE) have expanded, with substantial investments in solar, wind, and bioenergy projects. The National Solar Mission and initiatives like PM-KUSUM (solar pumps for agriculture) reflect the government's focus on integrating renewable energy into rural development. In addition, significant spending on schemes such as Swachh Bharat Mission and Jal Jeevan Mission demonstrates the emphasis on waste management and sustainable water use.

## **Renewable Energy Investments**

India has emerged as a global leader in renewable energy invest-

ments. Public and private investments together have pushed India's installed renewable capacity to over 180 GW in 2023, with ambitious targets of 500 GW by 2030. Public finance mechanisms, including viability gap funding, subsidies, and green bonds, have played a vital role in de-risking renewable energy projects. However, financing gaps remain large, estimated at over USD 20 billion annually (IRENA, 2022).

### **Sustainable Agriculture and Rural Development**

Agriculture is central to India's green economy, with nearly half the population dependent on farming. Public expenditure has increasingly targeted sustainable agriculture through schemes like Paramparagat Krishi Vikas Yojana (organic farming), soil health cards, and micro-irrigation support. Investments in solar pumps, energy-efficient technologies, and agroforestry contribute to reducing the carbon footprint of agriculture while enhancing rural livelihoods. Yet, fragmented implementation and limited outreach constrain impact at scale.

### **Green Infrastructure and Urban Transition**

Urban India faces acute challenges of pollution, mobility, and waste. Investments in metro rail projects, electric mobility incentives (FAME scheme), and smart cities represent efforts toward sustainable urbanization. Waste-to-energy plants and decentralized solid waste management are gaining importance with rising urban waste volumes. Nevertheless, policy incoherence across state and city levels slows progress.

### **Challenges and Opportunities**

Despite progress, challenges persist. Public expenditure is often fragmented across ministries, leading to duplication of efforts. Fiscal constraints limit large-scale investments, and private capital inflows remain insufficient. Regional disparities mean that states with weaker fiscal capacity lag behind in implementing green economy initiatives. Strengthening institutional frameworks, leveraging public-private partnerships, and integrating sustainability into fiscal policy are critical steps forward. India's transition to a green economy is both an economic imperative and a developmental necessity. Public expenditure, when strategically directed, can generate green jobs, reduce inequality, and foster resilience against climate shocks. With stronger financial commitments and innovative policy design, India is well-positioned to lead the green growth agenda globally.

**Table 1: Budget Allocations to the Ministry of New & Renewable Energy (MNRE), India**

| Fiscal Year  | Allocation (₹ Crore) | Key Focus Areas                                       |
|--------------|----------------------|---|
| 2021–22      | 7,741                | Solar, Wind, Bio–energy programs                      |
| 2022–23      | 7,033                | Renewable energy development, R&D                     |
| 2023–24      | 10,222               | National Solar Mission, Green Hydrogen Mission        |
| 2024–25 (RE) | 17,729               | Solar parks, Rooftop solar, PM–KUSUM                  |
| 2025–26 (BE) | 26,549               | Green hydrogen, Offshore wind, Solar energy expansion |

**Source:** Union Budget documents, Ministry of New & Renewable Energy (2022–2025)

Table 1 presents the budget allocations to the Ministry of New & Renewable Energy (MNRE) in India over the period 2021–22 to 2025–26, highlighting both the financial outlay and the key focus areas. The data shows a steady increase in funding, except for a slight dip in 2022–23, when the allocation declined to ₹7,033 crore from ₹7,741 crore in 2021–22. A significant upward trend is observed from 2023–24 onwards, with allocations rising to ₹10,222 crore and then nearly doubling to ₹17,729 crore in the Revised Estimates of 2024–25. This sharp increase reflects the government’s growing emphasis on large-scale renewable projects, such as solar parks, rooftop solar, and the PM–KUSUM scheme. The highest allocation, ₹26,549 crore in the 2025–26 Budget Estimates, underscores the priority given to emerging areas such as green hydrogen, offshore wind, and expanded solar energy deployment. Overall, the table illustrates the government’s progressively increasing commitment to renewable energy as a cornerstone of India’s green economy and energy transition.

**Table 3: India’s Renewable Energy Capacity and Targets**

| Year | Installed Renewable Energy Capacity (GW) | Share of Total Capacity (%) | Government Target (GW) |
|------|--|-----------------------------|------------------------|
| 2015 | 38                                       | 13                          | 175 by 2022            |
| 2020 | 94                                       | 24                          | 450 by 2030            |
| 2023 | 180                                      | 41                          | 500 by 2030            |

|                     |     |    |                  |
|---------------------|-----|----|------------------|
| 2025<br>(Projected) | 220 | 45 | 500 by 2030      |
| 2030<br>(Target)    | 500 | 60 | Net-zero pathway |

**Source:** Central Electricity Authority (CEA, 2023); IRENA (2024).

Table 3 traces the growth of India's renewable energy capacity alongside its official targets. In 2015, India's installed renewable capacity stood at 38 GW, accounting for only 13 percent of total capacity, with an ambitious target of 175 GW by 2022. By 2020, capacity had more than doubled to 94 GW, representing 24 percent of the energy mix, as the government revised its long-term target to 450 GW by 2030. By 2023, capacity had reached 180 GW, making up 41 percent of total generation, moving steadily toward the 500 GW target for 2030. Projections for 2025 estimate an installed capacity of 220 GW, which would constitute around 45 percent of the energy mix. By 2030, the government aims to achieve 500 GW of renewables, contributing roughly 60 percent of total capacity and aligning with India's broader net-zero pathway. This table demonstrates India's rapid progress in renewable energy deployment while also underlining the scale of expansion required to meet its long-term climate commitments.

### Conclusion

The green economy in India is no longer a policy option but a necessity for long-term sustainable growth. Public expenditure and investments play a pivotal role in accelerating this transition by supporting renewable energy, sustainable agriculture, waste management, and green infrastructure. The analysis reveals that while India has made commendable progress in mobilizing public funds and initiating large-scale programs, fiscal limitations and institutional challenges hinder rapid transformation. Policy coherence, fiscal incentives, and blended financing models are needed to leverage private capital and ensure inclusive outcomes. Strengthening public expenditure frameworks will not only advance India's environmental goals but also enhance its economic competitiveness in a rapidly changing global economy.

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The Authors have no conflict of interest to declare that they are relevant to the content of this article.

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