

Green Finance in India: Policies, Instruments and Prospects for Sustainable Development

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ABSTRACT

Green finance has emerged as a critical tool for mobilising capital towards climate-friendly and sustainable development goals in India. As the country pursues ambitious targets for renewable energy, net-zero emissions, and sustainable infrastructure, understanding the institutional frameworks, financial instruments, challenges, and opportunities surrounding green finance is essential. This article provides a comprehensive review of the evolution and current landscape of green finance in India, examines key mechanisms such as green bonds and climate finance, and discusses policy initiatives, barriers to growth, and future pathways for sustainable finance.

Keywords: Green Finance, Sustainable energy, green power, Indian scenario on green finance

INTRODUCTION

Green finance broadly refers to financial activities and instruments that support investments with positive environmental outcomes, including renewable energy, energy-efficiency programmes, clean transportation, and climate adaptation projects (Pradhan & Krishna, 2025; Devi, 2023; Jain & Ranjan, 2025). As one of the world's largest and fastest-growing economies, India faces mounting pressure to balance economic growth with climate mitigation and sustainable development (Rani & Seema, 2025). Achieving this balance requires mobilising vast financial resources — estimated in the trillions of dollars, from both domestic and international sources ----- * Professor, Department of Commerce, Sikkim University, adutta@cus.ac.in

Survey of Literature

Green finance has been much talked about. Green finance in India is little researched. Devi, S. (2023) showed in their study how the green finance can be used for a sustainable pathway for the next generation. With a wide range of definition on green finance studies as indicated earlier shows how renewable energy and energy efficient program can contribute to green finance (Pradhan & Krishna, 2025; Devi, 2023; Jain & Ranjan, 2025). Rani & Seema 2025 shows that India if it requires a balance growth require to engage in green ways and sustainable finance. However, Devi (2023) also show that green finance may be cost heavy on the nation.

Evolution of Green Finance in India

Green finance in India has evolved over the past decade through the introduction of dedicated financial instruments, institutional frameworks, and regulatory guidelines. Key milestones include:

Green Bonds: India has developed an active green bond market, with both corporate and municipal issuers participating. For example, Vadodara Municipal Corporation issued Asia's first certified green municipal bond, signalling public-sector engagement in climate finance (Reuters, 2024). Additionally, municipal green bonds such as the one issued by Surat Municipal Corporation were oversubscribed, indicating strong investor appetite (Times of India, 2025).

Climate Finance Partnerships: Collaborative lines of credit, such as the agreement between State Bank of India and Agence Française de Développement (AFD), provide multilateral support for climate mitigation projects (Times of India, 2025).

Policy Frameworks: India's Nationally Determined Contribution under the Paris Agreement and the net-zero by 2070 commitment reinforce the need for green finance mechanisms that align capital flows with sustainability goals (Drishti IAS, 2025).

Key Financial Instruments and Mechanisms

Green Bonds

Green bonds represent a market-based instrument designed to fund environmentally beneficial projects, such as renewable energy, waste management, and sustainable infrastructure (Pradhan & Krishna, 2025). These bonds often receive certification from recognised bodies, such as the Climate Bonds Initiative, enhancing investor confidence.

Green Loans and Credit Facilities

Financial institutions are increasingly offering green loans and credit guarantees that target climate-aligned sectors. Such instruments help reduce risk perceptions associated with long-term sustainable investments and bridge the financing gap for large infrastructure projects (Pradhan & Krishna, 2025; Rani & Seema, 2025).

Climate Finance Channels

Climate finance from international financial institutions and development agencies supports capacity building, technological advancement, and project structuring for climate mitigation in India. Examples include international credit lines aimed at enhancing renewable energy and resilience projects (Times of India, 2025).

Challenges in the Green Finance Ecosystem

Despite positive developments, several barriers hinder the expansion of green finance in India:

Regulatory Complexity: Lack of harmonised green taxonomy and inconsistent policies across states complicate investor assessment and project financing (Pradhan & Krishna, 2025; Jain & Ranjan, 2025).

Information Gaps: Limited availability of transparent data on environmental impact and risk inhibits broader participation from private investors and institutional funds (Rani & Seema, 2025).

Market Development Issues: The Indian bond market and green finance product ecosystem remain underdeveloped compared to global markets, which limits diversification of green financial instruments (Journal of Cleaner Production, 2025).

High Transaction Costs: Sustainable infrastructure projects often involve high upfront costs, deterring investors seeking near-term returns (Jain & Ranjan, 2025).

Policy Initiatives and Institutional Support

Government and regulatory agencies have promoted several policy initiatives to enhance green finance:

Regulatory Guidelines: Securities and Exchange Board of India (SEBI) has issued guidelines for green debt securities, facilitating standardisation and investor protection.

Public-Private Partnerships (PPPs): Encouraging partnerships between public entities and private capital can unlock new investment avenues for sustainable infrastructure.

Education and Capacity Building: Institutions and policy schools are training professionals in sustainable finance and ESG investing, strengthening human capital and expertise (Turn0search14).

Future Prospects and Green finance in India is at an inflection point, poised to play a central role in funding the nation’s sustainability agenda. Technological innovation, international climate funding, and evolving policy frameworks present opportunities to scale investments in renewable energy, clean infrastructure, and climate adaptation (Jain & Ranjan, 2025; Rani & Seema, 2025; Pradhan & Krishna, 2025). To achieve these goals, policymakers, financial institutions, and investors must collaborate to address current barriers and enhance the resilience and depth of the green finance ecosystem.

Green finance therefore not only helps India achieve its climate commitments but also contributes to broader sustainable development outcomes, including job creation, economic diversification, and environmental conservation.

Green Finance scenario in India

India had been progressively moving toward greener energy and funding them through an equitable manner. India had been able to increase its flow of Green Finance flows from 16 bn to 55 bn USD which is almost 3.5 times in about eight years as indicated in table 1.

Table 1 Green Finance Flows in India (Indian Rupees and in USD equivalent)

Year	Total Green Finance (in Billion INR)	USD equivalent
2016	1200	16 Bn
2018	1800	25 Bn
2020	2600	35 Bn
2021	3400	45 Bn
2022	3712	50 Bn
2023	3900+	52 B
2024	4100	55 Bn

Source: India Water Portal

Th growth of sustainable debt of Inda is about 186 percent which is higher than most of the European countries. With a remarkable 477 bn INR of which is mostly used in clear energy such as solar power and reduction in carbon footprint, India is trying to reach a zero carbon by 2070.

Table2 Sustainable Debt Market in India

Indicator	Value
Total GSS + Debt Insurance (2024)	\$55.9 Bn
Growth Since 2021	186%
Share of Green Bonds	83%
Sovereign Green Bonds Issued	477 Bn INR
Major Use of Funds	Clear energy and low carbon public transportation

Source: Climate Bonds.net

It is interesting to observe the sectorial distribution of Green Finance in India. With about 60 percent in renewable energy and another 12 percent in energy efficiency the goal and commitment of India is clearly visible. India is trying to reach a sustainable and low carbon emitting agriculture in due course by focusing on traditional grains like that of millet which are more carbon sink in nature.

Table 3 Sectorial Distribution of Green Finance in India

Sector	Share of Total Green Finance (Percentage)
Renewable energy	60 to 65
Energy Efficiency	10 to 12
Clean Transport	8 to 10
Water and waste management	5 to 7
Climate Adaption	5 to 6
Sustainable Agriculture	2 to 3

Source: India Water Portal

Domestic public finance acts as the major source of Green Finance in India. The private finance, too has a large share but in a way slightly distributed. The country has international funding to the extent of 20 percent of its total Green Finance coming from international financial sources.

Table 4 Source of Green Finance in India

Source of Finance	Share (percent)
Domestic Public Finance	40
Domestic Private Finance	40 to 45
International Finance	15 to 20

Source: Bhatnagar, Sharma Et al (2025), Green Finance and Investment in India: Unveiling enablers and barriers for a sustainable future, Journal of Cleaner Production, Vol 493, 144908

Some of the major Green Bond in India are L&T Infra Finance, Tata Cleantech Capital besides the Government of India. Public sector Banks are also in the way of issuance of green bond which is lead by Bank of Baroda.

Table 5 Green Bond Issuance in India (Some cases)

Issuer	Year	Amount in INR
L&T Infrastructure Finance	2017	667 cr
Tata Cleantech Capital	2018	180 cr
Government of India (Sovereign Green Bonds)	2023	16000 cr
Bank of Baroda	2026	10,000 cr

Source: SEBI

Despite a good progress the annual funding gap for Green Finance is about 170 Bn USD. The large part of this is taken up by the annual climate finance as an international commitment of India.

Table 6 India's Green Finance Requirement (Future Needs)

Indicator	Estimate
Annual Climate Finance Needed	200 Billin USD
Renewable Energy Target	500 GW by 2030
Net Zero Target	2070
Annual Funding Gap	170 billion USD

Source: Shalini Aggarwal, Farhat Aziz Lone and Manisha Paliwal (2025), Green bonds: A demographic study of retail investors in India, *The quarterly review of economics and Finance*, vol 102

CONCLUSION

Green finance has emerged as a critical tool for mobilising capital towards climate-friendly and sustainable development goals in India. As the country pursues ambitious targets for renewable energy, net-zero emissions, and sustainable infrastructure, understanding the institutional frameworks, financial instruments, challenges, and opportunities surrounding green finance is essential. This article provides a comprehensive review of the evolution and current landscape of green finance in India, examines key mechanisms such as green bonds and climate finance, and discusses policy initiatives, barriers to growth, and future pathways for sustainable finance. India is steadily working towards a clean energy environment and greener future. It is also trying to be zero carbon footprint status by 2070.

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