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Dr. Shalini Devi
 Associate Professor,
 Department of Commerce,
 Keshav Mahavidyalaya,
 University of Delhi,
 New Delhi, India

Green finance: A way towards sustainable India

Dr. Shalini Devi

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Abstract

Green finance has evolved as a vital instrument in the pursuit of sustainable development and aligning financial systems with environmental objectives. In this current era, when humans are facing challenges due to pollution and other environmental issues, environmentalists and educators recognised the importance of green finance that includes financial practices that promote environmental protection and thus ensures sustainable development. Researchers worldwide are continuously exploring innovative approaches to achieve sustainability. One such approach is green finance. This article is an attempt to offer insights into the progress made, challenges faced, and future directions for green finance in context of Indian economy. It also examines different dimensions of green finance including green banking, green bonds, and green insurance. This study is descriptive in nature. The study concludes that India has achieved considerable progress in green finance to drive sustainable economic growth and address climate change challenges. The development of green bonds increased renewable energy financing, sustainable infrastructure investments, policy support, and international collaborations. Green finance sector in India is in growing phase and it has a long way to go to become a self-sufficient and resilient green economy. It is crucial for our government to have a transparent and encouraging policy framework to realise full potential of green finance as a tool to achieve sustainability.

JEL classification: F64, F65, G21

Keywords: Climate change, green finance, green banking, green bonds, green insurance, sustainable development

Introduction

In recent decades, the world has perceived a growing recognition of the pressing need for sustainable development and environmental preservation. As the consequences of climate change become increasingly evident, governments, businesses, and individuals are acknowledging the critical role they must play in moving towards a low-carbon and resource-efficient economy. This paradigm shift has given rise to an innovative and transformative field known as green finance. Green finance may be defined as the process of obtaining and utilizing financial resources for endeavors that safeguard the environment while also providing equitable returns to investors. (Berensmann and Lindenberg, 2019; Ozili, 2021a) ^[3, 22]. The idea behind green finance is to enhance the magnitude of finance resources to economic entities involved in activities and initiatives that promote environment protection, with the aim of advancing the sustainable development goals i.e. SDGs. (Lee and Baral, 2017; Force, 2015) ^[16, 13]. Green finance aims to establish a harmonious linkage between the environment and the economy. Sustainable finance encompasses the allocation of funds towards projects that have social, economic, and environmental significance, including "green finance," "climate finance," and "low-carbon finance." The achievement of "low carbon-green growth" heavily relies on green finance. It serves as a crucial link between economic development, environmental enhancement, and the financial sector. The financing of environmentally significant projects has always presented challenges for the Indian economy, particularly in meeting the financial requirements for achieving a production capacity of 175 GW of renewable energy by the end of 2022. In India, obstacles such as high capital costs, insufficient debt financing, and short-term loan maturity, have consistently impeded the financing of renewable energy projects. Although there does not exist any particular definition of green finance, it includes all financial support given to the projects having primary objective of attaining sustainability, such as efficient energy management, creating eco-friendly buildings, waste management, biodiversity preservation,

Corresponding Author:
Dr. Shalini Devi
 Associate Professor,
 Department of Commerce,
 Keshav Mahavidyalaya,
 University of Delhi,
 New Delhi, India

renewable energy projects, and similar endeavors, can be classified as green financing. Green finance, sometimes also termed as sustainable finance or climate finance, represents the intersection between financial systems and environmental objectives. It encompasses a broad array of financial products, services, and investment opportunities that support projects directed towards mitigating climate change, protecting natural resources, and fostering environmentally friendly practices. From renewable energy projects and green infrastructure to sustainable agriculture and eco-friendly technologies, green finance feeds the necessary capital and financial procedures to drive the movement towards a more sustainable future.

The concept of green finance goes beyond simply allocating funds to environmentally conscious projects. It encompasses a broader perspective that considers investment decisions related to the environmental, social, and governance (ESG) factors. By merging ESG issues into financial analysis and decision-making process, green finance mitigates environmental risks besides promoting social responsibility and long-term economic stability. This integrated approach seeks to align financial activities with sustainable development goals, ensuring that economic growth and environmental protection go side by side. The entire world has acknowledged the significance of green finance in tackling the pressing issues of climate change and environment degradation. The increasing awareness of environment issues like global warming, ozone layer weakening, pollution, and competition for limited non-renewable energy sources has resulted in increasing emphasis on environmental protection and the preservation of natural resources among all stakeholders. However, the public sector's investments alone are insufficient to meet the demands of these projects. Encouraging private sector initiatives and cross-border investments is crucial to address the rising requirements. Additionally, it is essential to establish a regulatory framework and implement appropriate policies to tackle fundraising challenges and ensure the effective utilization of funds. The importance of green finance in India cannot be overstated as the country faces significant environmental challenges and strives for sustainable development. The key reasons highlighting the significance of green finance for India are:

Climate Change: India is highly susceptible to the dangerous effects of climate change, including increase in temperature, erratic monsoons, rising sea levels etc. Green finance occupies a very significant role in financing of renewable energy projects which helps to mitigate climate change adverse effects.

Sustainable Infrastructure Growth: India's rapid urbanization and infrastructure needs present an opportunity to build sustainable and resilient infrastructure. Green finance supports the financing of sustainable infrastructure projects, including green buildings, efficient public transportation systems, and waste management facilities.

Environmental Conservation and Biodiversity: India is renowned for its rich biodiversity and natural ecosystems, which face significant threats from deforestation, habitat loss, and pollution. Green finance enables investments in projects that focus on environmental conservation, restoration of ecosystems, and protection of biodiversity.

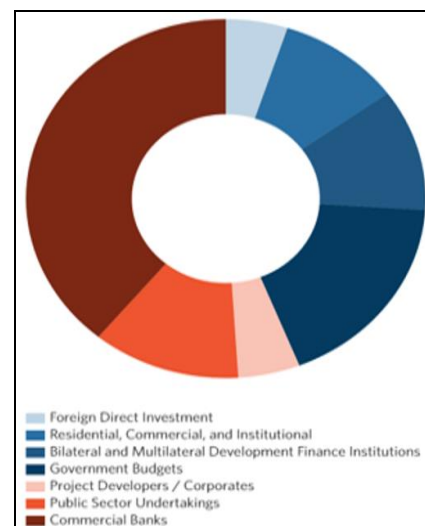
Clean Air and Water: India faces severe air and water pollution challenges, impacting public health and ecological systems. Green finance supports investments in clean technologies, wastewater treatment plants, and pollution control measures.

Economic Growth and Job Creation: Green finance offers opportunities for economic growth and job creation in India. Investments in sustainable infrastructure projects, renewable energy, and energy efficiency generate employment across various sectors, including manufacturing, construction, and services.

Access to Finance for Green Projects: Green finance provides access to capital for projects that may face challenges in obtaining conventional financing due to their long payback periods or perceived risks. By offering dedicated green finance stuff, like green bonds and green loans, green finance channels funds towards environmentally beneficial projects.

Green Finance in India: India, being a rapidly growing economy, has acknowledged the importance of green finance in attaining its SDGs. In recent years, our country has witnessed several noteworthy developments and initiatives aimed at promoting and integrating green finance into its financial system.

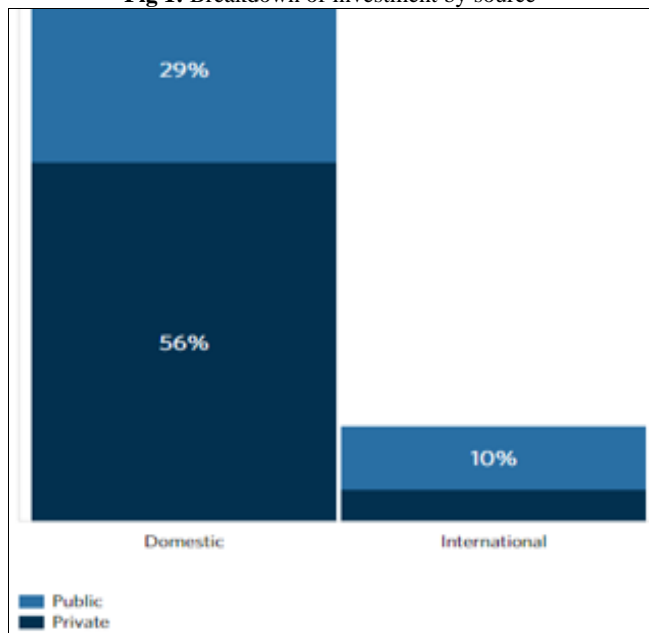
In Sep 2019, India declared its ambitious goal to achieve 450 GW of renewable energy production capability by the end of year 2030, positioning it as one of the most striving targets globally. The Nationally Determined Contribution (NDC) of India outlines an estimated financial requirement of approximately INR 162.5 lakh crores during 2015 to 2030, averaging around INR 11 lakh crores annually for climate-related actions. Despite the rapid growth of India's energy sector and significant investments, meeting these climate objectives necessitates substantial, investment at the sectoral level. The robust financial push and timely policy intrusions by the government have been pivotal in fostering the growth of the nation's renewable energy. However, given the existing rates of sector penetration, overall sector health, and the slowdown induced by the COVID-19 pandemic, the government must explore new and alternative financing mechanisms. This exploration is crucial to incentivize private sector involvement and enhance investment for a sustainable and transformative impact.



Source: Landscape of green finance in

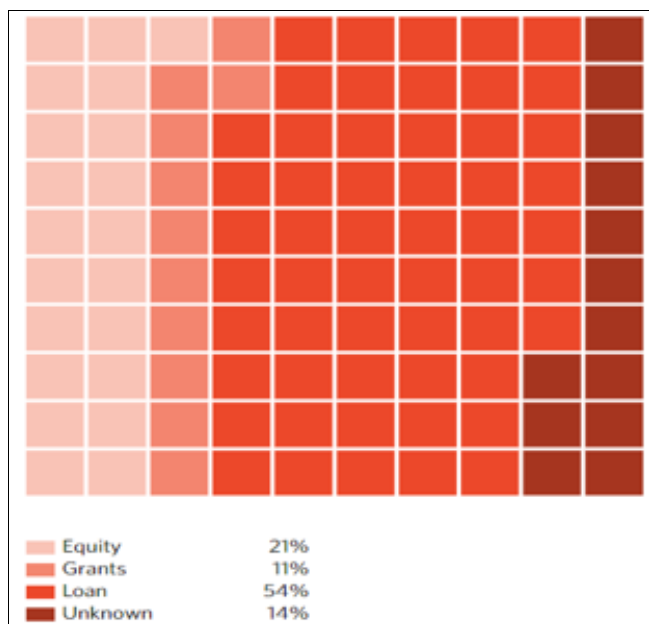
India 2022- climate policy initiative (CPI)

Fig 1: Breakdown of investment by source



Source: Landscape of green finance in India 2022- climate initiative (CPI)

Fig 2: Breakdown of source of finance by origin and channel of delivery



Source: Landscape of green finance in India 2022- climate policy initiative (CPI)

Fig 3: Breakdown by instruments

While both public and private entities contributed financing through various instruments, straightforward debt emerged as the predominant means. Among all the tracked finances, the primary instrument employed to transfer funds from state budgets was in the shape of grants-in-aid and budgetary allocations, constituting 90%. These funds were directed toward direct mitigation activities like ordering, installation, construction, and maintenance of facilities, besides indirect activities like research and development, along with administrative expenditures.

Objectives of the Study

This present study aims to:

- Analyse how green finance helps in realising the sustainable development goals.
- Identify different kinds of available green finance products.
- Examine the advantages, and challenges of green finance for India.

This paper tries to enrich the present literature on green finance. Very few studies have been conducted in this area particularly for the developing nations.

Review of Literature

The literature analysis is a crucial component of research work as it enables the understanding of previous studies conducted on the topic. It provides a foundation for formulating and analyzing the research problem, and offers insights into the scope, limitations, and gaps in past research. Several studies have explored various aspects of green finance. Chami *et al.* (2002) ^[4], asserts that green finance not only assists in enhancing the reliability of finance institutions but also aids in risk management. Keerthi B.S. (2013) ^[15] analyzed latest developments in green finance alongwith challenges, and opportunities for Indian economy. Tasnim Uddin Chowdhury *et al.* (2013) ^[8] explored the importance of green finance in achieving sustainability while focussing on financing agriculture, green building, renewable energy projects, and green banking. The study emphasized the need to enhance investment in renewable energy and environment-friendly projects. Azad and Lehari (2014) ^[1] examined the concept of sustainable economic, environmental, and social development. They specifically focused on the significance of "Green Products" in resource management. The authors identified the reasons that impede the adoption of green products. They ultimately concluded that ongoing innovations are necessary to develop products that consume natural resources in a more sustainable manner and produce eco-friendly goods that are recyclable and compostable. The global community is confronted with a significant environmental degradation challenge as economic development progresses. The banking sector, being accountable stakeholders, can contribute to the environment by implementing various green banking practices. Deka (2015) ^[9] emphasized on the green banking efforts undertaken by the State Bank of India (SBI) in Assam and examined the environmental and other advantages associated with these practices. Dipika (2015) ^[12] examined the increasing importance given by businesses and stakeholders for environment protection and sustainable development of the nation. The study observed that green banking contributes to economic growth while protecting the environment. Therefore, green lending should be prioritized as a main step towards attainment of sustainable development. Parvadavardini Soundarajan *et al.* (2016) ^[29] highlighted that green finance is a crucial element that links the finance industry, environment recovery, and economic growth for any nation. They summarized that sustainable finance, focusing on three P's namely, planet, people, and profit, is the future, with Indian banks playing a pivotal role as change agents. Berensmann and Lindenberg (2016) ^[2] explained the role of major actors such as international finance institutions, institutional investors, and banks in the growth journey of green finance. They resolved that the

attainment of ambitious climate and sustainability goals depends on the determination of these actors to propel the progress of green finance sector. Sharif Mohd *et al.* (2018)^[19] discussed the responsibility of green finance in achieving a balance between the environment and the economy. They explored available green finance instruments and the sustainability measures taken up in India, highlighting the country's potential to develop infrastructure for promoting green finance. S. Jayathilake (2019)^[14] conducted an in-depth examination of green finance concept and its relevance in banking industry. The study revealed that green finance aligns directly with SDGs. The findings of his work contributed to the advancement of the banking sector and helps to achieve the broader goal of sustainable development. Jeffrey D. Sachs *et al.* (2019)^[26] examined the declining trend in investments made in renewable energy, emphasizing the need to accelerate green financing to achieve SDGs. Another important green product is green bonds. These are the debt securities in which the issuer promises to utilize the proceeds for funding climate-related projects, energy-efficient products, and other environmentally focused actions (SEBI, 2020)^[30]. Banks, private companies, and financial institutions have also entered in the green bonds market attracting investors who prioritize socially responsible projects and promoting sustainable investment practices (Scholtens & Kang, 2021)^[27]. Since 2015, with introduction of the UN 2030 agenda, member countries have prioritized the accomplishment of the SDGs, requiring substantial financial resources for successful implementation (Pizzi *et al.*, 2021)^[24]. Green finance acts as a bridge between the financial services and environment friendly projects (Ngo *et al.*, 2021)^[21]. Green financing is seen as a tool to achieve comprehensive green growth by mitigating and adapting to the harmful impacts of environment changes (Prajapati *et al.*, 2021)^[25]. Chhaochharia, M. (2021)^[7]. Examines the advancements in green finance within India and globally. Multiple data sources are utilized to evaluate the level of general understanding and available financing alternatives for green projects. The observations indicate that enhancing information management systems and fostering improved harmonisation among stakeholders can contribute to a path of sustainable long-term economic growth, reducing information asymmetry and promoting a greener future. All these studies collectively highlight the role of green finance in attaining sustainability and economic development goals. Ozili (2022)^[23] reviewed the current literature on green finance. He made cross country observations and found that green finance is able to protect the environment and to ease the climate change, but it faces hindrances including low awareness about green finance, erratic policies, and lack of lucrative incentives to the financial institutions and investors. Financial products with a focus on sustainability have been developed to support various activities such as venture investment, risk assessment, and projects with the aim to preserve the environment, promote energy conservation, and foster sustainable growth of a country (Ding *et al.*, 2022)^[11]. The emergence of green debt products has been observed in global financial markets, particularly in financing renewable energy projects (Narayan *et al.*, 2022; Charfeddine & Kahia, 2019)^[20, 5]. Having a strong green financial system helps in directing social capital towards investments in green proposals and accelerating the modulation to a green economy within the

industry (Chen *et al.*, 2022; Mehta *et al.*, 2020; Shahbaz *et al.*, 2013)^[6, 17, 28]. Many businesses are now placing strong emphasis on sustainability and implementation of environment friendly practices that promote a greener and more sustainable future (Desalegn & Tangl, 2022)^[10]. Mohanty *et al.* (2023)^[18] utilizes a fundamental bibliometric approach to examine the status and advancements in research in green finance. Additionally, the paper sheds light on current issues within the field.

Research Method

This study is a descriptive study. The information and evidence is gathered from various secondary sources including research articles, journals, reports, and websites.

Green Finance - An Instrument to Sustainability

Green finance plays a vital role in fostering a harmonious association between the environment, finance, and development. By providing funding to projects aimed at achieving sustainable development, it contributes to the protection of natural resources and encourages the utilization of renewable energy sources. This approach facilitates reducing the adverse effect of human actions on the environment. Consequently, green financing serves as an efficient measure in realizing sustainable development goals. The green finance services include:

Green Banking

Green banking focuses on promoting environmentally friendly practices through banking activities. It encompasses technical advancements, changing expectations of the stakeholders, and operational innovations. In India, several banks offer green banking services, including State Bank of India, Punjab National Bank, IDBI, ICICI Bank Ltd, Kotak Mahindra Bank, and others. Various green banking practices include:

Online Banking: Providing banking services through the internet, promoting paperless and cashless transactions.

Green Mortgage: Offering mortgages for purchasing green buildings or renovating existing buildings to make them environmentally friendly.

Green Home Equity Loan: Providing loans to set up energy-efficient equipment in homes.

Home Office Conversion Loans: Loans for creating a workspace at home and facilitating remote work.

Green Car Loan: Offering loans at lower interest rates for purchasing vehicles with low to zero emissions.

Green Credit Cards: Deducting a certain percentage of the payment made with the credit card and directing it towards environment friendly assignments.

Energy-Efficient Loans: Providing loans to implement energy-efficient practices.

These practices in green banking encourage sustainable and eco-friendly choices, contributing to the protection of the environment while meeting the financial needs of individuals and businesses.

Green Insurance

The insurance industry, as part of the green financing, plays a significant role in achieving sustainability goals. While it may not directly contribute to environmental degradation or regulatory frameworks, it serves as a crucial component of green financing by providing risk management information and reducing risks through various strategies and underwriting practices. Different types of green insurance include:

Green car insurance: Premium rates are determined based on the mileage of the vehicle, encouraging reduced usage of private vehicles and contributing towards environment protection.

Green business insurance: Incentives are provided to business owners for renewing or reconstructing damaged buildings with environmentally friendly materials.

Eco-friendly home insurance: Provides support for renewable energy systems and offers maintenance coverage for eco-friendly homes.

Green travel insurance: Compensates for carbon dioxide emissions during travel by donating a portion of the premium to projects aimed at reducing carbon emissions.

Green life insurance: Donates a portion of the premium towards eco-friendly assignments.

Carbon insurance: Extends coverage for weather-related risks to plantation forests.

Green Bonds

Green bonds are the financial tools that allow issuers to raise capital specifically for environmentally friendly projects and initiatives. The collection from these bonds are dedicated to funding the investment proposals that aim at promoting sustainability, such as reforestation efforts, energy-efficient products, climate-linked projects, and other environmentally beneficial projects.

A balanced approach is crucial in the distribution of funds raised through green bonds. Issuers need to carefully consider the appropriate allocation of capital to eco-friendly projects while taking into account the associated risks and potential returns. This ensures that the funds are utilized effectively and contribute to the intended environmental objectives. Green bonds offer several advantages to issuers and investors. For the issuing company or financial institution, issuing green bonds can enhance their reputation and goodwill among stakeholders. It allows them to demonstrate their commitment to sustainable practices and attract investors who are specifically interested in supporting green investment projects. This helps in accessing a dedicated investor base focused on environmentally responsible investments.

At the same time, green bonds fulfil the investment preferences of individuals and institutions seeking socially responsible investment opportunities. These investors prioritize projects that align with their values and integrate environmental considerations into their investment decisions. By investing in green bonds, they can satisfy their desire to support projects that promote environmental protection and contribute to social responsibility. Green bonds play a vital role in mobilizing funds for environmentally friendly projects, attracting socially

responsible investors, and aligning investment with environmental goals. They provide an avenue for issuers to access capital for green initiatives and enable investors to contribute to sustainable development while satisfying their investment objectives.

Discussion

India has made substantial progress in green bonds, which are committed to financing of environment friendly investment proposals. In 2021, SEBI introduced an inclusive framework for green bonds, providing guidelines for investors and issuers. This initiative has fostered greater transparency, credibility, and standardization in the market for green bonds.

Financial institutions, along with banks and non-banking financial companies (NBFCs), have increased their focus on lending to renewable energy projects. The Green Growth Equity Fund (GGEF) was established to provide long-term equity investments for green infrastructure projects, including renewable energy, clean transportation, and waste management. Moreover, the National Investment and Infrastructure Fund (NIIF) has launched the NIIF Green Growth Equity Fund (GGF) in collaboration with the Government of India and international investors to support sustainable infrastructure development.

The Indian government has introduced various policy and regulatory measures to encourage green finance. The RBI has issued guidelines directing banks to include ESG considerations in their lending decisions. The SEBI has mandated the disclosure of ESG-related information by listed companies. The Ministry has executed various financial incentives and subsidies to promote renewable energy investments.

India has actively engaged in international collaborations and partnerships to promote green finance. The country is a founding member of the International Solar Alliance (ISA), a global coalition of countries dedicated to promoting solar energy deployment. India has also partnered with international associations like World Bank and the Asian Development Bank (ADB), to mobilize green funds and support green projects.

The government of India took its first move in the direction of addressing climate issues by signing the ISA with France on 1st Dec 2015. The objective of this alliance was to promote global efforts in combatting climate change. In April 2015, the RBI designated green finance and renewable energy sector as "priority sector." This move was intended to boost the competitiveness of the economy and increase employment opportunities. Another significant development in India's green banking sector was the transformation of the Indian Renewable Energy Development Agency (IREDA) into a green bank in 2016. A green bank may be understood as an institution that finances environment friendly projects and endeavors to lower carbon releases through various banking services.

Indeed, green finance offers benefits to both the environment and the economy. While India has made commendable progress in promoting green finance, several challenges still need to be addressed to ensure its widespread adoption and effectiveness.

Benefits of Green Finance

Efficient energy management: Green finance provides incentives for the installation and utilization of renewable

energy resources. It also offers funding for projects that aim to reduce energy wastage. By promoting efficient energy management, green finance helps in optimizing resource utilization and minimizing energy waste.

Environmental protection: One of the primary objectives of green financing is to fund projects focused on sustainable development and environmental protection. By supporting initiatives that reduce pollution, address climate change, mitigate ozone layer depletion, and preserve biodiversity, green finance helps in well-being and survival of living organisms and ecosystems.

Enhanced reputation: With an increasing number of stakeholders prioritizing investments that benefit society and the environment, companies engaged in green financing can build and enhance their reputation. By showing their responsibility towards environment sustainability, organizations can bring together socially responsible investors and gain recognition.

Attracting foreign direct investment (FDI): Global concerns about environmental protection are growing. By offering green investment products and demonstrating a commitment to sustainability, countries can attract FDI from investors who prioritize projects with positive social and environmental outcomes.

Overall, green finance aligns economic activities with environmental goals, ensuring a balance between financial considerations and ecological sustainability. It offers numerous benefits by promoting efficient energy management, protecting the environment, enhancing corporate reputation, and attracting foreign investment.

Challenges Faced by Green Finance

The green finance sector in India is in its growing phase and is loaded with different challenges. The key challenges faced by green finance sector in the Indian economy are:

Limited Awareness and Capacity Building

The primary challenge is the limited awareness and clarity on the concept and aspects of green finance among various stakeholders. There should be targeted awareness campaigns and capacity-building initiatives to educate stakeholders about the benefits and opportunities linked with green finance.

Lack of Standardization and Metrics

A lack of standardized definitions, metrics, and reporting frameworks for assessing the environmental impact of projects and financial products hinders comparability and transparency, making it difficult for investors to evaluate the sustainability performance of their investments.

Financing Costs and Risk Perception

The perceived higher financing costs and perceived risks associated with green investments can act as deterrents for investors.

Limited Access to Long-Term Capital

Green projects often require long-term capital investments. However, accessing long-term financing remains a challenge in India. Financial institutions, particularly banks, may face constraints in providing long-term funding due to

asset-liability mismatches and shorter loan tenures.

Regulatory and Policy Frameworks

While India has taken notable steps in formulating policies and regulations to promote green finance, there is a need for further refinement and strengthening of the regulatory framework. The regulatory environment should provide clear guidelines, incentives, and supportive mechanisms to encourage green investments.

Conclusion and Recommendations

Looking at the growing population of the country and the increase in demand for energy besides ever-increasing pollution and other environment concerns, green financing is becoming need of the hour for developing nations like India. Green finance is of paramount importance in India to address environmental challenges, mitigate climate change, and achieve sustainable development. It enables the financing of renewable energy, sustainable infrastructure, environmental conservation, and clean technologies. By integrating environmental considerations into financial systems and investment decisions, green finance contributes to India's efforts in creating a sustainable and resilient future, supporting economic growth, and improving the life quality of its citizens. Creating awareness about the need for protecting nature and increase in demand for financing the green projects has resulted in numerous opportunities in the domain of green finance. However, it is a long way to go. The green finance sector in India is in growing phase and a lot of efforts are required to be made to realise its main goal of sustainability. Few important recommendations in this area include raising public awareness about the importance of environment protection and different types of green investment products, establishing effective regulatory frameworks to confirm that the raised funds for every project are utilised solely for their defined purposes, supporting research initiatives to develop efficient green projects and innovative green investment products.

India has made significant strides in green finance, recognizing its potential to drive sustainable economic growth and address climate change challenges. The development of green bonds increased renewable energy financing, sustainable infrastructure investments, policy support, and international collaborations all demonstrate India's commitment to advancing green finance. As the country continues to prioritize sustainability and environmental stewardship, it is expected that further innovative measures and partnerships will emerge, strengthening the role of green finance in India's sustainable growth journey. It is crucial for the Indian government to adopt a long-term perspective on green financing and develop a strategic approach. To attract the necessary funding from domestic and international investors, a transparent and supportive policy framework is required. Although the green financial market in India has not experienced major scandals or revelations, it has yet to fully realize its potential. India has a significant journey ahead to become a self-sufficient and resilient green economy. Achieving a sustainable and green future in the coming years requires a balanced and robust mix of investors, issuers, and green investment projects.

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