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Green finance in India towards sustainable economic growth: An analytical study

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Abstract
The study examines the pivotal role of green finance in India's quest to address its pollution and climate change crisis and forge a sustainable path forward. Navigating through the intricate landscape of renewable energy, green investments, and green bonds the study illuminates the potential for green finance to drive pollution mitigation, job creation, and sustainable economic growth. Charting a course for a Sustainable India, this study underscores the transformative power of green finance in redefining the nation's development trajectory.

Keywords: Green finance, sustainable economic growth, environment, climate change, green investments

Introduction

Green finance is a loan or investment that promotes environmentally positive activities, such as the purchase of ecologically friendly goods and services or the construction of green infrastructure. As the hazards connected to ecologically destructive products and services rise, green finance is becoming a mainstream phenomenon. In short, green finance is any financial product or service that is used to support environmentally sustainable and climate-friendly projects and activities. The green finance market in India is still in its early stages of development, but it is growing rapidly. In 2021, India's green bond issuance reached USD 5.4 billion, up from USD 2.4 billion in the previous year. And in 2022, India issued its first sovereign green bond, raising USD 980 million.

Concepts of Green Finance

Green finance can be delivered through a variety of instruments, including:

- **Green bonds:** Bonds that are used to finance green projects. Green bonds are typically issued by governments and corporations, and they are often certified by a third-party organization to ensure that they meet certain environmental standards.
- **Green loans:** Loans that are used to finance green projects. Green loans can be provided by banks, other financial institutions, and even individuals.
- **Green equity:** Equity investments in green businesses and projects. Green equity can be provided by venture capital firms, private equity firms, and other investors.
- **Green insurance:** Insurance products that protect against climate risks and other environmental risks. Green insurance can be provided by insurance companies and other financial institutions. Green finance instruments can be used to finance both new and existing green projects. For example, a green bond could be used to finance the construction of a new solar power plant, or it could be used to refinance an existing solar power plant.
- **Green jobs:** Green jobs are decent jobs that contribute to preserving or restoring the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency. [ILO, 2016]
- **Green building:** Green building is a holistic concept that starts with the understanding that the built environment can have profound effects, both positive and negative, on the natural environment, as well as the people who inhabit buildings every day. Green building is an effort to amplify the positive and mitigate the negative of these effects throughout the entire life cycle of a building.

Statement of the problem

India, with an increasing population, is facing significant pollution challenges, as the annual average pollution level exceeds the safety limit set by the WHO. According to The Indian Ministry of Environment, forests and Climate Change, "India is committed to addressing its environmental challenges. The government has taken several steps to improve air quality, water quality, waste management and forest cover. However, more needs to be done to address these challenges". The Air Quality Life Index (AQLI) developed by the Energy Policy Institute at the University of Chicago highlights pollution as the most significant health threat in India. Green finance can be an essential measure to overcome pollution in India. By promoting green finance, India can create green job opportunities and spur innovation in its efforts to combat pollution and achieve a cleaner environment.

Objectives of the study

1. To study the concept of Green finance in India
2. To evaluate the performance of green finance projects in India
3. To analyze the environmental effects of green investments in India.

Research Methodology

Nature of Research Design

The study aims to find out the emerging concept of Green finance in India and the impact of Green investment on the

environment by analyzing selected instruments of Green finance and how they lead to sustainable economic growth. Hence the study is both descriptive and analytical.

Selection of Study Area
This study on Green finance in India and its Green investments focused on selected areas like renewable and energy efficiency, green instruments, green transportation, Green buildings, and related areas.

Method of Data Collection
The data will be collected from authorized and published sources.

Sources of Data
The study used the sources of Ministry of new & renewable energy, Ministry of power, Indian Renewable Energy Development Agency Limited (IREDA).

Period of Study
This study investigates the implementation and effectiveness of Green finance initiatives in various sectors in India that lead to a sustainable economy and reduce Greenhouse gas emissions and other environmental pollutants in India from 2015 to 2022.

Statistical tools
The data collected was analyzed with the help of statistical tools like Annual Growth Rate (AGR), and Compound Annual Growth Rate (CAGR).

Annual Growth Rate (AGR)
The Annual Growth Rate is the Average increase or decrease in the value of variables of a specific period. The average annual growth rate is determined by taking the numerical mean of specified year-on-year growth rates.

$$AGR = \left(\frac{Current\ Year - Previous\ Year}{Previous\ Year} \times 100\right)$$

Compound Annual Growth Rate (CAGR)
The Compound Annual Growth Rate is the mean annual growth rate of variables over a specific period longer than one year. It is often used to measure and compare the past performance of variables to project their expected returns.

$$CAGR = \left[\frac{Ending\ Value}{Beginning\ Value}^{\frac{1}{No\ of\ Years}} - 1\right] \times 100$$

Scope of the study
This study will reveal the current status of green finance in India and assess the impact of green finance on sustainable development in India.

Limitations of the study
This study is based on secondary data and it is limited to 8 years only.

Review of Literature
Kairvi Rathod (2023) the article "Recent Trends of Green Finance in India" discusses the importance of green finance for India's sustainable development. The author identifies several recent trends in green finance in India, such as the growth of green bonds, the increasing involvement of the private sector, and the development of green financial products and services. The author concludes that green finance is still in its early stages of development in India, but it has the potential to play a major role in the country's sustainable development.
In short, the article discusses the importance of green finance for India's sustainable development and identifies several recent trends in green finance in India. The author concludes that green finance has the potential to play a major role in India's sustainable development.
Babita Jha and Priti Bakhshi (2019) [1] examined that Green finance plays a pivotal role in achieving inclusive, resilient, and cleaner economic growth by creating environmental benefits. It helps in increasing the flow of finance from the public, private, and non-profit sectors to sustainable development priorities. Recognizing the significance of green finance, UN Environment has been working in the alignment of the financial system of the countries to channel the financial flows for attaining 2030 sustainable development goals. To build economic development sustainably, India also needs a national green finance strategy. It requires green infrastructure funding of about $4.5 trillion by 2040. The contribution made by both public and private sector organizations/banks will play a crucial role in green financing. The present study therefore mainly explores the various green financing initiatives taken by the public and private sector organizations/banks in India. The study showcases the various challenges in the area of green financing in India and also recommends measures to face those challenges. The study is descriptive and is based on secondary data taken from various government reports published by the Government of India and other published reports of public and private sector organizations and banks in India.
Vandana Tyagi (2017) [15] studied that the Green economy has over the past few years become a central concept on the global sustainable development agenda. The concept was first mentioned in a British government-commissioned sustainable development report from 1989. However, it was only during the late 2000s global economic crisis that the green economy was brought to international attention as an economic recovery strategy focused on creating 'green jobs' tackling climate change, and creating real investments. South Korea was the first country to declare 'Low Carbon Green Growth' as its long-term national development vision, in 2008.
Parvadavardini Soundarrajan and Nagarajan Vivek (2016) [8] examined that Green finance is a core part of the low carbon green growth, because it connects the financial industry, environmental improvement, and economic growth. The objective of this paper is to study green finance and to validate the concept as feasible in the Indian industries for balancing the ecological depreciation due to the assimilation of carbon gases in the atmosphere. Green Finance is a market-based investing or lending program that factors environmental impact into risk assessment, or utilizing environmental incentives to drive business decisions. Therefore, the paper also discusses the recent trends and the future opportunities and challenges in green finance in emerging India. Green investing recognizes the value of the environment and its natural capital and also seeks to improve human well-being and social equity while reducing environmental risks and improving ecological integrity.

Malik Amin Aslam Khan (2015) [4] examined that accepting the challenge of stewardship of the earth's resources today, to bequeath a more liveable future for our next generations, is the primary motivation behind the concept of 'Green Growth'. The concept is designed to revisit, revise, rethink, and improve the unsustainable growth model that the world is currently following and start thinking about alternate pathways to development. Over the past few years, many countries have been trying to cope with this challenge by firstly defining what "green" actually means and secondly endeavouring to translate it into practical action on the ground. Within this context, a lack of strong and unflinching political commitment has been often cited as one of the most difficult barriers to implementation.

Analysis and Interpretation

Table 1: Indian Renewable Energy Development Agency- Sector Wise allocation of Masala bonds from 2017-2018 to 2021-2022

Years	Rooftop PV		Solar		SPV		Wind	
	Amt (₹)	AGR	Amt (₹)	AGR	Amt (₹)	AGR	Amt (₹)	AGR
2017-2018	6.29	-	34.55	-	632.82	-	1232.28	-
2018-2019	55.54	782.98	345.51	900.02	8396.86	1226.89	2836.55	130.18
2019-2020	79.60	43.32	345.51	0.00	7892.39	-6.01	4424.64	55.98
2020-2021	64.00	-19.59	1544.02	346.88	5798.69	-26.53	19416.54	338.82
2021-2022	60.68	-5.18	3989.33	158.37	2442.59	-57.88	9270.76	-52.25
CAGR	57.35		158.51		31.01		49.72	

Source: Indian Renewable Energy Development Agency

The table shows that the Compound Annual Growth Rate (CAGR) of various renewable energy sources in India from 2017-2018 to 2021-2022. The Indian energy sector is experiencing significant growth in renewable energy. This is evident from the positive CAGR values for all four renewable energy sources listed in the table: Rooftop PV, Solar, SPV, and Wind. This growth is driven by several factors, including increasing awareness of climate change, government policies, and falling costs of renewable technologies. The growth of renewable energy has positive implications for sustainable development, such as reduced greenhouse gas emissions, improved air quality, increased energy security, and economic growth. Green finance plays a crucial role in supporting the growth of the renewable energy sector and achieving the Sustainable Development Goal.

Table 2: Wind and Solar Energy Generation from 2014-2015 to 2021-2022

Years	WIND		SOLAR	
	Generation (MU)	AGR	Generation (MU)	AGR
2014-2015	33768	-	5181.12	-
2015-2016	33029	59.45	9378.34	81.00
2016-2017	52666	-12.64	17334.68	84.83
2017-2018	46004	34.84	27584.65	59.12
2018-2019	62036	4.19	34794.42	26.13
2019-2020	64639	-6.94	43346.79	24.57
2020-2021	60149	-3.36	51250.34	18.23
2021-2022	58127	-2.18	72924.49	42.29
CAGR	7.02		75.93	

Source: Ministry of Power

It is observed from the table that the Wind power generation had a significant growth initially, reaching a peak in 2016-2017 but declined thereafter. The Compound Annual Growth Rate (CAGR) for wind energy was positive at 7.02 percent, but the recent years showed negative growth. Solar power generation has consistently grown throughout the period, with a much higher CAGR of 75.93 percent compared to wind. Its surpassed wind generation in 2019-2020 and continues to outpace it significantly. Overall, the table points towards a positive but uneven growth of green finance in India. While solar power is thriving, wind power needs policy and operational support to maintain its momentum. Increased investments in transmission and distribution infrastructure, along with innovative financing mechanisms, are critical to unlock the full potential of renewable energy in India.

Findings

- The renewable energy sources in India, including rooftop PV, solar, SPV, and wind, are experiencing impressive growth, fuelled by an upswing in their Compound Annual Growth Rate (CAGR).
- Solar power shines brightest, eclipsing wind with a considerably higher CAGR of 75.93 percent compared to wind's 7.02 percent.
- Wind power initially enjoyed a strong burst, but its recent slump underscores the need for supportive policies and operational improvements.
- While overall growth is encouraging, the uneven performance across sources calls for targeted interventions to ensure balanced development.
- To fully unlock the potential of India's renewable energy revolution, investments in transmission and distribution infrastructure, along with creative financing solutions, are essential.
- Green finance plays a crucial role in supporting the growth of the renewable energy sector. Green finance refers to financial instruments and products that are designed to support environmentally sustainable projects and activities.

Conclusion

Green financing is a key driver of India's sustainable economic growth. The Indian government is committed to developing the renewable energy sector through various policies and incentives, which are attracting significant investments from both domestic and international investors. The rapid growth of solar energy is reducing India's reliance on fossil fuels and improving energy security. While some challenges remain, such as the recent decline in investment in SPV and wind energy, the outlook for green financing in India is positive. It is poised to play a vital role in driving economic growth and sustainable development. In addition to economic benefits, green financing is also helping to address climate change and promote social equity. It is financing projects that reduce greenhouse gas emissions, build resilience to climate change, and benefit marginalized communities. Overall, green financing is a powerful tool for driving sustainable economic growth in India. It is helping to create jobs, boost the economy, reduce emissions, and make India a leader in the clean energy sector.

Reference

1. Jha B, Bakhshi P. Green Finance: Fostering Sustainable Development in India. International Journal of Recent Technology and Engineering,2019:8(4):2277–3878.
2. Rathod K. Recent trends of Green Finance in India. Vidhyayana An International Multidisciplinary Peer Reviewed E Journal,2023:8(5):2454–8596.
3. Keerthi BS. Recent Trend and Future Opportunities in Green Finance in the Emerging India. Journal of Sustainable Finance and Investment,2013:3(4):283–298.
4. Khan MA A. Green Growth: The Pathway to Sustainable Development. The Pakistan Development Review,2015:54(3):321–325.
5. Chhaochharia M. Green Finance in India: Progress and Challenges. Research Journal of Humanities and Social Sciences,2021:12(4):223–226.
6. Islam M, Managi S. Green growth and pro environmental behaviour: Sustainable resource management using natural capital accounting in India. Resource Conservation and Recycling,2019:147:281–291.
7. Bhatnagar M, Taneja S, Özen E. A wave of green start ups in India the study of green finance as a support system for sustainable entrepreneurship. Green Finance,2022:4(2):253–273.
8. Soundarrajan P, Vivek N. Green finance for sustainable green economic growth in India. Agricultural Economics Czech,2016:62(1):35–44.
9. Prabhu S. Balancing Economic Development with Environmental Protection: India's National Agenda for Governance. Economic and Political Weekly,1998:33(46):3038–3046.
10. Wasan P, Kumar A, Luthra S. Green Finance Barriers and Solution Strategies for Emerging Economies: The Case of India. International Journal of Green Economics,2021:99:1–12.
11. Sarma P, Roy A. Green Financial Instruments in India: a study on its current status and prospects. International Journal of Business Innovation and Research,2021:26(2):194–218.
12. Rasoulinezhad E, Taghizadeh Hesary F. Green finance, green energy, and CO2 emissions: A STIRPAT analysis of the top ten economies. Journal of Cleaner Production,2022:344:131112.
13. Kar SK, Mishra SK, Bansal R. Drivers of Green Economy: An Indian Perspective. International Journal of Sustainable Development and Green Economics,2015:4(1):1–22.
14. Bhatnagar S, Sharma D. Green financing in India: identifying future scope for innovation in the financial system. International Journal of Green Economics,2021:15(3):185–212.
15. Tyagi V. Green economy in India: Possibilities and challenges. International Journal of Research in Social Sciences,2017:7(2):577–586.
16. https://powermin.gov.in/
17. https://www.ireda.in/home
18. https://www.emeritus.com/
19. https://www.usgbc.org/articles/what-green-building
20. https://www.ilo.org/global/topics/green-jobs/news/WCMS_220248/lang-en/index.htm