IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

"Assessing The Impact Of Green Finance On Sustainable Development. A Comprehensive Analysis"

Arya Soman
Assistant Professor
Department of Commerce
The Cochin College, Kochi, Kerala

ABSTRACT

Green finance and sustainable development are intricately linked, as green finance plays a significant role in advancing sustainable development goals. Green finance focuses on mobilizing financial resources towards environmentally sustainable projects and initiatives. It not only supports the transition to a low-carbon economy but also fosters innovation, economic growth, and job creation in green industries while enhancing the resilience of financial systems to environmental risks. Moreover, by aligning financial flows with sustainable principles, it contributes to mitigating climate change, protecting biodiversity, and promoting responsible natural resource management, thus fostering a more balanced relationship between economic development and environmental preservation. This research aims to investigate the impact of green finance initiatives on promoting sustainable development. It examines the effectiveness of various green finance mechanisms in driving environmentally friendly projects and fostering sustainable economic growth.

Keywords: - Green finance, Environment, Sustainable development, SDG.

1.1 INTRODUCTION

India's population growth, urbanization trends, abundant renewable energy resources, and supportive government regulations make it an attractive destination for environmentally conscious businesses. The increasing demand for sustainable infrastructure, renewable energy, and efficient transportation systems aligns with India's goals for climate change mitigation. Estimates from the Reserve Bank of India indicate significant investments in climate-compliant industries by 2030, while predictions from the International Financial Services Centres Authority highlight that substantial investment is required to achieve net-zero emissions by 2070. These factors together create a conducive environment for businesses aiming to thrive in the climate-conscious market. India indeed confronts significant environmental challenges, including high levels of air pollution in its cities. The lack of accessible and affordable financing options further complicates efforts to address these issues. Implementing "green finance" mechanisms, such as green bonds, green equity, carbon markets, and trading, can play a crucial role in mobilizing both private and public capital for environmentally sustainable projects.

Green finance refers to financial products and services that promote environmental sustainability and sustainable development. It involves investing in projects, businesses, and technologies that have positive environmental impacts while also generating financial returns. Sustainable development, on the other hand, refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs. Green finance plays a crucial role in supporting sustainable development by channelling capital towards projects that address climate change, promote renewable energy, enhance resource efficiency, and mitigate environmental risks. This intersection between green finance and sustainable development is essential for addressing global environmental challenges while also fostering economic growth and social progress. Through instruments such as green bonds, loans, and other financial mechanisms, green finance encourages investment in sectors like renewable energy, energy efficiency, sustainable transport, and others that are environmentally friendly. This, in turn, contributes to addressing climate change, preserving biodiversity, and promoting responsible natural resource utilization. Additionally, regulatory bodies like the Securities and Exchange Board of India (SEBI) have introduced guidelines to encourage the integration of environmental, social, and governance (ESG) factors into investment decisions.

A report by the Reserve Bank of India underscores that the country's green financing [1]requirements are estimated to be at least 2.5% of Gross domestic product (GDP) annually until 2030. It also emphasises that the financial sector faces the dual challenge of adapting its operations and business strategies to support the transition to green finance while bolstering resilience against climaterelated vulnerabilities to ensure financial stability. The central bank notes that the financial system may need to mobilise substantial resources and reallocate existing ones to effectively contribute to India's net-zero target.

1.2 OBJECTIVES OF THE STUDY

- To identity different types of Green Finance Products.
- To examine the effectiveness of Green Finance mechanisms on sustainable development.
- To analyse the challenges of Green Finance.

RESEARCH METHODOLOGY

This study adopts a descriptive approach and utilizes secondary data sourced from various [2]government reports published by the Government of India, as well as reports from public and private sector institutions and banks in India.

REVIEW OF LITERATURE

Uddin et al. (2013) present a unique perspective on green finance by focusing on its relevance for developing countries. Their paper emphasizes the significance of incorporating green finance into agriculture and building construction. The authors discuss internationally recognized green projects, particularly in the US, to inspire awareness and serve as examples for developing countries to emulate in the realm of green finance

Lindenberg (2014) sought to clarify the concept of green financing in his article "Definition of Green Finance." The primary objective of his study was to establish a clear definition for green finance and delineate its boundaries. He concluded that, up to that point, there had been no precise

and universally accepted definition of green finance. According to Lindenberg, green finance encompasses financing activities related to environmental goods and services, as well as efforts aimed at minimizing or

[1] Reserve Bank of India Report on Currency and Finance for the year 2022-23

[2] www.imf.org , www.adb.org , https://rbi.org.in/,https://ifsca.gov.in/

preventing environmental damage. It also involves financing public policies that promote environmental concerns. Additionally, Lindenberg included other components of the financial sector that specifically support green initiatives, such as the Green Climate Fund and green investment funds, within the scope of green finance.

Bloomberg & Jun (2016) stressed the importance of private investment in Green Finance and suggested ways to encourage it, including providing diverse financial instruments, policy incentives, leveraging public funds, and implementing risk-sharing mechanisms. They focused on the role of Green Finance in addressing energy challenges in less developed cities of China, highlighting barriers like conventional financing and lack of standardization. They recommended creating more green financial instruments and government-backed investments.

Forstater et al. (2016) discusses Green finance within the global context and its alignment with the 2030 agenda for sustainable development. The authors emphasize the importance of considering the key concerns of developing countries, highlighting the need for an integrated approach to addressing environmental considerations in financing. They caution that the transition to a green economy should not come at the expense of developing countries' equity, development, financial inclusion, and competitiveness. Furthermore, they stress the impact of international development on developing countries as a significant concern, particularly within the context of G20 deliberations aimed at achieving environmentally sustainable development. The authors also address the specific needs of developing countries, such as inward direct investment and international knowledge sharing.

The UN Environment Report (2016) suggested that promoting green transformation requires significant involvement from both the financial system and the government. They emphasized the importance of private-public partnerships in advancing green finance initiatives. Furthermore, the report highlighted the continued significance of the G20 in policymaking and developing best practices for facilitating green transformation.

Mohd & Kaushal (2018) have underscored the significance of green finance for India's sustainable development by synthesizing existing literature on the subject. They advocate for measures such as certifying green projects, financing recycling and compost projects, microfinance, rainwater harvesting initiatives, and promoting green buildings and eco-friendly products among industrialists. Their paper consolidates various strategies to advance environmental sustainability through financial mechanisms.

P. Dhoot and S. Awate (2021) conducted a descriptive study titled "Green Financing: An emerging form of sustainable development in India." They aimed to examine the green finance products and services offered in Indian markets and analyze trends in green finance. Data was gathered from reports and financial institution websites. The study concluded that the Indian green finance market is still emerging and struggles to attract sufficient investors. It highlighted that current market practices and regulatory monitoring pose significant obstacles to the success of financial instruments in the green finance sector.

Sumedha Bhatnagar and Dipti Sharma (2022) emphasize that green financing (GF) promotes economic growth alongside environmental initiatives by innovatively developing the financial industry. They conclude that an integrative approach involving government, financial institutions, policymakers, private sector, and NGOs is crucial for diversifying markets and mitigating risks in green finance development.

1.3 DATA ANALYSIS

I. Green Finance in India

India's green finance sector is still in its early stages of development, but the country's G20 presidency in 2023 demonstrates a clear commitment to advancing sustainability on the global stage. This commitment is reflected in India's slogan 'One Earth, One Family, One Future', which emphasizes the interconnectedness of humanity and the planet, as well as the importance of collective action to address environmental challenges. India's participation in the United Nations Climate Change Conference (COP26) in Glasgow further underscores its dedication to environmental sustainability. At COP26, India made commitments to achieve net zero emissions by 2070, aligning itself with global efforts to limit global warming and mitigate the impacts of climate change. The nation's Green Financing requirement is estimated to be at least 2.5% of GDP annually till 2030 (RBI Report on Currency and Finance 2022-23). The report mentions that a balanced policy intervention with progress ensured across all policy levels will enable India to achieve its green transition target by 2030, making the net zero goal by 2070 attainable. It also notes that, compared with a no-policy action scenario that could increase India's carbon emission to 3.9 gigatonnes by 2030 (from 2.7 gigatonnes in 2021), a balanced policy intervention can lower carbon emissions to 0.9 gigatonnes by 2030. In a scenario where India seeks to achieve dual objectives of net zero by 2070 and an advanced economy status, it would have to increase the share of green energy in primary energy consumption to 82 % by 2070 and reduce emissions initially by 5.4 % annually. It would also require a reduction in the energy intensity of GDP by around 5% annually. In addition, it would have to deliver an energy mix of renewables at 70% by 2070-71 from the current 5.5%. Thus factoring the Green Swan events into economic planning is a necessity. Various private and public banks, as well as non-banking financial institutions, have pledged approximately $2570 million for financing green initiatives.

II. Green Banking

Green banking has emerged as a major catalyst in financing building projects that prioritize energy and water efficiency. Financial institutions, such as banks, are playing an active role in promoting sustainable development by offering specialized loan products, grants, and incentives for green building initiatives.

Green	Green mortgages
Banking	Green loans
Products	Green credit cards
Green savings accounts	
Green checking accounts	
Green CDs	
Green money market accounts	
Mobile Banking	
Online banking	
Remote deposit (RDC)	

Table 1. Green Banking Initiatives by Indian Banks

Green Banking Initiatives by Indian Banks include both public sector banks and private sector banks.

Sr.No	Name of Bank	Initiatives
1	SBI	SBI has launched green banking policy and set up windmills in Tamil Nadu, Maharashtra and Gujarat in generating 15MW power. This is the first bank in India which is in green banking and promoting green power projects.
2	PNB	taken various steps for reducing emission and energy consumption.
3	Bank of Baroda	giving preference to environment friendly green projects such as windmills, biomass and solar power projects which help in earning the carbon credits.
4	Canara Bank	adopted environmental friendly measures such as mobile banking, internet banking, telebanking, solar powered biometric operations.
5	ICICI Bank Ltd	started 'Go Green' initiative which involves activities like Green products/offerings, Green engagement and green communication with customers
6	HDFC Bank Ltd	Taking up various measures for reducing their carbon footprints in waste management, paper use and energy efficiencies
7	Kotak Mahindra Bank	Through the 'Think Green' initiative this bank had taken several initiatives such as to reduce the paper consumption and encouraging their customers to sign for e-statements and they had become partners with 'Grow- Trees.com' to plant one sapling for every e-statement on behalf of its customers.
8	IndusInd Bank	Initiated its Green Office Project under which it had installed solar powered ATMs in different cities targeting energy saving as well as reducing CO2 emissions
9	IDBI	is providing various services in the field of Clean Development Mechanisms (CDM) to its client.
10	YES Bank	It has projects portfolio in the areas of alternative energy and clean technologies

Source: Money Control (2018)

III. Green Insurance

Green insurance, also known as eco-friendly insurance or sustainable insurance, is a type of insurance policy that specifically covers environmentally friendly products, services, or practices. These policies often reward policyholders for using environmentally responsible practices or products, such as renewable energy sources, energy-efficient appliances, or sustainable building materials. They may also provide coverage for damages related to environmental conservation efforts or support initiatives to mitigate climate change.

Table 2. Types of Green Insurance

Types of Green Insurance	Explanation
Green Car Insurance	The amount of insurance premium will depend on the miles travelled by car thus will reduce the unnecessary use of private vehicles and hence contributes to the environmental protection
Green business insurance	Incentives to the owners of the business for the renewal or reconstruction of the damaged buildings with environment friendly products.
Green travel insurance	This insurance compensates for the effects of emission of carbon dioxide on the environment during travelling by donating part of the premium paid for the projects with the aim to reduce carbon emissions.
Eco-friendly home Insurance	Provides technological and maintenance support for the renewable energy power systems along with insurance coverage.
Green life insurance	The insurance company will donate a certain percentage of the insurance premium received for eco-friendly projects
Carbon Insurance	Provides insurance cover for the plantation forests against the weather-related risks.

IV. Green Bonds

Green bonds are debt instruments that raise capital to finance environmental or climate-related projects. While green bonds are similar to conventional Bonds as they have a fixed or variable interest rate. They differ since they are specifically designated for financing or refinancing environmental projects That have positive effects on the environment or the Climate such as the use of renewable energy, energy efficient Transportation, clean energy, sustainable Water management and the reduction of greenhouse Gas emissions. They are issued by Government, Corporations or International Development Banks.

In 2015, India introduced green bonds (Yes Bank) for the first time, marking the beginning of an emerging market. A transparent regulatory environment will unlock the full potential of green finance strategies in India, aligning with its goals under the Paris Climate Accord. India has raised approximately $6 billion through bonds, while China leads in green bond issuance with a 22% share, followed by the US at 13% in the $120 billion global market. Expectations are optimistic, with Asian green bond issuances projected to surpass $600 billion in the next five years. There is growing demand from global investors for green financing, making it imperative for India to develop a robust green financing system. IREDA launched its unique 5-year green bonds in 2017 which were named ‘Green Masala Bonds’. These bonds became the first to be listed on the International Securities Market (ISM). According to a report by IndiaCorpLaw (September 2021),

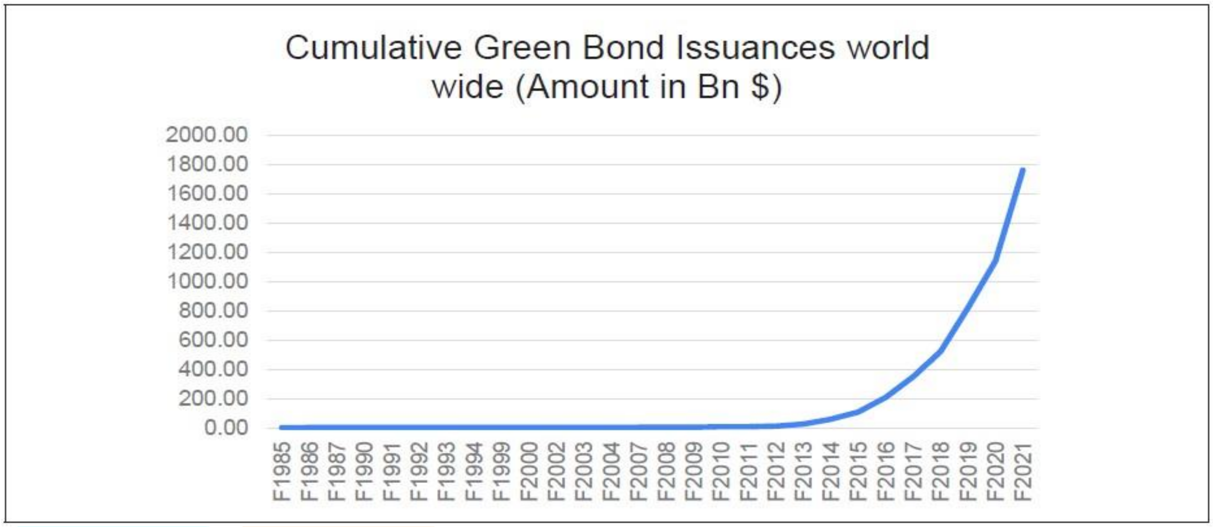
Indian corporates have been able to raise nearly $4.96 billion through such Green bonds. Also, Ghaziabad Nagar Nigam has become the first issuer of Green Municipal Bonds, in the year 2021.

Table 3. Types of Green Bonds

Types of Green Bonds		
Sl.No.	Name of Green Bonds	Purpose
1	Climate Change Bonds	These bonds are issued to fund projects that focus on mitigating climate change. E.g. renewable energy and energy efficiency projects.
2	Renewable Energy Bonds	These bonds are issued to finance projects that create and/or use renewable energy sources. E.g. wind, solar and hydroelectric power.
3	Energy Efficiency Bonds	These bonds are issued to finance projects that increase energy efficiency and reduce energy consumption. E.g. building retrofits and upgrades to equipment and appliances.
4	Social or Sustainable Development Bonds	These bonds are issued to finance projects that promote sustainable development such as projects that create jobs, reduce poverty and improve public health. E.g. affordable housing, education and healthcare.
5	Green Infrastructure Bonds	These bonds are issued to finance projects that promote green infrastructure, such as projects that protect natural resources and ecosystems. E.g. urban green spaces, reforestation and water conservation projects.
6	Natural Resources Bonds	These bonds are issued to finance projects that promote the conservation and sustainable use of natural resources. E.g. sustainable forestry management, reforestation, rehabilitation of mined areas and the development of clean energy initiatives.
7	Project-linked bonds	These bonds are linked to specific projects, such as the construction of a wind farm or the development of a public transportation system. E.g. light rail or bus rapid transit system.
8	Asset-linked bonds	These bonds are linked to a portfolio of assets such as a group of wind turbines, a fleet of electric buses, electric vehicle charging stations or construction of a green building.
9	Corporate green Bonds	These bonds are issued by companies to finance their own green projects or to refinance existing projects. For e.g. Bonds issued by a major car manufacturer to finance the development and production of electric vehicles (EVs) and related infrastructure.
10	Sovereign Green Bonds	These bonds are issued by National Government to finance green projects such as renewable energy, sustainable infrastructure and climate change adaptation.
11	Green bond funds	These are funds that invest in a diversified portfolio of green bonds, enabling investors to gain exposure to the green bond market without having to buy individual bonds. E.g. fund that invests primarily in bonds issued by companies in the renewable energy sector such as solar and wind power companies.

• Green bonds have been issued since 1985 (US and Norway) and have been growing with a CAGR of 47% in the last 27 years and a CAGR of 77% in the last decade.

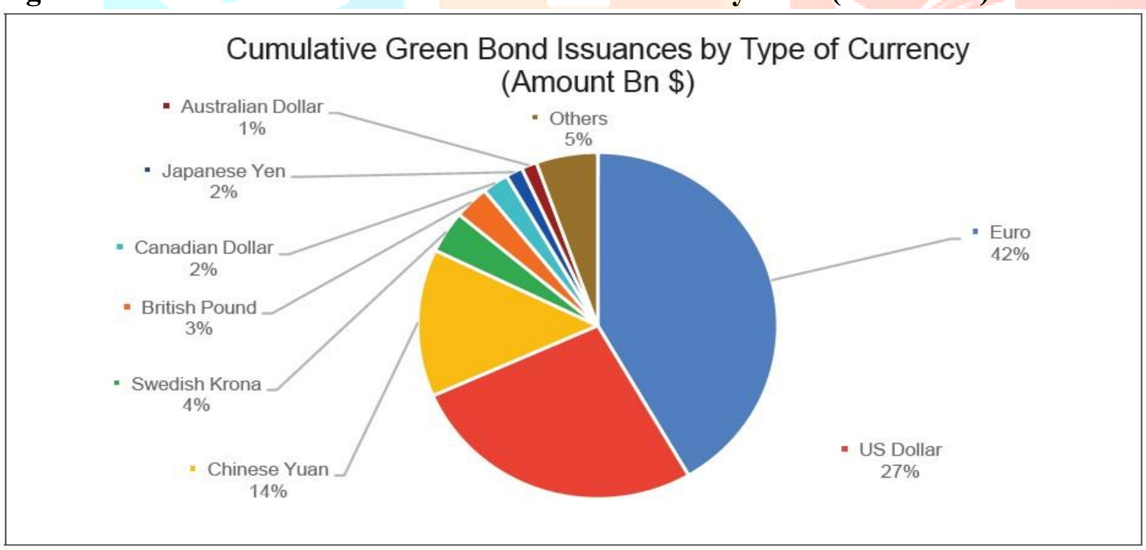
Figure 1. World Wide Cumulative Green Bond Issuances (1985-2021)



Source: www.imf.org

• Till 2021, for most of the green bonds issuance have been in Euro and US Dollars followed by Chinese Yuan. Only $3.15 bn worth of green bond issuance had happened in Indian Rupee which is approx. 0.18 %.

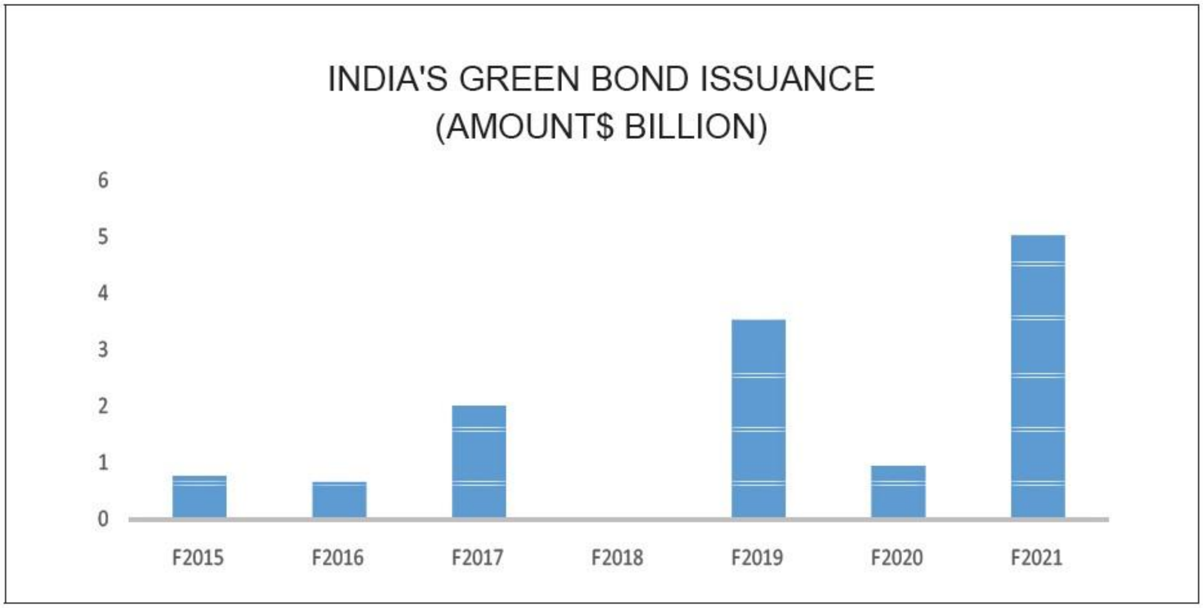
Figure 2. Cumulative Green Bond Issuances- Currency Wise (1985-2021)



Source: www.imf.org

• India's journey of Green bonds issuance started in the year 2015 and has since then been growing at CAGR of 37% (No issuance in year 2018).

Figure 3. India's Green Bond Issuances (2015-2021)



Source: www.imf.org

• Compared to other green bonds, Sovereign Green bonds are way younger having started their journey in FY 2016 with Republic of Poland being the front-runner. The share of Sovereign Green Bonds has been merely 11% of the universe of green bonds. India took its first step towards Sovereign Green Bonds in January 2023

V. Government Policies and Incentives of Green Finance in India

The Government Policies and Initiatives which have increased the Scope of Green Financial Products in India are as follows:

1. India's National Action Plan on Climate Change recommended that country should generate10% of its power from renewable energy resources by 2015 and 15% by 2020. Of India's installed power generation capacity of 2, 55,012.79 megawatt (MW), renewable power has a share of 12.42% or 31,692.14 MW which shows that there exists a huge scope for investment in this sector.
2. The Ministry of New and Renewable Energy (MNRE) has revised its targets for energy capacity to 1, 75,000 MW till 2022, comprising 1, 00,000 MW solar, 60,000MW wind,10,000 MW biomass and 5,000 MW small hydro. These revised targets demand a huge investment. Since, the sanctioned budget would not suffice so MNRE has asked the public and private sector financial institutions such as Power Finance Corporation (PFC), Rural Electrification Corporation (REC), Indian Renewable Energy Development Agency (IREDA), IFCI Ltd, SBI Capital Markets ltd and ICICI bank ltd to raise funds.
3. The finance ministry has increased the clean energy cess on coal by Rs.100 per metric tonne to fund clean environment initiatives. The scope of National Clean Energy fund (NCEF) has been expanded to include financing and promoting clean environment initiatives and fund researches towards that end.
4. The government has also proposed the use of renewable energy resources in railways sector. It includes use of CNG in train operations, setting up of water recycling plants, use of solar energy to illuminate coaches, station buildings and platforms.

1.4 CHALLENGES OF GREEN FINANCE

The challenges of green finance include:

- Lack of standardized frameworks: There is a need for universally accepted standards and guidelines for defining and assessing green projects and investments.
- Limited investor awareness: Many investors are not fully aware of the potential benefits and risks associated with green investments, leading to hesitancy in allocating funds.
- Cost considerations: Green projects often require higher upfront costs or longer payback periods, which can deter investors focused solely on short-term returns.
- Availability of data: Insufficient data on environmental performance and financial returns of green investments makes it difficult for investors to assess their impact and make informed decisions.
- Regulatory uncertainty: Inconsistent or inadequate regulatory frameworks related to green finance can create uncertainty and hinder investment flows.
- Access to finance: Limited access to finance for green projects, particularly in developing countries, poses a significant barrier to scaling up green investments.
- Market fragmentation: Fragmentation within the green finance market, including diverse standards and practices, can impede liquidity and hinder the development of a robust ecosystem.

1.5 CONCLUSION

The impact of green finance on sustainable development is profound and multifaceted. By channelling investments towards environmentally-friendly projects, green finance plays a pivotal role in mitigating climate change, reducing greenhouse gas emissions, and promoting sustainable development. It fosters innovation, creates green jobs, and enhances resilience to environmental challenges. Moreover, green finance leverages private sector resources, complementing limited public finance, and driving economic growth while safeguarding the planet for future generations. Through concerted efforts and a unified approach, the integration of green finance principles into the financial system will catalyse sustainable development, ensuring a prosperous and resilient future for all.

In addition to framing a clear green investment strategy, the government of India could also implement fiscal incentives such as tax breaks or subsidies for green projects to further incentivize investment in sustainable initiatives. Collaborating with international organizations and participating in global green finance initiatives can also provide access to expertise, funding, and best practices to accelerate India’s transition to a low-carbon economy. Furthermore, integrating environmental, social, and governance (ESG) criteria into investment decision-making processes can help mainstream green finance and ensure sustainable development outcomes. Additionally, raising awareness and educating both investors and the general public about the benefits of green finance can foster a culture of sustainability and responsible investment practices.

REFERENCE

https://www.ey.com/en_in/climate-change-sustainability-services/green-finance-is-gainingtraction-for-net-zero-transition-in india#:~:text=Future%20of%20green%20finance%20in%20India&text=The%20purpose%20is%20to%20ensure,terrestrial%20and%20aquatic%20biodiversity%20conservation

https://www.statista.com/topics/10776/green-finance-in-india/#topicOverview

https://blogs.worldbank.org/climatechange/india-incorporates-green-bonds-its-climate-financestrategy

Sachs, J. D., W. T. Woo, N. Yoshino, and F. Taghizadeh-Hesary. 2019. Why Is Green Finance Important? ADBI Working Paper 917. Tokyo: Asian Development Bank Institute. Available: https://www.adb.org/publications/why-green-finance-important

Sarangi, G. K. 2018. Green Energy Finance in India: Challenges and Solutions. ADBI Working Paper 863. Tokyo: Asian Development Bank Institute. Available:https://www.adb.org/publications/green-energy-finance-india-challenges-and-solutions Berensmann, K. & Lindenberg, N. (2017): Green finance across the universe, in: S. Boubaker, Cumming, D. & Nguyen D. (eds.), Ethics, ESG and Sustainable Prosperity. World Scientific Publishing, forthcoming.

Green Bonds – Role and scope In India's financial and fiscal landscapeDr. Satyendra Kumar* C.A. Lalit Kundalia**The Journal of Indian Institute of Banking & Finance July – September, 2023

P. Dhoot and S. Awate (2021): Green Financing: An emerging form of sustainable development in India, Vidyabharati International Interdisciplinary Research Journal 12(2) 698-712

Parvadavardini Soundarrajan, Nagarajan Vivek (2016): Green Finance for sustainable green Economic growth in India, Agric. Econ – Czech,62 2016(1): 35-44, 10.17221/174/2014-AGRICECON

Sharif Mohd. And Vijay Kumar Kaushal (2018): Green Finance; A step towards sustainable Development, MUDRA- Journal of Finance and Accounting, Volume 5, Issue 1, 10.17492/mudra. V5i01.13036

Babita Jha, Priti Bakhshi (2019): Green Finance: Fostering Sustainable Development in India, International Journal of Recent Technology and Engineering, Volume 8, Issue 4, 10.35940/ijrte. D8172.118419

A Review of Sustainable Green Finance Literature: MiniReviewApproach
Fathihani, Jumadil Saputra, Mohd Hassan Che Haat, Mohd Yusoff Yusliza and Zikri Muhammad
Proceedings of the 11th Annual International Conference on Industrial Engineering and Operations Management Singapore, March 7-11, 2021

Dr. Mahadev Kharade, Green Finance for Sustainable Development- study on the Indian context, -- Palarch's Journal Of Archaeology Of Egypt/Egyptology 18(10), 2459-2466. ISSN 1567-214x

Advancing green fnance: a review Of sustainable development Chengbo Fu1* , Lei Lu2 and Mansoor Pirabi1Fu et al. Digital Economy and Sustainable Development (2023) 1:20 https://doi.org/10.1007/s44265-023-00020-3