"Green Finance and Green Bonds: Catalysts for Sustainable Development and Climate Resilience"

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Abstract

To tackle the problem of climate change, it is imperative to enforce regulations that require industries and corporations to implement methods and processes that reduce carbon emissions. As sustainability becomes more important at a national level and across many policies, there is a growing acknowledgment of the crucial role that green financing plays in India's efforts to achieve a net zero economy. The financial industry has recently prioritised environmentally responsible investments, leading to the promotion of sustainable development (Falcone et al., 2018). Sachs (2015) argues that the use of eco-friendly financial tools can contribute to the development of an environmentally sustainable ecosystem. Some of the financial instruments that have been established by financial intermediaries and markets while the course has been in process include green bonds, green house mortgages, green loans for commercial buildings, environmental home equity schemes, and climate credit cards. A green bond is a financial tool that is issued by an organisation to raise funds exclusively for projects that have positive impacts on the environment and climate. These projects can be either for their initial funding or for refinancing purposes. The nature of this investigation is descriptive. This research study is intended to understand India's enduring Efforts to environmental preservation and its Support for renewable energy, energy efficiency and pollution control, to delve into the current scenario of green bonds and to analyse the various challenges associated with green bonds in India. The research examined secondary sources from various research papers produced by the Government of India and other published reports of international and national institutions.

Keywords: *Climate Change, Sustainable Development, Green initiatives, Environmental Conservation, Green Finance and Green Bonds.*

ISBN: **978-93-83302-66-6**

Introduction

The rising carbon emissions of various industries have brought sectors including power and steel to the forefront as significant contributors to the climate crisis. Addressing the issue of climate change necessitates mandating that industries and businesses to adopt carbon-reducing practices and processes. In 2022, Multilateral development banks allocated a total of USD60.9 billion in climate funding to low-income and middle-income economies. Of this amount, USD38.2 billion, accounting for 63% of the total, was designated for climate change mitigation finance, while USD22.7 billion, representing 37%, was allocated for climate change adaptation finance.

The financial sector plays a crucial role in combating climate change by aiding in the reduction of climate change risk and minimising the effect of unfavourable climate events. Such a change can only be achieved through substantial investment that supports it, and the answer lies in green financing. In light of increasing worldwide concern regarding environmental conservation, climate change, and sustainable progress, politicians and researchers have increasingly directed their attention towards green finance. With sustainability gaining prominence as a nationwide, multi-policy, and all-encompassing objective, there is an increasing recognition of the pivotal significance of green finance in India's journey towards achieving a net zero economy. In recent years, the financial industry has placed a greater emphasis on environmentally responsible investments, which has resulted in the promotion of sustainable development (Falcone et al., 2018). Sachs (2015) contends that the utilisation of environmentally friendly financial instruments has the potential to make a contribution to the construction of an ecosystem that is environmentally sustainable. Green bonds, green house mortgages, green loans for commercial buildings, environmental home equity programmes, "go green" auto loans, small business administration express loans, and climate credit cards are just some of the many financial instruments that have been developed by financial intermediaries and markets while the course has been in progress. As nations throughout the world work to reduce their carbon emissions and transition towards a more sustainable economy, green bonds have become increasingly popular in numerous countries.

Hence, a range of finance methods will be required to effectively enable a broader shift towards sustainability. The bond market, given its substantial size and the increasing prevalence of ESG-related activities, has the potential to be utilised more efficiently in order to bolster sustainable development and facilitate the transition of economies towards a more environmentally friendly path. Bonds are typically seen as a kind of long-term, secure debt financing. Given the substantial scale of the bond market, bond instruments have the capacity to finance a significant number of projects of substantial magnitude. Furthermore, bond investors have demonstrated a growing interest in gaining exposure to projects and portfolios that are aligned with environmental, social, and governance principles and Sustainable Development Goals.

India's Enduring Efforts to Environmental Preservation

The preservation and enhancement of the environment, along with the protection of forests and wildlife, are enshrined in the nation's Constitution. The Government of India initiated its National Action Plan on Climate Change in 2008, which includes eight national missions focused on reducing the emission intensity of the economy, enhancing energy efficiency, expanding forest coverage, and promoting the development of sustainable habitats. The climate policy is interconnected with other policy objectives, such as ensuring energy accessibility and safeguarding water stability.

India's climate goals for 2030, as outlined in the Paris Agreement, involve a 45% reduction in the emission intensity of its economy compared to 2005. As an additional objective, India intends to raise the percentage of its installed capacity that is comprised of energy resources that do not rely on fossil

ISBN: **978-93-83302-66-6**

fuels to fifty percent. In order to fund these and other obligations, the nation need approximately $170 billion annually in investments. Nevertheless, the expected climate financing flows, averaging $44 billion year, have failed to meet expectations.

India emphasised the importance of increasing financial resources to support developing nations in their endeavours to combat and adjust to climate change during the 27th United Nations Conference of Parties (COP) in Egypt in November. Immediately after the COP, the Government of India promptly implemented significant measures to attract private sector funds to meet its own requirements.

Support of India for renewable energy, energy efficiency and pollution control

India's sovereign green bonds demonstrate its dedication to increasing renewable energy generation and decreasing carbon emissions by providing financial support for renewable energy projects and the electrification of transportation infrastructure. Investments in these areas are crucial due to their contribution of around 41% to India's greenhouse gas (GHG) emissions in 2019. Moreover, it is projected that these sectors will be responsible for two-thirds of emissions by 2050, as the economy continues to expand. The funds from green bonds will be used to promote the implementation of established renewable energy technologies (primarily solar power, followed by wind and small hydro). Additionally, the funds will also be directed towards the advancement of emerging technologies, such as tidal energy, through research and development. Supporting India's energy transformation journey is crucial due to the country's heavy reliance on coal, which currently constitutes 55% of its energy requirements.

The sovereign green bond provides funding for a variety of project categories, including but not limited to: renewable energy, sustainable water and waste management, energy efficiency, green buildings, adaptation to climate change, sustainable management of living natural resources and land use, and conservation of terrestrial and aquatic biodiversity. The profits from the bond will not be used to finance any expenses that are associated with the extraction, production, or distribution of fossil fuels, nor will they be used to finance any operations in which the principal source of energy is sourced from fossil fuels.

The global green bond market has experienced significant growth in recent years and is widely recognised as one of the most rapidly expanding sectors within the fixed-income market. Due to the increasing emphasis on the environmental sustainability of projects, green bonds have gained widespread acceptance as a means to acquire funding for climate and environmental projects. They also tend to have a lower cost of capital compared to ordinary bonds. As of November 2018, the total amount of bonds issued had surpassed USD500 billion. While this increase is promising, it is crucial to consider it within a broader context. The global bond market has an approximate value of USD100 trillion in 2018, according to the Bank for International Settlements in 2019. Green bonds constitute a tiny 0.5% of the overall amount, with green bonds specifically for energy efficiency making up a paltry 0.05% of worldwide debt security issuance in 2018 (International Energy Agency 2019b).

Green Bonds

A Green bond is a financial instrument issued by an entity with the intention of raising funds specifically for environmentally and climatically beneficial projects, either for their initial financing or for refinancing purposes. A green bond is often referred to as a climate bond. These funds are specifically allocated for the purpose of financing or refinancing environmental projects that have beneficial impacts on the environment or climate, such as the implementation of renewable energy, energy-efficient transportation, clean energy, sustainable water management, and the mitigation of greenhouse gas emissions, among others.,

ISBN: **978-93-83302-66-6**

Importance of Green Bonds

Green Bonds play a significant role in promoting environmental sustainability and addressing climate change. Here are some key points highlighting the importance of Green Bonds:

Funding Renewable Energy Projects: Green Bonds provide a crucial source of funding for renewable energy projects, including solar, wind, and hydroelectric power. These projects are essential for reducing dependence on fossil fuels and transitioning to cleaner, more sustainable energy sources.

Environmental Conservation: The proceeds from Green Bonds can be directed towards projects focused on biodiversity conservation, sustainable land use, and protection of ecosystems. This helps in preserving natural resources and promoting the overall well-being of the environment.

Risk Diversification: Investors are increasingly recognizing the importance of considering environmental factors in their investment portfolios. Green Bonds offer an avenue for diversification by allowing investors to support environmentally friendly projects, reducing exposure to traditional industries that may be more vulnerable to climate-related risks.

Market Development: The growth of the Green Bond market contributes to the development of a broader sustainable finance ecosystem. It encourages financial institutions, governments, and corporations to adopt environmentally friendly practices and fosters innovation in sustainable finance instruments.

Long-Term Economic Stability: Investing in projects with positive environmental impacts contributes to long-term economic stability. By addressing climate change and environmental challenges, Green Bonds support the development of a resilient and sustainable economy.

Social Impact: Many Green Bond projects have co-benefits for local communities, such as job creation, improved infrastructure, and enhanced access to clean energy. This social impact contributes to the overall sustainability and well-being of communities.

Green Bonds are instrumental in directing capital towards environmentally sustainable projects, fostering responsible investment practices, and contributing to the global effort to combat climate change and promote sustainable development.

Review of Literature

Tolliver et al. (2020), through their research shed light on the importance of exploring the value of sustainable accounting in the process of adopting a green money system. The process of fostering overall sustainable development is considerably aided by the contributions made by banks, who are the organisations that are responsible for providing support to economic and development projects. According to the findings, sustainable accounting is a tool that can be utilised to facilitate the process of creating more environmentally friendly financial systems. As a component of the process of obtaining sustainable management of finances, the study suggested that institutions should make the transition to green bonds.

Biais, B., (2019) during the course of their research, they investigated the function that financial management plays in fostering environmentally responsible corporate practices and development. In accordance with the conclusions of the analysis, it was discovered that adequate models of financial management are essential in order to improve productivity while simultaneously reducing the risks associated with financial matters. Furthermore, the results demonstrated that the allocation of capital budgeting for sustainable initiatives contributes to an improvement in the competitive advantage of the

ISBN: **978-93-83302-66-6**

company. The research suggests that in order to improve environmental management, organisations should adopt the idea of financial sustainability.

Morana (2019) emphasised through their research that financial institutions give conventional projects, which make use of antiquated energy technology, such as fossil fuels, a higher priority than renewable technologies. This is due to the fact that the initial rate of return on renewable technologies may be lower. According to the findings of the study, the formulation of new policies that are based on greening "business as usual" is an essential step in the process of maintaining the development of the economy in a manner that maintains its sustainability.

Baker et al. (2018) investigated the impact that sustainability plays in contributing to the production of shared value and the value of an enterprise. On the basis of the findings, it was discovered that the concept of corporate sustainability is widely acknowledged as the most significant issue in contemporary economic and financial systems. During the same time period, it was discovered that this technique enhances financial growth and decision-making in relation to capital budgeting, cost of capital, and management of working capital. According to the findings of the study, the risks that are linked with sustainability reporting can be effectively managed by putting risk management and mitigation measures into place. In a similar vein, the possibility of the business going bankrupt can be reduced by effectively initiating low-risk sustainable financing structures within the organisation.

Voica et al.,(2015) the role that private investors and state entities play in the promotion of the green bond market is demonstrated by the researchers in their research work. According to the findings of the study, these bonds have made a significant contribution to the establishment of guidelines and infrastructure for green bonds. According to the findings of the study, there is a required increase in the number of partnerships between private organisations and government agencies in order to maintain the growth of the area.

Research Methodology

This examination employs a descriptive research design. The data has been gathered from several secondary sources such as websites, journals, articles, and published reports. The annual reports of the chosen financial institutions, sustainability reports, official websites of the organisations, and other sources are sorted through in great detail for the purpose of gathering data.

Objectives of the Study

The research aims to accomplish the following purposes:

To understand the concept of Green Bonds;

To delve into the current scenario of green bonds

To analyse the various challenges associated with green bonds

Indian Government Initiatives for Sovereign Green Bonds

India recently released the final framework for Sovereign Green Bonds, which has been specifically developed to adhere to the components and important suggestions outlined by the International Capital Market Association (ICMA) Green Bond Principles (2021). A Green Finance working committee has been established to supervise and approve important decisions regarding the issuance of Sovereign green bonds. This committee is responsible for choosing the projects to receive the funds, conducting regular

ISBN: **978-93-83302-66-6**

reviews of the allocation, and providing annual reports and impact assessments on the use of the funds from the sovereign green bonds.

Current Scenario of Green Bonds

According to the Intergovernmental Panel on Climate Change (IPCC) of the United Nations, in order to achieve the objective of the Paris Agreement, which is to limit the temperature increase to 2 degrees Celsius, an annual investment of around US$ 3 trillion will be necessary until the year 2050. The proliferation of Green Bonds markets has been facilitated by global environmental initiatives such as the Paris Agreement on Climate Change and the UN Sustainable Development Goals.

According to statistics published by the Climate Bonds Initiative, as of mid-June 2022, 25 countries had issued Sovereign Green Bonds with a total value of US$ 227 billion. The countries listed comprise advanced economies such as the United Kingdom, Spain, Ireland, Italy, Austria, Canada, and others, as well as emerging economies like Chile, Indonesia, Hungary, Poland, Fiji, Egypt, and so on.

The demand for green bonds is growing exponentially. Based on the analysis by the Climate Bonds Initiative, the yearly issue of bonds could potentially reach a value of US$ 1 trillion by the year 2023. The United States is the primary originator of green bonds, with the government-supported mortgage corporation Fannie Mae leading the way. Various private corporations, like Apple, Pepsi, and Verizon, have also taken similar actions. In addition, state and local governments have utilised green bonds as a means of financing infrastructure projects.

Global Green Bonds scenario

The UK, France, Germany, the USA, and China are among the major countries that have utilised green bonds as a means to raise financing.

• In the United States, Green bonds have been issued by Municipal Corporations, State Government and other Corporations, as well as by International Organizations such as the World Bank.

• In Europe, green bond issuance has been led by France, Germany and the United Kingdom, with the European Investment Bank being one of the largest issuers of green bonds.

• In China, green bond issuance has been growing rapidly, driven in part by the Government's ambitious renewable energy targets and the need to finance large-scale infrastructure projects. • In Canada and Australia, green bond issuance has been relatively limited so far, but the market is expected to grow as more Canadian and Australian issuers look to finance environmentally beneficial projects. Overall, green bond market is becoming more mature and globalized, with a growing number of countries and regions issuing green bonds. This trend is expected to continue in the future as the need for financing environmentally beneficial projects becomes more pressing.

The Climate Bonds Initiative reports that the worldwide market for green bonds experienced a significant growth from $37 billion in 2013 to $167 billion in 2018. This represents a CAGR of over 40%. This growth has been driven by increased investors demand for green investments, as well as increased issuance from Government and corporations.

According to IMF data, global green bonds worth approximately US$ 620 billion were issued in 2021. Among these, governments issued green bonds worth US$ 587.7 billion, while international organisations issued bonds worth US$ 32.3 billion.

ISBN: **978-93-83302-66-6**

According to a report by the International Finance Corporation (IFC, 2021), it is anticipated that the issuance of green bonds in emerging markets will exceed USD 100 billion by 2023.

India Green Bonds scenario

The Ministry of Finance has declared the plan to issue sovereign green bonds valued at INR 16,000 crore as part of its borrowing strategy for the period of October to March (H2FY23). The Union Government's Budget 2022 has proposed the issuance of Sovereign Green Bonds as part of its strategy to achieve the net carbon neutrality goal by 2070.

As of February 12, 2020, the amount of green bond debt held by India was 16.3 billion United States dollars, as stated in the report titled "Green Finance in India: Progress and Challenges" published by the Reserve Bank of India. These bonds have been issued by a numerous number of Indian firms. On the India INX, which is situated in Gandhinagar, Gujarat, the bulk of them are listed publicly. INX Gujarat, the Luxembourg Stock Exchange, and the Singapore Stock Exchange (SGX) all listed the US$ 650 million bonds that were issued by SBI on their respective stock exchanges in 2018.

Some issuers of green bonds with the maturity of 10 or more years include (issue year), Yes Bank (2015), Indian Renewable Energy Development Agency (2017, 2019), Rural Electrification Corporation Limited or REC (2017), Power Finance Corporation (2017), Indian Railway Finance Corporation Ltd. (2017), Adani Renewable Energy (2019) etc. Approximately 76% of the bonds issued in India since 2015 were denominated in US dollars.

India leads Asian emerging markets (excluding China) in green bond issuance

The cumulative value of green bonds issued in India was over $21 billion as of February 2023.

Figure 1 shows that the private sector accounted for 84% of the total.

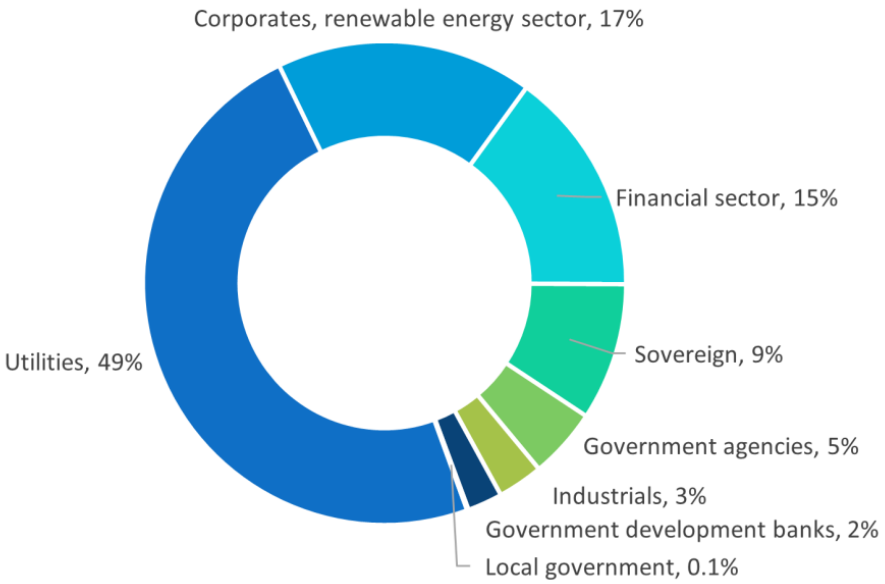

Figure 1 - Green bond amounts issued in India by type of issuer. (Source: World Bank with data from Bloomberg)

ISBN: **978-93-83302-66-6**

India's most prominent issuer of green bonds Greenko Group is financing hydroelectric, solar, and wind power initiatives in multiple Indian states using the proceeds from its environmentally-friendly bonds. Ghaziabad Nagar Nigam, a municipal corporation in Uttar Pradesh, has become the first local government in India to successfully issue a green bond worth USD equivalent of 20 million in 2021. The Indore Municipal Corporation issued green bonds of USD 87 million in 2023.

Indian issuers have issued a greater amount of green bonds ($21 billion) than other emerging markets in Asia, excluding China. With the foray of the Government of India into the green bond market, it can look forward to more investments in green and climate-friendly projects and activities that will contribute towards India's transition towards green, resilient, and inclusive development.

Challenges Associated with Green Bonds In India

The challenges associated with green bonds in India are as follows

Lack of Awareness

The primary factor hindering the success of green bonds in India is the insufficient awareness and comprehension of the concept. A significant portion of the Indian population lacks awareness regarding the concept and functioning of green bonds. There is a widespread lack of awareness regarding the advantages of investing in green bonds and their potential to mitigate environmental concerns. The absence of consciousness on this matter poses challenges in establishing a market for environmentally-friendly bonds in India.

Lack of Standardization

The absence of standardisation is another obstacle that impedes the expansion of the green bond market in India. The absence of uniformity poses challenges for investors in terms of comparing the ecological consequences of various projects and evaluating the investment risks connected with green bonds. There is a requirement for a uniform framework that can be employed to assess the ecological consequences of projects and to guarantee that the funds generated through green bonds are allocated towards ecologically friendly initiatives.

Increasing Transparency

The absence of transparency in the green bond market poses challenges for investors in evaluating the ecological consequences of the projects they are funding. Transparency is crucial for the efficacy of green bonds in India. This entails furnishing investors with transparent and precise information regarding the projects that are being financed through green bonds. Greenwashing, often known as "green sheen," poses a significant difficulty. Greenwashing is a misleading advertising or marketing technique that uses green marketing to falsely convince the public that an organization's products, goals, and policies are environmentally beneficial.

Limited Supply of Green Projects

The scarcity of green projects is another constraint on the expansion of the green bond market in India. The availability of environmentally-friendly initiatives is constrained, and the existing ones are sometimes insufficient in size to captivate the attention of institutional investors. The scarcity of investment options poses challenges for investors seeking to diversify their portfolios and reduces the likelihood of their investing in green bonds.

ISBN: **978-93-83302-66-6**

Lack of Regulatory Framework

The absence of a regulatory framework is a further obstacle that impedes the expansion of the green bond market in India. Currently, there is a lack of regulatory framework dedicated to governing green bonds, resulting in a lack of monitoring and standardisation regarding disclosure requirements and reporting standards. The absence of governmental control poses challenges for investors in assessing the environmental consequences of the funded projects and holding issuers responsible for their conduct.

High Cost of Issuance

The exorbitant expenses associated with issuing green bonds serve as a constraint on the expansion of the green bond market in India. The expenses related to the issuance of green bonds exceed those related to conventional bonds. The elevated expenses associated with this hinder the ability of smaller issuers to penetrate the market and restrict the quantity of green bonds that may be issued.

Ultimately, green bonds in India have not been successful in gaining widespread acceptance due to a multitude of problems, including as insufficient knowledge and understanding among stakeholders, absence of uniform guidelines, scarcity of environmentally friendly initiatives, absence of a well-defined regulatory structure, expensive issuance process, and inadequate trust from investors. In order to tackle these problems, it is necessary to enhance knowledge and instruction regarding green bonds, establish a uniform system for assessing ecological effects, and establish a regulatory structure that ensures supervision and responsibility. Furthermore, it is imperative to augment the availability of environmentally-friendly initiatives and diminish the expenses associated with issuing green bonds in order to enhance their accessibility to a broader spectrum of investors. By implementing these strategies, it is feasible to establish a prosperous green bond market in India that can contribute to.

Future Growth of Green Bond In India

The factors contributing to the potential future growth of green bonds in India are

Government Initiatives: The Indian government has been actively promoting sustainable finance and green initiatives. Policies and regulations that encourage green investments, along with incentives for issuers and investors, can contribute to the growth of the green bond market.

Renewable Energy Development: India has set ambitious targets for increasing its renewable energy capacity. The funding requirements for projects in solar, wind, and other renewable sectors present opportunities for green bond issuance to raise capital for these projects.

Corporate Sustainability Commitments: Many Indian companies are increasingly recognizing the importance of sustainability and environmental responsibility. As part of their corporate social responsibility (CSR) initiatives, companies may choose to issue green bonds to fund projects aligned with sustainable development goals.

Investor Demand: The growing awareness of environmental and social issues among investors, including institutional investors and socially responsible funds, is driving demand for green investments. The willingness of investors to support environmentally friendly projects can fuel the growth of the green bond market.

International Collaboration: India's participation in international efforts to address climate change and sustainable development can lead to collaborations and partnerships that promote green financing. This

ISBN: **978-93-83302-66-6**

may involve the sharing of best practices and experiences with other countries that have well-established green bond markets.

Infrastructure Development: The need for sustainable infrastructure development in India, including transportation, water, and waste management, provides additional opportunities for green bond issuance. These projects can contribute to both environmental and economic sustainability.

Financial Innovation: Ongoing financial innovation, such as the development of new financial instruments and structures, can make green bonds more attractive and accessible to a broader range of investors. This innovation can contribute to the diversification and growth of the green finance market in India.

It's important to note that the growth of green bonds is influenced by a combination of regulatory support, market demand, and the commitment of both issuers and investors to sustainable finance. Monitoring updates from financial institutions, regulatory bodies, and market reports will provide more accurate insights into the current state and potential future growth of green bonds in India.

Conclusion

The worldwide objective of balancing sustainability and economic development has been pursued by nearly all nations. In the case of India, the nation is making progress in this direction, but achieving the Nationally Determined Contributions (NDCs) may appear challenging. Green bonds have introduced a new range of integrated solutions; however, their full potential remains unexplored. Nevertheless, the initial measure should be the implementation of comprehensive legislation that simplifies the system through which alternative approaches such as tax incentives, global standardisation, and enhanced corporate social responsibility can expand. Engaging in proactive advertising and raising awareness can serve as the initial measures to broaden the scope of green bonds.

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ISBN: **978-93-83302-66-6**