Investor Perception and Participation in India's Green Bond Market

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Abstract. This study explored investor perceptions and participation in India's green bond market, a rapidly growing segment since its introduction in 2015. The purpose was to understand the motivations, risk perceptions, and decision-making processes of both institutional and retail investors. The research aimed to fill a significant gap in the literature, where existing studies often focused on market performance and regulatory frameworks, but seldom on investor behavior specific to green bonds in India.

Mixed methods were used, integrating quantitative data from a structured questionnaire and qualitative insights from in-depth interviews with key stakeholders. Descriptive statistics were used to summarize the data, and inferential statistics, including correlation and regression analyses, were applied to identify relationships between investor perceptions, ESG (Environmental, Social, and Governance) criteria, and participation levels. A method of purposive sampling was applied, targeting 150-200 respondents for the quantitative survey and 15-20 key stakeholders for qualitative interviews.

The findings indicated that investor participation in India's green bond market was influenced by a combination of financial returns, perceived environmental impact, and the credibility of issuers. Institutional investors were found to prioritize ESG criteria more heavily, while retail investors focused more on financial performance. Regulatory support and market transparency were also critical in building investor confidence.

However, the study acknowledged certain limitations, including the geographic focus on India, which might limit the generalizability of the findings to other markets. Additionally, the study's reliance on self-reported data could introduce bias. Despite these limitations, the study provides insightful information for regulators, policymakers, and market participants. It suggests that enhancing transparency, standardizing reporting practices, and increasing investor education on the long-term benefits of green bonds could significantly boost market participation.

In conclusion, while the interest in green bonds among Indian investors is growing, addressing challenges such as limited awareness, perceived risk, and lack of standardization is essential for further market development. The studies suggest for strengthening the regulatory framework and fostering a more informed investor base, which could contribute to the sustainable growth of India's green bond market.

Keywords: Green Bonds, Investor Perception, ESG Criteria, Market Participation, Sustainable Finance

S. Gupta et al. (eds.), *Proceedings of the 5th International Conference on the Role of Innovation, Entrepreneurship and Management for Sustainable Development (ICRIEMSD 2024)*,
Advances in Economics, Business and Management Research 310,
https://doi.org/10.2991/978-94-6463-612-3_19

1. Introduction

1.1 Global Emergence of Green Bond Market

Green Bonds represents a noteworthy breakthrough in finance that aims to mitigate ecological problems by allocating cash towards sustainable projects. The European Investment Bank initially offered these bonds in 2007 with the aim of raising money for environmentally beneficial initiatives like green farming, pollution management and energy efficiency. (Climate Bonds Initiative, 2021). Green bonds have gained appreciation during the last ten years due to rising understanding of the effect of climate disturbance and a requirement for environmentally friendly initiatives. As a output, they are now crucial tools for financing green initiatives in both the commercial and government sectors.

1.2 Growth of Green Bond Market in India

Since its launch in 2015, the green bond market in India has expanded significantly, propelled by the nations dedication to accomplish its target for climate change and green energy sources. India's road towards sustainable finance began with Yes Bank's initial green bond offering, which raised INR 1000 crores (about USD 160 Millions) for energy-efficient development. Subsequently, notable corporations such as State Bank of India (SBI), The Indian Renewable Energy Development Agency (IREDA), and the National Thermal Power Corporation (NTPC) issued green bonds. These organizations intend to back projects related to energy conservation, environmentally friendly infrastructure, wind and solar electricity. (Securities and Exchange Board of India [SEBI], 2022). India had become a major force in the global green bond marketplace by 2022, with the aggregate offering exceeding USD 18 Billion. (Climate Bonds Initiative, 2022)

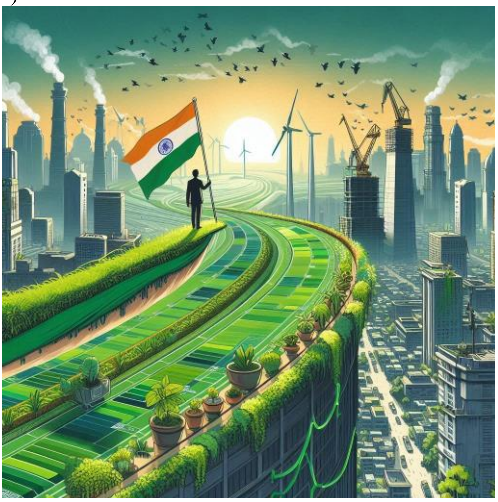

Figure 1: Green Bond Market in India (Generated by AI)

A pro-green foundation in India and growing popularity among investors in sustainable finance have fueled the growth of green bond market. In 2017, SEBI unveiled extensive regulations that governed the issuance of green bonds, bringing them into accordance with global norms including the Green Bond Principles. These rules enhanced investors' trust and openness in the marketplace by ensuring that the money raised from green bonds was only used for ecologically friendly projects. (SEBI, 2017). Furthermore, the increasing attention that ESG is receiving on a worldwide scale has drawn foreign institutional investors to India's green bond market, which has added to its growth. India's green bond market is expanding amid obstacles including insufficient awareness and higher issuing cost and it is vital to the nation's journey towards a carbon- neutral economy.

1.3 Research Gap in Investors' Perceptions.

Most of the research to date has concentrated on the technical and legal components of green bonds, including policy structure, market outcomes and the outcome of sponsored activities on the surroundings. (Sinha & Gupta, 2020; Climate Bonds Initiative, 2021). Little study has been conducted on the psychological characteristics of investors namely perspective, motives and variable driving their involvement in this nascent market, despite the substantial expansion of the green bond market in India. The organizational and financial aspects of green bond have been well examined by this research, but they frequently ignore the stakeholder's viewpoint which happens to be vital for comprehending strategies to maintain and expand the market. Furthermore, the difficulties faced by the investors such as perceived risk, a lack of standardize practices and an absence of trustworthy details about green bonds in Indian markets have hardly been examined in the literature. By investigating investors' attitude and involvement, this study seeks to close these loopholes and offer insights that may influence legislation and promote market growth.

2. Review of Literature

Authors (Year)	Title	Focuses
Sinha, P., & Gupta, S. (2020)	Green bonds in India: Potential, challenges, and strategies for sustainable finance	This paper focuses on the prospect of the green bond market in India with focus on the difficulties that confronts the issuer and investors.
Saxena, A. (2021)	ESG integration in investment decision-making: Evidence from India's financial sector	This study looks at how Indian institutional investors consider ESG factors into their investment choices. It concludes that although ESG factors are becoming more significant, there is still lack of uniformity and knowledge in the green bond market.
Mukherjee, D., & Roy, S. (2022)	Investor behavior in green finance: The case of green bonds in India	The research examines investors actions in green bond market with particular focus on how investors perceive risk and return. The researcher discovers that although the investors are drawn to green bonds, major obstacles to wider involvement still exist due to worries over effectiveness and transparency.

Sharma, V., & Srivastava, M. (2019)	The role of green bonds in financing renewable energy projects in India	This article delves into the characteristics of green bonds in funding India's clean energy industry. It highlights the significance of trust amongst investors in these forms of financing and explores how green bonds have aided in growth of large scale solar and wind projects.
Ghosh, A., & Jain, S. (2020)	Green bonds in emerging markets: A case study of India	The case study highlights the potential and challenges to emerging countries w.r.t green bond market. The writer addresses the variables influencing investors involvement and offer opinion on investors sentiments on green bonds.
Haque, M. E., & Tiwari, A. K. (2021).	Green finance in India: Regulatory framework, market developments, and investor sentiment	The article offers a thorough analysis of India's green finance scenes, taking into account the functions of green bonds. It talks about industry trends, legislative changes and investors' changing perception of financial sustainability.
Bhattacharya, A., & Singh, R. (2019)	Financing sustainability: The impact of green bonds on the Indian bond market	This study looks at the effect of green bond launch on India's overall bond market. The authors conclude while investors' enthusiasm about sustainable finance has increased because of green bond, issues with market depth and liquidity still exist.
Verma, P., & Goyal, K. (2021)	Challenges and opportunities for green bond investors in India	The paper confronts difficulties that investors in India's green bond market face such as lack of standards, increased expenses and low knowledge. It takes into account the room for expansion that arises from a stronger regulatory framework and greater investor knowledge.

3. Research Methodology

3.1. Objectives of the Study

a. To investigate investors behavior in India's green bond market with an emphasis on perception, motives and the variable influencing investment choices.

b. To examine the obstacles that investors encounters in Indian green bond market such as alleged risk, absence of standardized procedures and constrained availability of information, and evaluate the impact of these obstacles on their engagement.

c. To explore the tactics for maintaining and growing green bond market in India considering investors viewpoint with the aim to find information which can have impact on policy formulation and market expansion activities.

3.2. Hypothesis of the Study

Hypothesis 1 (H1): The perceptions and intentions of investors greatly impact their involvement in India's green bond market.

Hypothesis 2 (H2): Investors engagement in India's green bond market is heavily impacted by issues like potential risk, an absence of established processes and restricted access to trustworthy information.

Hypothesis 3 (H3): The viewpoints of stakeholders can greatly influence strategies that support the growth and sustainability of the green bond market in India.

3.3. Scope of the Study and Limitations:

To fill the vacuum in existing literature, which has a primary focus on the technical, legislative and monetary aspect of green bond, this research examines the mental and the behavioral characteristics in India's green bond market. The goal of the study is to shed light on how investors viewpoint, drives and variable push their involvement and affect their investment choices in new industry. The study also investigates the difficulties that investors have, such as fears about risk, lack of standard operating procedures and difficulty in obtaining reliable data on green bond in India. The research is aimed at providing policymakers, regulators and market players with useful information on how to improve investors' involvement, shape laws and eventually support long term development.

Significant number of green bond investors are based in large Indian financial centers like Delhi and Mumbai where the study was carried out. The study's limitations include its concentration on urban location and comparatively limited size of retail investors even if it offers insightful information about investors behavior. Furthermore, the results rely on data provided by participants, which could be biased.

3.4 Method

Data Collection Method	**Primary Data:** • Information gathered by means of standardized questionnaire sent to the retail green bond investors in Mumbai and Delhi. • Interview with 15-20 key stakeholders for qualitative interviews **Secondary Data:** • Data compiled from market evaluations, financial reports, and government documents on green bonds in India to offer contextual information and bolster the conclusions.
Sample Size	• The consumer survey has a sample size of about 400 respondents. • A purposive sample technique is employed to pick 15-20 industrial experts and 5 businesses for case studies.

Sample Size Calculation	• Cochran Formula $N0 = [(Z^{2} \cdot p.(1-p))/e^{2}]$ *Where:* *N0 = sample size* *Z = Z value (1.96 or 95% confidence level)* *p = estimated proportion of the population. (0.5)* *e = margin of error (0.05)* *Applying these values:* $N0 = [((1.96)^{2} \cdot 0.5. (1-0.5))/ (0.05)^{2}]$ ***= 384***
Sampling Technique	• A purposive sample approach was adopted where the population is either retail investors who purchased or the one who expressed interest in green bonds. The selection of retail investors was conducted across the financial hub of Mumbai and Delhi to ensure a diverse range of geographical locations, investing histories and degree of expertise with green bond.
Statistical Analysis Technique	• **Quantitative Technique** ○ **Descriptive analyses** to provide a summary of retail investors demographics and views on green bond. ○ **Factor Analysis** is used to determine primary variables impacting the choice of green bond among retail investors. ○ **Regression Analysis** is carried out to investigate the connections between incentives, the amount invested in green bonds and the expected risk. ○ **Correlation Analysis** carried out to investigate connection between incentives, the amount invested in green bond and expected risk.
Statistical Tool	• **SPSS:** For descriptive statistics, factor analysis, regression analysis, and correlation analysis. • **Excel:** Utilized for data cleaning, organization and preliminary visualization of key findings.

4. **Data Analysis and Interpretation**

The study and data collected from 396 individual retail investors serve as a foundation for each explanation provided below.

Table No 1: Demographic Information			
Category	**Variable**	**Frequency**	**Percentage (%)**
Age	18-30 years	147	37%
	31-45 years	166	42%
	46-60 years	64	16%
	Above 60	19	5%
		396	100%
Gender	Male	249	63%
	Female	147	37%
	Others	0	0
		396	100
Educational Qualification	Undergraduate	162	41%
	Postgraduate	190	48%
	Professional Degree	44	11%
		396	100%
Investment Tenure in Green Bond	Less than 1 year	155	39%
	1-3 years	186	47%
	More than 3 Years	55	14%
		396	100%

4.1 Factor Analysis

The key factors identified are

- Investors Knowledge and Awareness
- Financial Incentives
- Market Risks and Challenges
- Environmental Concern

4.2 Correlation Matrix

Variables	X1 (Knowledge)	X2 (Financial Returns)	X3 (Environmental Impact)	X4 (Perceived Risk)	Y (Investment Level)
X1 (Knowledge and Awareness)	1	0.58	0.45	-0.38	0.64
X2 (Motivation for Financial Returns)	0.58	1	0.36	-0.41	0.72
X3 (Environmental Impact Motivation)	0.45	0.36	1	-0.29	0.56
X4 (Perceived Risk)	-0.38	-0.41	-0.29	1	-0.47
Y (Level of Investment)	0.64	0.72	0.56	-0.47	1

4.3 Regression Analysis

Dependent Variable: Level of Investment in Green Bonds
Independent Variables: Perceived Risk, Motivation (Financial Returns, Environmental Impact), Access to Information

- Motivation for Financial Returns: Positive and significant correlation ($\beta = 0.47$, $p < 0.01$)
- Environmental Impact Motivation: Positive but not much significant correlation ($\beta = 0.24$, $p < 0.05$)
- Perceived Risk: Negative and significant correlation ($\beta = -0.32$, $p < 0.01$)
- Access to Information: Positive and significant correlation ($\beta = 0.38$, $p < 0.01$)

5. Findings of the Study

The finding of this research portrays financial rewards as well as investors knowledge and awareness have a major impact on retail investors involvement in India's green bond market. The expectation of monetary gain is the main driver of the investor's behavior. Positive regression results and strong correlation (0.72) support the point that investors are more inclined to purchase green bonds if they are looking to make money. Furthermore, investors knowledge is important since higher awareness is positively correlated with greater investment levels with (correlation 0.64).

Conversely, perceived risk has negative connection with investment (-0.47), meaning investors become less eager to invest as perceived risk increases. The result also shows although financial concerns have a greater influence, sustainability remains a significant incentive. This shows that the retail involvement in the green bond market might be greatly increased by enhancing awareness among investors and lowering perceived risk via improved regulation and transparency.

6. Conclusion of the Study

The conclusion emphasizes how important financial rewards and investors education are influencing retail investors involvement in India's green market. According to the study, increased investment is largely driven by the knowledge and understanding of green bonds, even though the financial benefit is still the primary driver. On other hand, perceived risk shows up a significant obstacle that keeps away a lot of investors from entering the green bond market. Even environmental concerns don't seem to have much impact on investment choices.

7. Recommendations

The following suggestions are made to enhance the retail investors participation in India's Green Bond Market

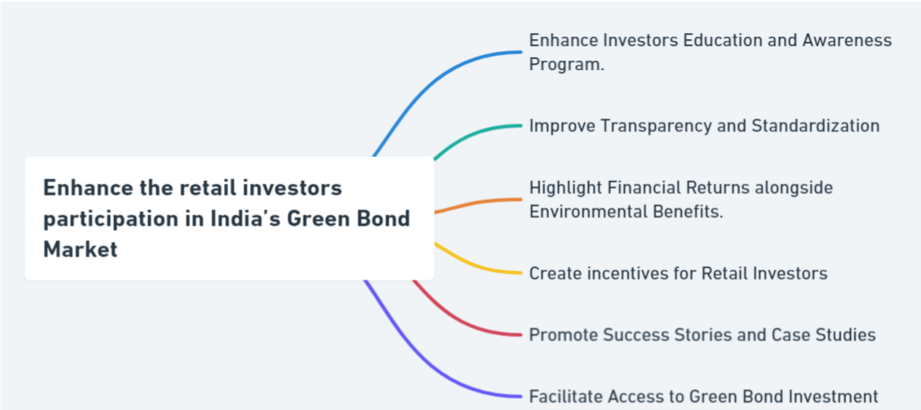

Figure2: Green Bond Market in India (Generated by AI)

a. Enhance Investors Education.
Focused educational programs should be created to educate retail investors on the benefits and drawbacks of green bonds. Having more awareness can help them to make informed choices, which might raise their market involvement.

b. Improve Transparency and Standardization
Issuers and regulatory bodies ought to strive towards developing uniform criteria from green bonds to allay worries about the perceived risks. Retail investors' perception of risk can be decreased, and their trust can be increased by being transparent in reporting on bond's financial results and ecological impact.

c. Highlight Financial Returns alongside Environmental Benefits.
A marketing campaign should highlight the financial outcome and beneficial environmental effects of the green bonds. Green bonds are attractive to a wider

variety of retail investors who are aiming for gain and benefit as they combine financial motivations with environmental concerns.

d. Create incentives for Retail Investors
For retain investors in green bonds, authorities and financial institutions may implement tax break, reduced entrance hurdles or other advantages. By making green bond market economically attractive, such benefits would engage more people to engage in it.

e. Promote Success Stories and Case Studies
Giving examples of the actual instances of the beneficial effect on the planet and the accomplishment of the regular people making profit from green bond investments can be quite inspiring. Emphasizing measurable results might contribute to establishing trustworthiness and drawing in additional institutional investors.

f. Facilitate Access to Green Bond Investment
Financial institutions ought to provide convenient platforms and reduce the minimum investment requirements to facilitate investors' exposure to green bonds. More investors may consider green bonds as investors choice is investing experience is simplified.

References

1. Al-hazimeh, A. M., & Zakari, A. (2023). A bibliometric analysis of green bonds and sustainable green energy: Evidence from the last fifteen years (2007–2022). *Sustainability, 15*(7), 5778.
2. Bachelet, M. J., Becchetti, L., & Manfredonia, S. (2019). The green bonds premium puzzle: The role of issuer characteristics and third-party verification. *Sustainability, 11*(4), 1098.
3. Baker, M., Bergstresser, D., Serafeim, G., & Wurgler, J. (2018). Financing the response to climate change: The pricing and ownership of U.S. green bonds. *NBER Working Paper Series*, No. 25194.
4. Berensmann, K., & Lindenberg, N. (2016). Green bonds: Institutional factors and the potential for developing a green bond market in developing countries. *German Development Institute Discussion Paper*, 25/2016.
5. Bhardwaj, B., & Malhotra, K. (2020). Green bonds in India: A critical analysis. *Journal of Business and Management*, 22(4), 45-52. https://doi.org/10.9790/487X-2204034552
6. Bollen, N. P., & Cohen, M. A. (2021). What explains the green bond premium? *Journal of Financial Economics, 139*(1), 88-105.
7. Climate Bonds Initiative. (2021). India state of the market 2021: Green bonds for climate resilience.
8. Ehlers, T., & Packer, F. (2017). Green bond finance and certification. *BIS Quarterly Review*, September 2017, 89-104. Retrieved from https://www.bis.org/publ/qtrpdf/r_qt1709h.htm
9. Fatica, S., Panzica, R., & Rancan, M. (2021). The pricing of green bonds: Are financial institutions special? *Journal of Financial Stability, 54*, 100873.

10. Flammer, C. (2021). Corporate green bonds. *Journal of Financial Economics, 142*(2), 499-516.
11. Ghosh, S., & Jain, R. (2021). Green bonds: An emerging paradigm for sustainable development. *Finance India*, 35(4), 1193-1209.
12. Karpf, A., & Mandel, A. (2018). The changing value of the 'green' label on the US municipal bond market. *Nature Climate Change, 8*(2), 161-165.