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Institutional Barriers to Green Finance: An Exploratory Study of Financial Institutions in Haryana

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Abstract: ***The promotion of green finance has become essential for achieving sustainable development, yet financial institutions continue to face significant challenges in its implementation. This study investigates the barriers to green finance adoption in Haryana, India, by employing an explorative-cum-descriptive research design. Primary data were collected from 180 professionals working in commercial banks, non-banking financial companies (NBFCs), cooperative banks, and investment firms through a structured questionnaire. Exploratory factor analysis (EFA) was applied to identify the key dimensions of challenges. The findings revealed five critical components: regulatory and market challenges, inadequate frameworks for project evaluation, market barriers, risk factors in green finance, and lack of investor awareness. These factors collectively explain 76.93% of the total variance, highlighting the multidimensional nature of barriers faced by financial institutions. The study underscores the need for stronger regulatory clarity, innovative financial products, robust risk management frameworks, and capacity-building measures to enhance institutional readiness. By addressing these challenges, financial institutions can play a more effective role in channeling resources toward environmentally sustainable initiatives.***

Keywords: ***Green finance, financial institutions, regulatory challenges, market barriers, risk factors, investor awareness, sustainable development etc.***

I. INTRODUCTION

Green finance, broadly defined as financial investments aimed at promoting environmental sustainability and supporting climate-related initiatives, has emerged as a pivotal mechanism in the global response to climate change. It encompasses a wide spectrum of financial instruments, including green bonds, sustainable loans, and investments that encourage the transition toward renewable energy, enhance resource efficiency, mitigate pollution, and conserve natural resources (Kumar, 2021). The increasing recognition of the long-term economic risks associated with unchecked environmental degradation has reinforced the role of green finance in advancing sustainable development, particularly within emerging economies such as India, where balancing growth with environmental responsibility is a pressing challenge (Bhardwaj & Malik, 2022; Sharma & Tandon,

2022). Despite its acknowledged potential, the practical implementation of green finance continues to present multiple challenges for financial institutions. Chief among these are regulatory and policy uncertainties, the limited availability of innovative sustainability-aligned financial products, and a general lack of awareness and expertise among banking professionals and investors (Mishra & Singh, 2020; Rani & Gupta, 2023). These limitations often result in hesitancy in channeling funds into green projects, thereby slowing down the progress of sustainable financing. The evolving body of literature emphasizes that while green finance provides a framework for aligning financial decisions with environmental and societal imperatives, its successful promotion requires robust institutional commitment and systemic support mechanisms (Saeed Meo & Karim, 2022; Wu et al., 2023; Verma, 2022). Green finance manifests in diverse forms, reflecting its multidimensional character. For example, green bonds provide capital for environmentally friendly projects (Yu, 2016), socially responsible investing integrates environmental, social, and governance (ESG) factors into investment decision-making (Walls, 2024), while impact investing seeks to generate measurable social and environmental benefits alongside financial returns (Yaşar, 2021). Although these models differ in focus, they share the overarching goal of facilitating sustainability through financial channels. Their effective adoption, however, depends on the presence of enabling conditions such as regulatory clarity, robust risk management systems, enhanced levels of financial literacy, and the integration of digital technologies into financial practices (Mohanty et al., 2023; Singh & Varma, 2023; Khan & Das, 2024). Scholars further stress that policy support, stakeholder collaboration, and institutional readiness are critical to overcoming the barriers that impede green finance. Recent studies underscore the need for stronger regulatory frameworks to prevent greenwashing, improved risk assessment models to address project uncertainties, and capacity-building measures to enhance the technical knowledge of financial actors (Bhatnagar & Sharma, 2022; Debrah et al., 2023). At the macro level, structural challenges such as project delays, credibility issues in corporate governance, and investor risk aversion have also been identified as major constraints (Mukherjee, 2023; Patel, 2023). Recognizing these barriers, policy interventions from central regulators, including the Reserve Bank of India (2025), have begun to advocate for pooled investments in climate-focused projects and the adoption of climate stress-testing mechanisms to strengthen institutional responses.

II. Literature Review

The implementation of green finance poses significant challenges for financial institutions, both globally and in the Indian context. Despite the increasing recognition of its importance in promoting sustainable development, institutional, regulatory, and market-related barriers continue to limit its full-scale adoption.

One of the foremost challenges is the lack of standardization and transparency in green finance markets. Deschryver and De Mariz (2020) argue that the absence of universally accepted definitions, taxonomies, and benchmarks for green financial products creates uncertainty among investors and institutions. This lack of clarity often leads to concerns about "greenwashing," where financial products are labeled as green without substantial environmental benefits. Saxena and Gupta (2022) echo this concern in their study of the Indian green bond market, highlighting how weak monitoring frameworks and inconsistent disclosure standards undermine investor confidence. Similarly, Weber (2016) points out that without harmonized sustainability reporting standards, financial institutions struggle to assess and compare the true environmental impact of projects, limiting their willingness to engage in green financing. Another critical issue is the limited availability of reliable and consistent environmental performance data. Financial institutions rely heavily on data to assess risks, returns, and impacts, but such information is often fragmented or unavailable, particularly in developing economies (Deschryver & De Mariz, 2020). Mishra and Singh (2020) note that in India, gaps in data and monitoring systems make it difficult to evaluate the true impact of financed projects, thereby hampering decision-making and risk assessment. This concern is echoed by Campiglio (2016), who emphasizes that climate-related financial risks remain underestimated due to insufficient disclosure of environmental and carbon-related data by companies. The small size and limited depth of green financial markets further exacerbate these challenges. Gupta and Jain (2021) emphasize that India's green bond market, though expanding, is still relatively

underdeveloped compared to global standards. Constraining factors such as a narrow investor base, high perceived risks, and low liquidity restrict the capacity of institutions to scale up financing. Additionally, the high upfront costs of green projects, such as renewable energy infrastructure, pose financing difficulties. Many private investors remain hesitant due to long payback periods and uncertain returns (Mishra & Singh, 2020). Flammer (2021) further notes that even globally, the relatively new nature of green bonds means they face skepticism, especially in markets with weak regulatory oversight. Institutional and regulatory challenges also play a significant role. Rao and Jhingan (2020) observe that financial institutions often lack adequate risk management frameworks tailored to green finance, making it difficult to integrate environmental considerations into credit and investment decisions. Inconsistent policy implementation across states and sectors further complicates the operational landscape (Mishra & Singh, 2020). Moreover, limited coordination among regulatory bodies and financial intermediaries creates confusion and slows down the institutionalization of green finance practices. Dikau and Volz (2021) argue that central banks and regulators in developing countries have been slow in mainstreaming green finance into monetary and financial policies, leaving a gap in systemic guidance for institutions. Lastly, there is a challenge of limited financial products tailored to specific environmental outcomes. While instruments like green bonds and loans exist, there remains a shortage of innovative products that can effectively address diverse environmental needs, such as biodiversity preservation, waste management, or sustainable agriculture (Mishra & Singh, 2020). Bhattacharyya (2021) adds that most green financial products in India remain concentrated in renewable energy, while sectors such as sustainable transport, water conservation, and circular economy initiatives receive far less attention. This narrow focus limits the holistic potential of green finance to support the broader sustainability agenda. In addition, capacity-building and awareness gaps within financial institutions themselves pose another hurdle. Weber (2010) stresses that many banks and investment firms lack in-house expertise in environmental risk assessment, leading to cautious or limited participation in green financial markets. This aligns with the findings of Reddy and Acharya (2020), who argue that training, knowledge-sharing, and institutional awareness are essential to enable financial institutions in India to better understand the risks and opportunities of green finance.

Financial institutions face multifaceted challenges in implementing green finance, ranging from inadequate standardization, poor data availability, and market immaturity to high costs, weak regulatory frameworks, and limited institutional capacity. Overcoming these barriers requires coordinated efforts from governments, regulators, and market participants to establish clear guidelines, improve transparency, develop robust data systems, build institutional capacities, and design innovative financial instruments. Only then can green finance achieve its potential to support sustainable development on a significant scale.

III. Research Methodology

The primary objective of this study is to examine the **challenges faced by financial institutions in the implementation of green finance** in Haryana, India. To achieve this, an **explorative-cum-descriptive research design** was employed. The exploratory component aimed at identifying and classifying the key barriers in promoting green finance, while the descriptive component sought to analyze and quantify their relative significance across different financial institutions. The target population comprised professionals working in **financial institutions,** including commercial banks, non-banking financial companies (NBFCs), cooperative banks, and investment firms operating in Haryana. Haryana is administratively divided into six revenue divisions: **Ambala, Faridabad, Gurugram, Hisar, Karnal, and Rohtak.** To ensure representativeness, one city was randomly selected from each division using the **lottery method.** Within each selected city, financial institutions were identified and respondents were chosen based on their engagement in lending, investment, or advisory activities related to sustainable finance. A **purposive sampling technique** was adopted, since the study required respondents with knowledge and/or involvement in green financial practices. The final sample size consisted of **180 respondents,** which was considered adequate for meaningful statistical analysis. The study relied primarily on **primary data** collected through a **structured questionnaire**. The questionnaire consisted of both **closed-ended and Likert-scale items,** covering multiple dimensions of challenges. The

collected data were coded and analyzed using **SPSS.** Descriptive statistics (mean, standard deviation, frequency, and percentages) were employed to summarize the demographic profile of respondents and identify major challenges. **Exploratory factor analysis (EFA)** was conducted to group interrelated items into broader challenge categories.

IV. Analysis and Findings

This section presents the results of the data analysis conducted to examine the challenges faced by financial institutions in the implementation of green finance. The analysis begins with the demographic characteristics of the respondents, followed by statistical tests to ensure the adequacy of the data for factor analysis, and finally the extraction of key components influencing green finance implementation.

Table 1: Demographic profile of the respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	112	62.22
	Female	68	37.77
Age Group	21–30 years	52	28.89
	31–40 years	65	36.11
	41–50 years	47	26.11
	51 and above	16	8.89
Education	Graduate	66	36.67
	Postgraduate	84	46.67
	Doctorate	30	16.67
Experience	0–5 years	54	30.00
	6–10 years	59	32.78
	11–15 years	41	22.78
	16+ years	26	14.44
Institution Type	Commercial Bank	83	46.11
	NBFC	45	25.00
	Cooperative Bank	36	20.00
	Investment Firm	16	8.89
Designation	Managerial Level	64	35.56
	Senior Officer	46	25.56
	Junior Officer	52	28.89
	Support Staff	18	10.00

Source: Primary Data

Table 1 presents the demographic characteristics of the 180 respondents. The sample comprised a majority of male participants (62.22%) compared to females (37.77%). Most respondents were in the age group of 31–40 years (36.11%), followed by 21–30 years (28.89%), while only 8.89% were above 50 years. In terms of education, postgraduate degree holders formed the largest group (46.67%), followed by graduates (36.67%) and doctorates (16.67%). Regarding work experience, 32.78% of respondents had 6–10 years of experience, while 30% had less than 5 years. With respect to institutional affiliation, nearly half were from commercial banks (46.11%), with the rest distributed among NBFCs (25%), cooperative banks (20%), and investment firms (8.89%). Designation-wise, managerial-level officials accounted for 35.56% of the sample, followed by junior officers (28.89%), senior officers (25.56%), and support staff (10%).

Table 2: KMO and Bartlett's Test Statistics

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.832
Bartlett's Test of Sphericity	Approx. Chi-Square	4016.171
	df	276
	Sig.	.000

To validate the suitability of the data for factor analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were employed. The KMO value of 0.832, which exceeds the recommended threshold of 0.70, indicates that the dataset is meritorious and appropriate for factor analysis. Additionally, Bartlett's test of sphericity was

statistically significant ($\chi^2 = 4016.171$, df = 276, $p < 0.001$), confirming that the variables are sufficiently correlated to justify factor extraction.

Table 3: Total Variance Explained

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.663	27.761	27.761	6.663	27.761	27.761	4.418	18.408	18.408
2	4.790	19.959	47.720	4.790	19.959	47.720	4.112	17.133	35.541
3	3.329	13.871	61.591	3.329	13.871	61.591	3.749	15.622	51.163
4	2.106	8.777	70.368	2.106	8.777	70.368	3.739	15.581	66.744
5	1.574	6.560	76.928	1.574	6.560	76.928	2.444	10.184	76.928
6	.706	2.942	79.870						
7	.558	2.326	82.196						
8	.534	2.227	84.424						
9	.468	1.949	86.372						
10	.416	1.733	88.105						
11	.363	1.513	89.618						
12	.338	1.407	91.025						
13	.323	1.347	92.372						
14	.311	1.296	93.668						
15	.282	1.174	94.842						
16	.264	1.101	95.943						
17	.243	1.012	96.955						
18	.211	.880	97.834						
19	.175	.730	98.565						
20	.157	.653	99.218						
21	.074	.308	99.525						
22	.058	.242	99.767						
23	.037	.154	99.921						
24	.019	.079	100.000						
Extraction Method: Principal Component Analysis.									

Principal Component Analysis (PCA) with Varimax rotation was applied to identify the underlying dimensions of challenges in green finance implementation. The results revealed five components with eigenvalues greater than one, collectively explaining 76.93% of the total variance. This high percentage suggests that the extracted factors provide a strong and comprehensive representation of the challenges under investigation.

Table 4: Rotated Component Matrix

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
RMC6	.906				
RMC4	.882				
RMC5	.880				
RMC3	.804				
RMC2	.802				
RMC1	.791				
IFP3		.901			
IFP2		.884			
IFP4		.867			
IFP5		.851			
IFP1		.835			
MKB5			.858		
MKB2			.854		
MKB3			.837		
MKB1			.829		
MKB4			.807		
RIK1				.840	

RIK2				.838	
RIK3				.819	
RIK4				.817	
RIK5				.808	
LIA3					.944
LIA2					.938
LIA1					.719

The first component, Regulatory and Market Challenges (RMC), consists of six items (RMC1–RMC6) with strong factor loadings ranging from 0.791 to 0.906. This component highlights barriers such as unclear regulatory guidelines, policy inconsistencies, and weak market mechanisms, all of which contribute to uncertainty and hesitation among financial institutions when adopting green finance. The second component, Inadequate Framework for Project Evaluation (IFP), is represented by five items (IFP1–IFP5) with high loadings between 0.835 and 0.901. This factor reflects difficulties arising from longer payback periods, ambiguous project appraisal methods, and uncertain returns on investment for green projects, making institutions less willing to extend financing. The third component, Market Barriers (MKB), comprises five items (MKB1–MKB5) with factor loadings ranging from 0.807 to 0.858. This component underscores obstacles such as limited availability of innovative financial instruments, insufficient policy or fiscal incentives, and low market penetration, which collectively restrict the expansion of green finance initiatives. The fourth component, Risk Factors in Green Finance (RIK), is explained by five items (RIK1–RIK5) with factor loadings from 0.808 to 0.840. This dimension captures the high perceived risks associated with green finance, including credit risks, financial uncertainties, and the volatility of returns, which discourage institutions from engaging in such investments. Finally, the fifth component, Lack of Investor Awareness (LIA), is formed by three items (LIA1–LIA3) with loadings ranging from 0.719 to 0.944. This factor emphasizes the insufficient knowledge, awareness, and interest among investors regarding the potential and benefits of green finance, thereby limiting demand and overall adoption.

Overall, the rotated component matrix confirms that the challenges in implementing green finance can be categorized into five broad dimensions: regulatory and market challenges, risk factors, lack of investor awareness, inadequate project evaluation frameworks, and market barriers. Together, these components provide a comprehensive understanding of the multifaceted constraints that financial institutions encounter while promoting sustainable finance practices.

V. Conclusion

The present study explored the challenges faced by financial institutions in promoting green finance within the context of Haryana, India. The findings confirm that despite growing awareness of the importance of sustainability-oriented financial practices, institutional adoption of green finance remains constrained by multiple factors. Five critical dimensions emerged as key barriers: regulatory and market challenges, inadequate frameworks for project evaluation, market barriers, risk factors, and lack of investor awareness. Together, these dimensions reflect the complex interplay of policy gaps, limited financial innovation, risk aversion, and insufficient stakeholder knowledge that collectively hinder the scaling of green finance initiatives. The results emphasize that overcoming these barriers requires an integrated approach involving policymakers, regulators, financial institutions, and investors. Regulatory bodies must provide consistent guidelines, strengthen monitoring mechanisms, and design policies that encourage innovation and market participation. Financial institutions, on their part, need to invest in capacity-building, develop robust risk assessment frameworks, and diversify financial instruments tailored to different sectors of sustainability. Equally important is the need for greater awareness and literacy among investors to stimulate demand for green financial products. By addressing these challenges, financial institutions can significantly enhance their role in supporting India's transition toward a low-carbon, resource-efficient, and climate-resilient economy. The study thus contributes to both academic discourse and practical policymaking by providing insights into the multidimensional nature of barriers in green finance implementation and highlighting pathways for strengthening institutional readiness and market development.

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