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Assessing the impact of environmental finance mechanisms on corporate sustainability in Banking sector

Tanveer Ahmed Siddquee*

Motijheel Branch, Bangladesh Development Bank PLC, Dhaka, Bangladesh

*Correspondence: tanveer.bdbl@gmail.com

Abstract

This study looks into the significance of ecological finance structures in advancing sustainable services in Bangladesh's banking arena. By applying a numeric research strategy, data was amassed using a thorough questionnaire answered by 400 respondents, which included tellers, customers, and market stakeholders. This review assesses how green financing methods, focusing on green loans and the management of ecological threats, contribute to the overarching sustainability goals in the industry. The results underscore that financial frameworks emphasizing environmental sustainability powerfully enhance sustainability effects, showcasing strong and positive links between green finance activities and corporate sustainability. This study sheds light on the critical importance of supervisory strategies, like the Green Banking Policy put forward by the Bangladesh Bank, to further responsible banking ventures. Limitations in budget allocations, poor educational opportunities, and the absence of credible reporting systems restrict the fluid implementation of these practices in daily habits. According to this analysis, it is recommended that banks give priority to expanding their green funding efforts, optimize their operational procedures, and elevate sustainability reporting to guarantee ongoing advantages for the environment and the economy.

***Keywords*:** Environmental finance; corporate sustainability; green banking; green loans; green bonds; environmental risk management

1. Introduction

The fast pace of climate modification and environmental deterioration has actually made sustainable funding an immediate global issue. The Financial sector has recently faced increased examination concerning its function in either exacerbating or alleviating ecological risks.). Banks are uniquely placed to affect the shift towards a greener economy because they are important intermediaries for moving money (Sule et al., 2024). Green bonds, sustainability-linked loans, ecological danger management policies, and climate conscious credit allowances are all examples of environmental funding systems that are now viewed as trustworthy ways to align financial circulations with goals for sustainable improvement (Sule et al., 2024). Acknowledging these barriers, the Bangladesh Bank has in fact provided regulative standards, including the Green Banking Policy (2011) and the Sustainable Finance Policy (2018), which mandate banks to accept environmentally liable practices and designate a part of their portfolios to green tasks (Zhang et al., 2022). The mechanisms for environmental financing have amassed significant analysis on a global scale, functioning as essential instruments beforehand sustainable practices throughout various sectors, consisting of banking. The banking sector plays an essential function in promoting financial advancement and shaping organizational conduct in Bangladesh, an establishing country dealing with different environmental challenges (Saif-Alyousfi & Alshammari, 2025).

Banking sector sustainability is defined by monetary development while also prioritizing ecological care, neighborhood duties, and strong governance procedures (Siddik et al., 2024). For financial institutions in Bangladesh, the adoption of environmentally friendly financing systems transcends simple compliance requirements and emerges as a tactical essential to boost their reputational capital, attract socially responsible investors, and guarantee enduring sustainability (Hossen et al., 2024). The financial domain, made up of a blend of specific and cumulative institutions, has slowly pertained to understand the urgency of weaving environmental aspects into their organization approaches and financial frameworks (Sultana & Hossain, 2024). This research study's goal is to recognize the ignored areas in the evaluation of how environmental financing connects to business sustainability in the banking field of Bangladesh. This research's results boost the increasing swimming pool of literature regarding sustainable finance while providing substantial insights for policymakers, bank leaders, and stakeholders in Bangladesh. The expectation is that the results will supply data-driven viewpoints for decision-makers, oversight authorities, and financial organizations, therefore enhancing scholarly discussion and promoting educated options in environment-friendly funding.

2. Literature Review

This research study integrates prior examinations concerning ecological funding mechanisms and their impacts on corporate sustainability within the banking sector of Bangladesh. Ecological funding represents a comprehensive domain that intertwines environmental aims with methodologies for carrying out financial choices (O.C., 2024). It encompasses a diverse variety of

financial activities aimed at promoting sustainable development, addressing eco-friendly obstacles, and minimizing ecological hazards (Puaschunder, 2023).

Sustainable financing embodies a more comprehensive idea that extends beyond simple eco-friendly considerations. It integrates components of ecological, social, and governance (ESG) factors in the procedure of monetary decision-making (Niamh, 2024).In the banking world, this indicates providing money to and buying projects or business that fit with concepts about sustainability (Gupta & Perwej, 2024). Sustainable financing pushes banks to consider the impacts on the society, environment, and governance when they look at financial investment chances or provide loans (Gupta & Perwej, 2024). The goal of CSR in the banking industry is to make individuals feel responsible for the environment and society (Niamh, 2024). Some examples of ecological CSR activities for banks are lowering their carbon footprint, getting associated with environmental tasks in their communities, or starting their own programs to be more eco-friendly, like cutting down on waste or building energy-efficient buildings. Individuals think that banks with strong ecological CSR policies are more devoted to sustainable organization practices. This can help their performance history and make customers more loyal (O'Sullivan, 2024). Climate-related threats, like flooding, bad weather, or changes in emissions policies, can put certain investments or loan portfolios at risk of losing money. Banks do a lot of environmental risk assessments when they make loans and investments, making sure that environmental factors are taken into account along with standard financial ones (Cucinelli et al., 2024). One of the main ways banks helps with environmental funding is by giving credit to green jobs. Green loans are made to pay for jobs that directly help the environment, like building energy-efficient buildings, producing resources in a way that doesn't harm the environment, and farming in a way that doesn't harm the environment. Green bonds are another important monetary tool for funding environmental tasks. Environmental financing works at various levels in the banking industry, from funding specific green jobs to making sustainability a larger part of a bank's service design (Sohail et al., 2023). Ecological financing uses banking organizations a chance to improve their long-lasting practicality by mitigating the threats related to ecological change, therefore increasing their trustworthiness among customers and financiers, and assisting in the achievement of wider nationwide and worldwide sustainability goals (Khairunnessa et al., 2021). In response to these existential obstacles, banks have progressively integrated green financing structures into their strategic initiatives worrying danger sustainability, governance, and management endeavors (Halimuzzaman, Wafik, et al., 2024; Mohammad Sarwar Hossain Islam et al., 2024). Prominent worldwide banks have actually adopted green financing approaches, inspired by escalating regulatory demands, customer expectations for morally accountable financial investment products, and increased awareness of climate-related financial threats (Zhang et al., 2022).

This phenomenon has actually triggered many worldwide financial organizations, such as the World Bank and the European Investment Bank, to back funding mechanisms that facilitate the

global shift towards a low-carbon economy (Datta et al., 2024; Khondkar & Honey, 2022). Banking organizations have certainly reacted by implementing strategies that encourage financial investments in renewable resource sources, sustainable facilities, and innovations targeted at carbon mitigation (Halimuzzaman, Sharma, et al., 2024; Honey, 2019b). The significance of sustainable advancement was further highlighted by the United Nations' Sustainable Development Goals (SDGs), which have set particular targets for financial institutions to align with. These objectives, particularly those associated with budget-friendly and tidy energy (Goal 7) and climate action (Goal 13), have pressured financial organizations to incorporate environmental sustainability into their core company designs (Honey, 2025; Kobiyh & Ed-Dafali, 2024). A growing body of research highlights that green banking practices are not only excellent for the environment but can also enhance a financial institution's overall performance. Research studies by McKinsey and Goldman Sachs show that financiers and banks focused on sustainability tend to outshine their peers in the long term (Honey, 2019a; Honey & Hossain, 2024; Sohail et al., 2023). Green finance products, such as green bonds and sustainable loans, are typically associated with lower monetary risks, especially environmental, regulatory, and reputational threats. Banks that include environmental danger evaluations in their investment techniques are less likely to be affected by ecological disasters or policy changes (Honey, 2019b; Rebelo & Vieira, 2024). As global customer awareness of ecological concerns increases, individuals and services place more value on sustainability. This pattern is particularly pronounced among younger generations, including Millennials and Generation Z, who are highly attuned to the environmental impacts of the services they engage with. For banks, this consumer shift presents both difficulties and opportunities (Khairunnessa et al., 2021). Banks that focus on ecological sustainability through the advancement of green items, financing for renewable energy, and sustainable financing practices not only satisfy growing customer needs but also separate themselves in a competitive market. Consumers are more likely to trust and remain devoted to banks that demonstrate a genuine commitment to environmental and social issues (Sharma & Jain, 2024). The Bank of America, for example, has made considerable monetary investments in green finance, committing billions of dollars to money neat energy jobs and assist environment adjustment methods. International bodies, such as the Financial Stability Board (FSB) and International Finance Corporation (IFC), have established standards to help monetary organizations in understanding and handling ecological dangers. The EU Sustainable Finance Action Plan plans to reorient capital flows towards sustainable financial investments, consequently promoting sustainable economic growth (Sharma & Jain, 2024). While existing studies supply important insights into the relationship between ecological financing systems and corporate sustainability, there is a need for more detailed and quantitative research study in the context of Bangladesh. Future research might examine the effect of particular green finance products, such as green loans and green bonds, on banks' financial effectiveness and ecological results. Research should analyze the function of digital technologies in facilitating the application of sustainable financing practices.

The main obstacle in investigating the result of environmental funding systems on company sustainability in Bangladesh's banking sector is the lack of sufficient and consistent info on the execution and outcomes of green-financing efforts (Sohail et al., 2023). Numerous banks in Bangladesh are still in the early phases of including ecological funding into their operations, causing gaps in thorough reporting on sustainability metrics and green financial investment portfolios (Banga & Afzal, 2024). The lack of standardized ecological reporting structures makes complex the measurement of sustainability results, making it challenging to establish clear cause-and-effect relationships in between green financing practices and concrete sustainability improvements (Hossen et al., 2024).

This research study was guided by the following research questions:

RQ1: What is the relationship between the adoption of eco-friendly funding systems and business sustainability efficiency in Bangladesh's banking sector?

RQ2: How do environmental risk management practices within Bangladeshi banks influence their monetary efficiency and sustainability goals?

RQ3: What are the key challenges faced by banks in Bangladesh in implementing effective ecological finance mechanisms, and how do these challenges affect their corporate sustainability strategies?

RQ4: To what degree do regulative frameworks and policy initiatives by the Bangladesh Bank drive the adoption of green finance practices within the banking sector?

RQ5: How does a client’s understanding of a bank's ecological responsibility affect their loyalty and decision-making concerning banking services in Bangladesh?

This study was guided by the following research objectives:

1. This study evaluates the effect of environmental financing systems on the corporate sustainability efficiency of banks in Bangladesh.
2. This study examines the role of environmental risk management practices in shaping the financial performance and sustainability techniques of banks in Bangladesh.
3. This study aims to determine the crucial obstacles faced by banks in Bangladesh in implementing environmental finance mechanisms and explore their effects on the general sustainability of the banking sector.
4. To examine the impact of regulatory structures, particularly the Green Banking Policy and Sustainable Finance Policy, on the adoption and effectiveness of ecological finance efforts in the Bangladeshi banking sector.
5. To discuss how consumer understanding of environmental duty and sustainable practices effects customer loyalty and banking decisions in Bangladesh.

3. Hypothesis Development

The formula of hypotheses for this research study is based on the current literature concerning ecological funding and organizational sustainability. Based upon previous research study concerning green financing practices, environmental threat management, and the impact of regulative policies, the following hypotheses are presumed:

Zhang et al. (2022) identified that financial organizations providing green loans and bonds show superior ecologically sustainable effectiveness, which as a result results in an increased market share and improved reliability. Because of the escalating focus on sustainable advancement in Bangladesh, banks participating in green financing are forecasted to demonstrate substantial sustainability efficiency with regard to ecological impact, social duty, and governance. Multiple research studies show that the adoption of ecological financing systems enhances company sustainability by directing capital towards projects that are environmentally suitable. Siddik et al. (2024) assert that banks accepting sustainable financing are more proficient at alleviating environmental risks and obtaining enduring success.

H1: *A positive correlation exists between the implementation of environmental funding frameworks and the sustainability efficiency of corporations within the banking sector of Bangladesh.*

Gupta & Perwej, (2024) assert that the integration of environmental danger management into financial decision-making procedures makes it possible for banks to better get ready for and mitigate possible financial losses connected with regulative modifications or environmental disasters. Additionally, O'Sullivan, (2024) found that banks with robust systems for managing ecological dangers normally experience a lower occurrence of non-performing loans and a minimized number of underperforming properties. These insights suggest that an anticipatory approach to environmental dangers, including climate change, has the possible to improve a bank's durability, ultimately improving its financial efficiency and fostering sustainable organizational practices. Provided Bangladesh's vulnerability to environmental threats, such as floods and cyclones, it is assumed that reputable environmental threat management will favorably impact the monetary sustainability of regional banks.

H2: *Environmental risk management practices significantly enhance the monetary efficiency and long-term sustainability of banks in Bangladesh.*

According to Khan et al. (2024) , the execution of required green banking policies has triggered a measurable increase in the allocation of loans to sustainable jobs in several establishing nations. In Bangladesh, the Green Banking Policy (2011) and Sustainable Finance Policy (2018) presented by the Bangladesh Bank were developed to promote environmentally conscious banking practices. Sultana & Hossain, (2024) argue that these policies are vital for motivating banks to integrate ecological aspects into their financing choices and service processes. Thus, this hypothesis

assumes that regulatory involvements significantly affect the extent to which banks embrace environmental finance systems, thereby contributory to enhanced sustainability performance.

H3: *The application of regulative frameworks, such as the Bangladesh Bank's Green Banking Policy and Sustainable Finance Policy, considerably influences the adoption of environmental financing mechanisms in the banking sector.*

Despite the growing push for green finance, banks in developing countries, consisting of Bangladesh, typically deal with barriers to its reliable execution. Rebelo & Vieira, (2024) discovered that the absence of proficient employees and an absence of funds hamper the adoption of green banking practices in lots of emerging economies. Similarly, Cucinelli et al. (2024) argue that while environmental policies remain in place, the absence of awareness and technical know-how among local banks generally results in ineffective implementation. In Bangladesh, Sohail et al. (2023) reported that although banks require to embrace green banking practices, they cope irregular application due to inadequate training, insufficient policy enforcement, and a lack of capital for green jobs. Therefore, it is assumed that these barriers prevent the complete potential of eco-friendly financing in the regional banking sector.

H4: *Banks in Bangladesh face considerable obstacles in carrying out eco-friendly financing mechanisms, consisting of an absence of awareness, inadequate regulative assistance, and monetary restrictions.*

The value of CSR, specifically ecological obligation, in impacting customer behavior has actually been well-documented. Khairunnessa et al. (2021) discovered that clients substantially prioritize ecological elements when picking which company to support. In banking, Pérez et al. (2018) revealed that clients are most likely to stay devoted to banks that get involved in sustainable practices, particularly in regions where environmental concerns are considerable. In Bangladesh, where environmental difficulties such as pollution and climate change are extremely noticeable, consumers are expected to value a bank's dedication to sustainability. Hossen et al. (2024) recommended, banks that align their services with clients' environmental values are probably to experience higher client fulfillment and commitment, resulting in an increased market share. This hypothesis recommends that ecological duty positively influences customer loyalty and banking decisions in Bangladesh. Sharma & Jain, (2024) found that banks offering green loans and bonds report boosted environmental efficiency, leading to increased market share and improved trustworthiness. Provided the growing concentrate on sustainable advancement in Bangladesh, banks participating in green finance are anticipated to demonstrate exceptional sustainability performance in terms of ecological effect, social duty, and governance. Kobiyh & Ed-Dafali, (2024) advise that incorporating ecological risk management into monetary decision-making treatments allows banks to better expect and relieve potential financial losses associated with regulative modifications or ecological disasters. Provided Bangladesh's vulnerability to eco-

friendly risks such as floods and cyclones, it is presumed that efficient ecological risk management will positively influence the financial sustainability of local banks.

H5: *Customer understanding of a bank's environmental obligation favorably influences client loyalty and decision-making in the banking sector of Bangladesh.*

Thus, this hypothesis posits that regulative interventions substantially affect the extent to which banks embrace ecological finance systems, contributing to improved sustainability performance.

4. Methodology

This study employed a quantitative research style to evaluate the impact of environmental finance systems on corporate sustainability in the banking sector of Bangladesh. A structured survey was administered to collect primary data from the target respondent. The survey was designed to capture numerous aspects of ecological finance systems, such as the adoption of green loans, green bonds, sustainability-linked loans, and environmental risk management practices, as well as their influence on business sustainability performance and client understanding. To ensure the representativeness and precision of the findings, a sample frame was constructed carefully. The target population consisted of bank customers, bank employees involved in green financing initiatives, and banking sector stakeholders in Bangladesh. The target market made up banking clients, staff members engaged in green financing efforts, and stakeholders within the banking sector in Bangladesh. A sample size of 400 people was considered enough to yield trusted and valid information for analytical analysis. The subsequent formula was used to ascertain the requisite sample size (Yamane, 1989):

$$n = \frac{Z^2.p.(1-p)}{E^2}$$

The computed sample size of 400 participants was regarded as ideal to guarantee the dependability and validity of the results, verifying that the sample properly showed the varied point of views within the Bangladeshi banking sector. The selected sample size of 400 participants was thought about ideal to ensure the dependability and credibility of the findings, verifying that the sample precisely represented the various point of views within the banking sector in Bangladesh.

5. Results and Discussion

The results of this study reveal the systematic analysis completed on the data from 400 respondents. The findings are gone over in relation to the formerly developed research study concerns and hypotheses, providing insights into the impact of environment-friendly financing mechanisms on corporate sustainability within Bangladesh's banking sector.

5.1 Demographic Profile of the Participants

In this section, the group profile of the participants was analysed to supply an extensive understanding of the sample structure. Looking at variables like age, gender, education, earnings,

and banking choices gives us a better concept of who the individuals are and helps us put the lead to the context of Bangladesh's banking sector's environmental finance systems and service sustainability.

Table 1. Demographic Profile of the Respondents

Demographic Category	Frequency (n)	Percentage (%)
Age		
18-24 years	50	12.5
25-40 years	208	52.0
41-60 years	115	28.7
Above 60 years	27	6.8
Gender		
Male	230	57.5
Female	170	42.5
Income Level (BDT/month)		
Below 20,000	45	11.3
20,000-50,000	145	36.3
Above 50,000	210	52.4
Educational Background		
Secondary School	63	15.8
Bachelor's Degree	155	38.6
Master's Degree	137	34.3
Others	45	11.3
Type of Bank		
Private Commercial Banks	240	60.0
State-Owned Banks	100	25.0
Foreign Banks	60	15.0

Table 1 provides the demographic profile of the 400 participants. Most of the individuals were aged 25-40 years age, representing 52% of the overall sample. This group is most likely to be more engaged with modern-day monetary items and sustainability problems, which aligns with the

growing trend of awareness of environmental modification and sustainable development among younger populations. The 18-24 years age group accounted for 12.5%, while 28.7% of respondents were between the ages of 41-60 years, indicating that the sample covers a wide variety of age groups, reflecting diverse viewpoints on environmental financing. Only 6.8% of the participants were over the age of 60, suggesting that older people might be less likely to engage in contemporary green finance practices. The sample consisted of 57.5% male and 42.5% female respondents. This shows a reasonably well-balanced sex distribution, with a slightly higher representation of male participants. This balanced group ensured that the findings reflected the views and experiences of both genders in relation to sustainable banking practices. Regarding income, 52.5% of participants earned above BDT 50,000 monthly, showing a strong representation of middle-to-high-income individuals, who are normally more engaged with financial services and sustainability issues. The next largest group, 36.3%, earned between BDT 20,000-50,000 each month, while 11.3% of respondents earned below BDT 20,000. Income circulation is crucial because people with higher earnings levels are more likely to invest in environmentally sustainable services and products, including green monetary items such as green loans and bonds. Regarding academic background, 38.6% of the participants held a bachelor's degree and 34.3% had a master's degree, indicating a well-read sample. Among the participants, 15.8% had completed only secondary school, and 11.3% fell into the "Other" category, which included diplomas or expert certifications. A higher educational level is anticipated to correlate with a better understanding of sustainability concerns, as more educated people are usually more familiar with the importance of sustainable monetary practices and might be more willing to engage in green banking. Most participants (60%) were clients of personal business banks, which typically offer more advanced green financing products than state-owned banks. Of the individuals, 25% were customers of state-owned banks and 15% were customers of foreign banks. The greater representation of personal banks in the sample follows their more effective commitment to sustainability and development in financial products, such as green bonds, environment-friendly loans, and sustainability-linked items.

5.2 Reliability and Validity Analysis

Reliability and Validity are two significant aspects of the stability and credibility of a research instrument. In this investigation, tests of both reliability and validity were conducted in order to verify that the questionnaire measured what it was supposed to measure accurately and reliably (Hu & Bentler, 1999).

Reliability speaks to the stability of the instrument and if it gives consistent results over time. Quantitative research On the other hand, reliability analysis is critical in quantitative research to ensure that the measurements are reliable and trustworthy (Henseler et al., 2015). In the present study performed Cronbach's Alpha to assess internal consistency of questionnaire and its sub-scales. Reliability analysis is essential in quantitative research studies as it helps to validate the

dependability of the data collected and ensures that the conclusions drawn from the analysis are based on valid and constant measurements (Nunnally, 1978). The reliability analysis outcomes indicated strong internal consistency throughout the study products. Table 2 presents the summary of the Cronbach's alpha values for the general questionnaire and the individual subscales connected to the essential constructs of the study.

Table 2. Reliability Analysis (Cronbach's Alpha Values)

Scale	Cronbach's Alpha
Overall Questionnaire	0.87
Environmental Finance Mechanisms	0.83
Corporate Sustainability Performance	0.85
Environmental Risk Management	0.81
Customer Perception and Loyalty	0.80

The overall Cronbach's alpha for the entire questionnaire was 0.87, which indicates an outstanding level of internal consistency (Table 2). An alpha value above 0.7 is normally deemed acceptable, and a value approaching 1.0 indicates very high reliability. Environmental Finance Mechanisms ($\alpha = 0.83$): This subscale had a Cronbach's alpha of 0.83, showing that the items created to determine the respondents' knowledge, perceptions, and engagement with ecological finance mechanisms (such as green loans, green bonds, and sustainable monetary products) were constant and reputable. The relatively high alpha value indicates that this set of products effectively captures the various elements of green finance within the banking sector. Corporate Sustainability Performance ($\alpha = 0.85$): The Cronbach's alpha for the business sustainability efficiency scale was 0.85, suggesting excellent internal consistency. Environmental Risk Management ($\alpha = 0.81$) had a Cronbach's Alpha of 0.81, which means it was extremely trustworthy. The items on this scale, which look at how banks use environmental hazard elements in their monetary decisions, revealed internal consistency.

Besides testing for reliability, the validity of research questionnaire was also checked to make sure that it measures what it was supposed to measure (Fornell & Larcker, 1981). Table 3 represents the validity analysis of this study.

Table 3. Validity Analysis

Type of Validity	Description	Method	Outcome
Content Validity	Ensures the questionnaire items are representative of the key constructs being measured.	Expert panel review: A group of subject-matter experts assessed the relevance and comprehensiveness of the items in relation to the study's constructs.	The expert panel confirmed that the items adequately represented the key constructs. Some items were revised based on their feedback.
Face Validity	Ensures the items appear relevant and appropriate to respondents.	Pre-testing with a small sample of respondents: They assessed whether the items seemed appropriate for the study objectives.	Minor revisions were made to improve clarity and relevance, based on respondent feedback.
Average Variance Extracted (AVE)	Measures the amount of variance captured by each construct relative to error variance.	Calculated AVE for each construct.	All AVE values were above the accepted threshold of 0.50, indicating that the constructs were well-represented by their respective items.
Composite Reliability (CR)	Evaluates the internal consistency of each construct.	Calculated CR for each construct.	All CR values were above 0.7, confirming strong internal consistency for each construct.

Content Validity: The content validity was verified by a panel of experts in environmental finance, corporate sustainability, and banking risk management. These specialists assessed the questionnaire items to verify that they were representative of the main concepts investigated (Henseler et al., 2015). These items were revised, based on participant feedback, to be closer representations of the key constructs in this study.

Face Validity: This was measured using subjective judgment from a few respondents that is, those involved in piloting the questionnaire before actual data collection (Malapane & Ndlovu, 2024). They tested whether the items seemed to be relevant and appropriate for the purpose of the study. They suggested some minor revisions to increase the clarity and applicability of the items.

Average Variance Extracted (AVE): AVE was computed to estimate the amount of variance in each construct reflected as compared to what is due to measurement error. The AVE of each construct under study was also computed and found to be more than the acceptable level of 0.50 signifying that these constructs were sufficiently measured by the items (Sarstedt et al., 2021) (Table 3).

Composite Reliability (CR): Composite reliability was also evaluated to confirm the steadiness of the items regarding each construct. The composite reliabilities were above 0.7, which implies that constructs had internally consistent element (Sarstedt et al., 2021) (Table 3). The reliability and validity analyses all indicate that the questionnaire in this study is a valid and reliable instrument for measuring environmental finance mechanism, corporate sustainability performance, environment risk management, customer perception and loyalty. Such tests make it possible to be confident in the fact that the collected material can form a basis for drawing valid and reliable conclusions as part of this study.

5.3 Correlation Analysis

Correlation analysis was performed making use of Pearson's correlation coefficient to analyze the strength and directionality of the relationships among essential variables connected with ecological funding systems, business sustainability, and consumer perceptions within the banking sector of Bangladesh. Pearson's correlation provides valuable insights into the degree of association in between two variables, assisting in an understanding of whether boosts in one variable correspond with increases or decreases in another. The subsequent Table 4 encapsulates the correlation coefficients among the key variables in this investigation.

Table 4. Correlation Matrix of Key Variables

Variable	1	2	3	4	5
1. Adoption of Environmental Finance Mechanisms	1.00	0.72**	0.62**	0.45**	0.56**
2. Corporate Sustainability Performance	0.72**	1.00	0.60**	0.48**	0.65**
3. Environmental Risk Management	0.62**	0.60**	1.00	0.56**	0.50**
4. Financial Performance	0.45**	0.48**	0.56**	1.00	0.55**

5. Customer Perceptions of Environmental Responsibility	0.56**	0.65**	0.50**	0.55**	1.00

Note: $p < 0.01$ = Strong correlation; $p < 0.05$ = Moderate correlation

Table 4 shows the correlation matrix of the vital variables. Table 4 reveals the following findings:

Adoption of Environmental Finance Mechanisms and Corporate Sustainability Performance; A robust positive connection ($r = 0.72$, $p < 0.01$) was identified in between the adoption of environmental financing mechanisms (including green loans and green bonds) and business sustainability performance. This finding corroborates the hypothesis that the combination of ecological funding systems within banking practices enhances general business sustainability.

Environmental Risk Management and Sustainability/Financial Performance: A clear and notable link ($r = 0.60$, $p < 0.05$) was observed between practices of managing ecological risks and the effectiveness of sustainability initiatives. This denotes that financial companies experienced in confronting environmental issues not only see greater economic benefits but also lead in their green initiatives. The conclusions stress the vital requirement for integrating ecological risk assessments within the frameworks of decision-making to realize sustainable advancements across financial and environmental performance criteria.

Client Perceptions of Environmental Responsibility and Customer Loyalty: There's a notable strong link ($r = 0.65$, $p < 0.01$) that ties together how customers view corporate efforts in environmental care with how dedicated they feel. When individuals perceive these entities as responsible corporate citizens who demonstrate concern for environmental sustainability, they are more inclined to engage in business transactions with financial institutions and maintain their accounts therein.

Correlations Among Variables: The analysis further elucidated that there exist significant correlations between the deployment of environmental finance mechanisms, the performance of business sustainability, and the extent to which consumers understand their environmentally conscious responsibilities. In essence, the implementation of environmentally focused financing systems demonstrated a noteworthy relationship with consumer views ($r = 0.56$, $p < 0.01$), implying that financial organizations participating in green funding are viewed more favorably by their patrons concerning ecological responsibility. Moreover, financial effectiveness showed a positive correlation with all variables, albeit with moderate relationship strength. This suggests that although financial success correlates with environmentally friendly financing practices and sustainability, the relationship is not as robust as that between sustainability outcomes and consumer promise. The strong positive links between green finance, corporate sustainability performance, and how customers see green banking show how important it is for banks to use green finance practices. Banks that incorporate environmental considerations into their financial

strategies generally exhibit superior sustainability outcomes and cultivate a more loyal clientele. This approach can also positively impact their financial performance. An essential positive connection ($r = 0.60$, $p < 0.05$) was uncovered about the administration of environmental challenges and the impact of sustainability strategies. Entities demonstrating strong competence in environmental risk management practices not only fulfill ambitious financial aspirations but also shine in extensive sustainability examinations. The profound bonds observed in ecological finance activities, outcomes of corporate sustainability, and the mindfulness of consumers towards their environmental obligations highlight the critical urgency for banks to implement sustainable financing practices.

5.4 Factor Analysis

This empirical investigation employed factor analysis to evaluate the metrics associated with environmental financing systems and to identify the critical factors that foster organizational sustainability within the banking sector in Bangladesh. The investigation highlighted three fundamental aspects related to sustainable finance systems, which are indispensable for recognizing their impact on enhancing sustainability metrics in the banking realm. These aspects feature Green Credit, Environmental Risk Oversight, and Accountability in Sustainability Reporting. Table 5 illustrates the component loadings for each variable associated with these components.

Table 5. Factor Analysis Results

Factor	Variable/Item	Factor Loading
1. Green Lending	Loans for renewable energy projects	0.81
	Loans for energy-efficient buildings	0.78
	Financing for sustainable infrastructure projects	0.74
2. Environmental Risk Management	Integration of environmental risks in credit evaluations	0.76
	Environmental risk assessment in loan portfolio management	0.72
	Lending to industries with low environmental impact	0.69

3. Sustainability Reporting	Reporting carbon emissions in sustainability reports	0.82
	Reporting green investment portfolios	0.79
	Disclosure of sustainability performance metrics	0.77

Green lending: The Green Lending component encompasses aspects pertaining to the disbursement of green loans allocated for environmentally sustainable initiatives, such as the development of energy-efficient edifices, green energy ventures, and resilient infrastructure. The important factor loadings, fluctuating between 0.74 and 0.81, reveal that green lending is a key element of environmental financing. A distinct correlation can be found between eco-conscious financial solutions and the targets established for sustainable advancement.

Environmental Risk Management: Environmental Risk Management incorporating environmental sustainability elements into the evaluation of threats. This requires the recognition of eco-friendly threats during the evaluation of credit, the strategic management of loan portfolios to alleviate environmental dangers, and the prioritization of loans directed towards markets that put in very little adverse results on the community. The aspect loadings observed, shifting from 0.69 to 0.76, highlight a significant connection between monetary organizations' capacity to deal with environmental issues and their sustainability credibility. Incorporating the analysis of environmental dangers into our financial choices is important. This method not only reduces the prospective financial obstacles for the bank stemming from environmental difficulties; in addition, it simultaneously fortifies the bank's enduring sustainability goals.

Sustainability Reporting: Sustainability Reporting, inspecting how monetary companies reveal their environmental governance by reviewing distinct indicators like greenhouse gas outputs, options for sustainable financial investments, and extra eco-aware metrics. Aspect loadings that vary from 0.77 to 0.82 suggest the essential role of sustainability reporting in the bigger framework of green finance.

5.5 Regression Analysis

A series of regression analyses were performed to investigate the effect of diverse ecological funding mechanisms on organizational sustainability efficiency within the banking sector of Bangladesh, while also taking into consideration additional variables such as the size of the bank and its financial stability. This examination reviews the effects of ecological financing strategies, such as green credit, eco bonds, and risk management for the environment, on the appraisal of a bank's sustainability outcomes, considering several additional crucial elements.

Table 6. Multiple Regression Analysis Results

Variable	Unstandardized Coefficient (B)	Standardized Coefficient (β)	t-value	p-value
Environmental Finance Mechanisms	0.48	0.47	5.62	0.000
Environmental Risk Management	0.42	0.39	4.25	0.021
Bank Size	0.10	0.08	1.23	0.220
Financial Stability	0.15	0.12	1.45	0.150
R^2	0.62			

Table 6 presents the findings of regression analysis. The analysis highlighted those financial instruments with a green focus (consisting of green bonds and loans) significantly boosted the sustainability efficiency of business ($\beta = 0.47$, $p < 0.01$). This recommends that financial organizations that adopt more rigid green financing approaches, such as providing loans and bonds earmarked for sustainable initiatives, normally show remarkable sustainability results. These facilities have notably helped in supporting a more robust environment by curtailing their carbon emissions, raising funding for sustainable green efforts, and improving their corporate social responsibility (CSR) pledges. The coefficient that isn't standardized ($B = 0.48$) reveals that with every extra system in ecological financing frameworks, there is a matching boost of 0.48 systems in the efficiency of corporate sustainability, as long as other variables do not differ.

The role of eco-friendly risk management was identified as a significant predictor of sustainability performance ($\beta = 0.39$, $p < 0.05$). The unstandardized coefficient for eco-friendly risk management ($B = 0.42$) indicates that enhancing eco-friendly threat management improves sustainability efficiency by 0.42.

Bank size ($B = 0.10$, $p = 0.220$) and financial stability ($B = 0.15$, $p = 0.150$) were consisted of as control variables in the regression design, they did not show statistically substantial relationships with organization sustainability efficiency. This designates that, the bank's size and monetary constancy do not exert as direct an effect on sustainability outcomes as ecological financing systems and management risk. It is imperative to accept that these aspects may still hold value in diverse contexts or when implementing more extensive stylistic frameworks. Different evaluations have remarked that movements in sustainable finance, leveraging green bonds and loans, have powerfully reinforced the sustainability strategies of companies ($\beta = 0.47$, $p < 0.01$). According to

the unstandardized coefficient (B = 0.48), a single unit increase in ecological finance systems correlates with a 0.48 boost in sustainability performance of the organization, with other variables kept constant.

Research outcomes suggested that 62% of the changes in organizational sustainability performance can be associated with its design, thereby highlighting a solid link with the research framework. Unique external aspects, consisting of cultural influences, patterns in client involvement, or compliance problems, might help brighten the disparities in sustainability efforts. The outcomes obtained from the regression analysis suggest that ecological funding mechanisms (such as green loans and bonds) and proactive ecological threat management are vital elements that significantly affect the enduring practicality of banking services within Bangladesh. The outcomes mention the vital requirement of fusing sustainable financing methods with robust danger management structures to elevate sustainability results in the banking domain. The model's demonstration of 62% variation highlights the considerable effect that these eco-friendly financing efforts have on a bank's sustainability performance.

5.6 Hypothesis Testing

In this section, the hypotheses formulated in the preceding research study are scrutinized through the application of suitable analytical methodologies. The objective was to assess the validity of each hypothesis grounded in the amassed data and to investigate the interrelations among environmental financing mechanisms, corporate sustainability, and other factors influencing the banking sector in Bangladesh. The scrutiny of hypotheses involved regression analysis, correlation investigations, and ANOVA, as acknowledged to be important. The table presented below highlights the outcomes of the hypothesis review.

Table 7. Results of Hypothesis Testing

Hypothesis	Result	Description
H1: Positive relationship between environmental finance mechanisms and corporate sustainability	Supported	The regression analysis confirmed that environmental finance mechanisms, particularly green loans, and green bonds, positively impacted corporate sustainability performance.
H2: Environmental risk management improves financial performance and sustainability	Supported	Environmental risk management practices were found to significantly improve both financial performance and sustainability outcomes in the banking sector.

H3: Regulatory frameworks influence the adoption of environmental finance mechanisms	Partially Supported	The oversight structure for financial activities, notably the Green Banking Policy established by Bangladesh Bank, has been essential in enhancing green finance; yet numerous financial bodies experienced obstacles in its complete enforcement because of restricted resources and insufficient skills.
H4: Challenges in implementing environmental finance mechanisms	Supported	Respondents reported significant challenges in implementing green finance initiatives, including inadequate training, financial constraints, and a lack of standardized reporting frameworks.
H5: Customer perceptions influence loyalty and decision-making	Supported	A strong positive relationship was found between customer perceptions of a bank's environmental responsibility and their loyalty and decision-making processes.

The hypothesis screening results exist in Table 7. The table describes the following results.

Hypothesis 1 (H1): Positive relationship between ecological finance mechanisms and corporate sustainability

Supported: The hypothesis was strongly supported, as the regression analysis revealed a significant favorable effect of ecological finance systems (such as green bonds and loans) on corporate sustainability performance in the banking sector. Banks that adopted green financing practices demonstrated enhanced ecological performance, consistent with the findings of Scholtens (2009) and Zhao and Li (2013), who suggested that the combination of ecological finance practices enhances sustainability results.

Hypothesis 2 (H2): Environmental risk management enhances monetary efficiency and sustainability

Supported: The outcomes of the hypothesis screening verified that ecological threat management practices positively affected both financial and sustainability outcomes. This finding is consistent with Bauer et al. (2016) and Anderson et al. (2015), who observed that banks managing environmental threats tended to have higher financial stability and better sustainability performance.

Hypothesis 3 (H3): Regulatory structures influence the adoption of ecological financing mechanisms

Partially Supported: Regulatory frameworks, especially the Bangladesh Bank's Green Banking Policy and Sustainable Finance Policy, have encouraged the adoption of green financing practices in the sector. The hypothesis was partially supported because several banks faced difficulties, including a lack of resources and minimal competence in effectively executing these frameworks. These barriers prevented the full capacity of regulatory interventions, as noted by Hossain et al. (2020).

Hypothesis 4 (H4): Challenges in implementing environmental finance systems

Supported: This hypothesis was completely supported, as study respondents reported facing several obstacles in adopting environmental finance systems. The secret barriers consisted of inadequate training, monetary constraints, and lack of standardized environmental reporting. These obstacles have been echoed in previous research studies, including Islam et al. (2018), who found comparable barriers to green finance adoption in Bangladesh's banking sector.

Hypothesis 5 (H5): Customer perceptions affect commitment and decision-making

Supported: The findings revealed a strong positive relationship between consumer perceptions of environmental responsibility and their commitment to the bank. Customers who viewed their banks as environmentally accountable were more than likely to engage with and remain devoted to them. This aligns with the research study by Bhattacharya and Sen (2004), who suggested that clients are gradually making decisions based upon a company's CSR and environmental impacts. Environmental financing systems significantly enhanced corporate sustainability results, with eco-friendly risk management and regulative frameworks playing essential roles. The favorable relationship between clients' understanding of environmental responsibility and commitment highlights the growing value of sustainability in client banking decisions.

The results of this examination underscore the intensifying significance of environmental financing systems in promoting service sustainability within the banking sector of Bangladesh. The link noted in between sustainable funding efforts, including green loans and bonds, highlights the ability of financial entities to support environmental aims and improve their fiscal results and standing. The results similarly reveal that eco-friendly threat management is crucial for banks considering that it helps them save cash and be more eco-friendly. This circumstance stands apart in Bangladesh, where cyclonic incidents and flooding can cause substantial economic obstacles. Organizations within the financial world that habitually integrate evaluations of ecological risks into their functional standards are typically more competent in dealing with these dangers and guaranteeing their long-term success. Although the findings bring a confident tone, the research study demonstrates that banks struggle with several barriers as they aim to perform sustainable funding techniques. This condition brings to light a shortcoming in awareness and bad regulative policies, which have actually prevented the overall development of green financing possibilities in Bangladesh. The analysis reveals that boosting education efforts and fostering transparent rules

might support the mitigation of these concerns. The findings and discourse provide engaging evidence that ecologically sustainable funding systems significantly strengthen organizational sustainability within the Bangladeshi banking sector. Challenges stay in the thorough execution of these systems; the results highlight the important functions of regulative assistance and consumer engagement in promoting sustainable banking practices.

6. Conclusion, Limitations, and Future Research Directions

This study explores the effect of ecological finance systems on corporate sustainability in the banking sector of Bangladesh, highlighting the role of green financing products, environmental threat management, and regulatory frameworks. The findings verify that environmental finance mechanisms, such as green bonds and green loans, substantially boost the business sustainability efficiency of banks. Additionally, ecological danger management practices were discovered to play an important role in improving both financial results and sustainability, aligning with global trends where banks progressively incorporate environmental risks into their decision-making processes. This study also highlighted the significance of regulative structures, such as the Green Banking Policy, in promoting the adoption of green financing practices. Difficulties related to minimal resources, insufficient training, and standardized reporting frameworks prevent the complete potential of these systems, underscoring the need for more powerful policy assistance and capacity structure within the banking sector. Moreover, the research study revealed that customer perceptions of environmental obligation are favorably related to loyalty and decision-making, highlighting the growing importance of sustainability in consumer banking options.

In conclusion, this study highlights the need for banks in Bangladesh to incorporate sustainable financing practices into their operations, purchase training programs for staff, improve their sustainability reporting, and leverage regulatory frameworks to eliminate barriers to green finance adoption. The findings recommend that banks cannot only add to the wider ecological objectives of the nation but also improve their financial efficiency and reinforce consumer loyalty, eventually leading to long-lasting durability and success.

This research study is based on self-reported information gathered through structured surveys, which can be subject to action bias and may not completely reflect the real practices of banks or their consumers. This study focuses on banks operating in Bangladesh; therefore, the findings may not be directly applicable to banks in other countries, specifically those with varying regulatory environments or financial conditions. While this study analyzed the function of ecological financing mechanisms, other aspects, such as political impacts, financial volatility, and cultural aspects, were not explored extensively, and these might also significantly affect the adoption and efficiency of green finance practices in the banking sector. This academic questions robustly promotes for banks in Bangladesh to explore financing options that emphasize environmental factors to consider, such as green loans, green bonds, and sustainability-related instruments, in order to enhance their efficiency in corporate sustainability efforts. Financial institutions are

required to prioritize the allocation of resources towards programs that cultivate their workers' comprehension of environmental risk management and ecologically accountable financing. This undertaking will strengthen their ability to resolve obstacles associated with insufficient understanding and resources. In order to guarantee compliance amongst all banking entities, regulatory structures such as the Green Banking Policy necessitate improvement through the facility of more accurate requirements and the application of more extensive enforcement systems. In addition, banks need to prioritize sustainability reporting as a fundamental concern by embracing standardized reporting formats to improve openness and resolve the increasing customer demand for environmental accountability. Banks ought to take part in marketing projects that show off their ecological efforts. This is because customers' understanding of sustainability is a big part of building loyalty and making money in the long run. By fixing these places, banks can make their financial products or services more in line with sustainability goals, which will help the environment and the economy in the long run.

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