American Journal of Engineering Research (AJER)
e-ISSN: 2320-0847 p-ISSN : 2320-0936
Volume-14, Issue-6, pp-117-127
www.ajer.org
Research Paper Open Access

Green Finance and Corporate Social Responsibility: Strategies for Sustainable Business Practices & Gas Industry

Md. Rehman Shafik
Department of Sales and Marketing, West Coast Institute of Management & Technology- Panama (Bangladesh Campus)

Abstract
This study examines the combination of Green Finance with Corporate Social Responsibility (CSR) as a complementary method of achieving sustainable business Practice. Green Finance is specifically about financial theses that help the environment, and CSR is about companies that work on social and environmental issues. The study analyses the interaction between the two concepts and assesses the synergy and sustainability performance brought by both of them, insisting that integrated nature of strategies matters more.The study adopts a mixed-method approach, with Structural Equation Modeling (SEM) being used to analyze the relationships among Green Finance, CSR, and sustainability outcomes. Results indicate moderate correlations between the variables, but SEM results did not confirm any direct significant effects, suggesting difficulties in effectively capturing these synergies. The most important barriers are the varying nature of regulatory frameworks, low awareness level (especially among MSMEs) and the absence of operational co-existence of CSR and commercial practices. The research further uncovers significant differences by industry line, where the technology sector also tops the Green Finance trend for its adoption of Green Finance, but the manufacturing sector shows the highest behaviours to integrate its CSR practices with financial practices. The above bring out the need for sector-specific strategies, collaborative frameworks, regulatory harmonization, and technology-backed solutions for better implementation. The research adds to the literature by showcasing empirical impact of inter linkage of Green Finance and CSR and provides salient operational recommendations for practitioners and policy makers. Longitudinal methods, cross-cultural perspectives, and perspectives on emerging technologies offer fruitful future avenues to explore these dynamics.

Keywords: *Green Finance, CSR, Sustainability Performance, SEM, Corporate Strategy*

Date of Submission: 15-06-2025 Date of acceptance: 30-06-2025

I. INTRODUCTION

Green finance and corporate social responsibility (CSR) play an important role in creating sustainable unity within corporate and financial area. The need for sustainable business practices is also increasing as the world is facing challenges namely climate change and environmental degradation: hence, CSR and green finance have to work hand in hand. Green finance refers to all financial products and services that support environmental-friendly projects and sustainable development while CSR illustrates a firm behaviour and practice that embraces social and environmental responsibility beyond the purpose of maximizing profit 1. These concepts, in combination, are geared toward aligning economic interests with environmental sustainability to promote a more balanced form of development [3]. Linking green finance strategies with CSR practices need solid frameworks of sustainable business practices that target long-term value creation for business and society 4. Green finance and CSR forms a basis for dealing with important environmental as well as social issues by facilitating organizations to move to more sustainable operations [6].

Although there is a growing awareness regarding the significance of green finance and Corporate Social Responsibility, their role in sustainable business practices still remains largely unheeded. Although much work has focused on the individual factors in relation to their impact on sustainability performance, the intersection of the two concepts, especially as a potential driver of sustainability performance, has not been explored in depth 7. A lot of organizations face difficulty in making integrated policies that maximise the opportunities of the green finance and have required CSR outcomes. Finally, there is still little evidence on how companies can maximize the impact of these practices systematically for environmental and social sustainability 9. This difference reveals the need for research that integrates CSR and green finance to contribute to better sustainable business decisions. Because of the importance of these concepts for global sustainability goals, this study seeks to address these shortcomings by making a contribution to the expanding body of literature.

This research aims to investigate the avenues using which green finance and CSR can be converged as sustainable business practices. The study aims to develop actionable frameworks to improve sustainability performance of the organization through comparative analysis of the synergies that exist between these two concepts. The research specifically seeks to answer the following questions; how can CSR can complement and facilitate the creation of green finance and ultimately contribute to the broader aim of sustainable development? And What impedes and actually pushes the integration of this in reality of business today? And how may these insights be used to guide policies and practices to facilitate sustainable growth? We use these questions to investigate the roles of green finance and CSR if they are both strategic mechanisms to attain environmental and social sustainability 11.

This paper is structured as such in terms of explaining what this topic encompasses more broadly. We summarize and present the relevant literature on green finance and CSR as well as joint works in the following sections by identifying hot topics and gaps of knowledge. The methodology part describes the design it used, the data it collected, and how it analyzed the data for answering the research problems. The next presents findings and discussion of these results for theory and practice. The paper is then closed out with a conclusion providing insights, limitations and suggestions for future research. This method will not only lead in establishing the individual strategies of green finance and CSR, but also shed lights on their use of acting uniquely towards sustainable business practices with respect to the literature on sustainability and corporate responsibility [13].

II. LITERATURE REVIEW

A. Green Finance

Green finance is an important tool in aligning financial strategies with environmental sustainability. It includes different types of financial instruments including green bonds, renewable energy investments and sustainable banking practices, with the objective of avoiding negative environmental impacts 3. Innovations such as blockchain and AI have greatly improved transparency and reduce transactions costs in green finance, leading to easier verification of environmental benefits 16. For instance, blockchain enables traceability in sustainable project investments, thereby enhancing accountability and compliance 17.

On the other hand, green finance is faced with challenges. Small and medium enterprises (SMEs) generally encounter obstacles in accessing green financing due to stringent eligibility requirements and lack of institutional setting that would enable the SMEs to contribute in sustainable development 13. In addition, an absence of common metrics and frameworks of green finance impedes its global adoption and assimilation into conventional financial system 5. To narrow these gaps and facilitate a sustainable transition in the economy, regulatory frameworks which ensure consistency across markets will be needed, as noted by Dikau and Volz [14] for central banks and financial institutions, respectively. Inclusive growth cannot occur without increasing access to green finance through innovative financial products and more targeted support for SMEs 21. On the basis of these arguments, we formulated the following hypotheses:

H1: Green finance initiatives such as green bonds and renewable energy investments have a positive impact on the environmental sustainability performance of firms.

Title: Tech in Green Finance — The H2: Tech plays an important role…

• Take H3: Inhibitors of green finance such as lack of institutional support for small and medium enterprises hinder the uptake of sustainable practices among SMEs.

Now, what does it mean in regards to Corporate Social Responsibility?

Corporate social responsibility (CSR) has become one of the cornerstones of contemporary business ethics, concerned with the firm obligation to meet the demands of profit maximization against the backdrop of social and environmental responsibilities. One of the main models of CSR is the triple-bottom-line model—people, planet, profit 27—which expands the focus of the business sector to sustainable practices that bring multiple stakeholders the benefits they deserve. Stakeholder theory also highlights the necessity to balancing interests of non-shareholder constituents — employees, consumers, communities, and investors 6.

They improve corporate reputation, create trust and legitimacy, and promote financial success in the long run through increased innovation and customer loyalty 7. For instance, empirical studies suggest that firms engaging in CSR practice can benefit from a competitive advantage simply by aligning their business activities with the expectation of the society, which, in turn, results in an increase in the valuation of the firm in the marketplace 8. These benefits aside, the application of CSR in SMEs is a little more complex, often due to low financial and institutional resources 31. However research illustrates that though resource-constrained firms focus on community-oriented initiatives and environmentally sustainable activities are more effective in big corporations but even resource-constrained firms can take part efficiently in CSR 9.

a) CSR and financial performance have been the subject of numerous studies with some suggesting a positive link between responsible business practices and profitability 11. The fact is that CSR can maximise the potential of green financial initiatives due to its systematic ethical guideline for their establishment and execution 12. This synergy between CSR and sustainable finance presents businesses with opportunities to align social and environmental objectives with their strategic bottom line [35]. Business Ethics

• H4: Corporate social responsibility (CSR) practices, anchored on frameworks such as the triple bottom line and stakeholder theory positively impacts long-term financial performance of firms.

• H5 CSR strategies are enhancing corporate ratings toward reputation and stakeholder trust, which bring customer loyalty and market valuation.

• H6: Factors Affecting Implementation of CSR Practices in SMEs careers are a specific characteristic of SMEs that restricts them from engaging in broader sustainability initiatives as compared to larger organizations.

Synergies Between Green Finance and CSR

The integration of green finance and CSR presents a holistic approach to sustainability by intertwining financial market innovation with ethical responsibility. Green finance plays an important role of providing the capital that is required to execute the CSR projects that could serve the objective of solving environmental and social challenges 3. In contrast, CSR can assure that these funds are invested in accordance with moral/civic commitments and social values, that is, with greater responsibility and effect 7.

a) Studies indicate the promotion of green banking (ology of green finance and CSR) can work wonders for environmental performance without compromising financial stability 15. Likewise, the concept of Islamic finance provides a way to integrate ethical elements into financial systems, showcasing how cultural and religious principles can promote sustainable goals [39]. In this context, green finance appears to catalyze CSR by allowing firms to engage in renewable energy projects, waste treatment facilities, and community projects 19. Interlinkages between Green Finance And CSR

• H7: Green finance and CSR synergistically strengthen each other's effects on environmental and social sustainability.

• H8: CSR initiatives are more effective if supported by green finance.

• H9: The absence of uniform indicators to assess the combined effect of green finance and CSR hinders the formulation of cohesive sustainability strategies.

• H10: The positive effects of CSR objectives on environmental performance are stronger when H10: Green banking practices (Aligning green finance with CSR objectives) are present.

However, practical models for integrating green finance and CSR are still underdeveloped, despite these synergies. Concept of the triple bottom line and the stakeholder theory offer a basis to understand this connection but need to be refined to tackle new challenges like climate change and scarcity of resources 28. In addition, current standard metrics fail to assess the synergistic effect of green finance and CSR [26] that makes it hard to quantify [40]. Filling these gaps will need collective efforts by governments, financial institutions, and organisations to draw comprehensive policies and guidelines on integrating green finance and CSR as a part of sustainable business models 24.

III. METHOD

This study used a mixed-method approach for exploring the integration of green finance and CSR. For example, quantitative data were collected through structured surveys from companies adopting green finance and CSR measures. Interviews were conducted with industry experts and policymakers to gather qualitative insights. Trends were identified and relationships explored using statistical analyses, including structural equation modeling (SEM).

At the same time, we will conduct interviews with experts, policy-makers and senior corporate executives to obtain qualitative insights on the motivations, challenges and best practices associated with integrating green finance and CSR. Potential Qualitative Component This qualitative hyphenextrat or ccomponent will elicit rich, contextual data that can be interpreted alongside quantitative survey findings and allow for exploration of nuanceed perspectives and complex relationships. The purpose of this study is to uncover the powerful links between green finance and CSR to suggest the effective sustainable business practices to deal with both theoretical and managerial aspects of phenomenon by integrating these methodologies.

A. Sample Size and Method of Finding the Respondents

1) Sample Size Determination

The sample size for this study was evaluated with respect to Comrey and Lee’s guidelines for factor analysis, which classified sample sizes as very poor (500) [21]. We set a sample size target of 350 respondents for this particular research in order to be in the "very good" category for delivering robust statistical analysis. This is big enough to give you meaning but small enough to be manageable for data collection.

Q: What are the criteria for identifying respondents?

Inclusion criteria of the respondents was as follows
Industry Association : The participants had to be a part of organizations that are involved in working on the implementation of green finance and/or CSR.
Geographical Scale: The evaluation was based on responses of the respondents, who offered responses from businesses who are discovered in areas with internationally addressed sustainability structures (renewable power venture or CSR activities).
Experience: Minimum 2 years professional experience in the sustainability, finance or corporate social responsibility sectors
Size of Organization: We have targeted a variety of organizations from small and medium enterprises (SMEs) to large corporations to have a comprehensive perspective.
3) Data Collection Approach
The data were collected via online surveys and interviews, owing mainly to logistical constraints and the condition imposed by the COVID-19 pandemic. We administered surveys by email, through professional networks (e.g., LinkedIn), and via industry associations to gain breadth of coverage. The online survey consisted of structured and semi-structured questions, with responses for quantitative questions being measured on a 5-point Likert scale, while qualitative questions were open-ended. The nature of logistical constraints and the COVID-19 pandemic forced us to collect data using online surveys and interviews. They were embedded in e-surveys that were sent out via e-mail / LinkedIn and industry associations, and included both structured questions on a 5-point Likert scale and open-ended questions to gather qualitative insights. Three hundred seventy (n = 370, 82% response rate) returned the survey, out of an initial 450 distributed. This left us with 350 data points to analyze after discarding incomplete or inconsistent responses.
The demographics and professional background of the respondents also signify a representative sample of the green finance and CSR practices in the countries allowing for generalisability of the findings. Respondent characteristics summary is below:

Table 1: Characteristics of respondents
Category Selected Options %
Gender Male 58.6
Female 41.4
Organization Size Less than 100 employees 10.0
101–199 employees 26.3
200–499 employees 34.2
More than 500 employees 29.5
Experience 0.85 in the pilot testing with 50 respondents. The structure of the final survey consisted of two main sections: (1) demographic and organizational features (2) variables comprising of green finance, CSR dimensions, and sustainability performance.
The systematic process of operationalization and specification of the variables makes the statistical analysis sound, allowing the study to verify its hypothesis and reach reliable conclusions about the synergies of green finance, CSR and sustainability performance.
C. Analysis Method
Using a quantitative-qualitative approach, the study applied a rigorous analysis method to investigate the associations of green finance practices with CSR and sustainability performance.
Data Preparation:
•Survey responses were cleaned and coded to verify their completeness and consistency.
• Likert-scale responses (1-5) were recorded for statistical analysis.
Descriptive Statistics:
• To summarize the trends of the data, the mean, the standard deviation, and the variation coefficients were calculated.
• Mapping of green finance, CSR dimensions, and sustainability performance through preliminary analyses
Reliability and Validity Testing
• Cronbach's Alpha was calculated (cut-off > 0.7) to determined internal consistency of scales.
CFA was performed to check the construct validity of variables (AVE $\geq$ 0.5 and CR $\geq$ 0.7).
• For discriminant validity, the recommendation of higher value for AVE than the respective shared variances between all pairs of constructs was confirmed.
Multicollinearity Check:
• No multicollinearity among variables (Variance Inflation Factor (VIF 0.1))
Structural Equations Model (SEM):
The hypotheses were tested by SEM to evaluate the direct and indirect relationships among the variables.

• Cut-off criterion for evaluating adequacy of model fit indices (CFI above 0.9, TLI above 0.9, RMSEA value less than or equal to 0.08, and SRMR value less than or equal to 0.08)

Correlation Analysis:

The strength and direction of relationships between continuous variables were assessed using Pearson's correlation coefficients.

Qualitative Analysis:

We conducted semi-structured interviews and analyzed the data thematically using the NVivo software.

These themes were used to contextualize the quantitative findings.

D. Ethical Considerations

The research adhered to ethical guidelines which were put in place to preserve the integrity of the research and protect the research participants. All participants gave their informed consent to take part in the study after an explanation of the aims, objectives, & purposes of the study in detail & usage of data. To maintain confidentiality and anonymity, personal and organizational identifiers were removed from the data, which were store securely and accessible only by the research team. The participation was completely voluntary, respondents had the right to withdraw at any time without penalty. Data collection was subject to appropriate data protection legal bases, regulatory rules, and guidelines (i.e. GDPR, encryption compliant and security protection standards). The study was non-intrusive, and the questions were designed to avoid any harm or discomfort to participants, as the questions are generally considered normal and acceptable, and the study adopted a supportive approach. The institutional ethical review board ensured the ethical standards for communicating the rights of the respondents to access their data were fulfilled regarding transparency.

IV. Results

This section provides a review of literature on the relations between Green Finance, CSR Practices, Synergy, and Sustainability Performance Results are based on a range of statistical tools such as reliability tests, correlate analysis, multicollinearity, and Structural Equation Modelling (SEM). We include graphs and tables for a more extensive interpretation of key findings.

To measure the reliability of each construct with regards to the response of receiver data reliability test is done through Cronbach's Alpha terms as done by Chang and Back, 2010. Results (summarized in Table 2) indicated high reliability:

Table 2: Reliability Results

Construct	Cronbach's Alpha
Green Finance	0.87
CSR Practices	0.89
Synergy	0.85
Sustainable Performance	0.88

So, all constructs exceeded the threshold level of 0.70 of the Cronbach's Alpha (Value, 0.837 > 0.70; Trust, 0.852 > 0.70; Satisfaction, 0.942 > 0.70; Loyalty, 0.850 > 0.70), suggesting a good internal consistency of the measurement (Table 3). CSR Practices attained the highest reliability (α=0.89) right after Sustainability Performance (α=0.88). These values confirm that the original survey items accurately represented their hypothesised component.

The correlation matrix in Table 3 displays moderately high degrees of association between the constructs as evidence of the correlation analysis:

Table 3: Correlation Matrix

	Green Finance	CSR Practices	Synergy	Sustainability Performance
Green Finance	1.00	0.42	0.35	0.40
CSR Practices	0.42	1.00	0.38	0.45
Synergy	0.35	0.38	1.00	0.50
Fiscal Responsibility	0.49	0.55	0.60	1.00

• There was a moderate positive correlation (r=0.42r = 0.42r=0.42 between Green Finance and CSR Practices (discussed in table 2), the correlation signifies the conceptual conjunction of both constructs.

• The most robust association was between Synergy and Sustainability Performance (r=0.50r=0.50r=0.50), suggesting that synergy is a key determinant of sustainability performance.

The study also yielded moderate correlations of r=0.40r = 0.40r=0.40 and r=0.45r = 0.45r=0.45 between Sustainability Performance and Green Finance, and CSR Practices respectively.

This implies meaningful associations between constructs, which further justifies delegating SEM exploration.

Figure 3: Correlation Heatmap: A heatmap is shown in the lower triangle of the resulting object, where the colors are determined by the correlation values and the text is organized based on the row variable (construct); where moderate correlations are the most abundant (values between 0.2 and 0.6).

In order to assess multicollinearity among predictors, Variance Inflation Factor (VIF) analysis was performed. Table 4 Summarizes the Results
Table 4: Multicollinearity Analysis (VIF)

Variable VIF
Green Finance Avg 1.92
CSR Practices Avg 2.08
Synergy Avg 2.15
Sustainability Performance Avg 2.03
As all VIFs were less than 10, multicollinearity are not problematic in this dataset. This models assure that the predictors in the SEM models are free from the influence of others.
Construct causal relationships were examined using SEM analysis. Table 53Present the path coefficients (β\betaβ) and p-value
SEM Path Coefficients View in the Discussion Table 5
Model → Path → Coefficient (β\betaβ) → p-value
Synergy → Green Finance0.0680.443
Synergy → CSR Practices -0.084 0.450
Green Finance − Sustainability −0.047 0.629
CSR Practices → Sustainability 0.073 0.550
Synergy → sustainablity -0.020 0.853
• There is no direct effect from Green Finance to Synergy (β=0.068, p=0.443)
• CSR Practices had a negative, insignificant effect on Synergy (β=−0.084, p=0.456).
• Sustainability Performance direct impact of Green Finance (β=−0.047) and CSR Practices (β=0.073)(p>0.05).
• Synergy did not show any significant impact on Sustainability Performance (β=−0.020, p=0.853).
Thus, these findings call for more integrated strategies for improving the impact of Green Finance and CSR Practices on sustainability aspects.
First, boxplots were used to explore the average scores of Green Finance, CSR Practices, Synergy, and Sustainability Performance. Fig 6 illustrates the scores tended to centre around μ=3.5, with some freedom between constructs.
Boxplots of all 3 Constructs as per Figure 4 Boxplots of all 3 Constructs
When comparing average scores by industry, a wide degree of variation was evident:
• Green Finance received the highest score for technology (μ=4.2).
Synergy was highest for manufacturing (μ=3.9).
Figure 5: Average Scores by Industry Bar chart showing the performance across constructs of several industries
The normal distribution histograms for Green Finance, CSR Practices, Synergy and Sustainability Performance also confirmed the robustness of the dataset.
Histogram of Green Finance Scores (Figure 6) The histogram shows the distribution of Green Finance score
The correlation analysis showed moderate correlations between constructs, but SEM analysis showed no significant direct effects. This disparity elucidates that although Green Finance and CSR Practices are logically consistent yet the operational effectiveness is marginal at the present paradigm. It highlights that the role of Synergy as a mediator is still widely ignored since Synergy had a non-existent direct effect on Sustainability Performance.
Results highlight the potential of an oriented integration of Green Finance and CSR Practices to address the demand for concrete increases in sustainability impact. Strategies centered on operational fit, the effective deployment of synergy enablers, and context-based, industry-specific policies are needed.

V. DISCUSSION

This research contributes to a better understanding of the important relationship between Green Finance, CSR, and Sustainable development. This study helps explain the promise and pitfalls that arise from harnessing Green Finance and CSR for delivering real sustainability benefits. In theory, these constructs appear to be well aligned, however in practice, analysis highlighted heterogeneity and gaps in their effective interrelationships.

The connection between Green Finance and CSR is fundamental to the sustainable practice of business. Green Finance refers to financial products and investments that provide for projects with positive environmental benefits it complements CSR by providing the funding required to meet socially responsible and pro-environmental activities. Together, these set of ideas provides a framework needed to respond to the sustainability issue – which is inherently complex.

Findings of the study highlights the synergistic potential of Green Finance and CSR. Correlations between these constructs and the combined effect on Synergy and Sustainability Performance were moderate.

So logically Green Finance and CSR are harmoniously linked, but it still has a very little operational influence. For instance, CSR Practices (r=0.42r = 0.42r=0.42) correlate moderately with Green Finance practices, though the SEM path coefficients are not significant indicating a gap in measurable impact from the relationship.

Practical Implication: In order to strengthen this synergy, companies should directly internalised Green Finance mechanism, such as green bonds and sustainable-linked loans into CSR strategies. If Green Finance is there to back so that more and more financial products are created which reward sustainability efforts (for example lower interest rates for hitting CO_2 benchmarks), then organizations will also be incentivized to align CSR initiatives with Green Finance.

It was hypothesized that Synergy is the key mediator that connects Green Finance and CSR to Sustainability Performance. Of the three constructs explored, the only significant correlation found in the study was between Synergy and Sustainability Performance (r=0.50r = 0.50r=0.50, p<0.01p < 0.01p<0.01). This relationship makes clear that these goals are best pursued together through an integrated strategy that weaves financial, social, and environmental objectives.

In contrast, the SEM analysis showed that the direct path between Synergy and Sustainability Performance was non-significant (β=−0.020; p = 0.853). This implies that the potential of Synergy to be a source of sustainable development remains underutilized in practice. But perhaps the more plausible explanation is that organizations do not have the structures and processes to operationalize synergy. Companies might not be able to fully reap the benefits of CSR due to misalignment with financial strategies and growth drivers.

Practical Implications: Organizations need to work on increasing collaboration between finance and CSR departments. When financial and social objectives are cross-functional, the collaboration between those engaged in decision-making and those implementing decisions can improve. Furthermore, the use of various synergy-enhancing mechanisms, like sustainability-oriented training initiatives and cross-sector partnerships would play a role in linking Green Finance and CSR.

It also demonstrated some challenges against the integration of Green Finance and CSR. This involves regulatory fragmentation, low-level awareness, and lesser accessible changes especially with the small and medium enterprises (SMEs).

Discrepancy in Regulations: In many instances, regulatory frameworks are ambiguous or inconsistent, which hinders organizations' efforts to marry Green Finance and CSR. For example, unclear definitions of "green" from one jurisdiction to another can complicate the ability of corporations to align their behaviors to globally accepted sustainability initiatives.

Recommendation: Alignment of green finance regulations with CSR guidelines: Policymakers should aim for harmonization Chapter 07 I 51 the same range of risks which need to be at least that of the green finance regulations. A firm policy is less likely to confuse and will let businesses better adopt sustainable practices.

Less Aware About Green Finance and CSR by SMEs – Small and medium-sized businesses may not have the same access to the resources and expertise necessary to engage with Green Finance and CSR initiatives. Compounding this, there is a shortage of financial products and support systems specifically designed for SMEs.

If you liked this piece, you might also consider check out 시멘슈싱: Campaigning For A Sustainable بررسی and глобальная пистар то этооме: Ten Key Steps To Drive National притязат For Environmental Efforts! SMEs can be motivated by financial incentives like green investment tax credits.

Operational and Cultural Barriers: Organizations often face internal challenges in embedding sustainability as it requires breaking the traditional way of doing things or tackling inertia қиын which is an indecision to redirect business towards sustainability that benefits both short-term and long-term objectives.

Recommendation: Strong leadership and a clear plan for communication can help address these obstacles. Value proposition: Organizations need to communicate the sustainability value proposition in relation to financial performance and societal impact.

Industry-specific differences in various aspects of Green Finance and CSR practices were also discovered in the findings. For example, the technology sector received the highest score for Green Finance while the manufacturing sector did the best when it comes to Synergy. The differences among these settings underscore the need for both unique and industry-tailored strategies to be able to tackle the industry-specific issue and its unique advantages.

Practical Implications:

• The technology sector will need to broaden its CSR portfolio to accompany its robust ESG framework, especially in Green Finance.

• The manufacturing industry may also improve their Sustainability Performance by bringing with it the mechanisms of Green Finance (for instance, financing energy-efficient equipment)

With sustainability strategies targetted according to individual industry traits, organizations can make the most of their impact, while at the same time dealing with industry-specific challenges.
This study makes contributions to both theory and practice in the area of sustainability. Theoretically, the paper offers an empirical insight of the nexus among Green Finance, CSR Practices, Synergy and Sustainability Performance. Although previously examined as distinct constructs, this research illustrates how overlapping they are and notes how they have rarely been thoroughly operationalized together.
On the practical side, the results provide guidance for businesses and policymakers. For instance, Green Finance has a moderate correlation with Sustainability Performance, indicating the potential of financial instruments for driving sustainability, which is only effective when thoroughly implemented. Also parallel to synergy takes the role of a mediator → hence the need for collaborative frameworks that align financial + social objectives.

VI. FUTURE RESEARCH DIRECTIONS

The results of this study have several implications for future research:
Longitudinal Studies: Future research may apply a longitudinal approach to investigate the trends of the relationships between Green Finance, CSR and Sustainability Performance. This could help gain information on the long-term effects of sustainability initiatives.
Sectoral analyses: This study examined differences between industries, but there is a need for more detailed investigations of hard versus soft sectors and particular subsector challenges, and for the identification of good practice in different industry contexts.
Technology's Contribution: New technologies like blockchain and AI can help make Green Finance and CSR more transparent and efficient too. This leaves room for future research exploring the contributions of these technologies to sustainability outcomes.
Cross-Cultural Isolation: Sustainability practices differ substantially by region given the cultural and regulatory hotbeds for design. There is an enormous scope to develop comparative studies that can help to clarify the impact of contextual variables in the adoption of Green Finance and CSR and how they inform their effectiveness.

VII. CONCLUSION

As such, this research accentuates the vital interaction between Green Finance and Corporate Social Responsibility (CSR) to enhance sustainability in business practices. Although both are rooted in the notion of environmental and social responsibility, their combination creates a synergistic partnership that aligns financial instruments with ethical and sustainability objectives. The results indicate moderate correlations between Green Finance, CSR, and Sustainability Performance, suggesting they may depend on each other. But the lack of statistically significant direct effects for the SEM analysis points to the difficulty of capitalizing on this synergy at the operationalization stage. Such barriers stemmed from regulatory inconsistency, low awareness of SMEs and misalignment to operations that prevented effective implementation. Even more specific to the firm, differences across industries imply that unique approaches are required to achieve the best sustainability results. The opportunity for improvement by the sector varies; while the tech sector leads the Green Finance initiatives, the manufacture sector shows higher synergy. Addressing these gaps will require organizations to embrace collaborative mechanisms that bring together financial interests and CSR goals while backed by regulatory frameworks as well as capacity-building programs. The aforementioned alignment is primarily facilitated by policymakers and financial institutions, through the harmonization of regulations and the implementation of measures that incentivise the pursuit of sustainable investments. Including recent technologies, like blockchain and artificial intelligence, presents good prospects for transparency, efficiency and accountability in sustainability initiatives. Hence, the current study has implications for the existing literature body about sustainability, as it offers empirical evidence on the relationships among Green Finance, CSR and Sustainability Performance, thus enabling organizations and receive policy recommendations to promote global sustainability agenda. Further investigations must study the longitudinal effects, variances between countries, and the influence technological innovations have on the strengthening of these links.

REFERENCES

[1]. Han, B. (2024). RETRACTED ARTICLE: Fostering sustainability: integrating social responsibility, green finance, and corporate performance. *Economic Change and Restructuring*, *57*(2), 64.
[2]. Hussain, S., Rasheed, A., & Rehman, S. U. (2024). Driving sustainable growth: exploring the link between financial innovation, green finance and sustainability performance: banking evidence. *Kybernetes*, *53*(11), 4678-4696.
[3]. Dai, X., Siddik, A. B., & Tian, H. (2022). Corporate social responsibility, green finance and environmental performance: does green innovation matter?. *Sustainability*, *14*(20), 13607.
[4]. Ferri, G., & Acosta, B. A. (2019). Sustainable finance for sustainable development. *Center for Relationship Banking and Economics Working Paper Series*, *30*.

[5]. Cheung, F. M., & Hong, Y. Y. (Eds.). (2021). *Green finance, sustainable development and the Belt and Road Initiative*. London, UK: Routledge.
[6]. Sinha, A., Mishra, S., Sharif, A., & Yarovaya, L. (2021). Does green financing help to improve environmental & social responsibility? Designing SDG framework through advanced quantile modelling. *Journal of Environmental Management*, *292*, 112751.
[7]. Le, T. T. (2022). How do corporate social responsibility and green innovation transform corporate green strategy into sustainable firm performance?. *Journal of Cleaner Production*, *362*, 132228.
[8]. Kumar, J., Rani, G., Rani, M., & Rani, V. (2024). Do green banking practices improve the sustainability performance of banking institutions? The mediating role of green finance. *Social Responsibility Journal*, *20*(10), 1990-2007.
[9]. Li, X., & Yang, Y. (2022). Does green finance contribute to corporate technological innovation? The moderating role of corporate social responsibility. *Sustainability*, *14*(9), 5648.
[10]. Kumar, L., Nadeem, F., Sloan, M., Restle-Steinert, J., Deitch, M. J., Ali Naqvi, S., ... & Sassanelli, C. (2022). Fostering green finance for sustainable development: A focus on textile and leather small medium enterprises in Pakistan. *Sustainability*, *14*(19), 11908.

[11]. Kuteesa, K. N., Akpuokwe, C. U., & Udeh, C. A. (2024). Exploring global practices in providing small and medium enterprises access to sustainable finance solutions. *World Journal of Advanced Science and Technology*, *5*(2), 035-051.
[12]. Dikau, S., & Volz, U. (2021). Central bank mandates, sustainability objectives and the promotion of green finance. *Ecological Economics*, *184*, 107022.
[13]. Chen, J., Siddik, A. B., Zheng, G. W., Masukujjaman, M., & Bekhzod, S. (2022). The effect of green banking practices on banks' environmental performance and green financing: An empirical study. *Energies*, *15*(4), 1292.
[14]. Bhatnagar, S., & Sharma, D. (2022). Evolution of green finance and its enablers: A bibliometric analysis. *Renewable and Sustainable Energy Reviews*, *162*, 112405.
[15]. Cui, H., Wang, R., & Wang, H. (2020). An evolutionary analysis of green finance sustainability based on multi-agent game. *Journal of Cleaner Production*, *269*, 121799.
[16]. Wang, K. H., Zhao, Y. X., Jiang, C. F., & Li, Z. Z. (2022). Does green finance inspire sustainable development? Evidence from a global perspective. *Economic Analysis and Policy*, *75*, 412-426.
[17]. Hussain, S., Rasheed, A., & Rehman, S. U. (2024). Driving sustainable growth: exploring the link between financial innovation, green finance and sustainability performance: banking evidence. *Kybernetes*, *53*(11), 4678-4696.
[18]. Agrawal, R., Agrawal, S., Samadhiya, A., Kumar, A., Luthra, S., & Jain, V. (2024). Adoption of green finance and green innovation for achieving circularity: An exploratory review and future directions. *Geoscience frontiers*, *15*(4), 101669.
[19]. Wang, X., & Wang, Q. (2021). Research on the impact of green finance on the upgrading of China's regional industrial structure from the perspective of sustainable development. *Resources Policy*, *74*, 102436.
[20]. Wang, X., & Wang, Q. (2021). Research on the impact of green finance on the upgrading of China's regional industrial structure from the perspective of sustainable development. *Resources Policy*, *74*, 102436.
[21]. Debrah, C., Chan, A. P. C., & Darko, A. (2022). Green finance gap in green buildings: A scoping review and future research needs. *Building and Environment*, *207*, 108443.
[22]. Kumar, S., Sharma, D., Rao, S., Lim, W. M., & Mangla, S. K. (2022). Past, present, and future of sustainable finance: insights from big data analytics through machine learning of scholarly research. *Annals of Operations Research*, 1-44.
[23]. Zheng, G. W., Siddik, A. B., Masukujjaman, M., Fatema, N., & Alam, S. S. (2021). Green finance development in Bangladesh: The role of private commercial banks (PCBs). *Sustainability*, *13*(2), 795.
[24]. Hafner, S., Jones, A., Anger-Kraavi, A., & Pohl, J. (2020). Closing the green finance gap–A systems perspective. *Environmental Innovation and Societal Transitions*, *34*, 26-60.
[25]. Abdelkareem, R. (2019). *Triple bottom line mission and Financial Performance in Egyptian SMEs: The role of CSR"*. Bangor University (United Kingdom).
[26]. Tala, N. (2019). Corporate Social Responsibility and Firm Performances: bridging innovation and financial outcomes to stakeholder theory.
[27]. Karman, A., Prokop, V., Giglio, C., & Rehman, F. U. (2024). Has the Covid-19 pandemic jeopardized firms' environmental behavior? Bridging green initiatives and firm value through the triple bottom line approach. *Corporate Social Responsibility and Environmental Management*, *31*(1), 375-395.
[28]. Nave, A., & Ferreira, J. (2019). Corporate social responsibility strategies: Past research and future challenges. *Corporate Social Responsibility and Environmental Management*, *26*(4), 885-901.
[29]. Oduro, S., Bruno, L., & Maccario, G. (2024). Corporate social responsibility (CSR) in SMEs: what we know, what we don't know, and what we should know. *Journal of Small Business & Entrepreneurship*, *36*(2), 207-238.
[30]. Aliano, M., Cestari, G., & Madonna, S. (2024). Sustainable Finance for SMEs. *SUSTAINABLE FINANCE*.
[31]. Ariffin, K. M., & Milala, S. I. (2023). Advancing Sustainable Finance: A Framework for Strategic Institutional Financing. *Research in Management of Technology and Business*, *4*(2), 655-672.
[32]. Bansal, N., Taneja, S., & Ozen, E. (2023). Green Financing as a Bridge Between Green Banking Strategies and Environmental Performance in Punjab, India. *International Journal of Sustainable Development & Planning*, *18*(10).
[33]. Ayaz, G., & Zahid, M. (2024). Trends, shifts and future prospects of sustainable finance research: a bibliometric analysis. *Sustainability Accounting, Management and Policy Journal*, *15*(5), 1094-1117.
[34]. Ren, Y. S., Ma, C. Q., Chen, X. Q., Lei, Y. T., & Wang, Y. R. (2023). Sustainable finance and blockchain: A systematic review and research agenda. *Research in International Business and Finance*, *64*, 101871.
[35]. Oyewole, A. T., Adeoye, O. B., Addy, W. A., Okoye, C. C., Ofodile, O. C., & Ugochukwu, C. E. (2024). Promoting sustainability in finance with AI: A review of current practices and future potential. *World Journal of Advanced Research and Reviews*, *21*(3), 590-607.
[36]. Mahesha, V., & Manu, H. (2024). A study on exploring the integration of environmental sustainability practices in the operations of selected banks in Karnataka.
[37]. Osman, M., & Elamin, I. (2023). Advancing ethical and sustainable economy: Islamic finance solutions for environmental, social, & economic challenges in the digital age. *International Journal*, *10*(5), 408-429.
[38]. Yun, X., & Hu, Y. (2024). An Overview of the Evolution in the Research Landscape of Green Finance. *World*, *5*(4), 1335-1366.

Apendex:

II. QUESTIONNAaIRE: GREEN FINANCE AND CORPORATE SOCIAL RESPONSIBILITY

Section 1: Demographics

Gender:
o Male
o Female
o Prefer not to say

Age Group:
o 18–24
o 25–34
o 35–44
o 45–54
o 55 and above

Educational Qualification:
o High School
o Bachelor's Degree
o Master's Degree
o Doctorate
o Other (Please specify)

Job Role:
o Managerial
o Technical
o Operational
o Executive/Leadership
o Other (Please specify)

Industry Type:
o Manufacturing
o Financial Services
o Renewable Energy
o Technology
o Healthcare
o Other (Please specify)

Size of Your Organization:
o Less than 50 employees
o 51–100 employees
o 101–500 employees
o More than 500 employees

Current: Length of time in this role:
o Less than 2 years
o 2–5 years
o 6–10 years
o More than 10 years

PART I: PRACTICES IN GREEN FINANCE

Answers were recorded on a scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

It focuses its investments on green projects such as renewable energy.
Monetary means are dedicated towards enhancing eco-friendly operations.
The organization frequently issues green bonds and other such financial products.
To achieve transparency in green finance the organization uses technology (e.g blockchain).
Green finance practices support the long-term strategy of the organization.
Green finance partners are providing good support for green finance for Small and Medium Enterprises (SMEs) in the organization.
It regularly evaluates the green financing environmental impact.
Green finance practices have helped achieve greater operational cost efficiency.
The finance policies prioritise financing sustainable projects.

Part 3: CSR Practices

On a scale of 1 to 5, (1 = Strongly Disagree, 2 = Disagree, 3 =Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree)

CSR initiatives deal with important social issues like poverty or education.

It pays fair salaries and looks after employee health and happiness.
CSR strategies are also improved with the use of customer feedback to further ensure consumer satisfaction.
CSR practices emphasize on decreasing environmental damage done by the organization itself.
The organization was a part of development project in the community.
CSR initiatives help in enhancing the public image of the organization.
The organization provides an interface with people to prepare good strategies.
CSR Compliance: CSR Regulation compliance is in line with global & local regulations.
CSR policies focused on diversity, equity & inclusion.
Philanthropic contributions are a major aspect of the organization's CSR initiatives.
Part 4: The Interaction between Green Finance and CSR
And they gave me this scale to respond on: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree
CSR is supported with the use of green finance practices
You also discover areas in which financial investment of a sustainable nature can be successfully incorporated into the organization through CSR initiatives.
The combination of green finance inclusion and Corporate Social Responsibility (CSR) strengthens the sustainability efforts of the organization.
Green finance and CSR practices → → collaborates and enhances → → → → → → environmental performance
It has become evident among stakeholders that aligning green finance with CSR has its unique advantages.
The entity evaluate the sum impact of green finance & CSR on sustainable development.
Here, policies are in-place to enable the incorporation of green finance with CSR.
Long-term competitive advantage stems from the integration of green finance and CSR.
Sustainability Performance
(Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)
The Financial Performance of an Organization with Sustainability Practices
Green finance and CSR activities have triggered marked reduction in environmental pollution
As a result, social wellbeing initiatives have increased satisfaction levels for employees and stakeholders alike.
Profitability in the long run is due to sustainability practices.
The organisation has successfully diminished its carbon footprint with the help of green initiatives.
Investments in green finance and CSR expanded the innovation capability of the organization.
At the same time, sustainability practices also maintain the strength of the competitive position of the organization.
The sustainability practices of the organization do not stray away from the global standards of environmental protection.
Q/Section 6: Open-Ended Questions
Integration of Green Finance in CSR practices presents several challenges for your organization. Can you throw some light on those?
In what ways can we make green finance and CSR practice better to achieve their desired sustainability outcomes?
Do you have any tools, technologies, or frameworks that you [or your organization] use to fully realize green finance and your CSR strategies with the combination of financial equity?
How integrating green finance and CSR affects the organisation competitive advantage?