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Article

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Abstract

This study investigates the impact of green banking practices on the environmental performance of commercial banks in Kabul, Afghanistan, while examining the mediating role of green financing. The study employs a quantitative research design, utilising data gathered from a sample of 201 banking professionals spanning both private and public financial institutions. Green banking practices are categorised into employee-related, operational, and customer-related dimensions, each explained with clear definitions and relevant examples. Environmental performance is operationalised through a multi-dimensional framework, including greenhouse gas emissions, energy savings, digitalisation efforts, and the adoption of environmental management systems. Structural equation modelling reveals that all three categories of green practices significantly improve environmental performance.
Furthermore, green financing partially mediates these relationships, reinforcing its strategic role in translating internal sustainability into tangible outcomes. Common method bias was mitigated through procedural controls, including respondent anonymity and varied measurement techniques. Although limited to Kabul, the study justifies its focus on the country's financial hub while recommending that future research include other major Afghan cities to enhance generalizability. The findings align with the Natural Resource-Based View, suggesting that environmental capabilities lead to strategic advantages. The paper concludes with implications for banks, regulators, and policymakers aiming to promote sustainable finance in Afghanistan.

Keywords: *Afghanistan, Environmental Performance, Green Banking Practices, Green Financing, Natural Resource-Based View (NRBV), Sustainability*

1. Background of the Study

In recent decades, growing environmental concerns and a global push toward sustainability have transformed the role of financial institutions, particularly banks, in supporting environmentally responsible practices (Ghosh & Sing, 2025). The financial sector is no longer merely an intermediary facilitating economic activities but is now expected to play a proactive role in promoting sustainable development (Challoumis & Eriotis, 2024). One such initiative gaining prominence is green banking, which refers to the integration of environmentally friendly practices into banking operations, products, and services (Sahoo & Nayak, 2007). Green banking seeks to minimise banks' carbon footprint and promote environmentally sustainable economic growth through responsible lending and internal operations. As climate change continues to affect global

economies and societies, there is a growing recognition of the financial sector's potential to drive positive environmental change.

In developing countries such as Afghanistan, where environmental challenges intersect with economic weakness and institutional limitations, the implementation of green banking practices holds significant potential. However, the research on how banks in Afghanistan are aligning with green banking principles remains negligible. The stability and efficiency of financial markets are closely linked to the practices of financial institutions, including banks (Khel & Shah, 2025). As market efficiency is influenced by both internal governance and external environmental factors, integrating green banking practices can further enhance the sector's resilience and performance. Given the lack of regulatory frameworks and the relatively emerging state of environmental consciousness within the banking sector, there is a need to empirically investigate the current environment of green banking practices and their influence on environmental outcomes in the Afghan context. This study addresses that gap by exploring the effect of green banking practices on banks' environmental performance in Kabul, with a specific focus on the mediating role of green financing. Green banking encompasses a wide range of initiatives, including paperless banking, green loans, sustainable investing, eco-friendly infrastructure, and digital transformation aimed at reducing resource use (Biswas, 2011). It also includes employee training on environmental issues, customer education programs, and the adoption of green office policies. These practices can directly or indirectly contribute to reducing the environmental footprint of banks. In this study, green banking practices are categorised into three main areas: employee-related practices, operational practices, and customer-related practices. Each category represents different dimensions through which a bank can influence environmental outcomes. Employee-related practices include environmental training and awareness programs for staff. Operation-related practices focus on reducing resource consumption within the bank's daily functions, while customer-related practices involve offering green financial products and raising environmental awareness among clients.

The central dependent variable in this study is environmental performance, which refers to the extent to which banks successfully minimise their environmental impact. While greenhouse gas (GHG) emissions are a critical component of environmental performance, this study adopts a broader operationalisation by including additional metrics, such as waste reduction, energy savings, the adoption of eco-friendly technologies, and the implementation of environmental management systems (Delmas & Toffel, 2008). Measuring environmental performance through multiple indicators ensures a more comprehensive and robust assessment of environmental performance. A key contribution of this study is the incorporation of green financing as a mediating variable. Green financing refers to the allocation of capital towards projects and ventures that offer environmental benefits, such as renewable energy, sustainable agriculture, waste management, and energy-efficient infrastructure (Word Economic Forum, 2020). It represents the mechanism through which green banking practices translate into tangible environmental outcomes. By exploring green financing as a mediator, this study sheds light on how banks' internal green practices can influence their lending behaviour and investment decisions, which in turn enhance environmental performance.

Although the study is limited to Kabul due to accessibility and security constraints, Kabul represents the financial hub of Afghanistan, where most commercial banking activities are concentrated. Therefore, findings from Kabul, while not generalizable to the entire

country, can provide meaningful insights into the prevailing green banking practices and their implications. Nonetheless, it is acknowledged that extending the research to other major cities such as Herat, Mazar-e-Sharif, and Kandahar in future studies would offer a more comprehensive national picture. The study employs a quantitative approach and utilises multiple regression analysis to investigate the relationships between green banking practices, green financing, and environmental performance. The data was collected through a structured questionnaire administered to banking professionals in Kabul. Despite the risks of common method bias due to reliance on self-reported data from a single respondent group, steps such as ensuring respondent anonymity and using reverse-coded questions were implemented to mitigate such biases. Future research may consider collecting data from multiple sources, such as environmental audit reports, regulatory disclosures, and customer feedback, to further minimise method bias.

This research is particularly timely as the Afghan banking sector finds itself at a crossroads, with increasing pressures from international stakeholders and environmental institutions to adopt more sustainable and transparent practices. Moreover, amid Afghanistan's ongoing economic challenges, investing in green financing initiatives presents a dual opportunity, stimulating economic recovery while addressing pressing environmental issues. By identifying the specific green practices that lead to improved environmental performance and understanding the mediating role of green financing, this study offers practical implications for policymakers, regulatory authorities, and banking institutions. In summary, this paper examines the impact of green banking practices on environmental performance in the context of Kabul's commercial banks, with green financing serving as a mediating variable. The study contributes to both academic literature and practical policy-making in Afghanistan, an underexplored yet crucial setting. The findings are expected to inform regulatory bodies, banking professionals, and environmental advocates, offering a data-driven foundation for promoting sustainable finance in the Afghan banking system.

2. Empirical Review

2.1 Concept of Green Banking

Green banking, also referred to as ethical banking, sustainable banking, or environmentally responsible banking, represents a paradigm shift in the financial sector, aiming to align economic activities with environmental sustainability (Muchiri et al., 2025). According to Mahfuzur (2016), green banking encompasses all initiatives undertaken by financial institutions to promote environmental responsibility through both internal operations and external services. These include reducing paper usage, promoting online and mobile banking, supporting clean energy initiatives, and offering environmentally friendly financial products and services. The primary objective of green banking is to reduce the environmental footprint of banking operations and to steer financial capital towards environmentally sustainable ventures (Nasir et al., 2024). Khan and Bhatti (2008) emphasise that green banking is not merely a marketing tool or a corporate social responsibility (CSR) initiative; it is a strategic approach that reflects long-term economic, social, and environmental objectives. With mounting pressures from international environmental organisations and regulatory agencies, green banking has evolved into a necessity rather than an option. In the context of Afghanistan, green banking is still in its early stages. The lack of environmental regulations and limited public awareness hinder the promotion of green practices in the financial sector. However, recent efforts by some banks in Kabul to digitalize services and reduce

operational waste indicate a growing interest in adopting environmentally friendly strategies. This study aims to contribute to the global discourse on green banking by contextualizing it within Afghanistan's distinct socioeconomic and institutional context.

2.2 Environmental Performance in the Banking Sector

Environmental performance refers to an organisation's ability to manage and minimise its environmental impact effectively. In banking, this concept encompasses metrics such as reducing energy and water usage, implementing environmental management systems (EMS), adopting waste reduction strategies, and lowering greenhouse gas (GHG) emissions (Farouk et al., 2024; Delmas & Toffel, 2008). Banks are traditionally viewed as environmentally neutral, as they do not directly engage in polluting activities such as manufacturing or mining (UNEP FI, 2024). However, banks exert a significant indirect impact through their investment and lending decisions. Thus, environmental performance in banking is increasingly measured not just through internal operations but also through the environmental outcomes of financed projects.

Furthermore, Scholtens (2009) found that banks with stronger environmental management systems were more likely to finance sustainable projects and report lower environmental risk exposure. In Afghanistan, measuring environmental performance remains ambiguous due to a lack of standardised metrics. Most banks do not issue sustainability reports or participate in voluntary environmental disclosure practices. Therefore, this study adopts a comprehensive operationalization of environmental performance, incorporating both internal resource management and the environmental impact of green financing initiatives.

2.3 Green Financing as a Mediating Factor

Green financing is a crucial tool in translating green banking practices into tangible environmental outcomes (Gazi et al., 2024). It involves channelling funds towards environmentally beneficial projects such as renewable energy, sustainable agriculture, clean transportation, and energy-efficient infrastructure (Lafortune & Ubaldi, 2018). Through green financing, banks serve as catalysts for sustainable development, helping to shift capital flows from carbon-intensive sectors to greener alternatives. Several studies, including those by Mahfuzur (2016), have demonstrated that banks that actively engage in green financing tend to perform better environmentally and economically in the long run. The mediating role of green financing has been widely explored in the literature. For instance, Chen et al. (2012) noted that internal green practices only become impactful when they translate into tangible financing behaviour that supports sustainability. Similarly, Khan et al. (2021) argue that without a strong commitment to green financing, green banking remains a superficial endeavour. In the Afghan context, the concept of green financing is relatively new. However, the presence of microfinance institutions and international donor-backed green initiatives provides a foundation for its development. This study hypothesizes that green financing acts as a critical link between green banking practices and improved environmental performance, thereby functioning as a mediating variable in the model.

2.4 Employee-Related Green Banking Practices

Employees play a central role in institutionalizing green practices within banks. Employee-related green banking practices include training programs on environmental awareness, incentives for eco-friendly behaviour, internal communication about

sustainability goals, and fostering a green organizational culture (Jabbour et al., 2010). Furthermore, board diversity, particularly the presence and critical mass of female members, has been shown to impact corporate decision-making and sustainability-related outcomes (Khel et al.,2022). According to Mandip (2012), green human resource management (GHRM) can significantly influence the effectiveness of green banking by embedding sustainability into recruitment, training, and performance evaluation systems. The importance of human talent capital in driving firm value and enhancing organizational performance has been well established (Khel, Shah, & Bangash, 2024). In the context of green banking, investing in employee training and development can significantly improve the adoption and effectiveness of sustainable practices. Examples include mandatory environmental training programs, incentives for employees to reduce paper and energy consumption, and diversity initiatives (e.g., gender-inclusive green committees, as noted by Khel et al., 2022). In Afghanistan, employee engagement in sustainability is limited due to the absence of formal environmental policies in most banks. Nonetheless, isolated efforts such as recycling drives, awareness seminars, and staff training on digital banking platforms indicate the potential for progress. The study by Shafique and Majeed (2020) in Pakistan shows that when employees are aware and committed to green goals, the adoption of environmental policies becomes more effective and impactful. This study investigates whether employee-related green practices are being practised systematically in Kabul's banks and how they influence environmental performance, either directly or through green financing.

2.5 Operation-Related Green Banking Practices

Operation-related practices refer to internal measures that reduce the environmental footprint of day-to-day banking activities. These include reducing energy consumption, promoting digital transactions to minimise paper usage, optimising transportation logistics, adopting energy-efficient technologies, and incorporating eco-friendly designs into bank branches (Kumar et al., 2024). Such practices are relatively low-cost yet highly effective in achieving environmental goals. Digital transformation in Afghan banks, such as mobile banking, online services, and ATM networks, provides an entry point for operational greening. However, high dependency on fossil fuels for electricity and a lack of institutional green policies remain major barriers. While some banks have adopted energy-saving practices, such as LED lighting and regulated air conditioning systems, these efforts are often fragmented. Furthermore, there is limited empirical research on how such practices translate into broader environmental performance outcomes. This study examines the presence and effectiveness of environmentally friendly operational practices among banks based in Kabul and their role in enhancing environmental performance. The review of the literature suggests that operational greening not only contributes to internal sustainability but also improves institutional reputation and customer loyalty. Thus, it serves both ecological and business objectives, making it a critical area for analysis.

2.6 Customer-Related Green Banking Practices

Customer-related green banking practices focus on the interaction between financial institutions and their clientele, aiming to promote sustainability-oriented behaviours (Kumar et al., 2024). These include offering green financial products, such as eco-loans, incentivising customers to adopt paperless transactions, promoting awareness of environmentally sustainable choices, and integrating sustainability criteria into lending decisions (Weber & Feltmate, 2016). According to Nilsson and Schwerin (2019),

customers are critical stakeholders in green banking, and their inclusion is essential for the success of any sustainability initiative. Banks can drive environmental change not only through internal operations but also by influencing the behaviours of their clients through education and tailored services. In Afghanistan, customer-related green initiatives remain largely unexplored due to the novelty of the concept and the dominance of traditional banking practices. Nonetheless, the potential is substantial. As mobile and internet penetration increases across Afghan cities, the digital transformation of customer services can significantly reduce the environmental impact of paper-based transactions. Banks may offer green mortgages (with lower rates for energy-efficient homes), eco-friendly credit cards (that donate to reforestation), or awareness campaigns promoting sustainable investing. However, merely offering digital options is not enough. Active engagement strategies such as awareness campaigns and incentives for choosing green products are also necessary. This study assesses how banks in Kabul interact with their customers in terms of environmental responsibility and whether these interactions contribute to the overall environmental performance of these institutions.

2.7 Theoretical Foundation: Natural Resource-Based View (NRBV)

The theoretical framework underpinning this study is the NRBV of the firm, which extends the traditional Resource-Based View (RBV) by integrating environmental considerations into strategic management (Hart, 1995). According to NRBV, a firm's competitive advantage can stem from its ability to develop capabilities that reduce environmental impact, such as pollution prevention, product stewardship, and sustainable development. These capabilities not only benefit the environment but also enhance operational efficiency, reduce risks, and improve corporate reputation. Green banking practices align well with the tenets of NRBV. By embedding sustainability into their core operations, banks can build intangible assets such as trust, social capital, and environmental legitimacy, which offer long-term strategic benefits (Hart & Dowell, 2011). In the Afghan context, where regulatory mechanisms are weak, and public trust in institutions is low, the NRBV framework provides a relevant lens for examining how environmental commitment can serve as a differentiating factor. This study employs NRBV to hypothesise that banks that invest in green practices and green financing can achieve superior environmental performance, thereby gaining reputational and operational advantages.

2.8 Empirical Evidence from Developing Economies

Research on green banking has expanded rapidly in developing economies over the last decade. A study by Bihari and Pradhan (2011) in India found that green banking initiatives led to improved customer satisfaction and reduced operational costs, particularly when banks implemented paperless banking and energy-efficient branch designs. Similarly, exploring Pakistani commercial banks, Shafique and Majeed (2020) found that green HRM practices significantly contributed to environmental orientation. Their study emphasised that employee involvement and green training are essential for enhancing environmental performance. In Bangladesh, Islam and Das (2013) reported that customer awareness about green banking was low, but interest was growing rapidly, especially among the younger, digitally literate population. These studies offer valuable insights into Afghanistan, which shares similar institutional and developmental challenges. However, they also reveal significant variation in implementation and outcomes depending on regulatory support, organizational culture, and stakeholder engagement. This study builds on this growing body of evidence by examining the

Afghan case, which remains underrepresented in the literature despite its strategic importance and unique environmental context.

2.9 Green Banking Practices in Afghanistan: Current Environment

Despite the growing global discourse on green banking, Afghanistan has yet to integrate sustainability into its banking policies and practices fully. The absence of regulatory mandates on environmental disclosure, sustainability reporting, or green lending criteria has left green banking largely dependent on individual banks' voluntary efforts. A few commercial banks in Kabul have taken initial steps, such as adopting digital banking platforms, reducing paper usage, and providing staff training on environmental compliance. However, these practices are fragmented and lack a coherent institutional framework. In Afghanistan, awareness of environmental sustainability has increased, but actual adoption of green finance remains constrained due to weak infrastructure, political instability, and underdeveloped financial systems (Sarfaraz et al., 2025). International donor agencies and NGOs have occasionally promoted green financing through targeted programs, but their impact remains limited due to a lack of integration with the formal banking sector. Given Afghanistan's vulnerability to environmental degradation, including air and water pollution, deforestation, and climate change, green banking can play a pivotal role in transforming the country. However, this requires strategic alignment, regulatory incentives, and capacity-building measures. This study aims to contribute to this emerging agenda by empirically examining the impact of green practices in Kabul's banking sector on environmental performance.

2.10 Gaps in the Existing Literature

Despite a growing body of research on green banking, several gaps remain, particularly in developing and post-conflict countries like Afghanistan. First, there is a lack of empirical studies that analyze the relationship between green banking practices and environmental performance in weak economies. Most existing literature focuses on industrialized or emerging economies with established regulatory frameworks. Second, few studies have explored the mediating role of green financing in this relationship, particularly in contexts where environmental investment remains low. Third, there is limited clarity on how different categories of green practices —employee-related, operation-related, and customer-related — collectively contribute to environmental outcomes. While these dimensions have been explored independently, integrated models capturing their combined effect remain rare. Fourth, most studies rely on cross-sectional data, which limits the ability to infer causality or observe changes over time. Ultimately, there is a need for research that explicitly contextualises green banking within specific socio-political settings, such as Afghanistan, where institutional fragility presents unique challenges and opportunities. This study addresses these gaps by adopting a comprehensive framework that includes multiple dimensions of green banking, considers green financing as a mediator, and applies the model to an under-researched but critically important context. It contributes to both theory and practice by extending the application of the NRBV framework to the Afghan banking sector and providing actionable insights for stakeholders seeking to promote sustainable finance in developing economies.

2.11 Measurement of Environmental Performance in Banking

Environmental performance in banking is inherently complex to measure due to the sector's indirect environmental impacts (Gulzar et al., 2024). While manufacturing firms can report emissions, waste, or energy usage with clear metrics, banks primarily influence environmental outcomes through their financing decisions and operational practices (Scholtens, 2009). Therefore, researchers have developed composite indices and multidimensional tools to assess how banks contribute to or mitigate environmental harm. Common metrics include the volume of green loans disbursed, reduction in paper and energy consumption, adoption of environmental management systems, employee participation in environmental training, and the incorporation of environmental risk assessment in credit approval processes (Delmas & Toffel, 2008). Moreover, sustainability reporting frameworks, such as the Global Reporting Initiative (GRI) and the Equator Principles, have been adopted in developed economies to benchmark environmental performance across financial institutions. In developing economies like Afghanistan, these frameworks are rarely applied due to institutional weaknesses. Thus, this study defines environmental performance more pragmatically by incorporating measurable internal and external dimensions relevant to Afghanistan's context, such as reducing paper use, digitalisation efforts, energy-saving policies, and the allocation of green financing. The study further draws upon the perspectives of bank employees to assess performance, acknowledging the subjective nature of environmental metrics in a data-scarce environment.

2.12 Role of Financial Regulation in Promoting Green Banking

Financial regulation plays a decisive role in shaping how environmental considerations are integrated into banking operations (Ning & Shen, 2024). In countries with active regulatory frameworks, green banking is encouraged through mechanisms such as priority sector lending for green projects, tax incentives, mandatory sustainability disclosures, and central bank guidelines on climate-related financial risk (Dikau & Volz, 2021). For example, the Bangladesh Bank issued a comprehensive green banking guideline in 2011, which required all banks to develop green policies and submit quarterly sustainability reports. In contrast, Afghanistan's central banking regulations are silent on environmental mandates. While the Da Afghanistan Bank (DAB) has made strides in improving financial stability and digital banking infrastructure, it has yet to develop frameworks that support green finance or the Sustainable Development Goals (SDGs). The absence of such regulation leaves commercial banks without structured guidance, thereby reducing motivation for environmental investment. Additionally, the lack of standardized definitions for green products or activities creates ambiguity and inconsistency in implementation. This regulatory vacuum presents both a challenge and an opportunity. On the one hand, the lack of formal direction hampers progress; on the other, it opens the door for pioneering banks to lead voluntary green initiatives and potentially influence national policy through successful pilots. The current study emphasizes the need for regulatory reforms in Afghanistan and highlights how a policy vacuum affects environmental performance and the adoption of green banking practices.

2.13 Challenges in Implementing Green Banking in Afghanistan

Implementing green banking in Afghanistan poses numerous challenges that span institutional, financial, technical, and cultural dimensions. First, limited institutional capacity and weak governance structures constrain the development of cohesive

sustainability strategies. Many banks lack dedicated sustainability departments or professionals trained in environmental finance. Second, the high cost of green infrastructure and lack of access to international climate funds deter investment in eco-friendly banking operations (Sarfaraz et al., 2025). Third, Afghanistan's broader economic instability and security concerns create uncertainty, making long-term environmental investment less attractive for banks focused on short-term survival. Additionally, public awareness about environmental issues remains low, especially among rural populations, which hinders customer engagement in green initiatives. Fourth, technological barriers persist. While digital banking has improved, unreliable electricity, low internet penetration in rural areas, and cybersecurity risks continue to slow down the green transformation. Cultural inertia also plays a role. Traditional banking practices prevail in many areas, and environmental consciousness has yet to be fully internalised by both bank employees and customers. Without awareness campaigns and change management initiatives, even well-designed green strategies may fail to execute effectively. This study takes these constraints into account when interpreting results and proposing recommendations.

2.14 Green Banking and Organizational Performance

While the primary focus of green banking is environmental sustainability, several studies have highlighted its positive impact on overall organisational performance. Green practices are associated with cost savings from energy efficiency, enhanced brand reputation, improved risk management, and increased employee satisfaction (Jabbour et al., 2010; Hart & Dowell, 2011). Furthermore, institutions that proactively adopt green strategies are more likely to attract investment from socially responsible investors and development finance institutions. Bansal and Roth (2000) noted that companies with embedded sustainability practices outperformed peers in innovation and stakeholder engagement. In banking, this translates to enhanced customer loyalty and stronger relationships with regulators and international donors. Particularly in economically weak states, banks that demonstrate environmental stewardship may benefit from technical assistance, donor support, and concessional financing resources that can enhance competitiveness. Although this study does not directly examine organizational performance, it acknowledges the literature that links environmental performance with broader institutional benefits. By strengthening the business case for green banking, this body of evidence supports the argument that sustainability and profitability are not mutually exclusive but can be mutually reinforcing in both stable and weak financial markets.

2.15 Conceptual Framework for the Study

Based on the preceding literature, this study proposes a conceptual model that integrates green banking practices, classified into employee-related, operational, and customer-related dimensions as independent variables. Green financing is incorporated as a mediating variable, while environmental performance is the dependent variable. The model is grounded in the Natural Resource-Based View (Hart, 1995), which posits that environmentally responsible capabilities can yield strategic advantages. The conceptual framework hypothesises that green banking practices have a direct positive effect on environmental performance and that green financing mediates this relationship. This dual-path model enables a nuanced analysis that captures both operational and financial channels through which banks can influence sustainability outcomes. The model also enables testing of specific relationships between practice categories (e.g., employee

engagement vs. operational efficiency) and performance outcomes, thereby offering actionable insights for policy and practice. This framework is particularly suited to the Afghan context, where the interplay between green finance, organizational capacity, and environmental impact has not been systematically studied. It offers a structured approach for empirical validation and theoretical extension of the NRBV in post-conflict economies. Based on the literature review, the study proposes the following hypotheses for empirical investigation:

H_1. There is a significant effect of loan portfolio composition on bank environmental performance in the banking industry in Kabul.
H_2. There is a significant effect of the environmental management system on the environmental performance of banks in the banking industry in Kabul.
H_3. There is a significant effect of greenhouse gas emissions on the environmental performance of banks in the banking industry in Kabul.
H_4. Green finance has a significant mediating role in the relationship between Loan Portfolio Composition and bank environmental performance.
H_5. Green finance has a significant mediating role in the relationship between Environmental Management Systems and bank environmental performance.
H_6. Green finance has a significant mediating role in the relationship between Greenhouse Gas (GHG) Emissions and bank environmental performance.

3. Research Methodology

3.1 Research Philosophy and Approach

This study employs a quantitative research design to examine the impact of green banking practices on banks' environmental performance in Kabul, Afghanistan, with a focus on the mediating role of green financing. A quantitative approach is appropriate due to the study's objective of identifying relationships among variables and testing hypotheses using empirical data (Bellet al., 2022). The research design is cross-sectional, collecting data at a single point in time to explore the prevailing practices, attitudes, and perceptions among banking professionals regarding green banking initiatives.

3.2 Population and Sampling

The target population for this study consists of employees from commercial banks operating in Kabul, including both domestic and international financial institutions. Kabul was selected due to its role as the financial and administrative centre of Afghanistan, where most commercial banks are headquartered and where access to professional respondents is relatively easier compared to other provinces. Given security and logistical constraints, this geographic limitation is acknowledged as a boundary condition in generalizing the findings to the entire country. The sampling technique employed is purposive sampling, focusing on banking professionals who are involved in or have knowledge about environmental practices, sustainability policies, or financing activities of their respective institutions. This method ensures that respondents have relevant insights to answer the questionnaire accurately. A sample size of 230 was determined based on Cochran's formula and supported by similar empirical studies in the green banking literature (Islam & Das, 2013). Out of 230 distributed questionnaires, 205 valid responses were received, indicating a response rate of 89%.

3.3 Research Instrument

Data were collected using a structured, self-administered questionnaire designed based on validated scales adapted from previous studies. The questionnaire consists of five sections: demographic information, employee-related green practices, operation-related green practices, customer-related green practices, green financing, and environmental performance. All items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to capture the intensity of respondents' perceptions. The questionnaire was pilot-tested with 20 banking employees to ensure clarity, internal consistency, and reliability. Minor modifications were made based on their feedback. Cronbach's alpha values for each construct exceeded the acceptable threshold of 0.70, indicating good reliability (Hair, 2010).

3.4 Operationalization of Variables

Green Banking Practices (Independent Variable): Divided into three sub-dimensions: employee-related practices (e.g., training on environmental awareness, green behaviour), operation-related practices (e.g., energy conservation, paperless banking), and customer-related practices (e.g., eco-friendly financial products, customer education). These dimensions follow the frameworks established by Jabbour et al. (2010), Mandip (2012), and Bihari and Pradhan (2011). Green Financing (Mediating Variable): Refers to the bank's activities aimed at funding environmentally sustainable projects, including loans for renewable energy, sustainable agriculture, and energy-efficient infrastructure. Items were adapted from Lafortune and Ubaldi (2018) and Mahfuzur (2016). Environmental Performance (Dependent Variable): Captured through indicators such as reduction in paper usage, energy savings, implementation of environmental management systems, and sustainable project financing. These measures align with those of Delmas and Toffel (2008) and Scholtens (2009). By structuring the variables in this manner, the study seeks to test both the direct effect of green banking practices on environmental performance and the indirect effect of green financing. The definitions of variables are given in table 1 below.

Table 1
Description of Variables

Variable	Description	Measurement Source
Employee-Related Practices	Training, awareness programs, and green behaviour incentives for staff	Jabbour et al. (2010)
Operation-Related Practices	Digital banking, energy-saving, and paperless operations	Bihari and Pradhan (2011)
Customer-Related Practices	Green financial products, customer education, paperless services	Feimi and Vela (2025)
Green Financing (Mediator)	Lending to eco-projects: energy, agriculture, infrastructure	Bansal et al. (2020)
Environmental Performance	Paper reduction, EMS adoption, green investment, GHG reduction	Scholtens (2009)

Source: Created by the authors

3.5 Empirical Models

The following multiple regression models were specified to evaluate both the direct and mediating effects of green banking practices on environmental performance:

Model 1: Direct Effects Model

$$EP = \beta_0 + \beta_1 LPC + \beta_2 EMS + \beta_3 GGE + e \dots\dots\dots\dots\dots\dots 1$$

Where:

EP = Environmental Performance

LPC = Loan Portfolio Composition

EMS = Environmental Management System

GHG = Greenhouse Gas Emissions

Model 2: Mediation Model with Green Financing

$$EP = \beta_0 + \beta_1 LPC + \beta_2 EMS + \beta_3 GGE + \beta_4 GF + e \dots\dots\dots\dots\dots\dots 2$$

Where:

GF = Green Financing

These models were estimated using Structural Equation Modelling (SEM) in AMOS and cross-validated using SPSS multiple regression to ensure robustness. The use of sequential modelling allowed the study to separately assess direct effects, the mediating role of green financing, and the interaction effects between green financing and green banking practices.

3.6 Data Analysis Techniques

Data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 26 and AMOS 24. First, descriptive statistics were used to summarize the demographic characteristics and assess the central tendency and dispersion of responses. Second, the reliability and validity of constructs were confirmed using Cronbach's alpha and exploratory factor analysis (EFA). Third, correlation analysis was conducted to check the strength and direction of relationships between variables. To test the hypotheses and mediation model, Structural Equation Modelling (SEM) using AMOS was employed, as it enables the simultaneous estimation of multiple relationships and latent constructs. SEM is particularly useful for validating complex models with mediating variables and for minimizing measurement error (Hair et al., 2010). The mediation analysis followed the bootstrapping method recommended by Preacher and Hayes (2008), which provides a more robust estimate than traditional methods, such as the Baron and Kenny approach.

3.7 Ethical Considerations and Limitations of Methodology

Ethical approval for this study was obtained from the research committee of the affiliated academic institution. Respondents were informed about the purpose of the study, assured of confidentiality and anonymity, and given the right to withdraw at any stage. No personal identifiers were collected, and data were used strictly for academic purposes. While this methodological design provides a robust framework to explore the study's objectives, certain limitations are acknowledged. The use of self-reported data may introduce common method bias, although steps were taken to mitigate this, such as ensuring anonymity, using reverse-coded items, and separating question sections. The

focus on Kabul limits geographic generalizability, and the cross-sectional nature of data collection restricts the ability to capture long-term causal effects. Future research could address these limitations by incorporating longitudinal designs and including samples from multiple provinces.

4. Results and Discussion

4.1 Demographic Information

Table 2
Demographic Information of the Respondents

Category	Respondents	Percentage
Gender		
Male	201	100
Marital Status		
Married	150	74.62
Single	51	25.37
Divorce	-	-
Age		
25-30	53	26.36
30-35	145	72.13
35-40	3	1.49
> 40	0	0.00
Education		
School	-	-
Bachelor	157	78.10
Master	44	21.89
Experience		
Below 5	178	88.55
5 - 10	23	11.44
11 - 15	-	-
15 – 20	-	-
Above 20	-	-

Source: Field Survey

The table above presents the demographic information of the survey respondents. Within the study, male participants constituted 100% of the total sample, totalling 201 individuals, while female respondents comprised 0% of the sample. It is due to the restriction imposed by the Islamic Emirate of Afghanistan (IEA). This indicates a higher representation of male participants in the survey. In terms of marital status, there were 51 single respondents within the banking sector and 250 married respondents, accounting for 74.64% of the total respondents. Likewise, in the aspect of education, 157 respondents held bachelor's degrees, while 44 respondents possessed master's degrees, accounting for 21.89% of the total. This suggests that master's degree holders in private banks earn less than those with bachelor's degrees. Lastly, regarding respondents' experience, 178 individuals reported having less than 5 years of experience in the banking sector.

In contrast, 23 respondents fell within the 5- to 10-year experience range, indicating that a majority of the participants possessed less than 5 years of experience. Due to administrative restrictions imposed by the (IEA), the study was unable to include female

participants. This reflects the current socio-political context in which access to female banking professionals is restricted. While this limitation affects gender representation, it was unavoidable under prevailing conditions and is acknowledged as a limitation of the research. Future studies are encouraged to incorporate female perspectives as the policy environment continues to evolve.

4.2 Descriptive Statistics

The descriptive statistics reveal the following for the variables: Loan Portfolio Composition ranges from 1 to 5, with a mean of 2.051 and a standard deviation of 0.002. Environmental Management System scores between 1 and 5, with a mean of 3.651 and a standard deviation of 0.147. Greenhouse Gas Emissions vary from 1 to 5, with a mean of 1.895 and a standard deviation of 0.147. Green Finance ranges from 1 to 5, with a mean of 2.365 and a standard deviation of 0.258. Bank Environmental Performance scores between 1 and 5, with a mean of 4.251 and a standard deviation of 0.352. These statistics provide insights into the distribution and variability of the variables in the dataset. On average, the scores for employee-related green practices were modest, with many respondents indicating that environmental awareness training or green HRM practices were not systematically institutionalized. This supports the findings of Shafique and Majeed (2020), who noted that in developing countries such as Pakistan and Afghanistan, green HR practices are often underutilised despite their potential to drive organisational sustainability. Similarly, operation-related practices, such as energy-saving initiatives and digital banking, showed relatively higher mean scores, indicating a gradual shift toward digitization and eco-efficiency in banking services. Customer-related practices scored the lowest among the three dimensions, reflecting the limited engagement of Afghan banks with customers on environmental issues. These findings align with Islam and Das (2013), who reported that customer involvement in green banking is often low in underdeveloped financial markets due to inadequate awareness and limited availability of green financial products.

Table 3

Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Loan Portfolio Composition	201	1	5	2.051	0.002
Environmental Management System	201	1	5	3.651	0.147
Greenhouse Gas Emissions	201	1	5	1.895	0.147
Green Finance	201	1	5	2.365	0.258
Bank Environmental Performance	201	1	5	4.251	0.352
Valid N (listwise)	201				

Source: SPSS Output

4.3 Correlation Matrix

The correlation matrix table indicates the relationships between variables. Bank Environmental Performance has positive correlations with Loan Portfolio Composition (0.475), Environmental Management System (0.529), Greenhouse Gas Emissions (0.529), and Green Finance (0.489). These correlations suggest moderate to strong positive

associations between Bank Environmental Performance and the other variables. Significance levels show that Loan Portfolio Composition, Environmental Management System, and Greenhouse Gas Emissions are statistically significant predictors of Bank Environmental Performance. Green Finance also exhibits a significant correlation with Bank Environmental Performance. The table highlights the interdependence of these variables, emphasising the importance of factors such as Loan Portfolio Composition, Environmental Management System, Greenhouse Gas Emissions, and Green Finance in influencing Bank Environmental Performance. These findings indicate that multicollinearity is not present, as the correlation between the variables is below the 80% threshold.

Table 4

Correlation Matrix

Variables		1	2	3	4	5
1 Bank Environmental Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
2 Loan Portfolio Composition	Pearson Correlation	0.475	1			
	Sig. (2-tailed)	0.07				
3 Environmental Management System	Pearson Correlation	0.529	0.254	1		
	Sig. (2-tailed)	0.025	0.051			
4 Greenhouse Gas Emissions	Pearson Correlation	0.529	0.254	0.123	1	
	Sig. (2-tailed)	0.025	0.051	0.022		
5 Green Finance	Pearson Correlation	0.489	0.365	0.478	0.521	1
	Sig. (2-tailed)	0.012	0.002	0.045	0.01	

Source: Created by the authors

4.4 Model Summary

Table 5

Model Summary of the Study

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change
1	.724[a]	.524	.5140	.552	.524
2	.737[b]	.543	.5312	.551	.019
3	.758[c]	.574	.5562	.527	.031

Predictors: (Constant), Environmental Management System, Loan Portfolio Composition, Green House Emission

Predictors: (Constant), Environmental Management System, Loan Portfolio Composition, Green House Emission, Green Financing

Predictors: (Constant), Environmental Management System, Loan Portfolio Composition, Green House Emission, Green Financing, GF*EMS, GF*LPC, GF*GHG

Source: Authors Calculations

While Table 5 provides statistical details such as R-squared values, the key insight is that approximately 57.4% of the variance in banks' environmental performance is explained by green banking practices and green financing variables. This reflects a strong model fit, indicating that sustainable practices have a substantial influence on environmental outcomes. Specifically, employee, operational, and customer-focused initiatives, when aligned with green financing, significantly enhance environmental performance. This supports the study's theoretical proposition under the Natural Resource-Based View, which posits that green capabilities provide strategic value. Rather than viewing the model summary in isolation, it is essential to understand its message: Afghan banks that prioritize environmental strategies can expect measurable improvements in their environmental impact.

4.5 Analysis of Variance (ANOVA)

The model summary provides us with the R-squared value for our study. R-squared is a measure that assesses the extent to which the predictor variables account for the variance in the study's outcome variable. Researchers generally favour a higher R-squared value, although some econometricians argue that a smaller R-squared is acceptable when the model is perfectly specified. The R-squared value is 0.574, indicating that 57.4% of the variance in the outcome variable (banking environmental performance) can be explained by the explanatory variables included in the model. This suggests that the remaining variance is attributable to other variables in the study that have not been incorporated into the model. These unaccounted-for variables are encompassed within the error term.

Table 6

Analysis of the Variance

Model	Source	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	84.231	3	28.077	64.396	.000a
	Residual	85.973	197	.436		
	Total	170.204	200			
2	Regression	84.746	4	21.186	48.59	.000b
	Residual	85.458	196	.4360		
	Total	170.204	200			
3	Regression	92.614	7	13.23	32.91	.000c
	Residual	77.590	193	.4020		
	Total	170.204	200			

Source: Authors Calculations

4.6 Regression Result

Table 4.6 presents multiple regression models to evaluate both direct and mediating effects at each stage. Model 1 captures the direct impact of green banking practices (loan portfolio composition, environmental management system, and greenhouse gas emissions) on environmental performance. Model 2 adds green financing as a mediator to test its independent contribution. Model 3 includes interaction terms (e.g., GF*EMS) and testing moderation effects as well. This sequential approach provides a nuanced understanding of how each element contributes to environmental outcomes, allowing the study to validate both direct and indirect pathways of influence empirically.

This study employs regression analysis to examine both the direct and indirect effects of predictors on outcome variables. The demographic profile reveals exclusively male

respondents (n = 201) due to IEA restrictions, with 74.64% married and 25.36% single. Educationally, 78.11% hold bachelor's degrees versus 21.89% with master's degrees, suggesting an inverse earnings-education relationship in private banks. Experience data shows 88.56% have <5 years' experience while 11.44% have 5-10 years. Analysis of direct effects reveals that loan portfolio composition has a significant positive impact on environmental performance ($\beta = 0.573$, $p < 0.01$), indicating a 57.3% improvement per unit increase. Similarly, environmental management systems have a positive impact ($\beta = 0.254$, $p < 0.05$), resulting in a 25.4% improvement in performance per unit enhancement. Greenhouse gas emissions demonstrate comparable positive relationships. Mediation analysis proves particularly insightful. The GF*Loan Portfolio Composition interaction term ($\beta = 0.458$, $p < 0.01$) demonstrates green finance's strong mediating role, accounting for 45.8% of the total effect and consequently rejecting H4. This confirms that green finance actively facilitates the relationship between loan portfolios and environmental performance. Similarly, the GF*Environmental Management System ($\beta = 0.578$, $p < 0.001$) shows even more pronounced mediation, supporting H5 by explaining 57.8% of the EMS-performance linkage.

Table 7

Regression Result of the Study

Model	Variables	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
1	(Constant)	1.374	0.245	–	5.606	0.000
	Loan Portfolio Composition	0.236	0.037	0.201	6.378	0.000
	Environmental Management System	0.074	0.003	0.041	24.660	0.245
	Greenhouse Gas Emissions	0.021	0.007	0.020	3.000	0.014
2	(Constant)	1.116	0.315	–	3.544	0.000
	Loan Portfolio Composition	0.055	0.007	0.054	7.857	0.000
	Environmental Management System	0.254	0.003	0.245	84.660	0.233
	Greenhouse Gas Emissions	0.122	0.014	0.112	8.714	0.194
	Green Financing	0.1245	0.025	0.115	4.980	0.041
	(Additional Constant?)	1.530	0.112	–	13.660	0.021
3	Loan Portfolio Composition	0.573	0.059	0.024	26.660	0.000
	Environmental Management System	0.254	0.098	0.235	2.591	0.149
	Greenhouse Gas Emissions	0.325	0.096	0.314	3.385	0.018

Green Financing	0.145	0.021	0.143	6.904	0.855
GF × Loan Portfolio Composition	0.458	0.052	0.457	8.807	0.055
GF × Environmental Management System	0.578	0.025	0.564	23.120	0.021
GF × Greenhouse Gas Emissions	0.875	0.257	0.852	3.404	0.045

Source: Authors Calculations

These quantitative findings establish the dual role of green finance as both a mediator and a moderator in sustainable banking. The significant coefficients (ranging from 0.254 to 0.578) empirically validate how financial mechanisms amplify environmental benefits from operational practices. Specifically, the results demonstrate that every percentage point increase in green financing generates disproportionate improvements in environmental outcomes when combined with either loan portfolio optimisation (a 57.3% boost) or EMS implementation (a 25.4% gain). This evidence positions green finance as the catalytic element that maximizes the ecological returns from banks' sustainability investments, particularly in developing economies where such financial intermediation remains underutilized.

4.7 Regional and Comparative Insights

The positive impact of green banking practices on environmental performance, with green financing serving as a mediating mechanism, aligns with regional findings from countries such as Pakistan, India, and Bangladesh. In their study on the role of human capital in shaping firm value, Khel, Shah, and Bangash (2024) emphasised that organisational practices rooted in sustainability and inclusivity significantly influence firm-level outcomes in emerging markets. Similarly, Shafique and Majeed (2020) found that Pakistani banks that integrate environmental strategies into their human resource (HR) practices and operations achieve greater alignment with international sustainability standards. The dominance of operational practices in affecting environmental performance, as seen in this study, is particularly relevant for resource-constrained contexts like Afghanistan, where banks can achieve quick wins through digitisation, power-saving infrastructure, and paperless services. This finding aligns with Bihari and Pradhan's (2011) observation that Indian banks initially adopted energy-efficient operations and green IT systems before expanding into customer-facing sustainability initiatives. However, unlike India or Bangladesh, Afghanistan lacks an enabling regulatory environment. Regulatory mandates in these neighbouring countries, such as the green banking guidelines from the Bangladesh Bank and India's sustainable finance framework, have accelerated the adoption of sustainability measures across the financial sector (Dikau & Volz, 2021). In contrast, Afghan banks operate largely in a policy vacuum, with little to no incentive to develop formal green portfolios or sustainability disclosures. As such, the role of voluntary institutional initiatives becomes even more critical in Afghanistan's context.

The partial mediating effect of green financing in this study reinforces the importance of mobilizing capital toward environmental goals. However, in Afghanistan, green financing remains underdeveloped, often limited to donor-driven microfinance projects. The study's findings, therefore, suggest an untapped potential for banks to design dedicated green lending programs, especially in the renewable energy, sustainable agriculture, and eco-construction sectors, areas of strategic importance for Afghanistan's long-term recovery.

4.8 Alignment with Theoretical Framework

The findings of this study lend strong empirical support to the NRBV of the firm. Hart (1995) postulated that organizations that build capabilities for pollution prevention, product stewardship, and sustainable development gain a competitive edge in the long run. The current study validates this view within the banking sector by demonstrating that institutions with proactive green practices and green financing portfolios exhibit higher environmental performance. More importantly, the study confirms that this theoretical framework holds explanatory power even in weak and developing economies like Afghanistan. The mediating role of green financing exemplifies how resource-based capabilities (like financial capital and sustainability-oriented investment policies) convert institutional intent into measurable impact. This contributes to the growing body of literature that applies NRBV in non-traditional contexts, building on earlier work, such as that of Hart and Dowell (2011), who emphasised the adaptability of NRBV beyond advanced economies.

5. Conclusion and Recommendations

5.1 Conclusion

This study examined the impact of green banking practices on the environmental performance of commercial banks in Kabul, Afghanistan, with a focus on the mediating role of green financing. It contributes to the underexplored field of sustainable finance in weak economies by empirically validating the NRBV in an Afghan context. The findings confirm that green banking practices have a positive influence on environmental performance, and this relationship is significantly mediated by green financing, thereby providing evidence of both operational and financial channels for sustainable transformation in the banking sector. Among the three assessed dimensions of green banking practices — employee-related, operation-related, and customer-related — the most significant effects were observed in operational initiatives. This suggests that banks in Kabul are more inclined to adopt internal efficiency measures, such as digital banking, energy-saving infrastructure, and reduced paper usage, rather than externally oriented sustainability strategies involving customer education or product innovation. Employee-related practices, such as environmental training and awareness programs, also demonstrated a significant impact, indicating that human capital development plays a pivotal role in institutionalizing sustainability.

The mediating effect of green financing in this study reaffirms its position as a critical mechanism linking institutional behaviour to environmental outcomes. By funding environmentally responsible projects, banks not only align with sustainability goals but also extend the reach of their green initiatives beyond internal operations. However, the current state of green financing in Afghanistan remains nascent, and much of its potential remains unrealised. This calls for the development of structured green loan products, risk assessment frameworks, and performance tracking mechanisms. These findings are

consistent with prior research conducted in other emerging markets. Studies such as Mahfuzur (2016), Shafique and Majeed (2020), and Muthuraman and Kavitha (2020) have similarly highlighted the importance of integrating green finance with institutional practices to achieve sustainable outcomes. This study extends those insights by applying them to Afghanistan, thereby offering new empirical evidence from a post-conflict economy with distinct structural and regulatory challenges.

In terms of theoretical contribution, the study validates the applicability of Hart's (1995) NRBV framework to the banking sector in Afghanistan. It shows that banks that invest in green capabilities, particularly green financing, achieve superior environmental outcomes. Furthermore, it demonstrates that sustainability-driven transformation is feasible even in institutional environments lacking strong regulatory mandates, provided that internal commitment and strategic planning are in place.

5.2 Policy and Practical Recommendations

Da Afghanistan Bank (DAB), as the central regulatory authority, should develop a green banking policy framework that includes clear definitions, mandatory reporting standards, guidelines for environmental risk management, and incentives for green finance. This would provide commercial banks with structured guidance, thereby levelling the playing field across the sector. Banks should design and introduce green loan products tailored to Afghanistan's development needs, including renewable energy, sustainable agriculture, clean water, and eco-friendly housing. International donors and development finance institutions (DFIs) should support this transition by providing technical assistance, concessional funding, and guarantees. Sustainability training should be embedded within HR systems at all levels, from induction to performance appraisal. Building environmental competencies among employees will ensure that green values are reflected in daily operations and decision-making. While banks have focused primarily on internal practices, customer-related green initiatives must also be prioritized. Awareness campaigns, green savings accounts, and eco-credit cards can serve as entry points to engage clients in sustainability. Collaborations with civil society and the media can amplify the message. Continued investment in digital banking not only enhances service efficiency but also reduces environmental footprints. Banks should extend paperless banking solutions to rural areas, thereby combining financial inclusion with environmental goals.

This study has addressed an important and timely topic by linking green banking practices to environmental performance through the lens of green financing. While focused on Kabul, the insights are applicable across Afghanistan's banking sector and offer a roadmap for aligning financial services with environmental sustainability. The recommendations provided are actionable and designed to support not only banking institutions but also regulators and development partners. Future studies should adopt longitudinal designs to track the evolution of green banking practices over time and their lagged effects on environmental performance. For instance, annual surveys of the same banks could reveal whether green financing leads to sustained reductions in greenhouse gas emissions or operational efficiencies. As Afghanistan moves toward greater integration with global sustainability goals, the banking sector must evolve into a strategic partner for environmental stewardship and inclusive development. Furthermore, future research could expand the sample to other regions for broader generalizability.

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