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Article

# Enhancing sustainability through green banking: Assessing its impact on environmental performance

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**Abstract:** The abstract serves both today's banks, which are significantly impacted by unsustainability in direct and indirect ways. There is growing pressure within the banks of Pakistan to enhance sustainable banking practices; where these green banking practices are still in the initial stages of enhancing sustainability, banks face increasing pressure to improve their environmental performance. This study examines the impact of environmental performance by enhancing sustainable green banking practices, focusing on the moderating role of ecological obsessive passion in this relationship. Green banking practices are evaluated through micro-level factors such as operations, investments, and policies. The study also explores how obsessive environmental passion affects the relationship between banking practices and their impact on environmental performance. Data were collected using the partial least-squares structural equation Modelling (PLS-SEM) method from 241 respondents working for banks in Pakistan. The findings indicate that sustainable banking procedures, comprising operations, investments, and policies, have a considerable positive impact on environmental performance. Furthermore, the study discovered that environmental obsessive passion modifies the relationship between green banking practices and policies and environmental sustainability. However, the relationship between green investments and ecological performance remains. To increase sustainability, banks should include green practices in their fundamental operations, investments, and policies. It includes using energy-efficient technologies, encouraging paperless transactions, and funding environmentally conscious enterprises.

**Keywords:** green banking; sustainability; environmental performance; green practices

## 1. Introduction

Climate change remains a problem that needs global and domestic approaches. Sustainable banking practices to mitigate environmental issues This study provides a new lens by exploring the moderating role of ecological obsessive passion, a rarely-studied psychological construct in contemporary literature. This aspect is essential because it allows for some preliminary evidence regarding intrinsic motivation as a moderator for the effectiveness of green banking efforts. Climate change remains a critical issue facing developed and developing countries and requires a concerted response from the international community (Khan et al., 2023). The rewards can be tremendous for developing countries with minimal resources and depend primarily on external financing mechanisms for climate adaptation and mitigation without sacrificing their economic growth. However, access to these funds is often limited by poor capacity and capability at institutions responsible for project design, such as Pakistan's challenge in this space (Ibeenwo et al., 2019). The banking sector is key because it can promote environmental sustainability by implementing "Green

Banking," including environmentally-friendly initiatives and financial products designed to reduce environmental impact (Zhang et al., 2022).

Green banking is a strategic approach that makes banking operations consistent with environmentally safe principles and encourages sustainable practices in the banking sector (Risal and Joshi, 2018). Because green banking is increasingly becoming popular, there is a distinct gap in research regarding the psychological concepts concerning the tendency to have environmental responsibility within banking institutions (Sohail, 2023). More research is needed to link green banking practices with ecological performance in developing countries (Bhardwaj and Malhotra, 2013). Correlatively, the absence of empirical evidence has led to a gap in knowledge among policymakers and industry leaders on the potential for higher environmental impacts and improved economic performance through sustainable banking practices (Sunil and Durgalashmi, 2022). In addition, Jain (2023) argues that high upfront costs, weak regulatory networks, and low public awareness of green banking initiatives exacerbate the barriers to adopting green banking practices. Such barriers significantly affect the universal exposition of green banking practices, banks' overall environmental performance, and their green contributions (Aslam and Jawaid, 2022).

The current literature identifies a significant gap in the body of knowledge regarding the multispectral impact of green banking practices on environmental performance (Prabhu and Aithal, 2023), especially in developing economies. Although the existing studies on green banking and financial performance reflect the importance of a positive association (Bukhari et al., 2020), they have yet to be conclusive on how some psychological parameters, such as environmental obsessive passion, may moderate this relationship's positive or negative nature. Moreover, more empirical studies are needed to assess the effectiveness of particular green banking policies and their effect on environmental performance (Shaumya and Arulrajah, 2017). Such inadequate information shows that research is needed to identify the impact of green banking practices on environmental performance and the role of customers in this (Iqbal et al., 2021). These gaps should be addressed, mainly to guide our policymakers and banking institutions about the beneficial implications of going green, the need for investment in the same, and the factors that may facilitate or hinder this practice (Kumar et al., 2023).

Aiming to examine the effect of green banking practices such as green operation, green investment, and green banking policies on environmental performance, the current study attempts to moderate the relationship by assessing environmental obsessive passion. The study aims to explore these relationships to show how banking institutions can improve their efforts toward sustainability by embracing greener practices. It seeks to identify and capture the main psychological variables responsible for making green banking initiatives successful in enhancing speed and analyzing the right ingredients for effective green banking.

This study will help the scholar critically examine green banking and environmental sustainability research. The study's findings could help provide insights for banking institutions, policymakers, and other stakeholders on the significance of integrating sustainable practices in their operations by clarifying the association between green banking practices and environmental performance (Risal

and Joshi, 2018). Further, the results might provide an understanding of psychological factors influencing the improved effectiveness of green banking, facilitating a culture of green banking in banking (Ozili, 2023). This research, therefore, aims to contribute towards the shift to a more sustainable financial system that is crucial in tackling the global risks of climate change and supporting the economic resilience necessary for sustainable futures (Malik et al., 2020).

## 2. Literature review

Green banking best practices have gained acceptance as a crucial component in fostering sustainable environmental practices in the banking industry. Green banking practices include a variety of measures that have been taken to minimize the banks' ecological footprint while encouraging sustainable investment. As for the environmental performance of the banks, adopting green banking practices has been found to have a notable impact on their performance and contribute to larger sustainability objectives (Kabir and Rakov, 2023; Sohail, 2023). A good example is Jain (2023), who explains how sustainability in the banking industry is essential to enhance a bank's reputation alongside creating trust and loyalty among clients, both vital for business growth. Such is similar to the findings (Ibeenwo et al., 2019), demonstrating that green image and bank trust mediate in green banking practices and customer loyalty portfolios.

Moreover, the motivations behind green investments are affected by more than these market forces but also by regulatory pressures, public financing decisions, and so on. Kabir and Rakov (2023) find that strict environmental regulations boost green investment in developed countries and that the strictness of ecological policies matters. Research has also provided further evidence for this relationship, demonstrating, for instance, that public environmental attention improves the efficiency of green investment (Pan and He, 2022), whose results show that public scrutiny can considerably advance green investments at the corporate level. Such findings highlight those regulatory frameworks and public awareness are key to driving green banking initiatives and investments.

However, the implementation of green banking practices poses challenges. The literature shows that despite increasing awareness of the significance of green investments, most banks still need to be challenged with considerable initial costs and low maturity (Ghaffar, 2024; Sohail, 2023). For example, the banking sector has great potential to facilitate sustainable economic growth, but the benefits of green banking practices among stakeholders are understood to be very limited (Ghaffar, 2024). It means that the need for green banking knowledge generally leads to the adoption of innovative initiatives that reduce environmental performance.

### 2.1. Green operations and environmental performance

Environmental performance should be given more consideration in traditional banking processes. Banks may make a significant ecological and sustainability effect by adopting eco-friendly policies. However, with its vast network of branches and ATMs, the bank consumes many resources, including power and paper. However, supporting digital banking technologies and implementing internal greenhouse

initiatives can considerably decrease the negative environmental impact. Thus, it is now more important than ever to promote corporate social responsibility (CSR) activities in developing economies and integrate green banking practices into regular operations, financial plans, and investment strategies (Fatima, 2023). The banking industry bears a great deal of responsibility because it is one of the primary funding sources for many kinds of enterprises and sectors.

Green banking techniques give banks a competitive edge in terms of performance while benefiting society and the environment. Banks play a significant part in the economic challenges and impact the industrial sector by providing loans and project finance. Green practices include the green pay and incentive system, which involves the social approach towards reward management to ensure individuals are attracted, retained, and motivated to support the environmental goals (State Bank of Pakistan (SBP), 2015). Online payments and incentive systems are green practices that employ a compensation management approach to attract, maintain, and encourage people to support environmental objectives (Nizam et al., 2019). Green banking techniques are, therefore, essential for promoting environmental performance. These businesses frequently emphasize environmentally sustainable methods and technologies.

The transformation towards green operations can include energy-saving technologies, paperless banking, and digital payment systems that add a layer of environmental performance. Previous studies demonstrated that operational initiatives reduce resource consumption and greenhouse gas emissions, thus adding to sustainability (Fatima, 2023). Furthermore, if organizations embed corporate social responsibility (CSR) initiatives in their daily operations, businesses can achieve higher sustainability outcomes (Nizam et al., 2019).

## 2.2. Green investments and environmental performance

Engaging in investment practices allows banks to provide loans and contribute to green banking efforts by participating in environmentally friendly projects and businesses. Research conducted by Kaakeh and Gokmenoglu (2022) has established a connection between the financial performance of the banks and environmental factors. Capitalization, size, and a company's book value-to-market ratio determine economic performance. Environmental performance positively impacts a company's average profit (Duong and Trang 2019). Their study explores various motives and barriers to investment in green banking practices. The research identified five motivations influencing over 60 per cent of investment policy changes in Pakistani banks towards green practices. According to Sinha et al. (2021), these loans facilitate projects that lower carbon emissions and advance sustainability. Market competition emerges as the primary motivator, followed by concerns about fuel scarcity and government strict policies to promote green banking technological usage and innovative ideas.

At the same time, reduced emissions (37%), promotion of a green lifestyle (23%), and green banking (4%) have a lesser impact on green practices evaluated bank management in Pakistan regarding sustainable banking. The importance of these variables is gradually shifting. Geographical location significantly influences

the responses to green investment practices, indicating that a bank's location affects its ability to meet green banking requirements. Banks offer a range of financial instruments for green investments, including extended market rate loans, mezzanine and debt securities, capital, and bridging capital lending, focusing on areas like wind energy, bioenergy, energy efficiency, and onshore wind. The adoption of green bank loans, which offer low-interest rates for implementing solar panels and energy-saving equipment, helps reduce the carbon footprint of banking activities and save money for banks.

Green investment, including loans and financing for green projects, is one of the cornerstones of sustainable banking. Studies have shown that it can successfully reduce carbon footprints and increase the uptake of renewable energy (Sinha et al., 2021). Key drivers of green investments include regulatory pressures and public awareness (Pan and He, 2022). However, insufficient incentive structures and prohibitive upfront costs remain barriers to the scale and impact of financial innovation, most critically in jurisdictions with weak policy foundations.

## 2.3. Green policy and environmental performance

The bank's policy-related practices centre on eco-friendly systems, policies, principles, and decision-making in transitioning into a more environmentally conscious institution. According to Banks of Pakistan, Green banking promotes eco-friendly behaviours that help banks and their clients lower their carbon footprint (Yafi et al., 2021). Central to this initiative is developing policies, including establishing green branches (energy-efficient/green buildings) under central banks' control. Banks, as major players in the economy, wield significant influence. Their provision of financial support to industries and businesses that harm the environment directly contributes to environmental degradation, leading to adverse health effects (Bocken and Short, 2021). Conversely, banks should proactively encourage industries to invest in environmentally friendly technologies and management systems. Providing loans to organizations with environmental concerns can cast banks in an unethical light.

Green policies such as green lending criteria and setting up green branches are essential to integrating sustainability into banking practices. Performing such studies with defined and enforceable policies hands accountability within the institution and aligns organizational aims with environmental ones (Yafi et al., 2021). However, most importantly, the lack of uniformity in policy application among institutions and regions is still formidable. Moreover, little is known about the interplay of psychological factors (e.g., employee environmental passion) with policy frameworks in driving outcomes.

## 2.4. Green banking in Pakistan

In context related to Pakistan, a nation striving to balance economic growth with environmental sustainability, the emergence of green banking practices signifies a noteworthy stride towards harmonizing financial services with ecological stewardship (Awan et al., 2023). Green banking represents a comprehensive approach to integrating environmentally responsible principles into financial

institutions' fundamental operations and strategies. It encompasses a range of initiatives, including formulating eco-friendly lending and investment policies, actively promoting eco-friendly goods and services, and adopting energy-efficient technologies as part of the banking infrastructure (Aslam and Jawaid, 2023). The Banks of Pakistan released a set of guidelines in October 2017 that included the following goals: establishing a green policy for green banking; establishing a means of financing environmentally friendly businesses; incorporating green banking practices into internal control frameworks; and enforcing green exposure limits in all industries to prevent hazardous environmental conditions. However, applying these guidelines raises questions about the specific aspects that green banking promotes and whether it is an effective tool for mitigating ecological pollution to the lowest level (Bukhari et al., 2022). Knowledge transmission and innovation within the bank can result from employee-related green measures, including education and training.

New evidence shows the importance of psychological components, like environmental obsessive passion and intrinsic motivation, to fuel sustainable behaviours. These aspects drive up the effectiveness of employee engagement and commitment to green initiatives (Taraniuk et al., 2023). Likewise, a supportive organizational culture promotes the acceptance of green banking practices by aligning employee values with sustainable development objectives. Nevertheless, the intricate relationship between the psychological motivations of individuals and the organizational culture in which they operate as contributing factors to the effectiveness of green banking practices has not been adequately addressed in developing countries.

Although previous studies demonstrate a positive connection between green banking practices and environmental performance, important gaps remain. Little attention has been given to underlying psychological factors (like environmental obsessive passion) that moderate the green banking outcomes relationship. Moreover, there is little research on the interplay of organizational culture and sustainability practices. First, it offers a gap-filling perspective in exploring the interaction of psychological factors as an important moderator in the association of green operations, investments and policies, and environmental performance.

## 3. Research methodology

### 3.1. Research design

This investigation used the explanatory research design. Descriptive research design is typically the focus of the positivist paradigm because causation is a matter of explanation. The main goal of this study is to assess how the Bank's green banking practices affect environmental performance. It also aims to pinpoint the causes or motivations behind this phenomenon as it transpired. Verifying the causal relationship between the suggested constructs aligns the explanatory research design with the goals of this study. This study uses a quantitative approach using PLS-SEM to analyze the correlation between green banking practices and environmental performance. On the other hand, longitudinal research designs may validate the sustainability of green banking effects over time. Longitudinal studies would provide insights into the effectiveness of green banking practices as they evolve by tracking

changes in such practices and how they influence environmental performance. Indeed, such approaches would explore how characteristics such as organizational commitment and market conditions shape sustainability outcomes over the long term.

### 3.2. Survey instrument

This research focuses on enhancing sustainability through green banking and assessing the impact on environmental performance; this calls for employing a quantitative data collection technique. Surveys or questionnaires are typically more suited for explanatory research designs. The necessary information was gathered through responders through a questionnaire using a five-point Likert scale. Primary data can be used for evaluation, such as online surveys, questionnaires, face-to-face interviews, etc. The structured questionnaire was divided into three parts. The first is data on the Bank's profiles. Part II relates to the respondents' demographics, and the third part relates to the questions on the research constructs. The method needed to study these variables is a close-ended five-point Likert scale. Variables to constructs of green banking operations, green investment, and green banking policy were adapted from the studies (Kotzaivazoglou et al., 2023). This number of respondents was obtained, which is required for multivariate analysis to test the hypothesis. Data was collected using a self-administered cross-sectional survey method, an effective way to test the model and correlations (Cobanoglu et al., 2003).

### 3.3. Population unit of analysis sampling technique

The concept of the study population, also known as the target population, plays a central role in research methodology. Identifying the target population provides clarity regarding the group or entities under investigation, guiding the research's scope and direction. Once the target population is defined, researchers select a representative subset, known as a sample, for their study. The careful selection of this sample is crucial to ensure that the research findings can be confidently applied to the broader target population, enhancing the generalizability of the results. This process influences various aspects of research, including methodology, data collection, and analysis techniques. The study's respondents must meet specific criteria to qualify as a true population representative. The main criterion is that the respondent ought to be a bank manager. Therefore, the purposive sampling technique was used as it was suitable for this study. This technique involves selecting participants based on predefined criteria, ensuring that the sample includes those most knowledgeable about the subject. The advantages of purposive sampling include obtaining in-depth and relevant insights, targeted efficiency, and flexibility in participant selection. However, it has limitations, such as potential bias and reduced generalizability.

Despite these limitations, purposive sampling was chosen for its ability to provide detailed and pertinent information from a specialized group, crucial for addressing the study's research objectives. Thus, the population of the study is the bank's employees in Pakistan engaged in environmentally sustainable practices. The sample profile includes the Bank, job title, gender, age, educational background, and

work history. There were 250 banking managers in the research sample. Most are males, and some of them are females. As suggested by Saeed et al. (2019), the general rule is that a sample size greater than 30 and below 500 is acceptable. However, the sample size needs to be ten times higher than the number of variables used for multivariate analysis. Hair et al. (2019) means having a minimum of five respondents per variable is sufficient, but the proper way of calculating the ratio is 10:1 (10 respondents for one variable). Contrary to this, 17 have 20 respondents per variable, which forms the ratio of 20:1. Based on the preceding suggestions, this study took a sample size of 250.

### 3.4. Conceptual model and hypothesis development

In light of the aforementioned discussion this study constructs conceptual model and hypothesis development in the relationship between banks' green operations, green investments and green banking policies on banks' environmental performance, with a moderating role of Environmental Obsessive Passion. Conceptual framework of the research is presented in **Figure 1**.

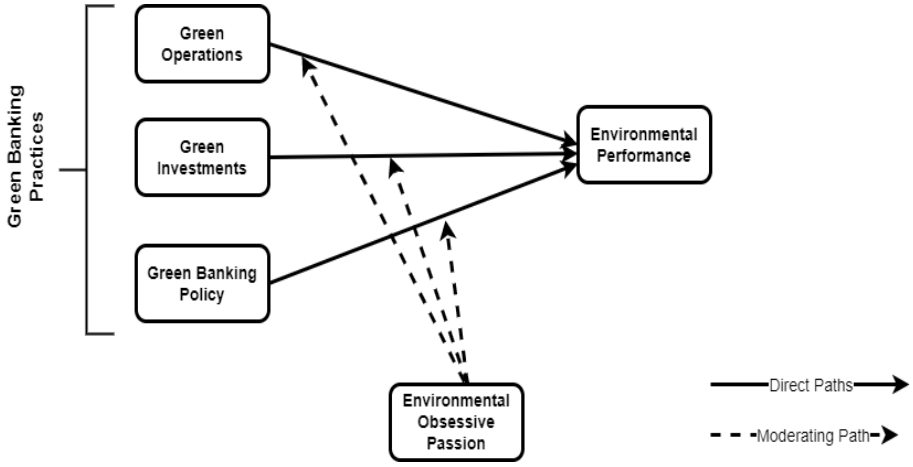


**Figure 1.** Conceptual model includes banking practices impact directly with environmental performance, obsessive passion moderates.

H1: Green operations direct impact on environmental performance.

H2: Green investment direct impact on environmental performance.

H3: Green banking policy direct impact on environmental performance.

H4: Green operations indirect impact on environmental performance through environmental obsessive passion.

H5: Green investment indirect impact on environmental performance through environmental obsessive passion.

H6: Green banking policy indirect impact on environmental performance through environmental obsessive passion.

## 4. Analysis and results

### 4.1. Demographic analysis

Demographic analysis is a technique that attempts to estimate changes in human characteristics over time and space. For example, groups can be analyzed to analyze the behavior of a particular group over time. As can be seen from **Table 1**, slightly more than half of the participants were 56% male and 44% were female. In terms of education, 9% have a doctorate degree, 61% have a postgraduate degree, 36% have a graduate degree or certifications, and 2.6% have other types of certifications. In terms of work experience, 5% said they have worked at the bank for less than 3 years, 35% for 4 to 6 years, and 40% for less than 7 years. Of those with 9 to 9 years, 17.5% said they have worked at bank about 10 to 14 years, while only 2% said they have worked at the bank for more than 15 years. Based on above demographic criteria **Table 1** shows below:

**Table 1.** Demographic analysis estimates human characteristics.

| **Attributes** | **Category** | **Distribution %** |
|---|---|---|
| Gender | Male | 56 |
| | Female | 44 |
| Age | Under 26 | 4.5 |
| | 26–34 | 20 |
| | 34–46 | 52.5 |
| | 46–54 | 22 |
| | 56 years and above | 3 |
| Qualification | Graduate | 36 |
| | Post-graduate | 61 |
| | Doctorate | 9 |
| | Certificate | 2.6 |
| Years of Experience | <3 | 5% |
| | 4–6 | 35 |
| | 7–9 | 40 |
| | 10–14 | 17.5 |
| | >15 years | 2 |

## 4.2. Measurement model

Suggested measurement tools are one-dimensional; we need to confirm their statistical reliability before moving on with validation. According to the recommendation of Hair et al. (2017), this study verified all measurement models for reliability, discriminant, and convergence. All of the components were loaded, and then CR, CA, and AVE were used to verify the validity of the composite construct, as well as convergence and dependability. It is possible to test for convergent validity with loadings that are more than 0.5 Hair et al. (2011) found that the average variance extracted was larger than 0.5, and that the reliability was greater than 0.7. The factor construct loadings are deemed appropriate when the CR and CA values exceed 0.7 and both AVE values exceed the necessary 0.5 significance value of $p < 0.01$ for noteworthy facts. Additionally, we tested discriminant validity according to the Fornell-Larcker criterion by comparing the AVE square root to the correct value.

Since the construct values are less than the square root of AVE, the measuring model satisfies the requirement, as shown in the accompanying **Table 2**.

**Table 2.** Measuring model through convergent validity, average variance and reliability.

| | CR | CA | AVE |
|---|---|---|---|
| Bank Operations | 0.903 | 0.936 | 0.830 |
| Green Investment | 0.872 | 0.917 | 0.787 |
| Green Policy | 0.846 | 0.893 | 0.678 |
| Environmental Performance | 0.901 | 0.927 | 0.717 |

## 4.3. Structural model

The structural model is analyzed using two parameters, $R^2$ and Δ. Environmental performance and obsessive passion are examples of extrinsic environmental qualities that can predict endogenous variables, with $R^2$ values of 0.313 and 0.645, respectively. According to Hair et al. (2017), insufficiency is defined as $p < 0.25$, moderate significance as $p < 0.50$, and extreme significance as $p < 0.75$. This study used nonparametric inference methods to conduct bootstrapping operations on a "5000-person" sample in order to evaluate the research hypothesis. The analysis shows that GBO and EP have positive impact (H1a 0.248, *t* 5 2.812), GBI and EP have a weak positive correlation (H2a 0.257, *t* 5 2.959), and GBP and EP have a weak positive correlation (H3a, 0.761; $t = 7.603$). In Hayes and Preacher (2014), evaluated the environmental performance of banks and their use of green banking practices. It argues that the activities would make greater green values more relevant by mitigating the moderating relationship between banks' green practices and their environmental performance.

The results demonstrate that banks' environmental performance is enhanced by environmental enthusiasm accompanied with high personal environmental value. Hypotheses 1, 2, and 3 all contributed to better environmental performance, according to the structural model. There is a strong indirect effect on GBO = 0.193, *t* 2.769 (H4) and GBP = 0.586, *t* 6.397 (H6) when environmental obsession and passion are included in the regression model. Although GBI had a little indirect impact on the model (0.053 t 0.758, H5). **Tables 3** and **4** shows the results, which show that concern for the environment between banks' banking practices and their environmental performance to a certain extent.

**Table 3.** Analysis of structural equation model and hypothesis testing.

| Path (Hypothesized) | Code Of Hypothesis | *T*-Values | *B* | Decision |
|---|---|---|---|---|
| GBO → EP | H1 | 2.812 | 0.248** | supported |
| GBI → EP | H2 | 2.959 | 0.257** | supported |
| GBP → EP | H3 | 7.603 | 0.761** | supported |

Moderating effect.

**Table 4.** Analysis of structural equation model and hypothesis testing.

| Path (Hypothesized) | Code Of Hypothesis | *T*-Values | *B* | Decision |
|---|---|---|---|---|
| GBO → EOP → EP | H4 | 2.769 | 0.193** | supported |
| GBI → EOP → EP | H5 | 0.758 | 0.053 | not supported |
| GBP → EOP → EP | H6 | 6.397 | 0.586** | supported |

## 5. Discussion

This study shows that improved environmental performance results from green policies, investments, and operations. Green policies had the most impact through the need for clear frameworks for sustainability. Our findings highlight that environmental obsessive passion moderates green operations and policies more than investments, indicating that intrinsic motivations strengthen the efficacy of operational and policy-level initiatives.

This study adds valuable insights regarding the relationship between environmental performance and green banking practices, especially in the banking sector. The demographic analysis illustrated a diverse participant base, with a higher holding postgraduate degrees and entering the study with several years of work experience in the banking industry. These responses indicate that the respondents have a good knowledge and understanding of the prevailing dynamics in the banking sector, which is essential for assessing the influence of green banking practices on environmental performance Kartika (2023).

All values are by the recommended threshold for construct reliability and validity, confirming the measurement model used in this study. It supports past studies highlighting that using sound measurement tools is crucial for accurate findings of green banking practices (Hu et al., 2023). Analyzing the structural model confirmed that GBO, GBI, and GBP positively impacted EP, confirming the hypotheses put forward in this study. In particular, GBP had the most significant influence on EP, demonstrating that clear policies play a key role in empowering banks to improve their environmental performance (Aliedan et al., 2023).

In addition, Environmental obsessive passion (EOP) significantly moderated the relationship between GBO and EP and GBP and EP. This result aligns with existing literature indicating that intrinsic motivations like environmental passion help bolster the effectiveness of green initiatives (Taraniuk et al., 2023). Contrarily, the non-significant finding of GBI's moderating role on EP suggests that, even though investing in green initiatives is a positive step, it alone cannot significantly enhance environmental performance unless complemented by robust operational practices and policies (Li and Wang, 2023).

The relevance of these results is impactful for banking companies seeking to improve their sustainability initiatives. From this perspective, the urgent focus on the development and implementation of comprehensive green policies combined with the cultivation of an environmental passion for every employee of a banking institution will undoubtedly lead to a significant improvement in the environmental performance of that institution. These findings support the notions behind a growing literature that finds a more holistic approach to green banking paramount, where the

Bank's operational practices and employee engagement are fundamental tenets of any sustainability strategy (Yao et al., 2023).

Overall, this analysis will enhance our comprehension of green banking practices to develop environmental performance in the banking sector (Kumar et al., 2023). It is crucial to note that GBO, GBI, GBP, and EP have shown a positive relationship with each other, emphasizing the importance of integrating sustainability into banking operations. Future work can follow up on the long-term impacts of such practices and the suitability of scalable green practices in divergent banking contexts (Zhang and Berhe, 2022).

### 5.1. Practical implications

These findings show the importance for funds of having engaged employees who care about sustainability. If green practice implementation can be incentivized through training programs, this will complement procedures already in place to align personal and organizational goals. Moreover, Regulators must push the banks to promote Overall Green Policies and adopt favourable financial instruments for Environmental Sustainability.

### 5.2. Policy implications

To promote green banking practices, policymakers can apply sustainability frameworks incorporating psychological factors like environmental passion. Moreover, setting some green operational standards and providing incentives for starting eco-sensitive investments can improve banks' green performance.

## 6. Limitations and future research

Despite the significant contributions of this study to understanding the link between green banking practices and environmental performance, it has several limitations. Regarding specific limitations, the sample size affects the generalizability of findings in framework contexts through the PLS-SEM, offering an ample analysis of multiple variables but not a thorough, expansive exploration of diverse banking anthropologies or geographies. The Sample was limited to banks in Pakistan, which may not be generalizable to other countries with different regulatory regimes or cultural milieus peuvent. Future research needs to broaden its design to include bigger sample sizes, various sectors, and different countries to make the outcomes more reliable.

Another limitation is the use of self-reported data. Self-reports are one of the main methods used in studying behaviour, but they give rise to biases like social desirability and respondent subjectivity. Such biases can result in exaggerated or distorted views on the extent of adherence to green banking practices. To reduce this limitation, further studies should consider triangulation strategies, including analyses of secondary data, organizational records, or direct observations. These approaches, if incorporated into our studies, will help improve the reliability and validity of the findings.

Moreover, other studies can consider using alternative methods, such as mixed-methods approaches, so that qualitative data might supplement the

quantitative. Quantitative results could be further complemented by qualitative analysis, like interviews or focus groups, adding a richer sense of context to the data. The impact of green banking practices can also be assessed through longitudinal studies, generating a richer understanding of their long-term effectiveness.

## 7. Conclusion

This research was to understand how green banking practices are enhanced through sustainability and assess their impact on environmental performance through a moderating role of obsession and passion. The research model implemented equation modeling to ensure variables' consistency, validity, and dependability, and a plethora of additional global research has shown similar results. Based on the findings and the parameters, the bank's environmental performance was significantly affected (Bukhari et al., 2020). Similarly, regarding eco-friendly banking, these three behaviors significantly influence ecological enthusiasm.

This shows that green banking issues are something that daily bank management needs to deal with, such as investments in green technology, but not in operations or policy. Banks that go unnoticed until a problem develops technology, but not in operations or policy. The term suggests they contribute to environmental protection through their daily banking operations and policies. Research shows that there is no moderation in the environmental impact of investments because green investments by banks are strategic tools that influence the given institutions but are not concrete or immediate. The suggested study provides strong management and theoretical contributions by using an acceptable method and ensuring reliability and validity. As a result, both academics and bank executives can benefit from the study.

Although these practices are essential to enhancing the banks' overall environmental performance, research needs to focus more on the contribution of employee and customer-related green practices to improving banks' environmental performance (Ojo et al., 2022; Raza and Woxenius, 2023). Questions like how sustainable ecological management practices affect bank performance and how to implement them might be better understood with the aid of this study. The possible outcomes are improving the green environment and gauging bank approval of green initiatives. The Findings of this study can inform banking policy and regulation. Every level of government should make an effort. To bring more attention to green banking, in terms of company and corporate governance, green banking practices should be mandatory for banks.

Scholars should test and evaluate their findings in various settings and cultural backgrounds for future studies. This was a cross-sectional study. Researchers in the future may use a series of studies to explore the role of banking practices in influencing bank environmental performance. Furthermore, this research can be expanded with a larger sample size, and it would be more valuable if they compared conventional and Islamic banking or international banking practices with green banking practices.

**Author contributions:** Conceptualization, SA, NK, TBC and HMMR; writing of original draft, SA; literature review, SA and HMMR; research methodology, SA; conclusion of the study, SA; supervision, NK and TBC; software, NK and TBC; discussion, NK, TBC and HMMR; review, NK and TBC; review and formatting, HMMR. All authors have read and agreed to the published version of the manuscript.

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