



Cairo University
Faculty of Commerce
Georgia Program

Finance and Investment Major

The Impact of Green Finance on Bank Investments Strategies, Sustainability and Efficiency

The Case of CIB Bank

Submitted by:

Rawan Mohamed Ali 542061	Sara Mohamed Hosny 542071	Sama Wael Kamel 542079	Zyad Reda Mohamed 542067
--------------------------------	---------------------------------	------------------------------	--------------------------------

Submitted to:

Prof. Mohamed Sherif

May 2025



(a) Rawan



(b) Sama



(c) Sara



(d) Zyad

Contents

Abstract	4
1 Introduction	5
2 Literature Review	8
2.1 Green Finance Adoption Pathways	8
2.2 Driving Sustainability Through Green Banking	9
2.3 Green Financial Instruments	10
2.4 Green Banking Practices	11
3 Model/Data/Methodology	15
3.1 Model	15
3.2 Data	15
3.3 Methodology	17
4 Empirical Results	18
4.1 Awareness & Perception of Green Finance	18
4.2 Green Finance & Sustainable Investments	19
4.3 External Factors Influencing Green Finance	21
4.4 Outcomes & Future of Green Finance	21
4.5 Green Finance in Banking – CIB Insights and Global Evidence	23
4.6 Green Finance Adoption	24
5 Conclusion	28
References	29
Appendix	32
Survey Questions	32
List of Figures	
2 Green Financial Instruments Framework	10
3 Summary of the Qualitative Study Output	13
4 VOS-Viewer Network Analysis of GF Literature Themes and Relationships .	14
5 Respondent Definitions	19
6 Bank Investment Probability in Green Projects	19
7 Key Benefits of Green Finance	20
8 Barriers for Green Finance	20
9 Role of Government Policies in Green Investments	21
10 Future of Green Finance in Banking	22
11 Critical Steps for Green Finance Adoption	22
12 Green Finance Maturity Mismatch: ST Loans vs. LT Green Projects	24
13 Green Banking Practices Outcomes	26
14 Green Multiplier Effect in Banking	27
15 Overview of Green Banking Coverage	27

List of Tables

1 Challenges and Opportunities of Green Finance	6
2 Understanding of Green Finance	19
3 Key Benefits of Green Finance (Multiple Responses)	19
4 Barriers to Green Finance Adoption (Multiple Responses)	20

5	Critical Steps to Accelerate Green Finance Adoption (Select Up to 2)	22
6	Work Distribution	33

Abstract

This study investigates the impact of green finance on banking investment, with a case study involving Egypt's Commercial International Bank (CIB). Green Finance is increasingly significant as it integrates environmental sustainability into financial systems, yet there is limited understanding of its effects in the banking sector. This study aims to bridge this gap by exploring how Green Finance initiatives, such as green loans and bonds, influence investment decisions among bankers and consumers. Employing a mixed-methods approach, combining survey data from banking professionals and consumers with in-depth analysis of CIB's green finance initiatives, ensuring both theoretical rigor and practical relevance, including a regression model $\mathbf{Y} = \alpha + \beta\mathbf{X} + \sum t$ to analyze how green finance activities (e.g., green bonds, loans) influence banks' investment decisions. Primary data from a 17-question survey of 58 respondents (bankers and consumers) and secondary data from CIB's reports reveal that 81% of participants recognize green finance, though 17% misunderstand it as mere marketing. Key barriers include high costs (77.6%) and low consumer demand (82.8%), while government policies (77.6%) and technology (70%) drive adoption. CIB's initiatives, such as a \$100 million green bond and paperless operations, reduced CO₂ emissions by 46% per employee and grew its green portfolio by 40% (2020–2023). Results indicate that while 81% of respondents recognize green finance, significant gaps remain in understanding its financial benefits associated with improved risk management. The findings align with global literature, showing green finance enhances reputation 63.8% of respondents, market access 69%, and risk management 55.2%. The research also demonstrates that banks adopting green finance mitigate environmental risks and gain competitive advantages through enhanced brand reputation (63.8% of respondents) and access to new markets (69%), proving that sustainability and profitability can be mutually reinforcing. The findings underscore the critical role of regulatory frameworks and public-private partnerships in accelerating green finance adoption, particularly in emerging markets like Egypt. However, profitability concerns and regulatory gaps persist. The study shows the need for collaboration between banks, governments, and tech firms to scale green finance, ensuring it transitions from niche to mainstream practice. Concluding that for green finance to transition from niche to mainstream, banks must prioritize customer education, cost-effective solutions, and transparent impact reporting to align sustainability with profitability.

1. Introduction

Traditional finance aims to maximize profit for its shareholders without considering externalities that could harm the environment and society. The modern world's economic system has led to a global environmental crisis. As this view is slowly starting to be embraced by businesses and financial institutions, financial markets are evolving to provide new forms of funding to actors who wish to face this crisis. Even if it always bears in mind its risk-return priorities, part of the financial market nowadays is joining public actors, non-governmental organizations, and civil society in the efforts to face the global environmental challenge. As the portion of the financial markets that focuses on solving the environmental crisis grows larger and more diverse, it carries with it the notion that capital can be used to solve extra financial issues in addition to providing funding and generating profits. This notion is not new, and some might even say it has existed since the first barter-like methods of exchange. In comparison, capitalism and modern finance are relatively young; the former became the encompassing global economic system only in the late twentieth century, and the latter is roughly considered to have been born in the 1950s with the first seminal works on modern financial theory. Nevertheless, the concept that natural resources are limited and that some by-products of mass production processes (e.g., polluting gases or waste) are highly detrimental to both humankind and its natural environment was not central in the public debate until recent years. Going green is no longer just a buzzword for businesses seeking to capitalize on social cred. It's a stand-alone concept and one in which more and more companies are taking an interest. In 2021, green finance hit a market value of \$540.6 billion, up from just \$5.2 billion in 2012, showing exponential market growth. With such results, 2023 could be the year that green finance blossoms from a green shoot into an even more fruitful avenue for companies worldwide seeking not only to be profitable but also to make an impact. ([Forbes Finance Council \(2025\)](#))

A vast number of studies have been conducted on the relationship between green finance and environmental performance. Two strands of these studies, opposing and supporting, for instance, Miroshnychenko et al. (2017) support the nexus and demonstrate that the issuance of funds to protect the environment and for the development of green products could significantly reduce environmental degradation. More recently, Zhou et al. (2020) explored the impact of green finance on economic development and the environment in China. They find that, by increasing green finance, the environment becomes greener, leading to environmental quality over time. Similarly, Chen and Feng (2019) classify green investment as corporate and local green finance. Their findings show that corporate green finance has no significant impact because it is so low, but that local green finance helps combat environmental degradation. Similarly, Siedschlag and Yan (2020) argue that increasing countries' green finance can lead to a positive contribution to firm performance, indirectly improving environmental performance. More importantly, Chen and Ma (2021) argue that green finance has a substantial impact on environmental abuse, improving environmental performance. ([Name \(2023\)](#)).

Climatic change has been a global concern for the past few decades, it is a threat to environmental sustainability. The initiation of pacts like the Kyoto Protocols, Paris Agreement, and Nationally Determined Contributions policies (NDC) and SDGs are a step toward addressing this global threat. Similarly, the agenda of the Glasgow Climate Pact (COP26) held in November 2021 also emphasized the reduction of CO₂ emissions to accelerate the transition toward zero emissions by 2050. Additionally, pacts like the Sustainable Development Goals (SDGs) have provided platforms for global agreement on limiting CO₂ emissions and promoting the shift towards renewable energy (WHO, 2021). This has caused an increased demand for renewable energy globally. By 2040, the share of renewable energy is predicted to increase by 40% (Tolliver et al., 2020). By 2050, two-thirds of the energy supply is supposed to be sourced through renewable energy (IRENA, 2020). ([Mudalige \(2023\)](#))

A smooth energy transition toward sustainability requires increasing clean energy investments. Hence, green finance has been introduced, which emphasizes efficient resource allocation and environmental sustainability along with efficient investments to reduce climate risk as well as investment risk. Compared to conventional finance options, green finance focuses on environmental sustainability by emphasizing the effective usage of resources. Green finance refers to financial instruments and investments that support environment-friendly projects or industries of sustainable development, energy transition, and the fight against global warming. It is a crucial part of sustainable finance, aiming to provide capital for projects, businesses, and technologies that promote a low-carbon economy.

According to the European Commission, sustainable finance integrates ESG considerations into investment decisions, leading to long-term investments in sustainable economic activities. ([Haentjens and de Gioia-Carabellese \(2023\)](#)). The table below (1) outlines the challenges and opportunities associated with green finance.

Table 1: Challenges and Opportunities of Green Finance

Challenges	Opportunities
Environmental damage and social costs are neglected.	Public and private collaboration can address global sustainability challenges more effectively Haentjens and de Gioia-Carabellese (2023)
A tendency not to address 'externalities' or link them to a short-term focus.	New green financial instruments can provide diversified investment opportunities for investors Haentjens and de Gioia-Carabellese (2023)
Greenwashing risk: Companies may claim to be 'green' without meeting actual criteria.	Reducing long-term risks makes green finance a financially prudent decision Haentjens and de Gioia-Carabellese (2023)

With growing awareness of the environmental impact of human activities, a rising demand for financial solutions that support the transition towards a low-carbon, climate-resilient, and environmentally sustainable global economy. This demand is driven by several factors. First, climate change, pollution, and biodiversity loss pose significant risks to the global economy, and investors are becoming more aware of these risks. Additionally, the rise of socially responsible investing (SRI) and ESG criteria has led investors to seek opportunities that align with their values. Consumers are more conscious of the environmental impact of their purchases, and this shift in consumer behavior is influencing businesses to adopt greener practices. As a result, companies are recognizing the need to integrate environmental considerations into their business models and supply chains. To achieve the creation of sustainable cities, there is a need for green projects via green financial bonds, green banks, carbon market tools, other new financial instruments, new policies, fiscal policy, a green central bank, and fin-tech. **Green Bonds:** One of the most well-known instruments in green finance, green bonds are debt securities issued to raise capital for projects that have positive environmental benefits. Green bonds allow investors to finance projects that align with their environmental values while receiving returns. **Green Loans and Credit:** Similar to green bonds, these loans typically offer favorable terms and lower interest rates to incentivize businesses to adopt environmentally friendly practices. Sustainable investing is increasingly integrated into mainstream financial portfolios as investors seek to balance financial returns with positive social and environmental impacts. It involves strategies such as negative screening (avoiding investments in harmful industries) and positive screening (investing in sustainable companies). Renewable energy is a major focus of green finance, particularly in China, which has become the world's most promising renewable energy market. From 2017 to 2021, China invested \$127.4 billion in renewable energy, with a growth rate of 32%. Lastly, this sector is vital to energy transformation, as it helps reshape energy supply and consumption structures to achieve sustainability. ([Haentjens and de Gioia-Carabellese \(2023\)](#)).

What if waste didn't exist? In a circular economy, nothing is thrown away—everything is reused, recycled, or repurposed. This shift from the traditional 'take, make, dispose' model to a circular system is not just an environmental necessity but a smart economic strategy for a sustainable future. The implications of a circular economy are wide-ranging and essential for reversing human-caused climate change. CE, in line with Goal 12, is strictly related to the 3 Rs (Reduce, Reuse, and Recycle), recently extended to 9 (adding Refuse, Rethink, Repair, Refurbish, Remanufacture, and Re-purpose). According to some studies, CE initiatives can help to reduce waste and maximize resource reuse and ecosystem protection, resulting in a win-win scenario for businesses, the market, and the environment. Due to the limitation of natural resources, companies need to use environmentally friendly manufacturing to develop a circular economy. GF and CE are linked in a systematic and complex approach. The link between finance and the CE's growth is quite close. The industrial transformation of CE requires market-oriented green financial assistance. The initial capital expenses and expected payback

time are more responsive to additional financing emerging from green product innovation and green initiatives. ([Kumar et al. \(2023\)](#))

GF and GI are two key concepts that are gaining significance as the global population confronts climate change and environmental degradation. Both play a major role in achieving a sustainable future. The need for GF arises from the fact that traditional financing sources may not be sufficient to sustain the shift to a comparatively low-carbon economy and finance projects that promote environmental sustainability. GF can help to mobilize additional capital to support the transition. GF can help to mitigate the risk associated with some environmentally sustainable projects by providing long-term and patient capital to support the development and deployment of these projects. GI refers to the development of new technologies, products, and processes that promote environmental sustainability. GI helps to drive the development of green technologies and products that can enhance energy efficiency and minimize greenhouse gas emissions. GI can help to create new markets and generate new jobs. In essence, GI is essential for achieving a sustainable future and addressing the challenges of climate change by driving the development of new technologies, products, and processes that promote environmental sustainability. Overall, GF and GI are essential for achieving a sustainable future and addressing the challenges caused by climate change. This can be achieved by providing the necessary financial assistance to support environmentally sustainable projects and by driving the development of innovative new technology and products that promote environmental sustainability. We can move towards a more sustainable future. In a circular supply chain, GI and GF can help companies design, produce, and use products and services in a way that minimizes waste and environmental impact while maintaining economic viability. This means the development of closed-loop supply chains that recover and reuse materials, the utilization of renewable energy sources, and the promotion of sustainable practices in the production process and use of products. ([Agrawal \(2024\)](#))

In this century, CE has been marketed as a method of sustainable development that does not limit economic progress. The development of CE is currently in its emerging phase, and the availability of financial resources to foster its expansion is considerably restricted. The limited progress of the CE can be attributed to inadequate macroeconomic policy frameworks and economic initiatives, insufficient development of economic sectors and financial institutions, a low proportion of capital market financing, and insufficient innovation in funding mechanisms. Various financial tools and platforms have been developed to facilitate CE initiatives. Sustainability-linked loans (SLLs) represent a significant financial innovation whereby credit facilities are linked to the borrower's performance on predetermined sustainability criteria, thereby influencing the interest rates. SLLs incentivize businesses to adopt circular practices that promote waste reduction, resource efficiency, and product life-cycle extension by offering more favorable interest rates when sustainability targets are achieved. The implementation of financial innovations is crucial in facilitating the adoption of circular business models, which, in turn, is necessary to advance the shift toward a more sustainable and resource-efficient economy. ([Kumar \(2025\)](#))

In conclusion, green finance represents a powerful tool to drive sustainable development by linking financial systems with environmental goals. Green finance and the circular economy are key to building a sustainable future. Traditional finance, once focused only on profits, is now shifting to support projects that protect the environment. Green finance provides the funding needed for eco-friendly initiatives, helping to reduce climate risks and promote long-term growth. At the same time, the circular economy focuses on reducing waste and reusing resources, offering a more innovative way to manage our planet's limited materials. Together, these approaches demonstrate that economic progress and environmental protection are mutually beneficial. As climate challenges grow, embracing green finance and circular practices is essential for creating a healthier, more sustainable world. Green finance refers to the two-way interaction between the environment and financial activities or organizations. It is based on the concept that for a healthy, sustainable economy to continue growing, financial activities must consider the environment. This type of finance involves minimizing the environmental impact of activities and supporting environmentally oriented businesses, while seeking greater economic prosperity.

2. Literature Review

As concerns about the environment grow, green finance has become an important way to support sustainable development. Green finance includes financial products and services that fund projects with environmental benefits, such as renewable energy, sustainable farming, and conservation efforts. With traditional financial methods being criticized for harming the environment, researchers are starting to look at how green finance affects banking investments. This literature review brings together important findings from various studies, focusing on how green finance has developed, the different tools it uses—like green bonds and loans—and how banks can help direct money toward eco-friendly projects. It also discusses challenges such as unclear regulations and the need for standard definitions of what is considered “green,” which can slow down the wider use of green finance. By exploring the relationship between green finance and banking investments, this review aims to provide a clear understanding of the current situation, point out gaps in existing research, and highlight the importance of including sustainability in financial decisions. Several relevant articles are examined to enhance comprehension of these critical themes.

2.1. Green Finance Adoption Pathways

Xu et al. (2023) investigates the relationship between the efficiency of resources and the growth of green finance, particularly the effects of green bonds on the two sectors. It intends to fill the gap on how forward looking financing can support a sustainable recovery, that is in the post COVID era (2015–2021), for 29 countries having a market for green finance instruments. The data were gathered from 29 countries having a market for green finance instruments. The study applies the Panel Vector Auto-regressive (PVAR) model to evaluate the interdependence among sector-specific green growth indices and the Resource Efficiency Index (REI). The most important results show that green bonds positively impact green economic growth in the industry and agriculture sectors, while growth in the industrial sector seems to further fuel growth in agriculture. On the other hand, there were no noticeable effects of resource efficiency on agricultural growth, which indicates the need for policies that are distinct and targeted at those sectors. The authors recommend policy directions focusing on reforms in the financial sector, better defined efficiency criteria, and the advent of digital green markets aimed at fostering sustainable development. The major findings of the research confirm that any achievement in green economic growth in the industries and agriculture sectors will lead to the development of the green bond market. In addition, the issuance of green bonds and green economic growth in the industry can accelerate agriculture's green economic growth rate. By analyzing the sectoral impacts using sophisticated econometric techniques, this study provides valuable evidence for policy making in the context of the transition to green economies.

Aslam and Jawaid (2023) research investigates the impact of green banking adoption practices (GBAP) on banking performance within Pakistan's banking system ecosystem at the environmental, operational, and financial performance level. The study attempts to fill a gap in the literature, which is predominantly focused on the precursors of green banking instead of its consequences through reasoned cost-benefit analysis using the resource-based view theory. The authors employed a purpose sampling to obtain data from 360 actively working professionals in the banking sector of Pakistan. They used partial least squares structural equation modeling (PLS-SEM) to analyze the responses. The findings of the study show that GBAP greatly improves all three aspects of performance, especially on environmental performance (lowering carbon emissions, paper and energy conservation), operational efficiency (improvement in service quality and process optimization), and financial returns (increase in profit and market share). The study also indicates the comprehensive benefits of green practices but suggests that these practices have the greatest impact on environmental performance, meaning that most banks find it beneficial to invest in ecosystem preservation in addition to pursuing economic goals. This evidence supports the arguments of green transition advocates to enhance the pace of the transition to green business models, underlining the potential of truly sustainable business practices to fulfill social ecological goals. The context of Pakistani banks provides a perspective that provides insights for developing economies, balancing environmental commitments with financial sector growth. However, further research could explore longitudinal effects and regional variations in green banking implementation.

[Zhang \(2023\)](#) study looks into the impact of China's Green Finance Innovation and Reform Pilot Zones established in 2017 on corporate financing behavior. This analysis seeks to determine whether these policy zones adequately directed funding toward environmentally conscientious businesses while restricting access to financing for polluting enterprises. Using data from Chinese A-share listed companies from 2010 to 2021, the study employs a difference-in-differences (DID) approach, analyzing corporations within the pilot zones against those outside the zones to determine the impact of the policy. The findings indicate that the policy did succeed in increasing access to financing for green enterprises, tiny, non-state-owned firms, and constraining funding for heavy polluters, huge, less profitable ones. The policy, however, had little effect on actual financing costs. Additionally, and somewhat contradictorily, the policy proved only moderately effective in enabling further green innovation among friendly firms, but did compel polluting firms to innovate more. The results imply that China's green finance pilot zones are directing financing to the appropriate businesses; however, they require more powerful incentives if a fundamental shift to corporate behavior and the cost of investment is desired. The study aids in developing a better understanding of the challenges facing the implementation of green finance policies and the Sustainable Development Goals.

2.2. Driving Sustainability Through Green Banking

[Sule et al. \(2024\)](#) investigates how green finance can be utilized by the banking sector to address climate change and promote sustainability. The authors focus on the potential of financial institutions to support the transition to a low-carbon economy by funding environmentally friendly projects through tools such as green bonds, green loans, and renewable energy financing. They aim to show how these mechanisms can help reduce carbon emissions, encourage sustainable development, and incentivize businesses and individuals to adopt eco-friendly practices. The article provides a conceptual analysis of current trends and future opportunities in green finance and employs a literature review methodology, drawing on existing research and case studies from regions such as Europe, Asia, and the Americas to illustrate successful green finance initiatives and explored the role of advanced technologies, including artificial intelligence (AI) and blockchain, in improving the transparency and efficiency of green finance operations. They also identified several challenges, such as the absence of standardized regulations, the risk of greenwashing, and limited public awareness, and proposed policy solutions to overcome these barriers. Their findings highlighted the significant potential of green finance in achieving global sustainability goals, particularly through the development of innovative financial products and the integration of technology. The study concludes that effective collaboration between governments, financial institutions, and the private sector is crucial for scaling green finance solutions and accelerating the shift toward a sustainable future and they offered a detailed examination of green finance mechanisms, their benefits, and the obstacles to their implementation, providing valuable insights for policymakers, practitioners, and researchers interested in sustainable finance.

[Gulzar et al. \(2024\)](#) explored the critical relationship between green banking practices and environmental performance, shedding light on how banks can effectively contribute to sustainability in an era of growing environmental concerns. The main goal of their research was to understand how to adopt eco-friendly practices and reflect the current trends in the banking industry, which is increasingly being pushed to adopt sustainable practices due to growing environmental concerns and stricter regulations. Their research was conducted within a contemporary time frame, reflecting recent trends and data relevant to the banking industry's shift toward sustainability. To achieve their objectives, the authors used a combination of quantitative and qualitative methods. They collected data from various banks that have implemented green initiatives and analyzed key metrics such as carbon emissions, energy consumption, and waste management, and used statistical models they evaluate how these green practices influenced the banks' overall environmental performance. The results showed that banks that actively embraced green banking practices saw significant improvements in their environmental outcomes, including lower carbon footprints and better resource management. Gulzar and his team also highlighted the challenges banks face in adopting these practices, such as high initial costs and the need for technological upgrades, but they emphasized that the long-term benefits outweigh these obstacles. The study concluded that green banking is not only crucial for environmental sustainability but also aligns with the broader goals of corporate social responsibility, helping banks build a positive reputation and stay competitive in the market. For policymakers and banking institutions, especially in developing countries, this research offers valuable insights into how integrating sustainability into

financial operations can contribute to both environmental and economic growth.

A study investigated the linkages between financial risk and sustainability within the banking sector, aiming to uncover the interplay between these two critical dimensions in modern banking systems. [Juditjanto et al. \(2024\)](#) analyzed how sustainability practices influence financial risk management and vice versa, particularly in the context of increasing global emphasis on environmental, social, and governance (ESG) criteria. The primary objective of their research was to study the banking industry within a contemporary time frame, reflecting the latest developments in the banking industry, where sustainability has emerged as a strategic priority alongside traditional financial performance metrics. To achieve their research goals, the authors employed a bibliometric analysis, a robust methodological approach that systematically examines patterns, trends, and gaps in academic literature. They collected and analyzed data from a comprehensive set of scholarly articles published on the topic, focusing on key themes such as risk mitigation through sustainable practices, the financial implications of ESG integration, and the challenges banks face in aligning profitability with sustainability goals. Through this analysis, [Juditjanto et al. \(2024\)](#) identified several significant findings as they observed a strong and growing body of research highlighting the positive correlation between sustainability practices and enhanced financial risk management, suggesting that banks adopting ESG principles are better equipped to navigate uncertainties and regulatory pressures and noticed a research gap concerning the applicability of these findings to smaller or regional banks, particularly in developing economies, where resource constraints and market dynamics differ significantly from those of larger, global institutions. The study also highlighted the growing role of technology in enabling sustainable banking, particularly fin-tech solutions for monitoring and reducing environmental footprints. The authors concluded that while sustainability offers a promising pathway for mitigating financial risks, its implementation requires tailored strategies that account for the unique challenges faced by different types of banks. This study contributes to the academic discourse by providing a systematic review of existing literature and identifying critical areas for future research, particularly in understudied contexts.

2.3. Green Financial Instruments

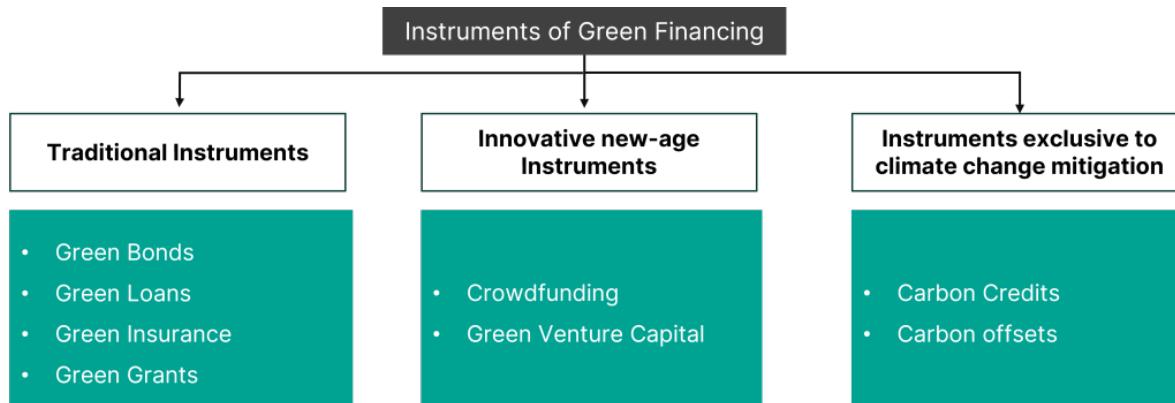


Figure 2: Green Financial Instruments Framework

The purpose of [Ning et al. \(2023\)](#) is to test the role of Green Bond Financing on Energy Efficiency Investment and Economic Growth, with a focus on addressing climate change and achieving sustainable development goals. The study aims to test how green bonds can act as a catalyst for financing energy efficiency projects and fostering green economic growth, particularly in the context of rapidly emerging markets. It highlights the growing importance of green finance, especially in Asia, where green bond markets have expanded significantly, from 3.4 billion in 2012 to 156 billion in 2017, with China being the largest issuer. To achieve the study objective, a fuzzy decision-making modeling technique is applied, analyzing the relationship between green bonds, energy efficiency investments, and economic growth. The study covers a broad time frame, reflecting the evolution of green finance and its impact over the years, focusing on the Green Bond Market. The results revealed that bank loans are now the main source of financing for energy efficiency projects. Project-based financing might be replaced with Energy Performance Contracts (EPC), warranting energy efficiency investment. Moreover, green banks invest both public and private funds in energy efficiency, promoting economic growth. The usage

of green bonds for financing environmentally beneficial projects or companies is limitless. Providing for screening energy efficiency investment proposals with small payback hurdle rates might have significant opportunity costs. Green bonds can be used to remove the financing barriers for green finance and sustainability tools. So in conclusion, green bonds are a critical tool for overcoming financing barriers in energy efficiency projects, with bank loans currently being the primary source of funding; with policy implications recommending the integration of renewable energy projects, public-private partnerships, and subsidies for green initiatives. The research uses a radial distance function approach to measure green growth indicators, such as energy productivity, renewable energy consumption, and carbon productivity, while incorporating parametric data envelopment analysis to assess technical efficiency.

Green Loans, which are designed to support environmentally friendly projects, carry less credit risk compared to traditional loans in the context of a European emerging economy, specifically Romania. According to [Neagu et al. \(2024\)](#), the investigation into whether the green loans granted by Romanian financial institutions during the period from 2010 to 2020 bear less credit risk compared with other loans in their portfolio. The study aims to address two main questions: first, what types of firms are more likely to access green loans, and second, whether these green loans are less risky than non-green loans. The research covers the period from 2010 to 2020, a time frame that includes significant developments in green finance, such as the implementation of the Paris Agreement in 2015. Using a novel micro-level dataset that combines information on all green loans granted by Romanian financial institutions with the financial statements of the borrowing firms, the study employs a multivariate logit model to analyze firm characteristics and a matched sample approach to compare the credit risk of green and non-green loans. The findings reveal that firms with stronger financial profiles, such as higher profitability and lower debt levels, were more likely to access green loans before 2015, but after the Paris Agreement, the profile of firms shifted to include those with higher investment rates and indebtedness. The study finds no significant difference in credit risk between green and non-green loans, challenging the ‘green hypothesis’ that suggests green loans are inherently less risky. The results highlight the need for further research and policy development to support the growth of green finance while ensuring financial stability. Contributing to the literature by providing micro-level evidence on green lending and its risk profile, offering valuable insights for policymakers and financial institutions aiming to promote sustainable finance.

[Martin \(2023\)](#) explores the concept of green finance, focusing on its role in promoting sustainable development and addressing climate change through environmentally friendly investment decisions. Green finance serves as the foundation for the development of sustainable financing of environmental projects. The study aims to analyze green finance regulations and instruments with a particular emphasis on their development and application in Serbia. Green finance is presented as a critical tool for achieving long-term economic growth that respects environmental and social principles, reducing climate risks, and ensuring macroeconomic stability. The paper highlights the importance of collaboration between the public and private sectors, including governments, central banks, and international organizations, to support green projects through various financial instruments. Key instruments discussed include: Green Bonds, Renewable and Sustainable Equity, Solar Bonds, Green Mutual Funds, Green Stocks, Green Mortgages, Green Credit Cards, and Renewable Energy Credits. The study also examines the regulatory framework for green finance in Serbia, noting the country’s adoption of laws such as the Law on Climate Change and its issuance of a €1 billion green bond in 2021, marking a significant step in its green finance journey. The findings emphasize the growing importance of green finance in addressing climate challenges, with global sustainable debt instruments reaching over \$4 trillion in market value by 2021. The article also concludes that increased awareness and participation from both private and public investors are essential for further developing green finance instruments and creating a sustainable future. Overall, the study provides valuable insights into the regulatory and instrumental aspects of green finance, offering a road map for its continued growth and impact on environmental sustainability.

2.4. Green Banking Practices

[Khan et al. \(2024\)](#) insights about the relationship between green banking practices, corporate reputation, and environmental awareness, with a specific focus on Islamic banks in Pakistan. Aiming to investigate how green banking initiatives, such as employee-related practices, daily operations-related practices, customer-related practices, and policy-related practices, influence the reputation of Islamic

banks. Initiating “Go Green” practices to help sustain the environment and enhance banking across the globe. The waves of global warming, the deteriorating air quality, and the emissions of greenhouse gases have laid the basis to work collectively for protecting the environment from further deterioration. In this regard, environmental awareness, the banks’ readiness, and the regulatory framework to govern the banking activities are fundamental to the success of green banking. In the changing Go Green era, all the banking endeavors that aim to de-pollute the environment would be counted in the green banking initiatives. Several activities have been identified as green banking practices, like online banking, issuing green loans, use of green credit cards, lesser use of equipment creating carbon emissions, and financial support of climate-friendly projects while banning those projects that have intensive carbon emissions. Additionally, it examines the moderating role of employees’ environmental awareness in strengthening this relationship. Green banking prevents damage to the environment by encouraging investments in pro-environmental goods and services. The research is motivated by the growing global emphasis on sustainability and the need for financial institutions, particularly in developing economies, to adopt environmentally friendly practices. Using a deductive approach, the study collects data from 390 employees of Islamic banks in Pakistan through a survey and analyzes it using SmartPLS and structural equation modeling. The findings reveal that green banking practices significantly enhance the reputation of Islamic banks, with employees’ environmental awareness playing a crucial moderating role. The study highlights the importance of integrating green practices into banking operations to achieve sustainable development goals and improve corporate reputation. Overall, green banking drives both environmental and economic benefits, particularly in the context of Islamic finance.

Investigating the role of green banking practices in improving the sustainability performance of banking institutions through [Kumar et al. \(2024\)](#), with a specific focus on the mediating role of green finance. Expanding sustainable practices is vital for attaining long-term economic growth objectives, resolving the economic environmental conflict, and improving environmental quality. Green banking practices have gained significant attention in the literature on green finance. The study aims to address how employee-related, customer-related, top-management-related, operation-related, and policy-related green banking practices influence the sustainability performance of banks in developing economies, particularly in India. The research is motivated by the growing global emphasis on environmental sustainability and the need for financial institutions to adopt eco-friendly practices to achieve long-term economic growth and environmental conservation. Using a deductive approach, the study collects data from 414 bank employees in India’s National Capital Region and analyzes it using partial least squares structural equation modeling (PLS-SEM). The findings reveal that employee-related, top-management-related, operation-related, and policy-related practices significantly enhance green finance and banks’ sustainability performance, while customer-related practices have an insignificant impact. Banks heavily rely on customers for revenue generation, which is vital in promoting the firm’s environment-related initiatives and generating positive publicity. A survey by [Sharma and Choubey \(2022\)](#) in the banking context reported that over 60% of survey participants believe green banking practices have a crucial role in building consumer trust and brand image. On the contrary, inadequate customer knowledge of green banking to appraise green loans/credits and complexities in appraising green projects are significant challenges that affect the growth of green banking. Additionally, green finance acts as a significant mediator between green banking practices and sustainability performance. The study concludes that green banking practices are crucial for improving environmental performance and achieving sustainable development goals. It targets policymakers and bank managers to promote green finance and sustainable banking practices, particularly in developing economies. The research also highlights the importance of integrating green practices into banking operations to address environmental challenges and contribute to a greener future. Overall, the study offers a road map for banks to enhance their sustainability performance and fulfill their social responsibility.

[Mishra \(2023\)](#) explored the adoption of green banking practices in commercial banks in Nepal, focusing on the factors influencing their implementation and their impact on environmental sustainability, aiming to identify the key drivers behind the adoption of green banking, including stakeholder demand, regulatory policies, environmental interest, financial benefits, and brand image. The research is motivated by the growing global emphasis on sustainable development and the need for financial institutions to reduce their environmental footprint. Although the banking sector is an essential part of a nation’s economic growth, its operations can also have a negative effect on the planet by supporting unsustainable practices, funding polluting enterprises, and increasing the carbon footprint.

Bangladesh Bank was the first financial institution to introduce the idea of green banking in a worldwide setting. Similar to how Laxmi Bank was the first bank in Nepal to pioneer the concept of green banking. Banks are focused on various environmental protection initiatives in these attempts, such as promoting bicycles as an emission-free mode of transportation and providing enticing financing packages for environmentally friendly products that reward consumers for adopting green behaviors. Using a deductive approach, the study collects data from bank employees and analyzes it using SPSS software. The findings reveal that brand image is the most influential factor in promoting green banking practices, followed by financial benefits, regulatory policies, environmental interest, and stakeholder demand. The study highlights the importance of green banking in reducing carbon emissions, promoting sustainable development, and enhancing the reputation of banks. It also emphasizes the role of digitalization and online banking in minimizing paper waste and improving operational efficiency. The research concludes that while green banking practices are gaining traction in Nepal, there is a need for standardized policies and greater awareness to fully integrate these practices into the banking sector. Additionally, it indicated that there was a moderately positive environment for green banking practices among Nepalese commercial banks. Overall, this study contributes to the growing body of knowledge on green banking adoption and offers practical implications for sustainable banking practices in Nepal.

[Bouteraa et al. \(2023\)](#) investigating the barriers to the adoption of green banking technology by consumers in the UAE using a mix of qualitative interviews with banking professionals and quantitative surveys with 332 customers. The UTAUT model was used to uncover the primary hindering scope. The study found that performance expectancy and facilitating conditions have significant impacts on adoption intention, while effort expectancy and social influence do not. Qualitative interviews with 10 banking specialists uncovered six major hurdles: customer awareness (cited by 80% of respondents), personal innovativeness (70%), system quality (70%), security/privacy (60%), government support (60%), and reputation of the bank (50%). Quantitative data validated four of these as significant predictors—customer awareness, personal innovativeness, system quality, and reputation—and found security/privacy and government support had no significant influence. These findings indicate that customers in the UAE largely disregard privacy concerns and prioritize the reliability of technology and the reputation of the bank, contrary to professional views. A major revelation of this study is the gap between bank expectations and customer engagement, where reliance on government policies appears to have minimal impact in stimulating adoption. These findings emphasize the need for focused consumer awareness campaigns and improved system interfaces to accelerate green banking uptake in the UAE's private banking-dominated market. A table summary below (3) illustrates in detail the results of the qualitative output.

Table 2. Summary of the qualitative study output

Factors extracted	Participants							Total participants
	P1	P2	P3	P4	P5	P6	S	
Customer awareness	✓	✓	✓	✓	✓	✓		08
	✓	✓	✓	✓	✓	✓	✗	
Personal innovativeness	✓	✓	✓	✓	✓	✓		77
	✓	✓	✓	✓	✓	✓	✗	
Privacy and security	✓	✓	✓	✓	✓	✓		06
	✓	✓	✓	✓	✓	✓	✗	
System quality	✓	✓	✗	✗	✗	✓		05
	✓	✓	✓	✓	✓	✓		
Bank reputation	✓	✓	✓	✓	✓	✓		06
	✓	✓	✓	✓	✓	✓		
Government support	✓	✓	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓	✗	

Figure 3: Summary of the Qualitative Study Output

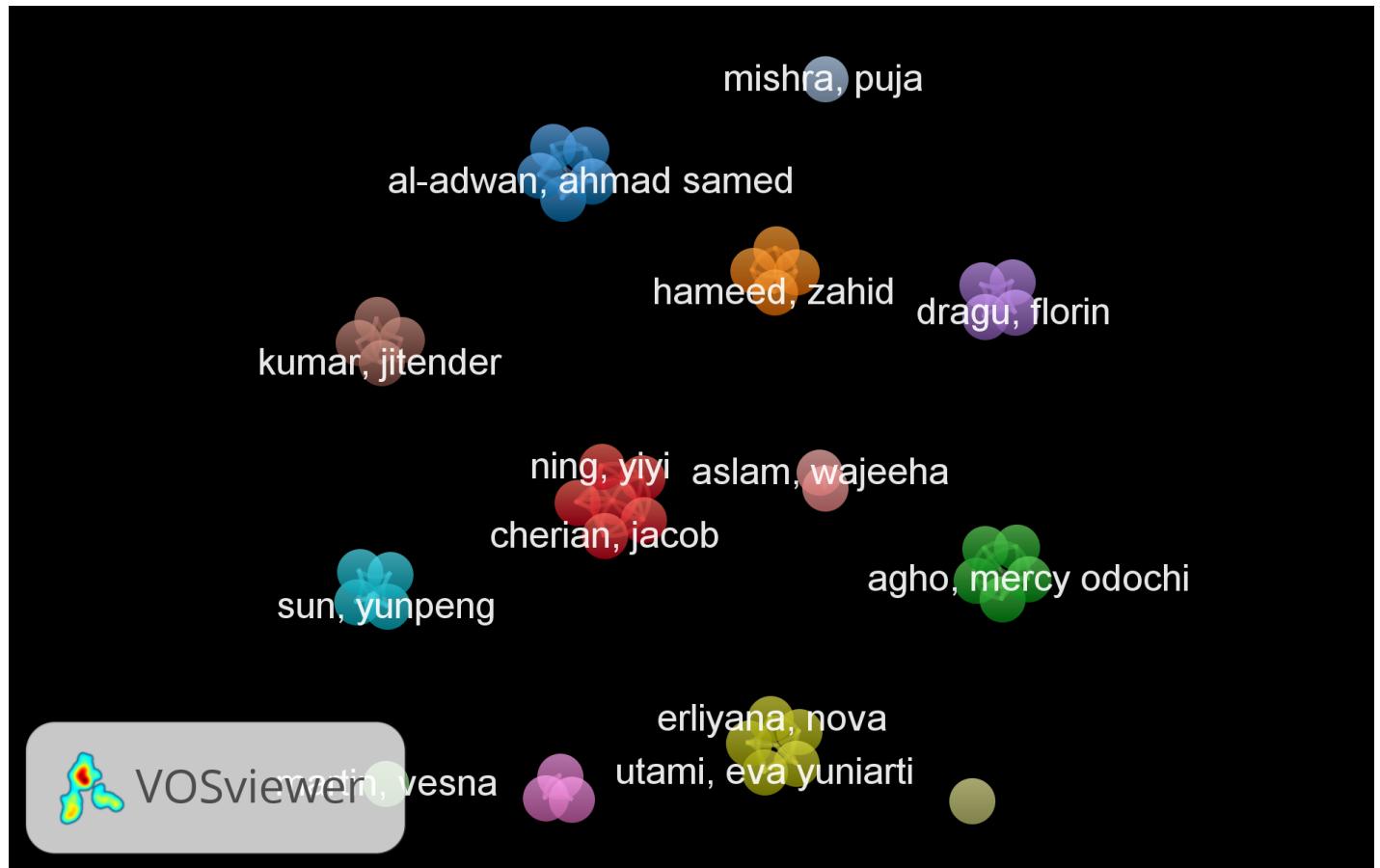


Figure 4: VOS-Viewer Network Analysis of GF Literature Themes and Relationships

3. Model/Data/Methodology

This research framework outlines the analytical foundation, data sources, and methodological approach employed to investigate the relationship between green finance initiatives and banking sector investment decisions. The study combines a theoretical model with empirical evidence to assess how financial institutions integrate environmental sustainability into their strategies. Below, we detail (1) a regression model quantifying key drivers of green investments, (2) primary survey data from bankers and consumers alongside secondary data from industry reports and case studies (including Commercial International Bank's pioneering green projects in Egypt), and (3) a mixed-methods methodology bridging qualitative insights with simple quantitative analysis. Together, this framework enables a comprehensive evaluation of barriers, opportunities, and future pathways for green finance adoption in banking.

3.1. Model

$$Y = \alpha + \beta x + \sum t \quad (1)$$

Using a straightforward equation to examine how green finance programs affect banks' decisions to invest in environmentally friendly projects. The left side of the equation (Y) represents different ways banks put money into green initiatives - how much they invest, how many sustainable projects they support, and what portion of their total investments go toward environmental causes. The main factor we're studying (X) includes all the green finance activities banks engage in, such as issuing green bonds, offering special loans for eco-friendly businesses, and directly funding sustainable ventures.

The equation also considers ($\sum t$) such as government policies and regulations (t_1), technological innovation (t_2), consumer demand (t_3), investor preferences (t_4), and risk management (t_5) are considered, as they play a significant role in shaping banking investment strategies in the context of green finance shows how important influences like government rules about environmental protection, how quickly banks adopt new clean technologies, what environmentally-conscious customers want, investors' preferences for sustainable options, and how banks manage the risks of these new types of investments. The starting point (α) shows the basic level of green investing that would happen even without special green finance programs, while the (β) coefficient tells us exactly how much these programs change banks' investment behavior indicating the impact of green finance on investment decisions, with a positive value suggesting that green finance positively influences these decisions.

3.2. Data

The data gathered utilizes a qualitative approach combining both primary and secondary data. The primary data was collected through conducting a survey, gathering responses from consumers and bankers. The secondary data is gathered through articles and reports for a well-rounded analysis. The survey is broken into four main sections and aims to review aspects of green finance. (1) The Awareness & Perception section measures what people are aware of regarding green finance, what they perceive about its importance, and whether there are perceptions that there could be. (2) Green Finance & Sustainable Investments examines expectations of expansion, concerns of attaining financial returns vs. sustainability, and actual possibilities for banks in greening. (3) External Factors Influencing Green Finance looks for regulatory, economic, and social factors in adopting green finance in banking. (4) Outcomes and Future of Green Finance presents a predictive outlook, indicating ways to boost its adoption in the banking sector. The 17-question survey is tasked with fetching all needed information so that they can comprehend trends that are currently prevalent, challenges, and spaces with chances for green finance growth. Using responses from both consumers and bankers, as well as market reports, the study is sure to provide credible inputs for facilitating and promoting environmentally friendly banking behavior.

CIB Egypt's Green Portfolio

Commercial International Bank Egypt (CIB), a private-sector bank headquartered in Egypt, provides retail, corporate, and investment services to individuals, companies, and small and medium-sized enterprises (SMEs). The bank reported total assets of EGP 835 billion (\$27 billion) as of December 2023 and held a market share of around 5%-7% for loans and deposits. CIB is a joint stock company, with its largest shareholders, Alpha Oryx Ltd and Fairfax Financial Holdings, accounting for about 19% and 7% of the total shares, respectively. [Commercial International Bank \(Egypt\) \(2024\)](#) has emerged as a leader in sustainable banking, being one of the first Egyptian financial institutions to actively promote green finance and integrate environmental, social, and governance (ESG) principles into its operations. While it may not be the absolute first bank in Egypt to engage in sustainability efforts, CIB has played a pioneering role in structuring large-scale green projects, issuing innovative financial instruments, and setting benchmarks for the sector. While Banque Misr and QNB AL Ahli have also launched green initiatives, CIB stands out for: First-mover advantage in green bonds (private sector), secondly, the largest portfolio of corporate green loans (as of 2023), and finally, the strongest international partnerships (IFC, EBRD, Climate Bonds Initiative).

According to CIB Sustainability Report [Commercial International Bank \(Egypt\) \(2023d\)](#), CIB Egypt has deeply integrated sustainability into its business, with strong board-level leadership. The bank has a cross-bank Sustainable Finance Policy aligned with global ESG best practice, engaging all departments and business lines. As a founder member of the Net-Zero Banking Alliance (NZBA), CIB outlined its most carbon-intensive sectors in 2022 (Power, Real Estate/Construction, and Transportation) and reduced its carbon emissions per employee by 46% (2018–2021). Since 2016, CIB's Environmental and Social Risk Management (ESRM) framework has positioned it as Egypt's sustainability finance leader, offering customers green products like renewable energy financing, energy-efficient buildings, and waste/water management. CIB clients benefit from: Energy Efficiency, Renewable Energy, Sustainable Transport, Green Buildings, Energy Management Systems, Waste and Water Efficiency, Non-energy GHG Reduction, and Energy Management Systems.

CIB has implemented several sustainability-focused initiatives, first, Green Financing as Green Loans & Bonds; CIB funds renewable energy (solar, wind), energy-efficient buildings, and clean transport projects. It partnered with the IFC (World Bank Group) to issue Egypt's first green bond (\$100 million) for climate-smart projects. The loan is IFC's first in the Middle East and North Africa through its COVID-19 fast-track financing facility. The funding will help CIB, a longstanding partner of IFC in Egypt, provide short-term loans to both corporations and businesses, including small- and medium-sized enterprises (SMEs) facing liquidity challenges. [International Finance Corporation \(IFC\) \(2020\)](#) confirms CIB's role in scaling green finance. Second, Operational Sustainability as Paperless Banking; reduced paper use by 80% through digital onboarding (e.g., CIB Smart Wallet) and e-statements, and 1.5 M+ users on CIB's mobile app, reducing branch visits ([Commercial International Bank \(CIB\) \(2023c\)](#)). CIB eliminated paper statements for 90% of retail customers and CO2 reductions, saving 1,200+ tons of CO2 annually through paperless operations ([Egypt \(2022\)](#)).

Also, as Energy Efficiency, 30% energy reduction in branches through LED lighting and smart systems, solar panel installations at 50+ branches, and CIB's partnership with European banks for energy efficiency financing ([Commercial International Bank \(CIB\) \(2023b\)](#)). Employee & Community Engagement as Green Training: Staff training on sustainability practices (e.g., waste reduction, carbon footprint awareness). Community Programs: Tree-planting campaigns and partnerships with Banlastic Egypt to reduce plastic waste. CIB's sustainability culture improved employee morale and productivity, as noted in ([Commercial International Bank \(CIB\) \(2023d\)](#)). Staff engagement in green projects correlates with higher job satisfaction. CIB ranked #1 Best Place to Work in Egypt (2023) by [Best Places to Work \(2023\)](#), partly due to its ESG initiatives. Consumer Experience; Digital Solutions: CIB's app (1.5 M+ users) reduced branch visits, enhancing convenience. Green Products: Eco-friendly loans attracted SMEs in solar energy, boosting client loyalty. Financial & Environmental Benefits; Profitability: CIB's green portfolio grew by 40% (2020–2023), per ([Commercial International Bank \(CIB\) \(2023a\)](#)). However, CIB does face challenges, such as limited awareness; some customers still prefer traditional loans, and high initial costs for solar installations require significant CAPEX.

In 2021, CIB was also the first Egyptian bank to issue a certified green bond, with a subscription value of \$100 million, after receiving approval from the Financial Regulatory Authority. Proceeds of the five-year bond were used to fund a portfolio of green loans extended by CIB to its corporate as well as medium- and small-enterprise clients in addition to funding CIB's green building capital expenditure for up to 20% of the proceeds. The bond proceeds were further directed to various categories of climate supporting initiatives, including green buildings, energy efficiency, renewable energy, water and wastewater management, and clean transportation. The issuance was part and parcel of CIB's mission to support clients looking to make sustainable investment choices and would also entrench the cost of environmental impact into the fabric of its credit policy and decision-making for lending and investment decisions. [Commercial International Bank \(Egypt\) \(2023a\)](#). CIB has decided to issue Egypt's first corporate green bonds in cooperation with the IFC. The main objective of this first green bond issuance is to make funds available for projects that address key environmental issues, such as climate change, natural resources depletion, loss of biodiversity, and air, water, or soil pollution. For the past two years, the IFC has been working with financial regulators in Egypt to prepare guidelines for this new and important market tool that will support the growth of Egypt's green economy. CIB will thus be able to assist private sector initiatives that seek financing for projects in renewable energy, agribusiness, green buildings, and resource efficiency projects. [Commercial International Bank \(Egypt\) \(2023b\)](#)

A green bond refers to debt security issued by an organization or the government to raise funds from investors exclusively for projects that have positive environmental or climate benefits. They help mobilize capital from a range of investors, including institutional investors, retail investors, and impact investors. Green bonds can back the transition to a low carbon economy by providing funding for renewable energy projects, energy efficiency improvements, and other climate-friendly investments. CIB's Green Bond Framework (Version5)—A Catalyst for Sustainable Transformation [Commercial International Bank \(Egypt\) \(2023c\)](#) CIB Bank has established itself as a pioneer in sustainable finance through its Green Bond Framework, aligning with ICMA's Green Bond Principles (GBP) and Egypt's Financial Regulatory Authority (FRA) guidelines. This initiative demonstrates CIB's commitment to environmental stewardship, financial innovation, and inclusive growth. A breakdown of its positive impacts across key stakeholders: (1) Environmental Impact: Low-Carbon Transition funds are exclusively allocated to green projects, including renewable energy, energy efficiency, green buildings, and water/waste management. 12,708 tons of CO₂eq saved annually (for the initial \$20M portfolio) via IFC's CAFI® tool. Supports Egypt's Nationally Determined Contributions (NDCs) under the Paris Agreement. Sustainable Project Financing, certified green buildings (a key focus area), and reduce energy consumption. Exclusion List ensures no financing for fossil fuels, deforestation, or harmful industries. (2) Economic & Social Benefits: CIB's Green Bonds provide eco-friendly financing for businesses, enabling SMEs and corporations to fund sustainable projects while promoting green practices in Egypt's private sector. For employees, the bank offers ESG training through its Sustainable Finance Division and ensures strict compliance via its Green Bond Task Force (GBTF), enhancing expertise in sustainable finance. Investors and regulators benefit from transparent impact reports audited by external reviewers and verified through Second-Party Opinions (SPO), ensuring alignment with international standards like ICMA GBP and FRA guidelines. This initiative strengthens trust while driving environmental and economic progress. (3) Broader Market & Societal Influence: through initiatives like its first green building financing line with IFC, setting a benchmark for sustainable banking. The program engages customers with eco-conscious services, employees through ESG skill development, and regulators by strengthening green finance policies, driving systemic change across Egypt's financial sector.

3.3. Methodology

This research methodology adopts a mixed-method study using both primary and secondary data collection to render the examination of green finance practices more comprehensive. A survey of banking professionals and consumers will be the collection of primary data to gain insights into their institutions' approaches to green finance, including key challenges, strategic priorities, and investment practices. This firsthand data will provide a deeper understanding of the practical aspects of green finance implementation and help understand how banks and financial institutions are progressing in green finance. Investigating the concerns, focus areas, and investment trends in sustainable banking

on real-life examples. Alongside the stated primary data, secondary data will also be accessed through articles and reports for a well-rounded analysis. Financial news & publications, industry reports, and academic literature will be reviewed to identify emerging trends and market challenges in the field of green finance. Also, case studies of Commercial International Bank (CIB) researching best green practices implemented as the first in Egypt, adopting Green Finance. Combining responses from a first-party survey with existing research and case studies ensures a balanced medium-depth examination. A blend of professional and consumer experiences with qualitative insights, coupled with quantitative, documented evidence, helps to reveal missing gaps, opportunities, and future directions for the adoption of green finance in the banking industry. This dual approach increases the credibility of the findings, presenting the worth both from practical and theoretical perspectives for sustainable financial practices, enabling a comprehensive exploration of the topic.

4. Empirical Results

The empirical findings of this study paint a significant picture of green finance's evolving role in the banking sector. While the concept has gained significant traction among respondents, with a majority expressing familiarity, there remains a discernible gap between recognition and deeper comprehension. Many correctly identify green finance as a mechanism for funding sustainable projects, yet a notable portion still conflate it with mere marketing or regulatory compliance, a sign that financial institutions must refine their communication strategies to clarify its purpose and impact. Optimism about the future of green finance is widespread, with respondents overwhelmingly anticipating that banks will expand their investments in sustainable projects within the coming years. Green bonds and loans are viewed as particularly promising instruments, reflecting broader global trends. However, this enthusiasm is tempered by practical challenges, including the perceived high costs of implementation and a lack of clear evidence on profitability. These barriers suggest that while banks may endorse green finance in principle, operational and financial hurdles could slow its full integration into mainstream banking practices. External factors, particularly government policies and technological advancements, emerge as dominant forces shaping the adoption of green finance. In contrast, customer demand plays a more subdued role, indicating that banks may need to take a more proactive approach in educating and incentivizing clients to embrace sustainable financial products. The benefits, however, are compelling: improved market access, enhanced reputational value, and better risk management underscore the potential for green finance to align profitability with environmental and social responsibility. Case studies, such as CIB Egypt's pioneering green bond initiatives, demonstrate that progress is achievable, with measurable outcomes in emissions reduction and sustainable project financing. Yet, the path forward requires addressing persistent challenges regulatory clarity, cost efficiency, and consumer engagement, to ensure that green finance transitions from a niche priority to an industry standard. The following subsections delve deeper into these themes, exploring awareness, adoption barriers, external influences, and future trajectories in detail.

4.1. Awareness & Perception of Green Finance

This section gives a guide for awareness of green finance among respondents, with (81%) (47 out of 58) indicating they were either familiar or somewhat familiar with the concept. However, a notable minority (15.5%) admitted being entirely unfamiliar, suggesting that while green finance is gaining attention, there remains a segment of the population and potentially banking customers who are not yet engaged with the topic. When asked to define green finance, the majority (63.8%) correctly identified it as a tool to fund environmentally sustainable projects, but a concerning (17.2%) perceived it as either a marketing strategy or a regulatory requirement, indicating some misunderstanding of its purpose because banks aren't explaining green finance clearly, or because people don't fully understand how it works beyond the basic idea. Financial institutions may not be communicating effectively, or the public may need better education about what green finance really does beyond the eco-friendly labels. Nearly (70%) of people surveyed said green finance is very important for banking's future, with none dismissing its relevance. This strong agreement shows that society is starting to see sustainable finance as essential for economic growth, matching worldwide trends like the UN's responsible banking guidelines. Even with this support, many people still confuse it with buzzwords. Banks need to explain it better, focusing on real-world benefits, not just jargon. The figure below (5) demonstrates

the respondents' understanding of green finance.

Table 2: Understanding of Green Finance

Definitions	Percentage (%)	Count
A tool to fund sustainable projects	63.8	37
A marketing strategy	17.2	10
A regulatory requirement	10.4	6
A risk management approach	8.6	5

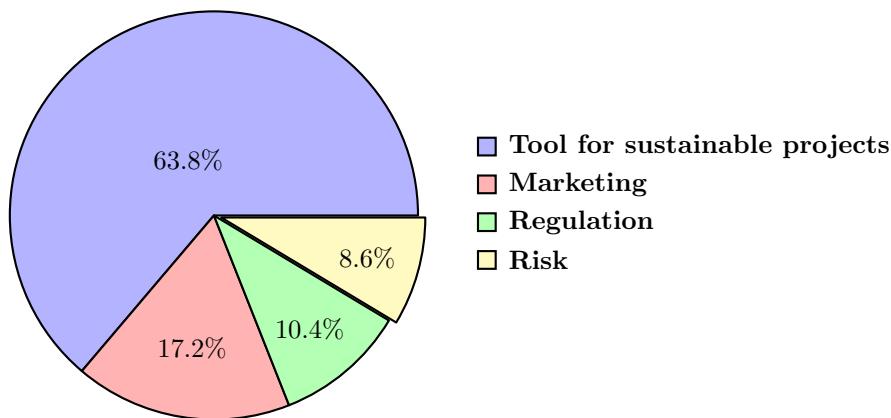


Figure 5: Respondent Definitions

4.2. Green Finance & Sustainable Investments

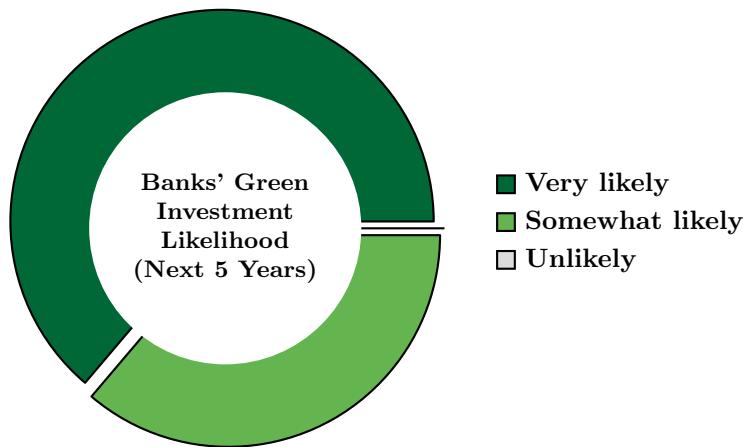


Figure 6: Bank Investment Probability in Green Projects

Table 3: Key Benefits of Green Finance (Multiple Responses)

Benefit Category	%	Count
Enhanced reputation and brand value	63.8	37
Increased customer loyalty and trust	51.7	30
Access to new markets and revenue streams	69.0	40
Improved risk management and profitability	55.2	32

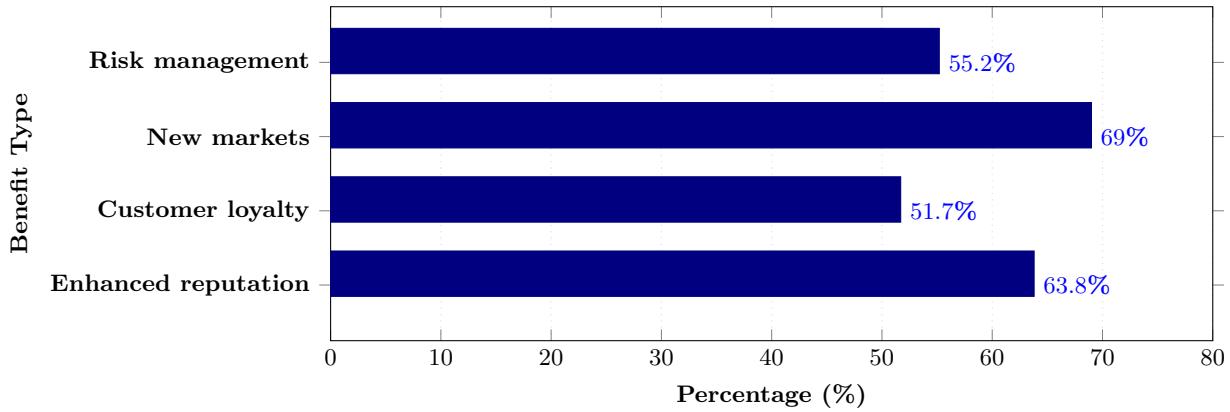


Figure 7: Key Benefits of Green Finance

Table 4: Barriers to Green Finance Adoption (Multiple Responses)

Barrier Type	%	Count
High initial costs of green projects	77.6	45
Insufficient public awareness and consumer demand	82.8	48
Lack of clear regulatory frameworks	39.7	23
Insufficient data on investment profitability	50.0	29
Economic pressures and competing priorities	50.0	29

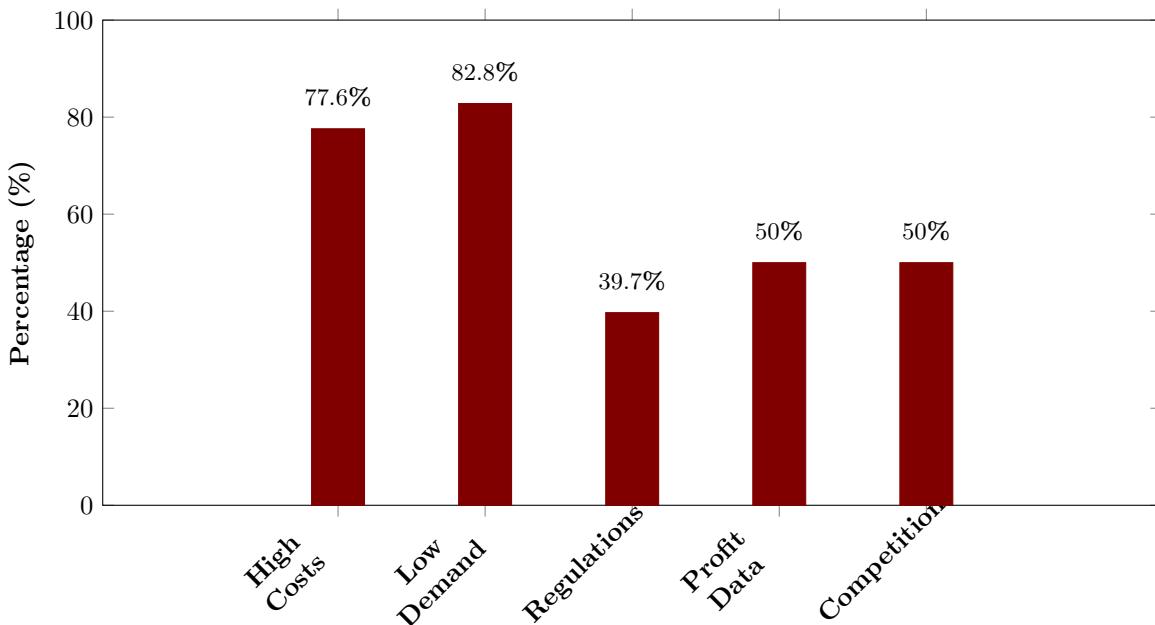


Figure 8: Barriers for Green Finance

As shown in figures (6), (7) and (8) above, respondents expressed strong optimism about the adoption of green finance in banking; with all 58 expecting banks to go greener and increase investments in green projects within five years. Green bonds and loans were viewed as particularly effective instruments, with (62.1%) rating them very effective—a finding consistent with their rising global issuance volumes (Climate Bonds Initiative), but high costs and uncertainty about profits are slowing things down. High initial costs (77.6%) and low consumer demand (82.8%) emerged as the

top obstacles, underscoring a tension between ambition and practical challenges. High costs match what studies show about green energy projects needing lots of money to start [Agency \(2023\)](#). At the same time, since customers aren't demanding these options enough, banks should probably do more to teach people about sustainable banking products. Additionally, (50%) of those surveyed said banks don't have enough proof that green projects make money, and face other financial priorities. This matches what we know about banks focusing on short-term profits. While banks support green finance in theory, making it work on a large scale will require changes to how banks operate and make decisions. They will need to find ways to make green projects more affordable and show that they can be profitable.

4.3. External Factors Influencing Green Finance

The survey found that most people (77.6%) see government policies as the main force behind green banking growth. Examples like Europe's climate plan prove that when governments create supportive rules and incentives, banks follow by putting more money into green initiatives and even accelerate market shifts. The survey found that (70%) of people believe technology is very important for green investments. Tools like AI for analyzing risks and blockchain for tracking environmental impact are helping banks make better, more transparent decisions about sustainable projects. Also shows that only about half (52%) of people think customer demand strongly pushes banks to go green. Maybe regular customers might not see enough easy-to-use green banking products. Some may feel their individual choices don't make a big difference. Rules and technology are the biggest drivers right now. Banks can't just wait for customers to demand green options; they need to lead the way and educate people. Either way, it signals an opportunity for banks to bridge the gap between investors who are pushing for sustainable finance and everyday customers who show less demand gap through targeted outreach and product design (eco-loans, carbon-tracker accounts ...). The figure below (9) visualizes the results.

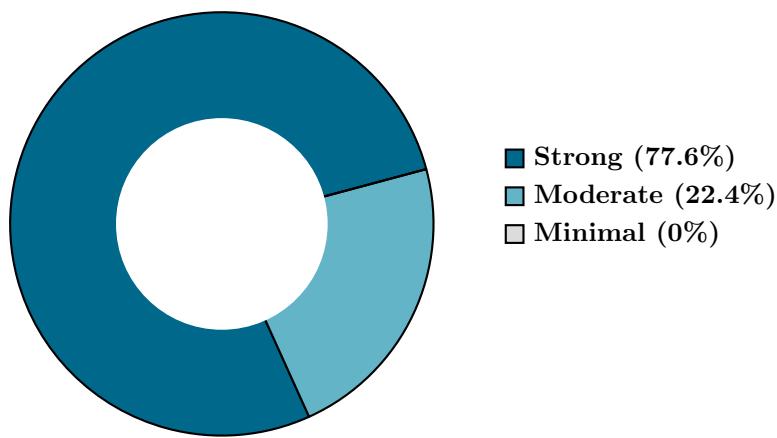


Figure 9: Role of Government Policies in Green Investments

4.4. Outcomes & Future of Green Finance

Respondents identified multiple benefits of green finance for banks, most notably access to new markets (69%) and enhanced reputation (63.8%). Research confirms that companies focused on environmental and social responsibility tend to be more valuable. And the survey found that most people (51.7%) believe green investments help reduce financial risks by spreading them out. This makes sense during economic ups and downs, environmentally-conscious companies often prove more stable. Essentially, going green isn't just good for the planet; it's becoming a smart business strategy that can pay off financially. People had different views about the future of green finance; (43%) think it will become normal for all banks, (35%) believe only some banks will focus on it and just 1 person thought it would decrease. This mixed opinion shows people aren't sure how fast banking will change. But almost everyone agrees green finance will at least stay important. To make it grow faster, most

suggest better government rules (53%), teaching customers about it (62%), Banks working with tech companies (64%) These ideas match what groups like the IMF recommend - that everyone needs to work together to make green banking successful. Green finance is seen as a win-win (profit + planet), but banks need to prove it's reliable. Stronger policies and partnerships with tech companies could speed things up, though a small number worry it might be too risky. As shown in the figure below (10), the future predictions of green finance adoption are clearly visualized.

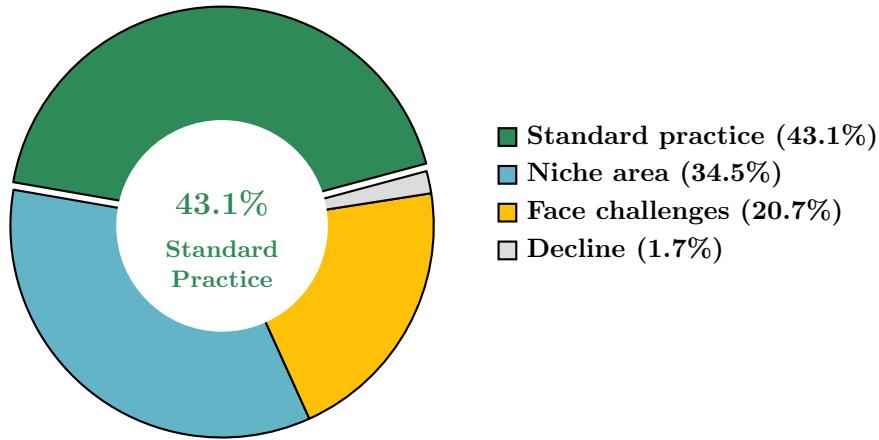


Figure 10: Future of Green Finance in Banking

Table 5: Critical Steps to Accelerate Green Finance Adoption (Select Up to 2)

Step	%	Count
Better collaboration between banks and green technology providers	63.8	37
Increased consumer awareness and demand	62.1	36
Stronger government policies and incentives	53.4	31
Improved financial models to demonstrate profitability	20.7	12

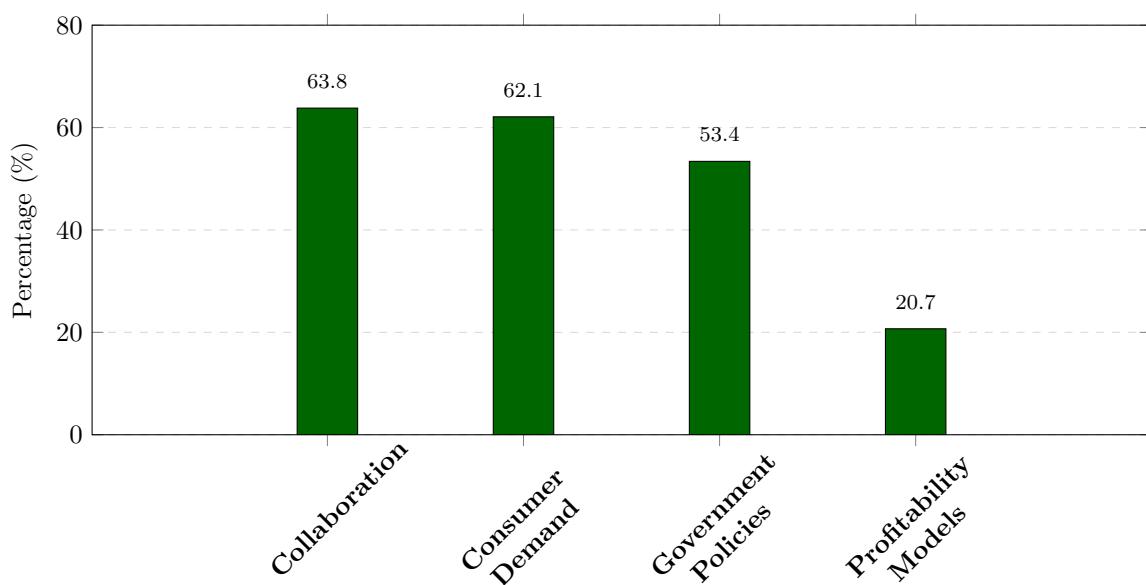


Figure 11: Critical Steps for Green Finance Adoption

As shown in figure (11) the results of the survey reveal that stakeholders view collaboration between banks and green technology providers (63.8%) and greater consumer awareness (62.1%) as the most critical drivers for the adoption of green finance—ranking them above government policy (53.4%). This suggests that the banking sector believes that market-based initiatives have the potential to make a larger impact than regulatory intervention. The relatively modest emphasis on demonstrating profitability (20.7%) may reflect either confidence in existing financial models or the absence of short-term concern for viability issues. These findings align with the World Bank's 2023 report, which identifies the function of public-private partnerships in emerging markets [The World Bank \(2023\)](#). For banks, their immediate agenda should include collaborative R&D efforts with clean-tech firms to drive innovation, alongside consumer awareness campaigns promoting sustainable finance products. The strong focus on policy initiatives (53.4%) may reflect uncertainty about implementation timelines, which suggests that banks favor actionable coordination over anticipating legislative change.

4.5. Green Finance in Banking – CIB Insights and Global Evidence

The data reveal that green finance is now a bank revolutionizing force, and CIB Egypt is a regional trailblazer of sustainable finance as it confronts challenges that come with every international trend. With both CIB's practice and global studies in mind, the research substantiates that green financial products make a positive contribution to the performance of banking on multiple dimensions. CIB's pioneering \$100 million green bond issuance in 2021, in line with ICMA Green Bond Principles and Egypt's FRA guidelines. It's a shining example of how renewable energy, green buildings, and clean transport projects can yield both environmental returns and financial returns, as evidenced by the bank's 40% growth in its green portfolio (2020-2023) ([Commercial International Bank \(CIB\) \(2023a\)](#)). This is in line with global evidence by [Xu et al. \(2023\)](#) and [Ning et al. \(2023\)](#), which shows green bonds and loans spur sectoral growth, particularly renewable energy and agriculture, through increased efficiency in resource utilization and mobilizing capital.

Environmental advantages are most pronounced, with CIB experiencing a 46% fall in carbon footprint per employee (2018-2021) and saving over 1,200 tons of CO₂ annually through paperless activities – achievements that are in line with the operational efficacies documented by [Aslam and Jawaaid \(2023\)](#) in Pakistani banks. The bank's partnership with international institutions like IFC and EBRD has rooted its capability to enable SMEs' transitions to low-carbon technologies, aligning with [Zhang \(2023\)](#) findings on green finance's catalytic role in China's pilot cities. Through such partnerships, CIB has been able to leverage international best practices but adapt them to the unique situation of Egypt's market, offering a hybrid sustainable finance model. Interestingly, the bank's focus on digitalization has further enhanced these environmental benefits, with its mobile banking reaching 1.5 million customers and significantly reducing energy consumption associated with branches. However, the study also identifies continued barriers, including high capital expenses for green technology and customer awareness gaps preventing adoption, which have also been identified by [Bouteraa et al. \(2023\)](#) in UAE banking markets.

CIB's experience underscores the critical necessity for robust governance frameworks, with its Environmental and Social Risk Management (ESRM) framework since 2016 providing valuable lessons in risk mitigation – though [Neagu et al. \(2024\)](#) Romanian case study cautions that green loans do not automatically reduce credit risk. The bank's position as Egypt's top workplace (2023) highlights employee engagement value of sustainability initiatives, an outcome supported by [Khan et al. \(2024\)](#)) and [Kumar et al. \(2024\)](#) for reputation-enhancing effect of green banking initiatives. Yet, regulatory fragmentation in Egypt, consistent with [Sule et al. \(2024\)](#) identification of policy conflict across regions, continues to hinder standardization efforts, while [Judijanto et al. \(2024\)](#) research confirms smaller banks in emerging economies face specific challenges in applying such practices due to constraints on resources. Combining CIB's experience with global insights shows that green finance can create a competitive edge, operational efficiency, and stakeholder value, but unlocking its full potential requires tackling three key challenges: harmonizing policies to reduce regulatory gaps, developing innovative financing tools to ease high initial costs, and implementing training programs for employees and customers alike. These efforts would have the potential to bridge the current gaps in localized impact

measurement and accelerate the banking sector's contribution to national climate goals, as evidenced by CIB's alignment with Egypt's Nationally Determined Contributions under the Paris Agreement. The findings collectively make CIB a best practice model for sustainable banking in emerging markets, while highlighting universal challenges that require collective solutions across the financial ecosystem.

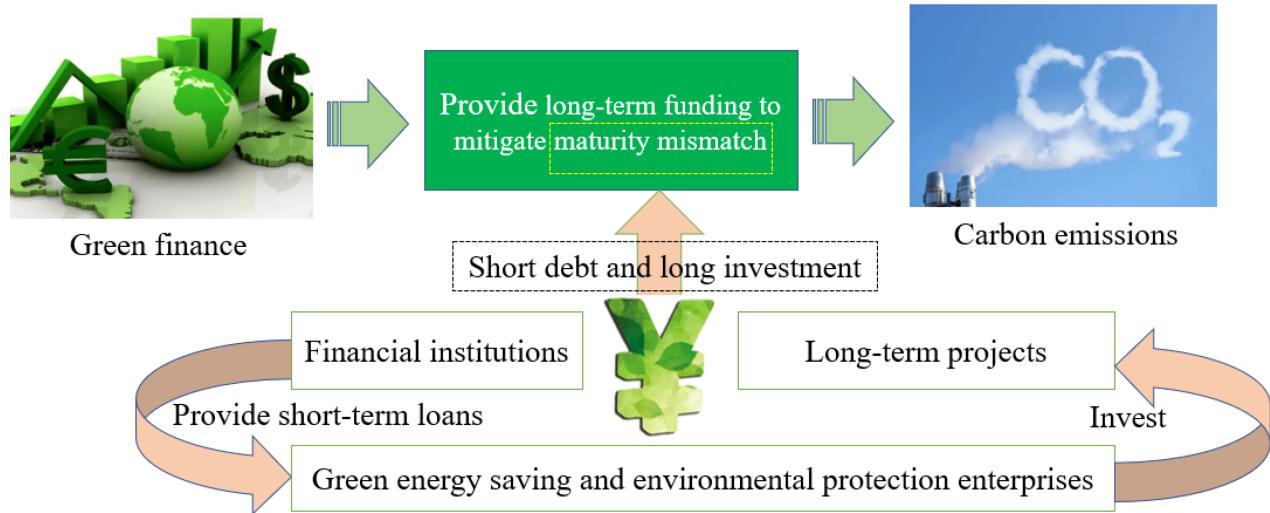


Figure 12: Green Finance Maturity Mismatch: ST Loans vs. LT Green Projects

As shown in the figure above (12), Green Finance helps solve a common problem in funding environmental projects called maturity mismatch—where the short repayment periods of traditional bank loans don't align with the long time-frames needed for green investments like solar farms, wind energy or sustainable infrastructure. Most banks and financial institutions offer short-term loans 1-5 years but eco-friendly projects often take 10-30 to become profitable. For example, a company building a wind farm needs decades to repay its costs through energy sales, struggles to meet repayment deadlines, leading to discouraging investment in clean energy, and slows down progress in reducing carbon emissions. Green Finance addresses this by: (1) Green Bonds, loans with 10+ year repayment periods, (2) Government-backed Loans for renewable energy, (3) Special Investment Funds for sustainable businesses. By matching long-term projects with long-term money without cash flow problems, green finance will get stable funding to grow, pollution decreases because more clean energy projects succeed. In short, green finance bridges the gap between short-term banking and long-term sustainability, making it easier to fund projects that protect the environment while still being profitable. ([MDPI Sustainability \(2024\)](#))

4.6. Green Finance Adoption

The empirical evidence demonstrates that adopting green finance offers banks significant advantages while requiring strategic implementation. Survey data show strong support (63.8%) for bank-tech partnership as the most effective adoption model, particularly useful in surmounting the greatest barriers of high costs (77.6%) and consumer awareness gaps (82.8%). Successful adoption has three key steps: First, banks must work with technology providers to develop low-cost green products like solar energy loans, which CIB Egypt successfully did with 40% portfolio growth. Second, they must inform customers (where 51.7% link green finance with trust) and employees (key to operational success, as seen in CIB's top employer status). Third, banks must promote clearer policies since 53.4% of respondents stressed the significance of regulatory support. The benefits of adoption are substantial across three areas. Environmentally, banks can achieve major reductions in carbon footprints (CIB cut emissions by 46% per employee). Operationally, digital green solutions improve efficiency (CIB saved 1,200+ tons of CO₂ through paperless systems). Financially, green finance opens new markets (69%

of respondents noted this benefit) while enhancing reputation (63.8%) and risk management (55.2%). Younger customers (35 of 58 respondents aged 18-24) show particular interest in sustainable options, representing a growth opportunity.

To maximize performance, banks should focus on four enhancement strategies: 1) Implement training programs to boost employee green skills (linked to better customer service in surveys), ensuring staff at all levels understand sustainability goals and can effectively communicate them to clients. These programs should include practical workshops on ESG risk assessment and green product benefits, aligning with findings that 63.8% of respondents associate green finance with improved brand reputation. 2) Develop simple green products like eco-loans to attract SMEs, which accounted for 40% of CIB's successful green portfolio growth, while also offering incentives such as lower interest rates for sustainable projects to drive adoption. 3) Use technology (rated 'essential' by 41 respondents) for transparent impact tracking, leveraging AI and blockchain to monitor carbon savings and project performance in real time, thereby addressing the 50% of survey participants who cited insufficient profitability data as a barrier. 4) Create clear sustainability reports to build stakeholder trust, as CIB did through its ESRM system, with metrics that highlight progress in emissions reduction, energy efficiency, and community engagement to satisfy both regulators and environmentally conscious investors. The survey confirms green finance will become standard practice (25 of 58 respondents), especially if banks address the profitability concerns raised by 20.7% of participants through better financial modeling, such as showcasing long-term ROI from green investments or piloting small-scale projects to demonstrate success before scaling.

As a study published in Springer's Environmental Science and Pollution Research (2024) discloses, excellent green banking requires a four-way integral approach including operating responsibility (institutionalization of daily practices for sustainability), employee responsibility (employee involvement in sustainable practices), customer responsibility (retail of green financial products), and policy responsibility (development of strong sustainability frameworks). These factors together constitute organizational perception and ultimately enhance environmental performance measures. The model demonstrates that banks with synergy between these factors, particularly when green finance programs are integrated into all levels of operations, exhibit measurable improvements in sustainability outcomes. This is consistent with recent research findings indicating that holistic green banking approaches can lower the carbon footprint of financial institutions while, at the same time, enhancing operational effectiveness and customer satisfaction (Environmental Science and Pollution Research, 2024). The model underscores that achieving green performance in banking requires systematic integration of sustainability across all functions, from daily operations to strategic decision-making. The theoretical framework in the figure below (13) describes how green finance practice drives environmental performance via interconnected organizational responsibilities.

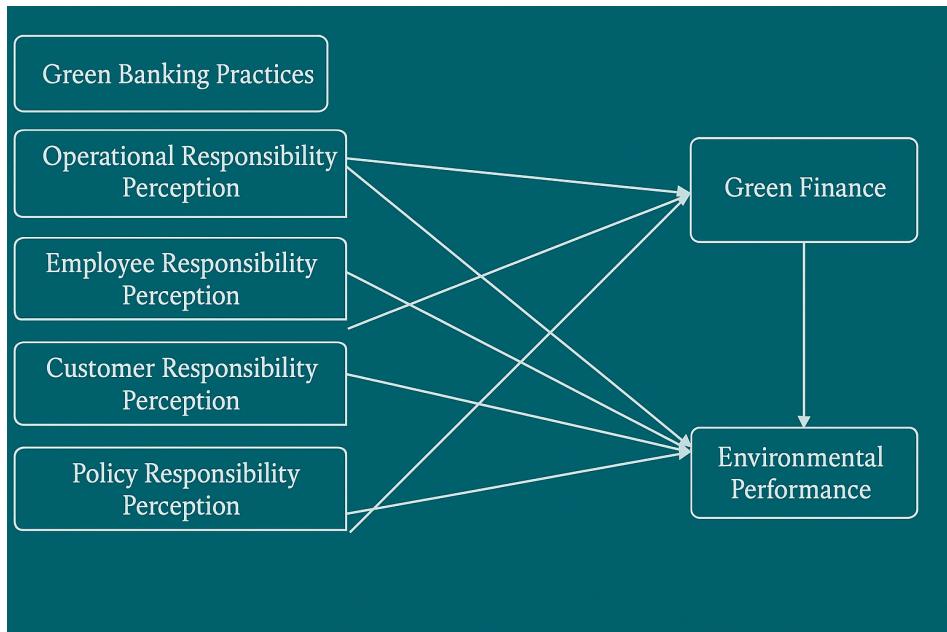


Figure 13: Green Banking Practices Outcomes

Government policies (cited by 78% as critical) and technological solutions like AI/blockchain (70% approval) are driving green finance adoption, mirroring CIB Egypt's success with its \$100 million green bond initiative that reduced CO₂ emissions by 12,708 tons annually. While benefits are clear, including market expansion (69%), reputation gains (64%), and risk diversification (52%) as ESG-focused firms show stable returns - adoption barriers persist, particularly in customer engagement (only 52% see demand as a driver) and proving profitability (46% seek clearer ROI evidence). CIB's measurable achievements, like its 46% operational emissions reduction since 2018 through renewable energy and green building financing, validate the business case while highlighting three key requirements for mainstreaming: (1) simplified products (eco-loans) for broader customer appeal, (2) transparent impact reporting to address the 64% prioritizing bank-tech partnerships for tracking, and (3) policy frameworks that incentivize long-term thinking, as 53-62% of respondents emphasized through calls for stronger regulations and education. This aligns with the mixed outlook where 43% predict green finance becoming standard versus 35% viewing it as niche, suggesting that while pioneers like CIB demonstrate the model's viability through concrete ESG integration, universal adoption depends on making sustainability both accessible and financially compelling across all banking sectors.

The path forward is clear, banks that combine strategic partnerships, customer education, and policy engagement will gain competitive advantages in profitability, risk reduction, and stakeholder satisfaction. For instance, collaborating with fintech firms can reduce the 77.6% high-cost barrier by co-developing affordable green solutions, while targeted marketing campaigns can educate the 82.8% of customers who remain unaware of sustainable banking benefits. Proactive policy advocacy, such as working with regulators to standardize green loan definitions, can mitigate the 39.7% of concerns about regulatory ambiguity, as seen in CIB's alignment with international standards. While challenges remain in standardization and costs, the evidence from CIB and global studies proves green finance adoption is both achievable and beneficial for banks at all stages of sustainability development, from newcomers focusing on basic paperless banking to leaders issuing green bonds. Future success depends on maintaining this balance between environmental responsibility and financial performance while continuing to innovate in product design and delivery methods, such as applying game-based strategies to reward eco-friendly customer behavior or using big data to personalize green investment options. Ultimately, banks that embrace these strategies will not only future-proof their operations but also position themselves as leaders in the transition to a sustainable economy. It's not just about being green—it's about building a system where green is the obvious choice."



Figure 14: Green Multiplier Effect in Banking



Figure 15: Overview of Green Banking Coverage

5. Conclusion

The study highlights how green finance is shaping the future of banking, focusing on the case of Commercial International Bank (CIB) in Egypt. Green finance is all about bringing finance and environmental goals together, addressing global challenges and supporting green projects like renewable energy and eco-friendly buildings to help in reducing big global issues. Using a mixed-methods approach as a 17-question survey of 58 respondents and CIB's own reports found that 81% of respondents are aware of green finance, while 17% still view it mistakenly as just a marketing tool. However, barriers like high costs and consumer awareness gaps highlight the need for strategic partnerships and education. This confusion reflects a broader lack of communication within the banking sector, where financial institutions may not always effectively explain the strategic and environmental goals behind green initiatives. Survey data reveal optimism about green finance's future, with 63.8% linking it to enhanced reputation and 69% noting new market opportunities. The regression model $Y = \alpha + \beta X + \sum t$ identifies green finance activities (X) as key drivers of sustainable investments, supported by external factors like government policies and technological innovation as digitalization and AI that were mentioned as critical for improving transparency and decision-making in sustainable financing.

The findings showed CIB Egypt's pioneering efforts, such as issuing a \$100 million green bond, adopting paperless banking, which reduced about 46% CO₂ emissions per employee, and funding renewable energy, illustrate how banks can align profit with environmental responsibility through renewable energy projects and ESG training programs. In addition, CIB partnered with global institutions like the IFC to strengthen its green bond strategy and offered sustainability training for employees, improving engagement and operational efficiency. However, there are still real challenges as high costs of green projects, standardizing regulations, and low consumer demand, as survey results indicated that 82.8% of participants viewed low consumer demand as a critical barrier, suggesting that banks need to take more proactive steps in raising public awareness and creating accessible green products. On the positive side, things like supportive government policies and new technology are helping push the movement forward and have played a role in expanding green portfolios, evident in CIB's 40% green investment growth between 2020 and 2023.

In summary, the study confirms that green finance offers not only environmental benefits but also competitive advantages for banks willing to innovate and lead. Though challenges remain, the potential for green finance to reshape the banking landscape is undeniable. It represents a necessary step toward a more resilient, responsible, and future-focused financial system. Banks that embrace sustainability not only meet ESG expectations but also unlock new revenue streams, enhance risk management, and strengthen their public image. CIB's recognition as the best workplace in Egypt in 2023 partly reflects how internal sustainability culture improves morale and drives innovation. As 43% of respondents predict green finance becoming standard, banks must innovate, leveraging data analytics and circular economy principles, to make sustainability both accessible and profitable. Collaboration between governments, financial institutions, and tech innovators is critical to achieve sustainable practices, whether through green bonds for SMEs or carbon-tracker accounts for retail customers. Ultimately, this work provides a road map for transforming green finance from a niche practice into an industry standard, emphasizing that sustainability is inseparable from modern financial success. The future of banking depends on adopting green finance not as a duty, but as a chance to shape sustainable and inclusive growth for future generations.

References

- Agency, I. E. (2023). World energy outlook. Available online: <https://www.iea.org/reports/world-energy-outlook-2023>. Licence: CC BY 4.0 (report); CC BY NC SA 4.0 (Annex A).
- Agrawal, R. (2024). Adoption of green finance & innovation for achieving circularity. *Journal of Cleaner Production*. Available online.
- Aslam, W. and Jawaid, S. T. (2023). Green banking adoption practices: improving environmental, financial, and operational performance. *International Journal of Ethics and Systems*, 39(4):820–840. Available online at: <https://www.emerald.com/insight/content/doi/10.1108/IJES-06-2022-0125/full/html>.
- Best Places to Work (2023). Best places to work certification program. [Available Online; accessed 24th April 2025].
- Bouteraa, M., Raja Hisham, R., and Zainol, Z. (2023). Challenges affecting bank consumers' intention to adopt green banking technology in the UAE: A UTAUT-based mixed-methods approach. *Journal of Islamic Marketing*, 14(10):2466–2501. Available online at: <https://www.emerald.com/insight/content/doi/10.1108/JIMA-02-2022-0039/full/html>.
- Commercial International Bank (CIB) (2023a). Cib annual report 2023. [Available Online; accessed 24th April 2025].
- Commercial International Bank (CIB) (2023b). Cib sustainability report 2023. [Available Online; accessed 24th April 2025].
- Commercial International Bank (CIB) (2023c). Digital transformation. [Available Online; accessed 15-June-2024].
- Commercial International Bank (CIB) (2023d). Esg and digital development integrated report 2022–2023. [Available Online; accessed 24th April 2025].
- Commercial International Bank (Egypt) (2023a). Cib on track to be first green bank in egypt. Available online at: <https://www.csregypt.com/en/cib-on-track-to-be-first-green-bank-in-egypt/>.
- Commercial International Bank (Egypt) (2023b). Green bond framework. Available online at: <https://www.cibeg.com/-/media/project/downloads/about-cib/cib-corporate-responsibility-formerly-community/corporate-sustainability/green-bond/green-bond-framework-v3.pdf>.
- Commercial International Bank (Egypt) (2023c). Green bond framework (version 5). Available online: <https://www.cibeg.com/-/media/project/downloads/about-cib/cib-corporate-responsibility-formerly-community/corporate-sustainability/green-bond/green-bond-pdf-v5.pdf>.
- Commercial International Bank (Egypt) (2023d). Investor relations and ESG presentation: First quarter 2023. Available online: Slide deck covering financial and ESG performance for Q1 2023.
- Commercial International Bank (Egypt) (2024). Green bond framework: Second party opinion. Available online at: <https://www.cibeg.com/-/media/project/downloads/about-cib/cib-corporate-responsibility-formerly-community/corporate-sustainability/green-bond/secondpartyopinioncommercialinternationalbank03oct2024pbc1400693.pdf>. Second Party Opinion prepared by Sustainalytics.
- Egypt, D. N. (2022). Egyptian banks go paperless to cut costs, boost sustainability. [Available Online; accessed 24th April 2025].
- Forbes Finance Council (2025). Why finance leaders must master the art of storytelling. <https://www.forbes.com/councils/forbesfinancecouncil/2025/04/23/why-finance-leaders-must-master-the-art-of-storytelling/>. Accessed: [Insert Access Date].

- Gulzar, R., Bhat, A. A., Mir, A. A., Athar, S. A., and Al-Adwan, A. S. (2024). Green banking practices and environmental performance: navigating sustainability in banks. *Environmental science and pollution research international*. Available online.
- Haentjens, M. and de Gioia-Carabellese, P. (2023). *Introduction to Green Finance and Sustainability*. Routledge. Available online.
- International Finance Corporation (IFC) (2020). Ifc provides up to \$100 million loan to egypt's CIB bank to support private sector growth, climate-smart projects. Press release. <https://www.ifc.org/en/pressroom/2020/ifc-provides-up-to-100-million-loan-to-egypt-s-cib-bank-to-support> [Available Online; accessed 10-June-2024].
- Judijanto, L., Yusniar, Y., and Arini, R. E. (2024). Linkages between financial risk and sustainability in the banking sector: A bibliometric study. *West Science Social and Humanities Studies*. Available online.
- Khan, I. U., Hameed, Z., Khan, S. U., and Khan, M. A. (2024). Green banking practices, bank reputation, and environmental awareness: evidence from islamic banks in a developing economy. *Environment, Development and Sustainability*, 26(6):16073–16093. Available online.
- Kumar, B. (2025). Exploring the role of finance in driving circular economy and sustainable business practices. *Journal of Cleaner Production*. Available online.
- Kumar, B., Kumar, L., and Kumar, A. (2023). Green finance and circular economy. *Environmental Science and Pollution Research*. Available online.
- Kumar, J., Rani, G., Rani, M., and Rani, V. (2024). Do green banking practices improve the sustainability performance of banking institutions? the mediating role of green finance. *Social Responsibility Journal*, 20(10):1990–2007. Available online.
- Martin, V. (2023). Green finance: Regulation and instruments 1. *Journal of Central Banking Theory and Practice*, 12(2):185–209. Available online.
- MDPI Sustainability (2024). Green finance mechanisms addressing maturity mismatch in sustainable investments. *Sustainability*, 16(10):4319. Figure 2: Maturity mismatch in green finance. Available online: <https://www.mdpi.com/2071-1050/16/10/4319> (accessed on Month Day, Year).
- Mishra, P. (2023). Adaptation of green banking practices in commercial banks of nepal. *Apex Journal of Business and Management*, 1(1):55–76. Available online.
- Mudalige, H. M. N. K. (2023). Emerging new themes in green finance: a systematic literature review. *Future Business Journal*, 9(1):108. Available online.
- Name, A. (2023). The introduction of green finance. *Journal of Environmental Research and Letters*, 3(3, 2022). Available online.
- Neagu, F., Tatarici, L., Dragu, F., and Stamate, A. (2024). Are green loans less risky? micro-evidence from a european emerging economy. *Journal of Financial Stability*, 70:101208. Available online.
- Ning, Y., Cherian, J., Sial, M. S., Álvarez-Otero, S., Comite, U., and Zia-Ud-Din, M. (2023). Green bond as a new determinant of sustainable green financing, energy efficiency investment, and economic growth: a global perspective. *Environmental Science and Pollution Research*, 30(22):61324–61339. Available online.
- Sule, A. K., Eyo-Udo, N. L., Onukwulu, E. C., Agho, M. O., and Azubuike, C. (2024). Green finance solutions for banking to combat climate change and promote sustainability. *Gulf Journal of Advance Business Research*, 2(6):376–410. Available online.
- The World Bank (2023). Global financial development report 2023: Green finance and sustainable growth. Available online: <https://www.worldbank.org/en/publication/gfdr> (accessed: 2024-02-15).
- Xu, J., She, S., Gao, P., and Sun, Y. (2023). Role of green finance in resource efficiency and green economic growth. *Resources Policy*, 81:103349. Available online at: <https://doi.org/10.1016/j.resourpol.2023.103349>.

Zhang, T. (2023). Can green finance policies affect corporate financing? evidence from china's green finance innovation and reform pilot zones. *Journal of Cleaner Production*, 419:138289. Available online at: <https://doi.org/10.1016/j.jclepro.2023.138289>.

Appendix

Survey Questions



Gender: Male Female

Age: 18-24 25-34 35-44 45-54 +55

Are you responding as a banking professional or a consumer?

Banking professional Consumer

How familiar are you with the concept of green finance and its role in sustainable investments?

Familiar Somewhat familiar Not familiar at all

Which of the following best describes your understanding of green finance?

- A tool to fund environmentally sustainable projects
- A marketing strategy for banks
- A regulatory requirement imposed by governments
- A risk management approach for banks

How important do you think green finance is for the future of banking and sustainable development?

Extremely important Important Neutral Not important Extremely not important

How likely is it that banks will invest a large amount of their money in green projects over the next 5 years?

Very likely Somewhat likely Unlikely

How effective do you think green bonds and green loans are in promoting sustainable banking investments?

Very effective Moderately effective Slightly effective Not effective

What do you think is the biggest barrier for banks to increase their green investments? (Select up to 3)

- High initial costs of green projects
- Insufficient public awareness and limited consumer demand for sustainable banking
- Lack of clear regulatory frameworks
- Insufficient data on the profitability of green investments
- Economic pressures and competing financial priorities

How can banks balance profitability and environmental responsibility?

- Prioritize environmental responsibility over profits
- Focus on profits first, then environmental goals
- Find a balance between profits and environmental benefits

How important is technological innovation in enabling banks to invest in green projects?

- Extremely important, essential for efficiency and scalability
- Moderately important; supports banks in green investments but is not a decisive factor
- Slightly important, has little to no role in enabling banks to invest in green projects

How significant is the role of government policies and regulations in promoting green

investments?

- Have a strong influence on promoting green investments
 Contribute somewhat to encouraging green investments
 Have a minimal impact on promoting green investments

How do you think investor preferences and consumer demand for sustainable investments affect banking decisions?

- Strongly encourages banks to adopt green finance
 Moderately encourages banks to adopt green finance
 Slightly encourages banks to adopt green finance

What do you think are the most significant benefits of green finance for banks? (Choose all that apply)

- Enhanced reputation and brand value
 Increased customer loyalty and trust
 Access to new markets and revenue streams
 Improved risk management and long-term profitability

How does green finance influence the risk profile of banks?

- Significantly reduces risk by diversifying investments and promoting long-term stability
 Moderately reduces risk but depends on the quality of green projects
 Increases risk due to uncertainties in green project returns
 Has no noticeable impact on risk

What do you think is the future of green finance in the banking sector?

- It will become a standard practice for all banks
 It will remain a niche area for specialized banks
 It will decline due to lack of profitability
 It will evolve but face significant challenges

What do you think is the most critical step needed to accelerate the adoption of green finance in banking? (Select up to 2)

- Stronger government policies and incentives
 Increased consumer awareness and demand
 Better collaboration between banks and green technology providers
 Improved financial models to demonstrate profitability

Table 6: Work Distribution

Reviewer Name	Team Contribution
Rawan Mohamed Ali	Abstract - Introduction - 4 articles (+VOS Viewer) - Model/Data/Methodology - Survey Questions - Empirical Results - Final PPT
Sara Mohamed Hosny	Introduction - 3 articles - Model/Data/Methodology - Survey Questions - Conclusion - PPT Presentations - Final PPT
Sama Wael Kamel	Introduction - 3 articles - Model/Data/Methodology - Survey Questions - Final PPT
Zyad Reda Mohamed	Abstract - Introduction - 3 articles - Model/Data/Methodology - Survey Questions - Final PPT