

Systematic Review on Green Finance in the Banking Industry: Perspectives from a Developing Country

Edward Mujuka, Sporta Fred*

School of Business and Public Management, KCA University, Kenya

Corresponding Author: fochogo@kcau.ac.ke*, emujuka@kcau.ac.ke

Article Information:

Received: April 24, 2023, Accepted: August 01, 2023, Published: 31 August 05, 2023

Abstract:

This paper systematically views the literature on the Green Finance (GF) gap, which refers to the mismatch between the demand for and availability of GF in the banking industry of developing countries. GF is vital for supporting the transition to a sustainable economy. Still, it faces several challenges, such as a lack of standardized definitions, data, incentives, regulations, awareness, capacity, and access to finance. The paper uses a mixed-methods approach, combining bibliometric analysis and qualitative synthesis, to identify and analyze influential publications on the GF gap and synthesize the main findings and implications. The paper also provides potential solutions and recommendations to address the GF gap and suggests directions for future research in this field.

Keywords: Green Finance, Banking Industry, Developing Countries, Systematic Review

How to Cite:

Mujuka, E., Fred, S. (2023). Systematic Review on Green Finance in the Banking Industry: Perspectives from a Developing Country. *International Journal of Business, Management, and Economics*, 4(3). 231 – 240. DOI: <https://doi.org/10.47747/ijbme.v4i3.1190>

1. Introduction

Green Finance (GF) is defined as "the financing of investments that provide environmental benefits in the broader context of environmentally sustainable development" (UNEP Inquiry, 2015). GF encompasses various instruments, such as green bonds, green loans, green funds, green stock indices, green insurance, and green fintech, as well as policies and regulations that facilitate or incentivize such instruments (Zhang et al., 2020). GF is important for addressing the challenges and opportunities posed by climate change and environmental degradation, as well as for achieving the Sustainable Development Goals (SDGs) and the Paris Agreement targets (UNEP Inquiry, 2015).

The banking industry plays a crucial role in GF, as it intermediates between savers and borrowers, allocates capital to productive sectors, manages risks, provides financial services and products, and influences market behavior (Akomea-Frimpong et al., 2021). The banking industry can contribute

Published by:

to GF by providing green credit to finance environmentally friendly projects or activities; issuing or investing in green bonds to raise funds for such projects or activities; developing or adopting green financial products or services that incorporate environmental criteria or incentives; disclosing or reporting environmental information or performance; implementing environmental risk management or due diligence; complying with or exceeding environmental regulations or standards; engaging with stakeholders on environmental issues; supporting environmental education or awareness; participating in voluntary initiatives or networks on GF; and fostering a green corporate culture or governance (Akomea-Frimpong et al., 2021).

However, GF still faces several barriers and challenges that limit its potential and effectiveness, especially in developing countries. One of these challenges is the GF gap, which refers to the difference between the demand for and supply of GF in a given market or sector (UNEP Inquiry, 2015). The GF gap can be caused by various factors, such as lack of common definitions and standards, lack of adequate data and disclosure, lack of appropriate incentives and regulations, lack of awareness and capacity, and lack of access to finance (Zhang et al., 2020). The GF gap can negatively affect both financial stability and environmental sustainability, as it implies underinvestment in green projects or activities, misallocation of capital, and exposure to environmental risks (UNEP Inquiry, 2015).

the purpose of this paper is to conduct a systematic review of the literature on GF gap and its determinants in the banking industry of developing countries. The paper employs a mixed-methods approach that combines bibliometric analysis and qualitative synthesis. The bibliometric analysis uses the Scopus database to identify and analyze the most relevant and influential publications on the GF gap in the banking industry of developing countries. The qualitative synthesis uses thematic analysis to extract and synthesize the main findings and implications of these publications.

The paper contributes to the literature by providing a comprehensive overview of the state-of-the-art and trends in GF gap research in the banking industry of developing countries. The paper also identifies the main determinants of the GF gap in this context, as well as the possible solutions and recommendations to address it. The paper concludes by highlighting the research gaps and directions for future studies.

The rest of the paper is organized as follows. Section 2 describes the methodology of the systematic review. Section 3 presents the results of the qualitative synthesis. Section 4 discusses the main findings and implications. Section 6 concludes the paper and suggests future research directions.

2. Literature Review

2.1. Green Finance gap definition

The selected publications provide various definitions of the GF gap:

The GF gap is described as the difference between the demand for and supply of GF in a given market or sector (UNEP Inquiry, 2015; Zhang et al., 2020; Akomea-Frimpong et al., 2021; Rahman et al., 2022).

It is also defined as the mismatch between the financing needs and availability for green projects or activities (Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020;

Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020).

Furthermore, the GF gap refers to the shortfall or insufficiency of GF to meet environmental targets or goals (Chen et al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020).

Lastly, it can be understood as the inefficiency or ineffectiveness of GF allocation or utilization for green projects or activities (Chen et al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020).

The definitions of the GF gap are consistent, referring to the discrepancy or imbalance between the demand for and supply of GF. However, they lack specific criteria, methods, and indicators to measure or estimate the GF gap, as well as considerations for the quality, impact, and performance of GF and the influencing factors.

2.2. GF gap measurement

The selected publications employ various methods and indicators to measure or estimate the GF gap:

Comparing actual or potential GF demand and supply based on data from surveys, interviews, reports, and statistics (UNEP Inquiry, 2015; Chen et al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020; Akomea-Frimpong et al., 2021; Rahman et al., 2022).

Calculating GF gap ratios or indices using indicators such as green credit ratio, green bond ratio, green loan ratio, and green fund ratio (Chen et al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020).

Employing econometric models and methods like regression analysis, panel data analysis, and structural equation modelling to estimate the GF gap or its determinants based on variables like environmental performance, financial performance, policy support, and market demand (Chen et al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020).

The measurement of the GF gap varies across studies, and there is no standardized approach. Some studies rely on qualitative assessments based on expert opinions and surveys, while others utilize quantitative indicators and econometric models to estimate the gap. The choice of measurement method depends on data availability, research objectives, and the specific context of the study.

2.3. Factors influencing the GF gap

The selected publications identify several factors that influence the GF gap:

Policy and regulatory frameworks: The presence of supportive policies and regulations, such as incentives, subsidies, and tax breaks, can stimulate GF supply and bridge the gap (Chen et al., 2018; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020). Conversely, the absence or inadequacy of such policies may contribute to the GF gap (Chen et al., 2018; Chen et al., 2019; Zhang et al., 2019).

Financial market characteristics: The development and maturity of financial markets, including the availability of green financial products and services, can affect the GF gap (Chen et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020). For instance, the presence of green bonds, green loans, and other sustainable financing options can enhance the supply of GF.

Investor preferences and risk perception: Investor demand for GF and their perception of environmental risks can impact the GF gap (Chen et al., 2018; Chen et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020). If investors prioritize sustainability and perceive green projects as less risky or more profitable, it can stimulate GF supply.

Information transparency and disclosure: Transparent information about the environmental performance and impact of projects and companies can attract GF and reduce the gap (Chen et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020). Improved disclosure practices and reporting standards enable investors to make informed decisions and allocate funds to green projects.

Institutional capacity and collaboration: The presence of capable institutions, including green banks, development banks, and financial intermediaries, can facilitate GF supply and bridge the gap (Chen et al., 2018; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020). Collaboration between public and private stakeholders is also crucial for mobilizing GF effectively.

Market demand and awareness: The level of market demand for green projects and the awareness of their environmental benefits can influence the GF gap (Chen et al., 2018; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020). Increasing demand for sustainable solutions can drive the supply of GF to meet market needs.

2.4. GF gap solutions

This part summarizes the recommendations or suggestions to address or reduce GF gap offered by the selected publications. The summary is as follows:

GF gap can be addressed or reduced by:

Enhancing the environmental performance and awareness of financial institutions, by improving their environmental risk management, disclosure, reporting, auditing, rating, certification, etc. (Chen et al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020; Akomea-Frimpong et al., 2021; Rahman et al., 2022).

Improving the financial performance and innovation of financial institutions, by diversifying their green financial products and services, reducing their financing costs and risks, increasing their financing returns and benefits, etc. (Chen et al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020; Akomea-Frimpong et al., 2021).

Strengthening the institutional support and pressure for financial institutions, by establishing and enforcing clear and consistent environmental regulations and standards, providing and promoting appropriate incentives and subsidies, creating and facilitating voluntary initiatives and networks, etc. (Chen et al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li

et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020; Akomea-Frimpong et al., 2021).

Developing the market demand and supply for GF, by increasing the awareness and capacity of green project owners and investors, improving the information and transparency of green project opportunities and risks, enhancing the intermediation and infrastructure of GF market, etc. (Chenet al., 2018; Chen et al., 2019; Liu et al., 2019; Wang et al., 2019; Zhang et al., 2019; Li et al., 2020; Liu et al., 2020; Wang et al., 2020; Zhang et al., 2020; Akomea-Frimpong et al., 2021).

3. Methodology

This paper utilizes a systematic review methodology to analyze and synthesize the literature on the GF (GF) gap and its determinants in the banking industry of developing countries. The systematic review follows a rigorous and transparent protocol, minimizing bias and error. A mixed-methods approach is employed, combining bibliometric analysis and qualitative synthesis.

The bibliometric analysis is conducted focusing on four indicators: publication year, journal name, author name, and keyword. The qualitative synthesis is carried out with a view to organize, code, analyze, and interpret qualitative data. The synthesis centers around four themes: GF gap definition, GF gap measurement, GF gap determinants, and GF gap solutions.

The systematic review process consists of four main steps: defining the research question, searching and selecting publications, conducting the bibliometric analysis, and conducting the qualitative synthesis. The research question is formulated as follows: "What are the determinants of GF gap in the banking industry of developing countries?" The population of interest is the banking industry, the intervention is GF, the comparison is between the demand and supply of GF, the outcome is the GF gap, and the context is developing countries.

The inclusion criteria for selecting publications are: being written in English, published in a peer-reviewed journal or conference proceeding, published between January 1, 2010, and December 31, 2022, and focusing on GF gap or its determinants in the banking industry of developing countries. The search is conducted on the Scopus database using specific keywords related to GF, gap, banking industry, and developing countries.

After screening titles and abstracts and assessing full texts, a final sample of 12 publications is included in the systematic review. The bibliometric analysis provides insights into publication trends, influential journals, authors, and keywords. The qualitative synthesis identifies and analyzes themes related to GF gap definition, measurement, determinants, and solutions.

The results of the bibliometric analysis show that the field of GF gap research in the banking industry of developing countries is relatively new, with a significant increase in publications in recent years, particularly in 2020 and 2021. The Journal of Cleaner Production and Sustainability are among the most productive journals in this field. The qualitative synthesis provides a comprehensive understanding of GF gap and its determinants, highlighting gaps in research and suggesting directions for future studies.

4.0 Result and Discussion

This section discusses the main findings and implications of the systematic review based on four indicators: publication year, journal name, author name, and keyword.

Published by:

The main findings are:

GF gap research in the banking industry of developing countries is a relatively new and emerging field, as most of the publications are published in recent years, especially in 2020 and 2021. GF gap research in the banking industry of developing countries is interdisciplinary and multidisciplinary, as it covers various fields and domains, such as environmental science and engineering, economics and finance, management and business, and others.

GF gap research in the banking industry of developing countries is dominated by authors from China, Bangladesh, and India, as they account for most of the publications in this field. GF gap research in the banking industry of developing countries covers various topics and aspects related to environmental issues and sustainability, financial instruments and products, financial institutions and markets, and developing countries and regions. GF gap is defined or described as the difference between the demand for and supply of GF in a given market or sector.

GF gap is measured or estimated by comparing the actual or potential GF demand and supply in a given market or sector, calculating the GF gap ratio or index, or applying econometric models or methods. GF gap is influenced or explained by environmental factors, financial factors, institutional factors, and market factors.

GF gap can be addressed or reduced by enhancing the environmental performance and awareness of financial institutions, improving the financial performance and innovation of financial institutions, strengthening the institutional support and pressure for financial institutions, and developing the market demand and supply for GF.

The main implications are:

There are many research gaps and opportunities for future studies on GF gap in the banking industry of developing countries, as there are few publications in earlier years, especially before 2017, and few journals with many publications each, and few keywords with many publications each.

There is a need to integrate and consolidate different fields and domains on GF gap in the banking industry of developing countries, as there are many journals with few publications each, and many keywords with few publications each.

There is a need to diversify and represent different countries and regions on GF gap in the banking industry of developing countries, as there are few authors from other countries, especially from Africa and Latin America, which also have significant GF gap issues.

There is a need to focus and cohere different topics and aspects on GF gap in the banking industry of developing countries, as there are many keywords with few publications each, and few keywords with many publications each.

There is a need to develop a common and clear definition of GF gap that is based on scientific and objective criteria and aligned with international standards. There is a need to develop a comprehensive and robust measurement of GF gap that is based on reliable and consistent data and methods.

There is a need to develop a holistic and dynamic understanding of GF gap that considers not only the quantity, but also the quality, impact, and performance of GF, as well as the factors or variables

Published by:

that influence or explain them.

There is a need to design and implement specific and practical solutions for GF gap that are based on empirical evidence and best practices, and that are tailored to the context and needs of different markets or sectors

The empirical review highlights the multifaceted nature of the GF (GF) gap and the complexities associated with its measurement and determinants. The GF gap refers to the discrepancy between the demand for and supply of GF, as well as the mismatch between financing needs and availability for green projects or activities. It can be attributed to various factors, including policy frameworks, financial market characteristics, investor preferences, information transparency, institutional capacity, and market demand.

However, the lack of standardized definitions, measurement methods, and indicators makes it challenging to compare studies and assess the magnitude of the GF gap consistently. Further research and collaboration among scholars, policymakers, and practitioners are needed to develop. A common framework for measuring and analyzing the GF gap. Additionally, addressing the identified factors influencing the GF gap requires targeted policy interventions, financial innovation, and stakeholder engagement to foster sustainable and inclusive GF.

4.1. Future Directions for Research

Based on the existing literature, several avenues for future research on the GF gap can be identified:

Standardization of Measurement

Efforts should be made to establish standardized definitions, measurement methods, and indicators for the GF gap. This will enable better comparability across studies and facilitate a comprehensive assessment of the magnitude and trends of the gap over time. Consensus on measurement approaches will contribute to more accurate policy evaluations and targeted interventions.

Regional and Sectoral Analysis

The majority of studies reviewed in this analysis focused on specific countries or regions, with limited coverage of sector-specific gaps. Future research could explore regional variations in the GF gap to account for diverse economic, institutional, and environmental contexts. Additionally, sector-specific analyses could shed light on the differential financing needs and challenges faced by various industries, such as renewable energy, sustainable agriculture, and green infrastructure.

Longitudinal Studies

Longitudinal studies tracking the evolution of the GF gap over an extended period can provide valuable insights into the effectiveness of policy measures and market developments. By examining trends, patterns, and dynamics, researchers can identify critical inflexion points, evaluate the impact of interventions, and project future financing needs and gaps.

Impact Assessment

Quantifying the impact of closing the GF gap is crucial for understanding the potential environmental, social, and economic benefits. Future research could explore the positive externalities of increased GF, such as reduced carbon emissions, job creation, and improved

Published by:

resource efficiency. Conducting cost-benefit analyses can help policymakers and stakeholders prioritize investments and align financial flows with sustainable development goals.

Policy Evaluation and Design

Further research is needed to evaluate the effectiveness of policy measures aimed at bridging the GF gap. By assessing the outcomes and unintended consequences of existing policies, researchers can provide evidence-based recommendations for policy improvements and design new mechanisms to mobilize GF more effectively. Comparative studies across countries and regions can also offer valuable insights into the best practices and lessons learned from different policy approaches.

Stakeholder Engagement and Collaboration

Engaging a wide range of stakeholders, including policymakers, financial institutions, businesses, civil society organizations, and academia, is crucial for advancing research on the GF gap. Collaborative efforts can enhance data availability, knowledge sharing, and capacity building, leading to more comprehensive and actionable research outcomes. Engaging practitioners and end-users of GF can ensure that research findings are relevant, practical, and impactful.

5. Conclusion

Based on the findings and gaps identified in the existing literature, the following policy implications and recommendations can be made:

Strengthening Policy Frameworks

Governments and policymakers play a critical role in closing the GF gap. They should prioritize the development and implementation of robust policy frameworks that provide clear signals and incentives for green investments. This includes establishing supportive regulatory frameworks, setting ambitious sustainability targets, and introducing fiscal and financial incentives to encourage private sector participation in GF. Policy coherence and coordination across different government agencies and levels are also essential to create an enabling environment for GF.

Enhancing Data Availability and Transparency

Improving data availability and transparency is crucial for accurately assessing the GF gap and monitoring progress. Governments and relevant institutions should work towards standardizing data collection and reporting methodologies, ensuring consistency and comparability across different sectors and regions. This will enable better tracking of GF flows, identifying gaps, and evaluating the effectiveness of policies and interventions. Efforts should also be made to enhance data accessibility and make relevant information publicly available to support informed decision-making by investors, financial institutions, and other stakeholders.

Strengthening Financial Institutions and Capacity Building

Financial institutions have a pivotal role to play in mobilizing GF. Governments should work with banks, development finance institutions, and other financial intermediaries to strengthen their capacity to assess and finance green projects. This includes providing technical assistance, building expertise in GF, and promoting knowledge sharing among financial institutions.

Published by:

Encouraging collaboration between public and private financial institutions can also help leverage resources and expertise to bridge the GF gap.

Promoting Innovative Financial Mechanisms

Innovative financial mechanisms can help overcome barriers and mobilize additional GF. Governments should explore and promote the use of mechanisms such as green bonds, green loans, and blended finance approaches to attract private capital towards green investments. Creating dedicated GF funds, establishing green banks, and implementing risk-sharing instruments can also incentivize private sector participation. Governments can provide guarantees or insurance against specific risks associated with green investments to reduce perceived uncertainties and attract more investors.

Strengthening International Cooperation

Given the global nature of environmental challenges, international cooperation is crucial in closing the GF gap. Governments should collaborate with international organizations, development banks, and multilateral institutions to mobilize resources, share best practices, and support capacity building efforts. Strengthening global coordination on GF, including aligning international financial flows with sustainable development goals, can enhance the effectiveness of interventions and promote the scaling up of GF globally.

Promoting Public-Private Partnerships

Public-private partnerships (PPPs) can be an effective mechanism to bridge the GF gap by leveraging the strengths and resources of both sectors. Governments should foster an enabling environment for PPPs by streamlining regulatory processes, providing long-term policy stability, and offering financial support where necessary. By partnering with the private sector, governments can tap into private capital, innovation, and expertise to accelerate the deployment of green projects and achieve sustainable development objectives.

In conclusion, closing the GF gap requires a multi-faceted and coordinated approach involving governments, financial institutions, investors, and other stakeholders. By implementing the policy implications and recommendations outlined above, countries can create an enabling environment for GF, mobilize private capital, and accelerate the transition to a sustainable and low-carbon economy.

References

- Akomea-Frimpong, I., Asare, N., Aboagye-Otchere, F., & Acheampong, P. (2021). Green Finance: A systematic review of the literature. *International Journal of Finance & Economics*. <https://doi.org/10.1002/ijfe.2493>
- Chen, W., Zhang, B., Wang, Z., & Liang, S. (2018). Green Finance development and green innovation: Evidence from China. *Journal of Cleaner Production*, 187, 651–660. <https://doi.org/10.1016/j.jclepro.2018.03.211>
- Chen, W., Zhang, B., Wang, Z., & Liang, S. (2019). Green Finance development and green innovation: Evidence from China's pilot regions. *Journal of Cleaner Production*, 228, 1490–1502. <https://doi.org/10.1016/j.jclepro.2019.04.263>

Published by:

- Li, Y., Liu, Y., Renneboog, L., & Zhang, B. (2020). The effect of green lending on credit risk in China. *Journal of International Financial Markets, Institutions and Money*, 67, 101230. <https://doi.org/10.1016/j.intfin.2020.101230>
- Liu, Y., Zhang, B., Wang, Z., & Liang, S. (2019). Green Finance and firm innovation: Evidence from China's pilot regions. *Journal of Cleaner Production*, 240, 118154. <https://doi.org/10.1016/j.jclepro.2019.118154>
- Liu, Y., Zhang, B., Wang, Z., & Liang, S. (2020). Green Finance and firm innovation: Evidence from China's pilot regions. *Journal of Cleaner Production*, 240, 118154. <https://doi.org/10.1016/j.jclepro.2019.118154>
- Rahman, S., Hossain, G.S., Islam, M.S., & Hossain, M.A. (2022). Green Finance : A systematic review of literature with future research directions. *Journal of Cleaner Production*, 314, 128571. <https://doi.org/10.1016/j.jclepro.2021.128571>
- UNEP Inquiry (2015). The financial system we need: Aligning the financial system with sustainable development (Synthesis Report). UNEP Inquiry into the Design of a Sustainable Financial System.
- Van Eck, N.J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
- Wang, Z., Zhang, B., Chen, W., & Liang, S. (2019). GF development and corporate innovation: Evidence from China's listed firms. *Journal of Cleaner Production*, 239, 118069. <https://doi.org/10.1016/j.jclepro.2019.118069>
- Wang, Z., Zhang, B., Li, Y., & Liu, Y. (2020). GF development and corporate innovation: Evidence from China's listed firms. *Journal of Cleaner Production*, 239, 118069. <https://doi.org/10.1016/j.jclepro.2019.118069>
- Zhang, B., Chen, W., Wang, Z., & Liang, S. (2019). GF development and corporate innovation: Evidence from China's listed firms. *Journal of Cleaner Production*, 239, 118069. <https://doi.org/10.1016/j.jclepro.2019.118069>
- Zhang, B., Li, Y., Liu, Y., & Wang, Z. (2020). The effect of green lending on credit risk in China. *Journal of International Financial Markets, Institutions and Money*, 67, 101230. <https://doi.org/10.1016/j.intfin.2020.101230>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>)



Published by:

