THE EFFECT OF GREEN FINANCE INSTRUMENTS IN ENSURING THE SUSTAINABILITY OF WOMEN-LED ENTERPRISES IN KIAMBU COUNTY

BY

ADAKA SANDRA ANZEMO

MASTER OF SCIENCE IN DEVELOPMENT FINANCE

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ADAKA SANDRA ANZEMO

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KCA UNIVERSITY, 2025

DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a master's degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

Student Name: **ADAKA SANDRA ANZEMO** Reg. No: **23/06903**

Signature …  … Date:..**14/10/2025...**

I do hereby confirm that I have examined the master's thesis dissertation of

Adaka Sandra Anzemo

And have certified that all the revision that the dissertation panel and examiners recommended have been adequately addressed

Signature:  _____ Date: ___14/10/2025_____

DR. ABRAHAM ROTICH, PHD

ABSTRACT

This study examines the effect of green finance instruments in ensuring the sustainability of women-led enterprises in Kiambu County. Green funding has become a key strategy for sustainable development, including environmental protection and climate change mitigation, and it helps women-led businesses adopt sustainable practices. Green finance is a key enabler for equipping women-led companies in emerging economies like Kenya. The following objectives guided this study: to assess the effect of green loans and credit on the sustainability of women-led enterprises in Kiambu County, to examine the effect of green bonds on the sustainability of women-led enterprises in Kiambu County, to explore the effect of green microfinance on the sustainability of women-led enterprises in Kiambu County and to evaluate the effect of government incentives and policies on the sustainability of women-led enterprises in Kiambu County. Microfinance theory, financial inclusion theory, stakeholder theory, and institutional theory informed the study. Primary data used collected through questionnaires with women-led entrepreneurs. The study used survey questionnaires to poll 3400 women-led businesses and sample 358. The study employed descriptive statistics and multiple regressions to correlate factors in this quantitative data using SPSS version 27.0. Women-led enterprises receive sustainability support from green finance mechanisms, including green loans, bonds, microloans, and government-sponsored incentives. This research investigates the effects of green finance on women-run enterprise sustainability by assessing green loans, bonds, microfinance, and government incentive strategies. The findings of this study demonstrates that green microfinance ($\beta = 0.799$, $p < .001$), together with government incentives ($\beta = 0.197$, $p < .001$), contribute positively to women-led business sustainability. However, green loans ($\beta = 0.012$, $p = 0.784$) and green bonds ($\beta = 0.012$, $p = 0.784$) failed to yield statistically significant effects. The research suggests that institutions should provide gender-responsive green loans while streamlining green bond protocols and building microfinance networks with education-based financial support from governments. Sharing subjectively reported data defines one limitation, while exclusivity to Indian women entrepreneurs creates another challenge alongside the non-capability of determining cause-effect relationships from cross-sectional data. Future studies should include analysis across countries, qualitative research, and extended period investigations about the long-term effects of green finance. The study provides knowledge to guide policy decisions to develop financial systems supporting sustainable women-led enterprises.

Key Words: ***Green Loans and Credit, Green Bonds, Green Microfinance, Government Incentives and Policies, and Sustainability of Women-Led Enterprises***

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ACRONYMS AND ABBREVIATIONS

AfDB: African Development Bank

AWEP: African Women's Entrepreneurship Program

CIFs: Climate Investment Funds

CLRM: Climate Litigation Risk Management

CSR: Corporate Social Responsibility

EIB: European Investment Bank

ESG: Environmental, Social, and Governance

EVs: Electric Vehicles

GEF: Global Environment Facility

GROOTS Kenya: Grassroots Organizations Operating Together in Sisterhood Kenya

IFC: International Finance Corporation

KCV: Kenya Climate Venture

KWFT: Kenya Women Microfinance Bank

MFIs: Microfinance Institutions

NSE: Nairobi Securities Exchange

REIPPPP: Renewable Energy Independent Power Producer Procurement Programme

SDG: Sustainable Development Goal

SMEs: Small and Medium-sized Enterprises

SSA: Sub-Saharan Africa

UNFCCC: United Nations Framework Convention on Climate Change

WEF: Women Enterprise Fund

OPERATIONAL DEFINITION OF TERMS

Green Bonds: Green bonds are fixed-income instruments that fund renewable energy, efficiency, and pollution reduction projects. Green bond proceeds go only to green projects and issuers meet the Green Bond Principles for accountability and transparency. Investors receive profits for supporting environmental sustainability through this financial instrument. (Flammer, 2018).

Green Loans and Credit: Green loans exclusively fund renewable energy and energy-efficient building projects. These loans follow the Green Loan Principles, which provide standards for project finance applications, assessment, fund management, and reporting. Through effective funding management, supported initiatives benefit the environment. (International Capital Market Association, 2021).

Green Microfinance: Green microfinance lends small amounts to low-income customers for environmental projects. Green microfinance funds renewable energy, sustainable agriculture, and ecological small business development projects. By funding green activities, Kiva loans help borrowers adopt cleaner practices. (Loan Market Association, 2021).

Government Incentives and Policies: Governments implement these strategies to promote ecologically friendly corporate and individual practices. Tax incentives, subsidies, and loans support green projects. Regulations and standards that promote sustainability generally mandate renewable energy and

emissions targets. (Organisation for Economic Co-operation and Development, 2022).

Sustainability: Sustainability occurs when current requirements are met without compromising future ones. Sustainable practices must protect ecosystems, economic stability, and social prosperity. Sustainability allows stakeholders to include environmental, social, and governance issues into lending and investing decisions for ethical results in the finance business. (United Nations, 2019).

Women-Led Enterprises: This includes female-owned or managed businesses. Promoting women-led green enterprises boosts economic growth and environmental protection. When gender perspectives are part of green infrastructure and financing systems, women entrepreneurs can access green economy prospects equally. (United Nations, 2019).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Green finance refers to the financial activity favoring environmental sustainability and investment in green projects and reducing the emergence of climate risk (Eyo-Udo et al., 2024). Green finance includes green bonds, loans, microfinance, and sustainable investment funds, paying special attention to ecological and social benefits (Agrawal et al., 2024). Bonds that governments and private entities issue use proceeds for renewable energy and conservation projects (Fu et al., 2023). Green loans are loans in support of businesses that embrace eco-friendly practices in the desire to promote long-term sustainability (Ye & Dela, 2023). Green microfinance supports small enterprises undertaking environmentally friendly financial inclusion activities. This green finance adoption is facilitated by government incentives such as tax benefits and subsidies (Li et al., 2024). Mobilizing capital for climate-resilient investments also affects financial institutions (Sule et al., 2024). Integrating green finance into mainstream financial markets will accelerate economic growth while reducing the carbon footprint

Green finance has specific objectives and risk assessments that differ from traditional finance. Traditional finance emphasizes profitability and risk management, and green finance integrates environmental, social, and governance factors (ESG) in investment decisions (Holmes & Maylie, 2024). Green financial instruments fund sustainable projects, whereas the main contributors are conventional finance, which provides economic growth with minimal environmental considerations (Nanayakkara & Chitale, 2024). On the other hand, since traditional financing has no mechanisms to measure environmental impact, green finance incorporates indicators of environmental freight. Unlike traditional financiers who focus on

short-term returns, investors in green finance care for long-term ecological and social benefits (Muckerheide, 2023). In addition, regulatory frameworks for green finance are more explicit regarding stricter disclosure requirements than those of conventional financial systems (Krogstrup & Oman, 2019). Green finance also favors innovative renewable energy and sustainable infrastructure compared to traditional financial investments (Chen & Zhao, 2021). Green finance is vital to realizing global sustainability objectives. Table 1.1 shows the annual green loans issued by different financiers from 2016 to 2025.

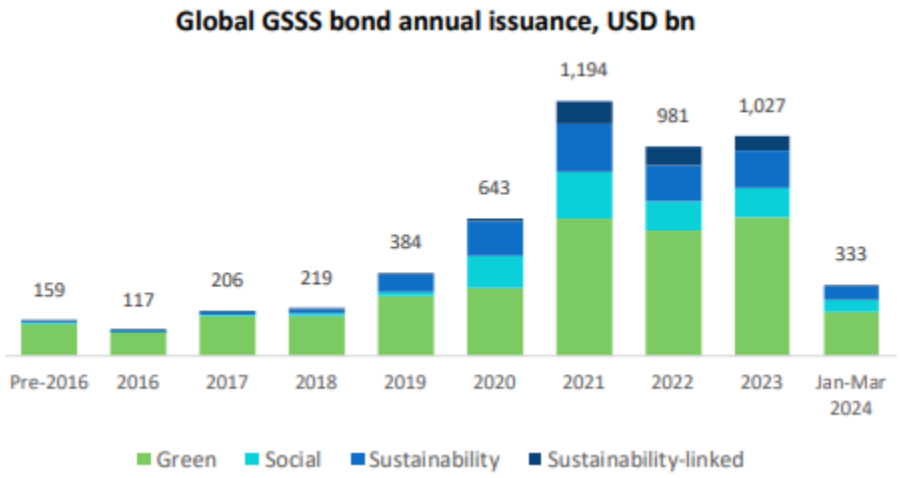
Regulatory policies, investor preferences, and climate-related risks have increased demand for green finance. Governments worldwide are implementing subsidies and tax credits to encourage sustainable investments (Barrachina et al., 2021). Investor preferences toward ESG-aligned portfolios have driven the adoption of green financial instruments (Ballester et al., 2024). As people become more aware of the risks related to climate, companies and financial institutions are increasingly integrating sustainability into their strategies (Uzsoki & Rahim, 2021). The development of green finance benefits from technological advancements in renewable energy and sustainable production methods (Yang et al., 2021). However, the financial sector is adopting green banking practices for the transition to low-carbon economies. Green initiatives need capital, and multi-lateral organizations and development banks are crucial in mobilizing this capital (Richard, 2024). Green finance accelerates the development of the market alignment of financial markets to global goals.

Globally, International climate agreements and sustainable development commitments have propelled green finance (International Finance Corporation, 2023). According to the Paris Agreement and the United Nations Sustainable Development Goals (SDGs), financial systems are important in reducing climate change (Espinoza Trujano & Phiri, 2021). The European

Union and the United States have developed green finance policies to support low-carbon transitions (World Bank, 2020). Fueled by its adoption as a global leader in green bonds, China has seen that the adoption of green bonds could foster sustainable economic growth (Rajak & Dolan, 2024). ESG considerations are being incorporated into investment strategies worldwide by financial institutions and industries to help promote sustainability (Nguyen et al., 2024). International funding and support for policy lead to green finance initiatives in emerging economies (Wanjiru, 2024). Global financial markets have adopted green finance standards that provide transparency and accountability over sustainable investments (World Bank, 2024). They help establish global economic resiliency and environmental conservation.

FIGURE 1.1

Global Bond Issuance



Source: (World Bank, 2024)

Regionally, green finance adoption is adaptive depending on (i) the policy frameworks, (ii) economic structure, and (iii) resource availability. For instance, Africa continues to witness growing interest in green finance through initiatives like the African Green Bond Program (Romano et al., 2020). Sule et al. (2024) show that stringent sustainability regulations by the European Union have led to a move towards green finance. However, Asian countries, such as

India and Japan, have policies that foster green investment in renewable energy (World Bank, 2021). The green microfinance effort in Latin America aims to support environmentally sustainable businesses. Regional financial institutions are integrating green practices of climate resilience and sustainability (Eyo-Udo et al., 2024). This further facilitates green finance accessibility with regional governments and the financial sectors' collaboration. Regional green finance strategies achieve long-term sustainability goals.

Green finance is executed locally with the help of government policies, community initiatives, and private sector participation. Local governments offer tax reliefs and grants to encourage green investments (Morsy et al., 2019). Green microfinance institutions support small enterprises that use green financial means to adopt environmentally sustainable practices (Apple, 2021). Community-driven financial models, such as cooperative green investment funds, promote local sustainability activities (Zhang et al., 2025). Green Banks and credit institutions offer green loan products to local businesses in transitioning to sustainable practices. Educational programs promote awareness of green finance adoption (Rajak, 2024). Successful implementation of green finance depends on the collaboration between local stakeholders and financial institutions. By establishing green finance at the local level, economic growth is ensured with the conservation of environmental resources.

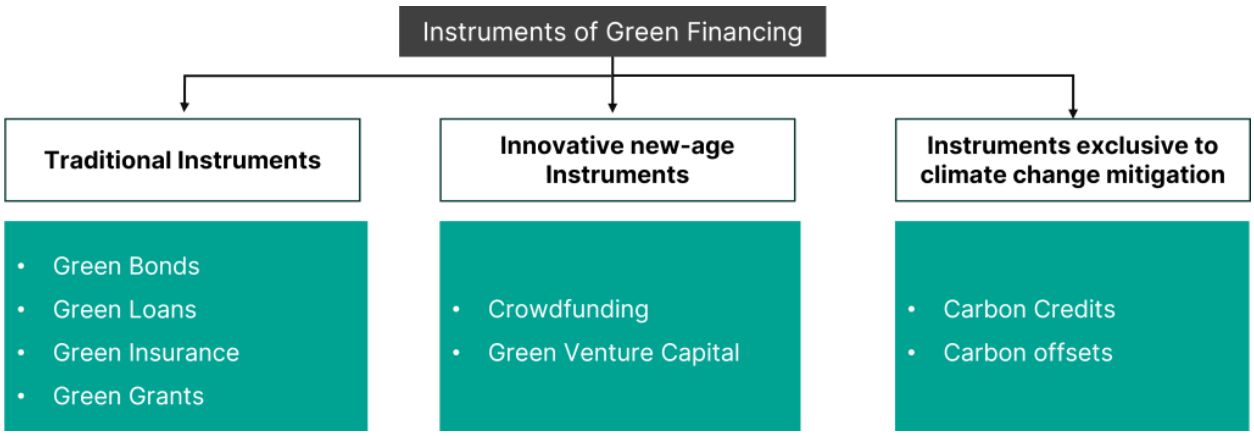
1.1.1 Green Finance Instruments

Green finance aids eco-friendly initiatives. Projects include renewable energy, biodiversity, water, sanitation, hygiene, and waste management (Migliorelli, 2021). Businesses, governments, and individuals can promote sustainability and decrease environmental damage using green finance. Financial innovations invest in resource efficiency, GHG emission reduction, and alternative energy (nuclear, solar, and hydro) projects to shift to low-carbon and resource-

efficient economies (Mishra, 2024). The ILO receives green funding as a 24 million-job promise by 2030. Financial tools for environmental conservation can become green finance. Popular devices provide a good fiscal return, supporting commercial investment. The figure below lists popular climate funding tools.

FIGURE 1.2

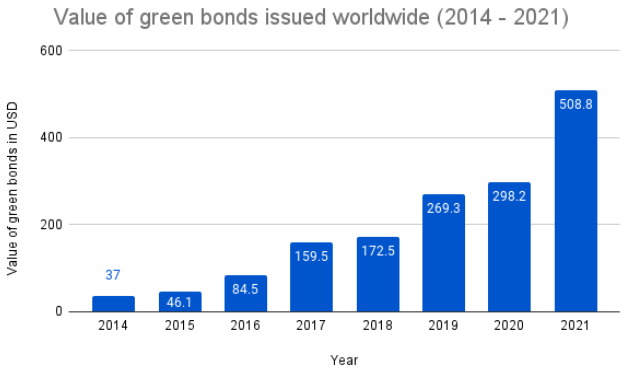
Green Finance Instruments



An organization or government issues green bonds to fund environmental or climate-friendly projects. They get funding from institutional, retail, and impact investors. Green bonds fund renewable energy, energy efficiency, and other climate-friendly investments (Qadir & Pillay, 2022). The European Investment Bank introduced it in 2007. The market for green bonds issued by the World Bank to combat climate change has increased since 2008. The Climate Bonds Initiative predicted USD 522.7 billion in 2021 green bond issuance (World Economic Forum, 2024). Over 50 nations offer green bonds.

FIGURE 1.3

Value of Green Bonds Worldwide



The green bond market in India is approximately USD 20 billion or 3.8 per cent of total corporate bonds led by Indian companies like JSW, Hydro, GreenKo, and Adani Green since SEBI published the green bond guidelines in 2015. Tax breaks or interest credits are available through green bonds, but there is no clear definition of what qualifies as a green bond that would discourage investors (Abhilash et al., 2023). With India's entrance into the Sovereign Green Bonds Club 2023 enhancing the demand for state-issued bonds, the RBI has the geranium or cheap green money. Green loans fund more eco-friendly consumer and business projects and offer lower interest rates (Giraudet et al., 2021). However, these loans also enable businesses, in general and in particular MSMEs, to integrate sustainability into operations and business practices in which a competitive edge is possible (Della Croce et al., 2011). Nevertheless, green and low-carbon ways could lead to excess costs, so green loans are vital to financing sustainable growth and avoiding earnings decreases.

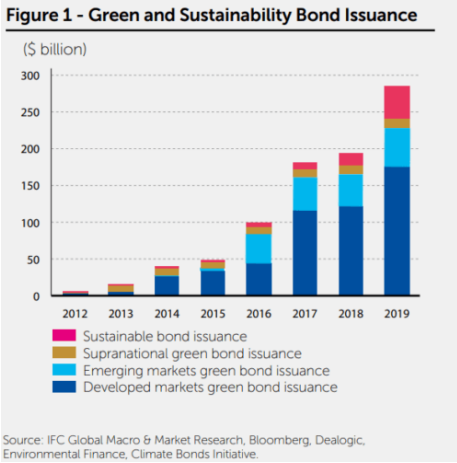
The green funds provide means for climate change mitigation, conservation, and resource management through governments, NGOs, and their local corporate foundations (Bosma & de Hon, 2018). That helps shoot them the funds to fill the gap regarding funding climate research within universities and research centres. The GlobalGreen funds provide green grants for local

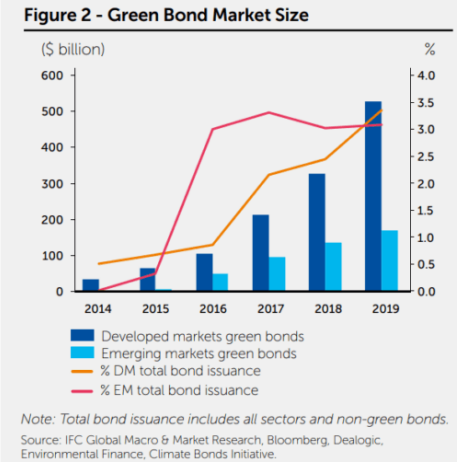
grassroots activities to strengthen local climate actions. In 2010, the UNFCCC founded the Green Climate Fund to provide USD 1 billion to help least-developed countries, small island states, and African countries (Green Climate Fund, 2025). Specifically, green loans are used for clean tech, like electric vehicle loans, solar panels, and zero-emissions buildings (Hussain, 2020). Nordea describes green loans as Green Bond Framework compliant and thus transparent for environmental project financing (Agrawal et al., 2024). Green loans are usually linked to green bonds so that banks can have banking facilities available to them for sustainable financing.

Green loans finance or refinance environmental projects. These massive green transaction loans have multiple funding sources. Green bonds attract investor capital, whereas banks offer small-sized green loans or private companies (García et al., 2023). Additionally, the finance structure must meet green project criteria. In the loan's use of proceeds section, acceptable green project types are listed, and borrowers must follow the reporting guidelines to avoid misreporting project progress and impact. Under the Green Loan Principles, climate change adaptation, climate-smart agriculture, and ecosystem protection are eligible projects. Loan borrowers must report how they allocate loan resources, the projects financed, and their intended or accomplished impact (Agrawal et al., 2024). Lloyd's Bank awarded the first green loans to green real estate enterprises in the UK in 2016. Although green loans increased, they were underutilized in underdeveloped nations and made up a small share of the global market (Yokoi-Arai et al., 2023). It guarantees loans to boost lenders' trust and requires borrowers to meet credit risk standards.

FIGURE 1.4

Green Bond Market





Before 2008, the World Bank issued the first green bond, laying the groundwork for growing interest in green projects. Green bond issuance exceeded $350bn in over 50 nations by 2020 (Yokoi-Arai et al., 2023). The U.S. remains the top issuer due to the demand for socially responsible environmental sustainability investment. Exemptions or credits give issuers tax breaks (Mertzanis & Te Bourbi, 2024). Third parties verify green bonds for authenticity and transparency and assure compliance with the Climate Bonds Initiative, whose certified verifiers lists (OECD, 2017) are maintained by organizations. The 2020 Swiss Prime Site AG offered green bonds against real estate developments that had been externally certified for sustainability.

Green bonds in Kenya are accelerating climate-friendly project financing by bringing in international and domestic capital (Mertzanis & Tebourbi, 2024). The drive is to encourage policy reforms and engage institutional investors to help smaller banks and corporations with entry into the green bond market. It also emphasizes creating green Islamic finance products (OECD, 2017). The program fosters supportive market conditions and local capacity in sustainable growth, climate change reduction, and poverty alleviation, focusing on East Africa.

Since the 1980s, microfinance, a mechanism of small-scale financial services to underserved populations, has become popular in addressing poverty (Visconti, 2016). This has tempered enthusiasm, which opened the door to commercializing banks such as Grameen Bank (Bateman & Chang, 2019) while losing public support to the institutions.

Green microfinance promotes sustainable development for poor and small enterprises by supporting change mitigation efforts, including renewable energy, sustainable agriculture, and water management (Visconti, 2016). First, the Green Index rates microfinance institutions based on their environmental performance but, unlike other indicators of green microfinance, focuses on process indicators and not actual environmental consequences, leaving a gap between what is reported as being done in the name of green and what it results in (Bateman & Chang, 2019). This disconnect offers a reason for a larger perspective to take in green microfinance in terms of its socio-environmental impact. Financial products are key but can reinforce negative socio-economic processes (Sparkassenstiftung for International Cooperation, 2020). The political and social dimensions of debt-based services may be exacerbated, leading to the need for success in green microfinance based on political and social considerations (Huybrechs et al., 2019). To achieve long-term sustainability, social and environmental policies and community involvement are needed.

Government incentives that remove the market barriers and motivate private sector investment to develop sustainability are needed for green finance (Okeke et al., 2024). Logically, Investors need clear and well-designed policy frameworks to reduce risks and signal as predictable signals. As such, governments should employ risk-sharing tools to safeguard investors and support green investments. Private funding must be present before public

incentives are used, and technical assistance should also be used to lower dependency (Clark et al., 2018). Resources for green market development are pooled by the Global Environment Facility (GEF) and Climate Investment Funds (CIFs), as gathering them separately is not worthwhile (Yadav et al., 2024). For effectiveness, transparency must be a green finance policy, monitoring mechanism, and collaboration with global partners (Huybrechs et al., 2019). Green bonds, loans, and grants support sustainable development but are green washed and are of limited availability to poorer countries (Clark et al., 2018). Green finance growth requires clear definitions, transparency, and access.

1.1.2 The Sustainability of Women-Led Enterprises

The Kenyan economy benefits from women-owned enterprises which combine environmental problem solutions with economic strength enhancement. KCV is a vital authority that helps these businesses by delivering financial backing, mentorship, and market connections. Through investments in renewable energy, sustainable agriculture, and eco-friendly manufacturing, KCV creates opportunities for women entrepreneurs to achieve both environmental sustainability and economic growth (Wanjiru, 2024). The transformative power of women empowerment manifests through businesses like Dash Crop, which improves food security by producing native flours, and Exotic EPZ, which generates employment opportunities specifically for female-headed homes. The businesses foster various Sustainable Development Goals, including No Poverty (SDG 1), Zero Hunger (SDG 2) and Decent Work and Economic Growth (SDG 8), according to Wanjiru (2024). Female entrepreneurs lead the way in developing Kenya's green economy while actively pursuing social transformation and making sustainability essential to national development.

The future requires financial investments into business operations controlled by women to create climate resilience. The strategic approach from KCV helps female entrepreneurs expand their companies and establish practices for gender equality, economic inclusion, and environmental stewardship (Wanjiru, 2024). Botanic Treasures and Mace Foods operate as social enterprises implementing sustainable innovation to promote SDG 12: Responsible Consumption and Production and SDG 15: Life on Land through eco-friendly farming practices. The women-led enterprises actively work toward achieving SDG 7 by driving the adoption of renewable energy solutions throughout Kenya. Through their sustainable actions, women entrepreneurs concurrently reduce climate change and generate economic resilience that leads to job creation and sustainable income streams. KCV leads efforts to develop women into leaders of green enterprises because female business owners contain a strong potential to advance sustainable development, according to Wanjiru (2024). By backing these women entrepreneurs, investors establish a dual advantage: they enhance Kenya's and other nations' sustainable future through increased inclusion and renewable growth of their businesses.

Finance for sustainability is limited, and green loans and credit are essential for women's enterprise sustainability. In emerging markets, only 7% of private equity and venture capital goes towards female-led businesses, and 3% of environmental philanthropic funding goes towards women's initiatives (International Finance Corporation, 2023). Under the Women Entrepreneurs Finance Initiative (We-Fi), more than $359 million will support over 200,000 women-led SMEs with over $3.5 billion in total financing mobilized. Data also suggest that gender-diversified firms emit 5 per cent less carbon dioxide than other firms and score among the best in ESG performance, indicating a more outstanding sustainability commitment (International Finance Corporation, 2023). However, challenges like collateral requirements and the restrictive ways of

lending remain barriers to women's access to green finance. This is essential to enabling the benefits of women-led enterprises and driving sustainable economic growth.

Green bond financing is an emerging focus in sustainable finance with gender considerations for integration. By 2020, quantities of green bond issuances grew to USD 305.3 billion, but they represented the least likely to have gender criteria in their allocation of proceeds among sustainable bonds. In 2021, European financial institution NatWest Group set out with the first – of many – social bonds for supporting women-led enterprises, offering €500 million (Uzsoki & Rahim, 2021). Refinancing loans meant for existing women-led businesses and funding new loans to women-led businesses helped to get the proceeds. Despite these initiatives, there remains a significant financing gap concerning financing women entrepreneurs, estimated to be US$1.5 trillion (International Finance Corporation (IFC), 2023). This gap needs to be addressed because women are more likely to start a business focused on sustainability that helps build resilient industries and commerce. Women-led enterprises are an essential part of driving sustainability. Poverty, jobs, innovation, and community development – that is what they do. These businesses serve as regenerative forces for the community by constructing business communities and hiring local workers for collective prosperity. While gender considerations take root in financial instruments such as social bonds, gender considerations in green bond financing are still largely missing. In order to bridge the substantial financing gap of women entrepreneurs and foster sustainable and resilient economic growth.

Green microfinance empowers women entrepreneurs and strengthens their businesses through ecologically flawed business practices. A recent Pakistani study demonstrated that green financing helps women entrepreneurs and promotes sustainable economic growth. Globally, women-owned MSMEs have a $1.7 trillion financing deficit (Chen et al., 2023). CARE's

initiative has grown, funding over 9 million enterprises $154.9 million and supporting over 150,000 companies. Green microfinance in women entrepreneur support programs can boost profitability and sustainability. Sustainable green and climate-related firm's help women handle environmental issues and boost economic growth. It could boost global GDP by $12 trillion and some countries' output by 35% (Lee & Huruta, 2022). Despite these obstacles, green financing and specialized support programs will empower women entrepreneurs and make their businesses more sustainable.

Governments across Africa have introduced several policies and initiatives to enable women-led businesses. The Women Enterprise Fund (WEF) makes accessible credit available to women entrepreneurs who can expand their businesses and contribute to economic development in Kenya. Also, the Kenyan government has a policy that mandates that 30 per cent of the value of all government contracted procurement should go to women-owned businesses, persons with disabilities or young people (Njogu-Ndongwe et al., 2024). The African Women's Entrepreneurship Program (AWEP) is a funding and capacity-building resources program offered to African business women globally, enabling them to participate in the global economy. Additionally, women-led businesses in Kenya gain support from the Green Climate Fund to promote climate-friendly cooking solutions and practice sustainable habits. Together, these initiatives seek to enable women entrepreneurs, increase business sustainability, and increase economic growth in general.

This study is essential to understanding the critical effect of green finance, government incentives, and policies in empowering women-led enterprises, particularly in fostering sustainability. However, women entrepreneurs have a vast financing gap of $1.5 trillion, which

prevents them from being able to drive economic growth and environmental solutions. This research examines green bonds, microfinance, and targeted government initiatives to bridge the gaps and promote sustainable women's businesses. It is important to identify these opportunities as this will enable women to participate in economic resilience and climate action and be part of inclusive growth for global sustainability efforts.

1.2. Statement of the Problem

In an ideal world, women-led enterprises would receive the same degree of access to green loans and credit, green bonds, green microfinance, and government incentives and policies that create a link between economic growth and environmental sustainability. Ideally, these enterprises would be significant in defeating climate change and establishing appropriate and sustainable practices, fostering innovation, facilitating the creation of jobs, and developing environmental resilience. With financial resources and policy backing, women entrepreneurs could scale their green businesses and contribute to global sustainability goals and inclusive economic development. Without such access to green finance, these businesses would thrive, ensure integration of sustainability, and lead in building a greener, more resilient future.

Nevertheless, the reality in most developing regions, including Kenya, is not as it should be. Women entrepreneurs more often struggle to access green finance (Akinyi & Mwangi, 2023). Sustainability and women's contributions to it are gaining increasing importance, but green bonds, microfinance and other financial instruments are generally not suited to the precise needs of women companies. Moreover, existing government policies and financial support mechanisms generally fail to be implemented or are not directed at supporting these entrepreneurs, resulting in underfinanced green enterprises. Due to a lack of necessary financial resources or institutional backing, these businesses fail at scaling up and contributing to broader sustainability objectives.

Recent studies have stressed the need to increase women's access to green financial resources, but they have ignored women entrepreneurs' problems. Akinyi and Mwangi (2023) discovered green finance instruments among hurdles to green finance for women entrepreneurs in Sub-Saharan Africa (SAA) and Kenya. Yet, they rarely address women entrepreneurs' special needs, limiting their scaling (Akinyi & Mwangi, 2023). The International Finance Corporation (2022) showed that 55% of Kenyan women-led firms cited financial market access as their main growth restriction, with 70% lacking financial literacy to participate in green financing. The effect of financial intermediaries in green finance was studied by Karimi et al. (2021), who found that high collateral requirements and the lack of gender-sensitive financial products prevent Kenyan women entrepreneurs from accessing affordable green finance. Okoth (2024) also shows that government incentives and policies for women-led firms have been restricted and have not supported green business operations. That said, little has been written about how institutional structures and regulatory support might improve green finance products to address women's face-specific access issues.

This study aimed to explore these important gaps and examine how green loans and credit, green bonds, green microfinance, and government incentives and policies can be designed to support women-led enterprises more. Consequently, this research helps to fill gaps in understanding the unique issues that women confront when accessing green finance. The study aimed to study how women entrepreneurs can be empowered and how businesses can become more sustainable using tailored financial instruments and supportive policies to make the economy more inclusive and sustainable. This is particularly important for the regions of Kenya where women-led enterprises have the potential to promote and advance both economic growth and climate action. The findings will provide critical insights for policymakers and financial

institutions to create inclusive, gender-responsive green finance frameworks that enhance both enterprise performance and national sustainability objectives.

1.3 Research Objectives

To evaluate the effect of green finance instruments in ensuring the sustainability of women-led enterprises in Kiambu County.

1.3.1 Specific Objectives

i. To assess the effect of green loans and credit on the sustainability of women-led enterprises in Kiambu County.
ii. To examine the effect of green bonds on the sustainability of women-led enterprises in Kiambu County.
iii. To explore the effect of green microfinance on the sustainability of women-led enterprises in Kiambu County.
iv. To evaluate the effect of government incentives and policies on the sustainability of women-led enterprises in Kiambu County.

1.4 Research Questions

i. What is the effect of green loans and credit on the sustainability of women-led enterprises in Kiambu County?
ii. What is the effect of green bonds on the sustainability of women-led enterprises in Kiambu County?
iii. What is the effect of green microfinance on the sustainability of women-led enterprises in Kiambu County?

iv. What is the effect of government incentives and policies on the sustainability of women-led enterprises in Kiambu County?

1.5 Justification of the Study

Green funding helps maintain women-led businesses. Since gender equity and environmental sustainability are needed, investigating the effect of green finance instruments in Kiambu County women-led firms is crucial. Green loans, microfinance, and bonds help eco-friendly firms. However, women-owned firms are losing such funding. This study investigated how green finance might help women-led enterprises reduce their environmental impact and grow. In addition, it also talks about the lack of research on the relationship between environment, gender, and entrepreneurship in Kiambu County. The study has recommended best practices for policy formulation regarding supporting women entrepreneurs through green finance to ensure they have a comprehensive understanding of the challenges and opportunities for women in accessing green finance. Moreover, it fosters sustainable economic growth, employment creation, and ecological resilience in the local communities. The studies' outcomes can also provide investment, policymaking or industry stakeholder value by creating a framework or an investment strategy to support green businesses that both serve economic and environmental goals in alignment with global 'sustainability' goals.

1.6 Significance of the Study

1.6.1. Local Communities

Sustainable women-led firms in local communities boost economic growth, job creation, and social development. Successful women entrepreneurs invest in their communities, giving infrastructure, education, and healthcare, which promotes the process. More about inclusive growth, their good influence is inclusive. A Kiambu County women-letting, women-led business can eliminate poverty and inequality and empower families and communities, especially in

women's economic engagement. Women entrepreneurs also promote social and environmental sustainability and build stronger communities. These firms also promote local markets and inspire ideas and resources for community development, improving well-being and the local economy.

1.6.2. Environmental Stakeholders

Environmental stakeholders benefit from women's businesses' growth and sustainability, especially green businesses. More women businesses are using eco-friendly technologies and sustainable practices to reduce carbon footprints and climate change. Women-led green enterprises reduce waste and save energy to meet global environmental goals. It highlights women's vital role in achieving the UN's Sustainable Development Goals (SDGs), particularly in climate action, responsible consumerism, and production. These companies expand their environmental protection efforts to include local ecosystems and climate resiliency. These companies will grow to encourage green innovation and sustainability.

1.6.3. Investors

Investors, especially impact and sustainable investors, benefit from women-led businesses. With responsible investments expected to rise, supporting women-led green enterprises offers a compelling chance to maximize earnings and social impact. These businesses support international environmental goals like the Paris Agreement, giving investors a sense of purpose and competitive profits. Green bonds and microfinance help investors diversify and promote sustainable development. Women green entrepreneurs are also more adaptable and resilient and prioritize long-term sustainability. These investments create a more inclusive, equitable, and sustainable global economy as well as financial gains. All participants in the ninth of women-led enterprises profit.

1.6.4. Governments

In areas of sustainable development and inclusive economic growth, governments benefit from women-led firms' sustainability. Women entrepreneurs boost the economy, generate jobs, grow industries, and reform roaming taxes. It also helps women-owned enterprises become economically independent, eliminating the need for social programs. Governments should encourage women-led firms to participate in green funding that supports national climate action programs and helps them fulfill global environmental targets, such as the UN SDGs. These enterprises boost local growth, creativity, and economic diversity, making communities more resilient. Green finance and women's entrepreneurship policies help government's foster inclusive and sustainable economic growth for society.

1.7 Scope of the Study

The study considers the green finance instrument to contribute to the sustainability of women-headed enterprises in Kiambu County. The study focuses on four primary green finance instruments – green loans and credit, green bonds, green microfinance and government incentives and policies. The study focused on the impact of the instrument on the sustainability of women-driven vehicles in Kiambu County. For that, stratified sampling used to select a sample size of 3,400 women-led enterprises to represent all sectors. Data used obtained from the experiences of these enterprises through primary data sources. The data analysis approach of this study is to study multiple regressions to understand the relationships between green finance instruments and sustainability for the period of data from October 2024 to May 2025. The tool developed is aligned with the research objectives of producing actionable findings that can provide helpful information on how to grow women-led enterprises in Kiambu County.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter provides a theoretical review that informs the research variables, as well as an empirical evaluation of the associated literature pertaining to the study variables. The chapter also introduces the knowledge gap and conceptual framework as well as operationalization of the variables.

2.2 Theoretical Review

Theoretical frameworks such as the microfinance theory, financial inclusion theory, stakeholder theory, and the institutional theory are presented here as they pertain to the research variables.

2.2.1 Microfinance Theory

The Microfinance Theory stemmed from financial exclusion responses during the 1970s when Muhammad Yuns established the Grameen Bank in Bangladesh (Yunus, 1983). According to the theory, small, no-collateral loans extended to poor women lead to their economic development and poverty elimination (Ledgerwood, 1999). Schreiner and Colombet (2001) show that microfinance connects traditional unregulated lending to conventional financial organizations. The joint liability lending system described by Morduch (1999) forms the basis of microfinance operations because it helps borrowers protect each other from default risks. Microfinance institutions (MFIs) have dual operational principles, according to Armendáriz and Morduch (2010), as they aim to achieve financial self-sufficiency while producing social impact through the integration of excluded populations into formal economic markets. According to this theory, creditors who obtain financial products and related services create entrepreneurial activity that

fuels economic expansion throughout disadvantaged communities, thus fostering financial inclusion (Cull et al., 2009).

Microfinance Theory has developed over time to establish multiple financial tools and institutional systems that expand access to finance for female entrepreneurs and small businesses. According to Robinson (2001), microfinance evolved from charity-based operations to commercially viable financial institutions that protect their social mission. Helms (2006) explains how proper interest rate policies create an equilibrium between potential loan affordability for borrowers and lending sustainability for financiers. Hermes and Lensink (2007) document how technological assessments and credit scoring enabled the transition from group-based loans to loans given to individuals. The authors of Cull et al. (2009) investigate the importance of regulatory mechanisms that protect microfinance organizations from financial instability while improving transparency. They researched gender-based financing programs and revealed women as more dependable creditors who produce solid repayment performance and economic steadiness (D'Espallier et al., 2011). Engineering microfinance methods demonstrate how this economic model changes to support monetary stability and social equality.

Financial inclusion, especially for those who are marginalized, such as women or rural entrepreneurs, is an area where Microfinance Theory has one strong point, which is mentioned by Morduch (1999). It is intended to foster self-sufficiency and entrepreneurship, thus creating less dependence on state welfare (Ledgerwood, 1999). Further, microfinance loan repayment rates are also high, especially in women-led groups under the influence of community support structures (D'Espallier et al., 2011). However, critics maintain that microfinance does not always result in sustained poverty reduction because such loans are typically insufficient to catalyze significant business growth (Bateman, 2010). Additionally, the high interest rates of some MFIs

are a concern related to financial exploitation (Hermes & Lensink, 2007). Specifically, Banerjee et al. (2015) point out that borrowers may take additional loans to repay existing debts, thus attracting over-indebtedness in microfinance. While such criticisms have been leveled, supporting microfinance to provide microfinance to underserved communities continues to be a necessary means of helping provide financial accessibility and economic opportunities for these underserved communities.

This study is highly applicable to microfinance theory because it offers indeed a theoretical foundation in order to grasp the rationality of green microfinance program. The theory submits that they support the notion that financial service access empowers women entrepreneurs to invest in sustainable business practices (Yunus, 1983). Sustainability objectives are widely embraced by the integration of green finance principles into microfinance, which not only helps enterprises survive but also assures that such enterprises contribute to environmental protection (Cull et al., 2009). Lastly, Helms (2006) underscores that such government-assisted microfinance systems will contribute to improving financial inclusion by making loans more accessible for women in remote areas. D'Espallier et al. (2011) argue that gender-focused financial programs increase a business's stability, making microfinance a vital policy tool for micro-enterprising women. Secondly, this study analyzed green microfinance's effect on women-led enterprises' sustainability and how environmental and financial policies can improve this effect.

2.2.2 Financial Inclusion Theory

Most financial inclusion theory was developed to tackle obstacles that make it difficult for people, particularly those from low-income or marginalized areas, to carry out their basic needs. The idea was first developed in the early 2000s by researchers like the World Bank (2003), who

defined financial inclusion as providing a fair chance for everyone to use financial services. Cull, Demirgüç-Kunt, & Morduch (2009) extend this by arguing the effect ofmicrofinance in facilitating financial access. As Rhyne (2001) and Ledgerwood (1999) contribute to the theory, it appears that this improves economic outcomes through inclusive financial systems. Furthermore, Sarma (2012) states that such higher levels of economic stability and growth in developing countries can be achieved using better financial inclusion. This work demonstrates how financial systems are already accessible to maximize economic development by mainstreaming the previously excluded.

The theory of financial inclusion has developed over time from application solely on financial services to a broader range of financial products and access in the formal and informal markets. Zins & Weil (2016) find that financial inclusion has a positive relationship with economic growth; namely, increased economic growth used brought about by enhanced inclusion. Besides essential banking services for access to credit, savings, insurance, and payment systems, financial inclusion was recognized as the subject of Demirgüç-Kunt & Klapper (2012). As explained by Sharma and Kapoor (2013), financial inclusion is physical and digital access, where mobile banking is a leading source for receiving financial services to the underserved population. However, national policy initiatives suggest that a financial inclusion gap be closed to promote social literacy (Sarma & Pais, 2011). Enabling financial inclusion has been crucial to the development of mobile finance, particularly in developing countries such as Kenya, where providers like M-Pesa have been key to that development.

Financial inclusion theory has contributed to knowledge on tackling economic inequality. However, criticisms have challenged the oversimplified nature of the challenges. Bateman (2010) also reveals that financial inclusion is sometimes a means of perpetuating inequalities as

it can offer products that are sustainable or do not deal with underlying causes of poverty. Nair and Marthi (2016) argue that the notion that accessing financial services will inherently provide a better economic environment fails to acknowledge the structural barriers. As Helms [2006] points out, poor financial product design (high-interest loans or hidden fees) may not address the problems of the unbanked but may worsen them. As such, Rutherford (2000) criticized microfinance inclusion because low-income groups may not fully comprehend the products they can obtain through microfinance and thus fall prey to exploitation. Bateman (2013) asserts that the idea of financial inclusion is a neoliberal policy that does not include the issue of income inequality or lack of economic opportunities.

Kiambu County directly applies the framework of access to financial services to promote the sustainability of women's enterprises. According to Cull et al. (2014), access to credit and financial services is essential to improve entrepreneurial success. In addition, Demirgüç-Kunt and Klapper (2012) state that inclusive financial systems facilitate the inclusion of marginalized populations for economic development. Sarma (2012) concurs with the importance of promoting financial literacy to overcome barriers to access, particularly law for women entrepreneurs facing specific obstacles. This is why the work of Zins and Weill (2016) points out how mobile financial services are overcoming physical barriers to banking, which is particularly important in rural areas such as Kiambu. The study can apply financial inclusion theory principles to assess how financial resources, such as loans and microfinance, are accessible for women leading businesses and how this may influence the long-term viability of these businesses.

2.2.3 Stakeholder Theory

Initially proposed by R. Edward Freeman in his (1984) book Strategic Management: A Stakeholder Approach, stakeholder theory is. Freeman maintained that companies have to

consider beneficiaries in addition to their shareholders, namely employees, customers, suppliers, and the community. The theory formed in reaction to the outdated shareholder approach to business management. According to Freeman (1984), businesses are interdependent with their stakeholders, and trade-offs addressing the stakeholders' needs will lead to long-term value creation by all parties. Post, Preston, and Sachs (2002) further elaborated on this by demonstrating that stakeholder engagement enhances corporate social responsibility. Building on the theory, Mitchell, Agle, and Wood (1997) further divided stakeholders into power, legitimacy, and urgency. Also, Harrison and Wicks (2013) supported the theory to the extent that companies that effectively manage stakeholder relationships do better in the long run.

Since its origin, stakeholder theory has grown considerably because researchers have expanded its usefulness across industries in various business settings. According to Mitchell et al. (1997), the stakeholder salience concept examines stakeholder classification through power legitimacy and urgency attributes that decide organizational stakeholder priority levels. Eisenhardt (1989) studied stakeholder theory within strategic management and suggested that organizations must resolve numerous stakeholder demands to maintain lasting business success. Agle et al. (2008) further developed the theory by studying stakeholder management techniques that affect company results, especially when examining social responsibilities and ethical standards. Freeman & McVea (2001) demonstrated that corporate strategy becomes more successful in creating lasting value by integrating stakeholder interests because it leads to market success in highly competitive and socially accountable markets. According to Wicks et al. (1994), businesses must develop stakeholder orientation to fulfill their social responsibilities while achieving societal acceptance.

The stakeholder theory draws appreciation because it constructs a total business framework that outperforms shareholder-focused management in providing complete organizational intelligence. The theory faces criticism because it remains unclear and complex to adopt in practical business situations. Jensen (2001) points out that stakeholder theory fails to provide organized guidance to handle contradictory demands of stakeholders' interests, therefore producing confusion about managerial decision-making. Donaldson & Preston (1995) maintain that theory lacks sufficient ethical principles for decision-making because it emphasizes stakeholder management instead of moral principles. According to Mayer (2002), stakeholder theory faces a significant limitation due to its incorrect assumption that all stakeholders can achieve satisfaction significantly when their objectives challenge one another. According to Hill & Jones (1992), the practical application of the theory could produce adverse effects through misguided multiple stakeholder satisfaction. The vision of CSR and stakeholder management stems from Social Contract Theory despite ongoing scholarly criticism.

The framework of Stakeholder theory demonstrates direct applicability toward research on green finance and women entrepreneur businesses operating in Kiambu County. Stakeholder theory offers a structural framework that explains stakeholder influence and response to green finance initiatives by analyzing groups, including women entrepreneurs, government agencies, financial institutions, and community organizations. According to Freeman et al. (2001), companies gain sustainability and business competitiveness by successfully including stakeholders in their management practices. Mitchell et al. (1997) state that green financial institutions require stakeholder balance when practicing green loan financing and microfinance strategies to meet women entrepreneurs' needs and investor priorities. The study points out how Wicks et al. (1994) stress that successful social and environmental goal require stakeholder

collaboration. The approach to resolving stakeholder interests presented by Agle et al. (2008) supports improved decision-making in line with the study's goals to advance sustainability and inclusivity for women entrepreneurs.

2.2.4 Institutional Theory

The original development of institutional theory began when Philip Selznick started his work in the 1940s, but DiMaggio and Powell broadened it during the 1980s. Organizations assume their form because of the institutional settings they interact with through regulatory standards and social certification systems. Selznick (1949) established that organizations create new structures and adopt practices by adapting to external institutional demands. According to DiMaggio and Powell (1983), the theory gained further development through the introduction of "institutional isomorphism," which illustrates how organizations that operate in similar fields naturally harmonize because of their need to demonstrate legitimacy. According to institutional theory, organizations alter their behaviors because of social, cultural, and political forces in their environments. According to Meyer and Rowan (1977), organizations adopt formal structures, even if inefficient, to gain legitimacy from external observers. This academic research is a foundation that directs additional investigations regarding organizational conduct and institutional alteration.

Institutional theory has developed over time to explain the organizational and industrial acceptance of institutional demands. Meyer and Rowan (1977) found that organizations create formal structure designs that maintain societal appearance even though they do not necessarily lead to better efficiency. DiMaggio and Powell (1983) explained organizational similarity through fields by developing the isomorphism concept that connects organizations by coercive pressure and mimetic and normative influences. According to Powell and DiMaggio (1991),

institutional fields mature over time by evaluating organizational responses to regulatory frameworks, societal expectations, and industry standards. According to Oliver (1991), organizations adopt one of two strategies: either following or rejecting institutional pressure in reaction to their aims and resource levels. The theory has been utilized over time within multiple fields of study, from corporate governance analysis to environmental management and organizational development in emerging economic systems.

Institutional theory helps organizations understand how external factors press organizations to normalize regulatory compliance, social expectations, and industry standards. According to critics, the theory fails to recognize how individual actors within organizations can contribute to organizational decision-making. According to Oliver (1991), institutional theory fails to consider how organizations purposefully handle institutional pressures because it focuses purely on conformity. According to Barley and Tolbert (1997), the theory's emphasis on stability and legitimacy fails to capture organizational dynamics and innovative elements. According to Powell and DiMaggio (1991), institutional theory demonstrates generic application across contexts because it fails to recognize varied institutional pressure responses. Meyer and Rowan (1977) face criticism for institutionalization theory as the concept demonstrates a positive understanding of how organizations automatically transition to societal norms. The institutional theory strongly influences organizational research since it explains enduring organizational patterns and practice institutionalization.

The external regulatory frameworks, government policies, and societal expectations shape the business conduct of women-led enterprises in Kiambu County through institutional theory. The theory defines legitimacy and conformity as tools that explain women entrepreneurs' behavior while pursuing green finance options. Fields with similar organizations will adopt

similar practices because of normative and coercive pressures, according to DiMaggio and Powell (1983). The local government supports sustainable business practices through policy initiatives, which makes this context significant. The study benefits from institutional theory to reveal how women entrepreneurs respond to environmental regulations and financial incentives that influence their business practices. Meyer and Rowan (1977) explain that organizations implement artificial formalities to achieve legitimacy while women entrepreneurs provide green financial opportunities to their businesses to demonstrate credibility and sustainability functions.

2.3 Empirical Review

This section briefly reviews the literatures according to the framework of the present study. Past studies on green loans and credit, green bonds, green microfinance, and government incentives and policies on the sustainability of women-led enterprises are discussed in this section.

2.3.1. Green Loans and Credit and Sustainability of Women-Led Enterprises

Green financial products are tools for advancing the environmental sustainability of women-owned businesses in green industrial settings. Dewi et al. (2023) highlight the fundamental effect of green microfinance by supplying women business owners with the necessary resources to build sustainable financial operations, especially for energy-based businesses. Female-led green SMEs encounter additional obstacles when obtaining credit, according to Arcuri et al. (2024), which demonstrates the necessity to develop gender-inclusive financial products. According to Mwesigwa et al. (2024), institutional assistance such as government-backed financial programs stands essential for sustaining female business ventures, especially in developing Ugandan markets. Green finance sustainability needs female entrepreneurs to benefit from the crucial effect of gender diversity in financial institutions, according to Abuatwan (2023). Radović-Marković and Živanović (2019) maintain that women face barriers to credit because appropriate

financial products do not meet their specific requirements for green entrepreneurship. Women in Ghana benefit from interest-free loans and capacity-building activities through cooperative lending groups that promote sustainable business operations, according to Fieve and Chrysostom (2022). The research by Aristei and Gallo (2024) shows that green management enhances the stability of green firms. However, these organizations encounter significant challenges in obtaining credit, especially during economic downturns, which supports the necessity of inclusive financial systems.

Gender disparities in green debt availability create substantial obstacles to the sustainable operation of women-owned businesses. The study by Arcuri et al. (2024) shows that women who lead green SMEs struggle to get credit and pay higher rates than men, affecting their sustainability potential. Dewi et al. (2023) present green microfinance as an opportunity that helps women entrepreneurs secure the financial resources required for green projects. Mwesigwa et al. (2024) demonstrate through their research that institutional support, such as government policies and financial aid, is vital for women entrepreneurs to succeed in the green industries. Financial institutions prioritizing gender diversity offer better lending conditions to businesses run by women, according to Abuatwan (2023). The financial system in Serbia fails to offer specialized funding solutions that address the needs of female leaders in sustainable tourism, according to Radović-Marković and Živanović (2019). The study by Fieve and Chrysostom (2022) demonstrates how cooperative lending groups in Ghana create long-term loan programs and training initiatives that support women entrepreneurs in sustaining their businesses. Aristei and Gallo (2024) demonstrate that green firms showcase resilience but encounter financing obstacles that limit their opportunity to obtain green loans and credit, particularly in times of financial instability.

The sustainability of women entrepreneurs in the green industries needs financial and non-financial institutional support to become empowered. According to Mwesigwa et al. (2024), developing countries benefit significantly from institutional support through financial aid, government policies, and mentorship programs that increase female business sustainability. According to Dewi et al. (2023), women must receive training through capacity-building while receiving business mentorship to develop green-financing skills. Although institutional support strengthens credit pathways for women-led green SMEs in Italy, they endure gender-based discrimination within the loan system, according to Arcuri et al. (2024). Abuatwan (2023) shows how adding women to Palestinian financial institutions makes green finance more effective in supporting sustainable practices. Radović-Marković and Živanović (2019) stress how green entrepreneurship needs product solutions tailored for women in the tourism sector of Serbia. Women in Ghana benefit from credit cooperative lending groups through interest-free loans and training, according to Fieve and Chrysostom (2022). According to Aristei and Gallo (2024), the absence of green credit options presents a significant barrier to both environmentally friendly and women-operated businesses regarding financial crisis survival.

The long-term sustainability of women-run businesses depends on green loans and credit to succeed, yet the financial system requires transformations that better uphold these needs. The study by Dewi et al. (2023) identifies green microfinance as a key financing instrument that assists women entrepreneurs in implementing environmental sustainability within their business structures. Women-led green SMEs encounter additional difficulties in obtaining credit, according to Arcuri et al. (2024), which demonstrates why tailored financial tools are essential to achieve fair market access. Mwesigwa et al. (2024) emphasize institutional backing as essential to providing resources women entrepreneurs need for sustainable business operations. Data from

2023 Abuatwan proves that financial institutions with diversity between genders can serve as key backers for green financing systems toward STEM development. Serbia's tourism sector women entrepreneurs encounter substantial difficulties because proper financial solutions remain unavailable, thus obstructing their efforts to expand their green ventures, according to Radović-Marković and Živanović (2019). Fieve and Chrysostom (2022) describe how Ghana's credit cooperative lending groups supply women with interest-free loans and capacity-building programs that lead to sustainable business operations. Aristei and Gallo (2024) demonstrate that green firms encountered increased financial limitations because of missing green finance access throughout the COVID-19 pandemic and, therefore, need robust financial systems for enduring green entrepreneurship support.

2.3.2. Green Bonds and Sustainability of Women-Led Enterprises

Green bonds prove important for sustainability progress because of their expanding use among women-owned businesses. García et al. (2023) showed that companies that issue green bonds operate with robust governance structures that include sustainability committees and a high percentage of females on their corporate boards, which leads to better environmental play. Research by Alamgir and Cheng (2023) proves that green bonds have substantially affected sustainability by decreasing carbon output and extending renewable power. According to Mitchell et al. (2024), Nordic businesses use sustainable business models to manage internal challenges when issuing green bonds, creating better environmental and economic benefits. According to Liu et al. (2024), firms that issue green bonds make substantial positive changes toward improved environmental responsibility in low-polluting industries. Green bonds have been identified by Lin et al. (2024) as financial tools that improve efficiency in enterprise funding, thereby lowering enterprise costs, including those faced by women-led businesses

seeking funding. The study by Baldi and Pandimiglio (2022) warns about the risks of greenwashing that occur when companies improperly report their environmental project impacts, particularly during the green finance search processes of women-led businesses. Kumar et al. (2024) demonstrated how green bonds can shape government policies by allowing them to promote sustainable practices, which create additional benefits for women-run businesses.

Companies demonstrate their environmental strategies through sustainability benefits generated from green bond programs. García et al. (2023) showed that companies that release green bonds show higher numbers of female board members alongside sustainability committees, resulting in better environmental performances. Alamgir and Cheng (2023) established how green bonds generate complementary benefits by cutting carbon output while boosting renewable power generation, thus advancing sustainability benchmarks. Green bonds issued by Nordic companies transformed their governance and sustainability models, according to Mitchell et al. (2024), bringing about beneficial environmental outcomes. Liu et al. (2024) revealed that green bonds enhanced environmental performance, specifically in Chinese emerging markets that need rapid green transformations. Lin et al. (2024) demonstrated how green bonds enhance financial efficiency to support enterprises in obtaining funding for green projects beneficial for women-led sustainability efforts. According to Baldi and Pandimiglio (2022), green bond transparency should be strengthened because risks, including greenwashing, degrade these financial instruments' credibility during issuance. Green bonds attract government attention to establish supportive regulation for green investments while benefiting women-led enterprises through extended sustainability duration, according to Kumar et al. (2024).

The financial advantages of green bonds accompany their positive impact on the environment. García et al. (2023) showed that companies that release green bonds observed

better environmental performance, which made their investments more attractive to investors. Green bonds have proved to Alamgir and Cheng (2023) that they reduce carbon emissions and enhance renewable energy production, boosting these companies' financial interests. The Nordic energy industry proved able to merge green bonds with sustainable business frameworks, which brought simultaneous financial advantages and environmental benefits, according to Mitchell et al. (2024). The research of Liu et al. (2024) established that green bonds generate positive environmental responsibility impacts, specifically in organizations with well-established management systems. Green bonds enable companies to improve their financial performance through efficient capital rising during their initial financing period and lowering their funding expenses, according to Lin et al. (2024). The authors Baldi and Pandimiglio (2022) warned about potential adverse effects on green bond yields through greenwashing risks yet emphasized that transparency protects the effectiveness of green bonds. According to Kumar et al. (2024), green financial instruments help shape governmental policies that lead to extended economic transformations and regulatory frameworks that help preserve women-run businesses, demonstrating how green bonds have substantial economic value in addition to their environmental capabilities.

The issuance of green bonds leads to strong long-term sustainability for women-operated enterprises. Academic research by García et al. (2023) demonstrates that businesses achieve enhanced environmental outcomes and green bond issuance when they maintain elevated female board representation with sustainability as a priority. According to Alamgir and Cheng (2023), enterprises benefit from green bonds by reducing carbon pollution and creating additional capacity for renewable energy generation. Mitchell et al. (2024) demonstrated that Nordic enterprises succeeded in uniting financial strategic objectives with environmental targets through

bond issuance when they eliminated internal barriers to green bonds, which delivered immediate and lasting advantages. Through their research, Liu et al. (2024) demonstrated that Chinese companies that issued green bonds experienced enhanced environmental performance in operations that produced low pollution. Lin et al. (2024) show that Green bonds offer improved financing efficiency because they provide reduced borrowing rates to women-led businesses, fueling sustainable development. The success of green bonds risks failure because of greenwashing, according to Baldi and Pandimiglio (2022), who stress the importance of transparent governance. The research by Kumar et al. (2024) revealed that green bonds activate governmental policy reforms that establish favorable conditions for women-owned businesses to develop sustainability.

2.3.3. Green Microfinance and the Sustainability of Women-Led Enterprises

Combining financial resources with education and institutional support through green microfinance is essential in sustaining women business owners. The research by Chen et al. (2025) demonstrates that green microfinance institutions act as important drivers to reduce poverty levels and help business growth for women. Women in rural settings benefit from microfinance empowerment through financial facilities and training programs, according to Khursheed (2022). According to Lee and Huruta (2022), financial literacy is vital in achieving successful green microfinance because it enables women to make well-informed financial choices. Family support is a moderator that enhances green knowledge-driven entrepreneurial success, according to Zhang et al. (2025). Pei (2024) examines how green microfinance establishments in China support women's economic independence through credit and insurance offerings. The authors Khursheed (2022) and Lee and Huruta (2022) underline that financial inclusion and literacy need integration into microfinance policies to achieve maximum impact.

The combined factors of financial accessibility alongside educational initiatives and institutional infrastructure create stable conditions for women to maintain their enterprise operations.

Successful sustainable businesses led by women need three essential components, which combine green microfinance with financial literacy education and social assistance. Green microfinance institutions function as key drivers that use financial aid to empower women and decrease poverty levels, according to Chen et al. (2025). According to Khursheed (2022), microfinance supports women's entrepreneurship development with a special focus on population areas that lack access to services. Lee and Huruta (2022) demonstrate that financial literacy enhances women's business success when they make informed decisions about microfinance. According to Zhang et al. (2025), sustainable entrepreneurship depends heavily on green knowledge innovation supported significantly by family relationships. The research conducted by Pei (2024) demonstrates that Chinese women achieve financial security through green microfinance policies that provide credit and insurance services. According to Khursheed (2022) and Lee and Huruta (2022), long-term success requires policies to enhance their financial inclusion strategies. Financial accessibility, proper literacy standards, and supportive government policies are essential to ensure women's entrepreneurial survival.

Green microfinance institutions, financial knowledge, and supportive legislation significantly impact women's ability to form businesses and succeed economically. According to Chen et al. (2025), green microfinance institutions combine financial services access with business expansion and poverty reduction. According to Khursheed (2022), microfinance helps women become independent through its financial services distribution, particularly in regions lacking sufficient financial assistance. According to Lee and Huruta (2022), financial education enables women to gain vital financial abilities that enhance their entrepreneurial success through

green microfinance initiatives. Zhang et al. (2025) show how green knowledge and innovation help maintain women-owned businesses and suggest that family backing adds more success momentum. The paper by Pei (2024) investigates Chinese green microfinance institutions that use specific financial programs to enhance women's economic stability. Khursheed (2022) and Lee and Huruta (2022) confirm through their research that policy-based microfinance initiatives support sustainable business expansion. Research indicates that green microfinance, education, and social assistance help women sustain their business leadership roles.

Sustainable operations for women-led businesses depend on three essential components: green microfinance, financial education, and supportive policies. The study by Chen et al. (2025) demonstrates how green microfinance institutions help create financial opportunities for women entrepreneurs, thereby boosting economic development. Khursheed (2022) explains that microfinance institutions give women power through financial support and educational training for areas with limited resource access. Lee and Huruta (2022) demonstrate that women who understand finance demonstrate better business management through green microfinance programs. Zhang et al. (2025) prove that both green knowledge and innovative capabilities drive the success of women entrepreneurs, but family backing significantly impacts their success in particular cultural settings. Green microfinance institutions in China enable women to achieve financial independence through conducting customized financial programs, according to Pei (2024). Researchers Khursheed (2022) and Lee and Huruta (2022) disclose how government policies enhance microfinance frameworks with institutional support. Multiple studies prove that financial accessibility through education and institutional support is fundamental to long-term success for female-led businesses.

2.3.4. Government Incentives and Policies and the Sustainability of Women-Led Enterprises

Government policies extend vital support to women entrepreneurs for business growth that promotes sustainability throughout different geographic areas. The research by Li (2023) investigates China's policy framework, which includes financial backing alongside educational programs and networking resources that improve women entrepreneur business outcomes. Women's entrepreneurship initiatives in Qatar depend heavily on government-supported training programs and mentorship services, which strengthen their entrepreneurial potential during economic transformation, according to Al-Qahtani et al. (2022). Kutlu and Ngoasong (2023) reveal how government policies impact tourism business models through their gender analysis, which either supports or breaks traditional gender roles toward achieving sustainable development. According to Orobia et al. (2019), women entrepreneurs need financial support and modern IT infrastructure as the foundation for their business success. Ajayi-Nifise et al. (2024) expand this research approach by studying the US and African federal governments, which promote business growth through financial aid, tax breaks, and relaxed regulatory requirements. The Algerian microcredit agencies managed by government bodies play a crucial part in developing women's entrepreneurship, according to Mahfoud (2024).

The success of sustainable economic development through women's entrepreneurship depends significantly on government policies that target female entrepreneurship in resource-rich countries. Al-Qahtani et al. (2022) explore women's difficulties in resource-based economies and introduce an implementation model to remove obstacles to facilitate economic diversification and boost female business development. Such initiatives need government backing through financial assistance and mentoring services to help women develop better entrepreneurial

competencies. The Chinese authorities have deployed financial and market access initiatives to support women in becoming entrepreneurs, according to Li (2023). According to Kutlu and Ngoasong (2023), a Turkish patriarchal society requires supportive government policies to develop sustainable tourism business models for women. According to Orobia et al. (2019), developing countries like Uganda need financial and IT infrastructure access through governmental intervention to promote sustainable business development. Ajayi-Nifise et al. (2024) state that governments should enhance regulatory structures and make funding available to women-led businesses in both the USA and African nations so their businesses can succeed. Mahfoud (2024) explores Algerian government agencies that advocate for female business owners by funding specialized advance initiatives targeting women's business needs.

Implementing government policies alongside financial assistance creates favorable conditions that drive women to establish sustainable businesses. The study by Li (2023) emphasizes the value of supportive policies in China, which operates various programs to assist women in accessing funds and networks. Al-Qahtani et al. (2022) advocate for purpose-built policies because they create essential conditions for women's entrepreneurship development in resource-abundant economies, including Qatar, which aims to integrate women into sustainable development goals. Government policies in Turkey control the development of gendered business models in the tourism sector by either upholding traditional societal norms or driving change against social constraints, according to Kutlu and Ngoasong (2023). Orobia et al. (2019) establish the finance requirement with infrastructure policies for maintaining business sustainability among female entrepreneurs in Ugandan markets. Ajayi-Nifise and colleagues (2024) use examples from the US and African countries to demonstrate that sustainable innovation and entrepreneurial activities develop through government financial incentives,

funding options, and regulations that allow flexibility. The government of Algeria under Mahfoud (2024) coordinates efforts to support women with microcredit programs that deliver essential financial resources for the business growth of female entrepreneurs.

Business sustainability reacts to government policies by influencing culture, infrastructure development, and gendered societal commitments. Li (2023) states that Chinese government policies have established legal frameworks and market access initiatives to support women's entrepreneurship through positive outcomes. Al-Qahtani et al. (2022) maintain that Qatar needs governmental policies that promote women's participation in economic diversification and sustainable development to remove cultural and social barriers women face during entrepreneurship. Kutlu and Ngoasong (2023) explain that government policies and social expectations create gendered perceptions in tourism, which require new policies that question traditional roles and support women entrepreneurs. Uganda requires financial and IT infrastructure policies to support women entrepreneurs in maintaining their business operations, according to Orobia et al. (2019). According to Ajayi-Nifise et al. (2024), the experiences of female entrepreneurs in the USA and Africa demonstrate that government interventions promoting innovation and reducing regulation while providing financial backing remain essential for business achievement. Women entrepreneurs in Algeria access government-sponsored programs through which they gain financial backing and microcredit accessibility, according to Mahfoud (2024).

Gender-sensitive policy measures support sustainable business growth and inclusive entrepreneurship by guaranteeing success for female-owned businesses in the face of community obstacles. The study by Li (2023) examines Chinese government policies for women entrepreneurs by examining financial and educational programs that boost their business

outcomes. The researchers from Al-Qahtani et al. (2022) advocate for gender-sensitive policies in policymaking and designate mentorship and training programs as vital for women entrepreneurs in Qatar. Kutlu and Ngoasong (2023) demonstrate how gender influences business models within Turkey's tourism industry, which needs interventions to support female business practices while transforming conventional gender norms. According to Orobia et al. (2019), Ugandan women entrepreneurs need financial support and well-developed infrastructure to remove business obstacles and promote sustainability. According to Ajayi-Nifise et al. (2024), government policies in Africa and the United States create market stimulants for entrepreneurship through supportive measures like lowered taxation, economic backing, and adaptable regulations. The Microcredit Agency in Algeria serves as a foundation for government support in developing women's entrepreneurship alongside enhancing infrastructure, according to Mahfoud (2024).

Government-sponsored programs that assist economic success and social advancement have become essential for sustaining development within women-run businesses. According to Li (2023), government policies in China unlock women's business opportunities while providing education, financial resources, and market channels. The authors of Al-Qahtani et al. (2022) suggest that resource-rich nations like Qatar should implement government policies to boost women entrepreneurs by resolving cultural barriers and providing specific financial backing. To harness women's potential in business opportunities within Turkish tourism, the community needs supportive policies, according to the arguments of Kutlu and Ngoasong (2023), when addressing the patriarchal environment of Turkey, which hampers women's business development. Orobia et al. (2019) explain that Uganda relies on government programs and the availability of financial resources and information technology infrastructure to develop

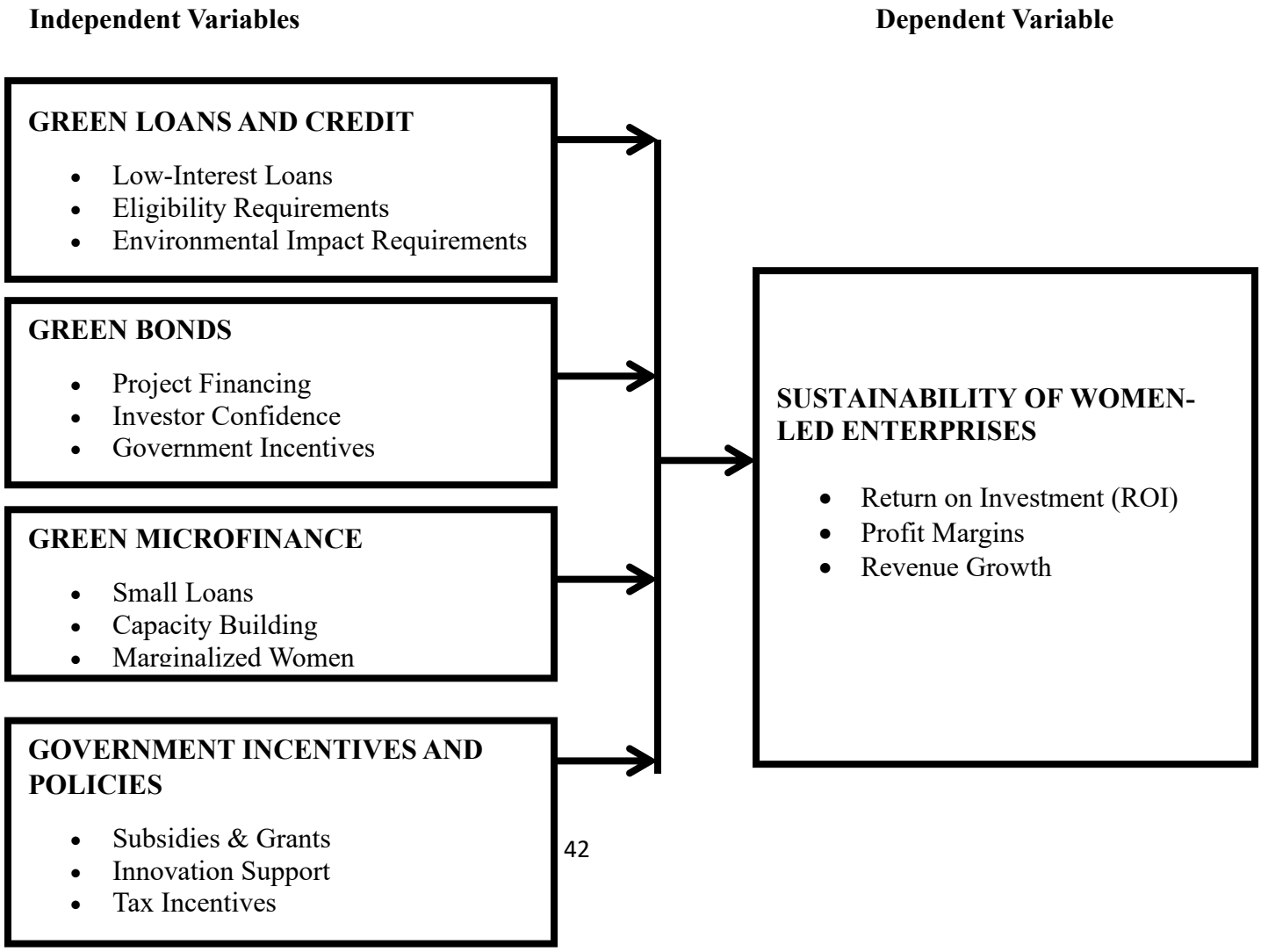
sustainable businesses. Ajayi-Nifise et al. (2024) point out that government policies offered in the USA and African countries establish favorable conditions for women entrepreneur growth through financial funding, tax advantages, and flexible regulatory systems. The governmental support of women entrepreneurs in Algeria reaches its objective through synchronized programs that provide microcredit along with financial aid to ensure business sustainability, according to Mahfoud (2024).

2.4 Conceptual Framework

Figure 2.1 depicts this study's independent and dependent variables. Multiple factors and hypothesized connections are explored using the framework as a study map (Maxwell, 2012).

FIGURE 2.1

Conceptual Framework



2.5. Literature Gaps

The study by Dewi et al. (2023) explores green microfinance potential while neglecting to analyze the multi-sector long-term outcomes of these products. The Arcuri et al. (2024) study identifies gender-based inequality while omitting evidence on how targeted financial products work within different economic and cultural environments. Mwesigwa et al. (2024) focus on institutional support without comparing financial aid, government policies, and mentorship as sustainability promotion approaches. The study by Abuatwan (2023) examines why financial institutions matter for gender diversity yet fails to show how gender-diverse institutions affect loan terms available to female business owners seeking financing. The research by Radović-Marković and Živanović (2019) focuses on the Serbian tourism industry. However, it examines solely the financial product gaps for women within this sector, thus creating an understanding gap across industrial domains. Fieve and Chrysostom (2022) argue for cooperative lending, although they fail to conduct a region-to-region comparison. The paper by Aristei and Gallo (2024) investigates green management practices yet fails to present methods for merging these principles with financial loan products that increase borrowing opportunities. This research fills the current knowledge gaps by analyzing green microfinance sustainability in various industries and its financial policies for enhancing women entrepreneurs' access to loans.

Despite broad study, various research gaps remain unresolved in green bonds and sustainability. The García et al. (2023) study identifies how female directors elevate environmental performance, yet it lacks evidence about their contribution to sustainability within women-led businesses. The study by Alamgir and Cheng (2023) investigates emissions reduction without explicitly discussing the specialized financing benefits of green bonds for women-owned businesses. The study by Mitchell et al. (2024) examines the governance strategies of Nordic

companies but leaves unanswered whether such models can succeed in developing economic environments. The study by Liu et al. (2024) places significant weight on environmental responsibility, yet it ignores feminine access barriers to green bond funding. Lin et al. (2024) discuss financing efficiency, yet their research does not explain the barriers that prevent women entrepreneurs from obtaining green bonds. Baldi and Pandimiglio (2022) address the risks of greenwashing, but their study does not evaluate the increased exposure of female business leaders to these dangers. Kumar et al. (2024) established a connection between green bonds and policy adjustments while neglecting to evaluate their positive impact on inclusive financing systems for gender. The research investigates the financial sustainability effects of green bonds on developing markets' women-owned businesses and strategies to increase bond accessibility for these enterprises.

Despite substantial research about women-owned enterprises and green microfinance, several knowledge gaps remain. Chen et al. (2025) focus on poverty reduction in their research without investigating specific industrial effects on woman-led business sectors. Khursheed (2022) directs his research to microfinance operations in rural areas without acknowledging barriers experienced by urban women-led businesses competing in regulation-constrained environments. According to Lee and Huruta (2022), financial literacy is an important success factor, yet these authors overlook how divergent educational achievements can restrict their achievement. This paper by Zhang et al. (2025) investigates green knowledge and innovation yet fails to reveal how technological innovations in green finance improve women's business support. Pei (2024) investigates China’s green microfinance institutions yet omits a comparative evaluation of these institutions existing elsewhere in developing regions. The articles by Khursheed (2022) and Lee and Huruta (2022) focus on financial inclusion but omit the analysis

of gender discrimination within loan acceptance protocols, which prevents women from obtaining credit. The investigation analyzes sector-specific obstacles that affect women business owners throughout urban and rural regions while studying how technological advancements in environmentally friendly funding can enhance accessibility to credit along with dissipating barriers to credit access.

Research demonstrates the importance of government incentives for supporting women-led enterprises, yet important aspects of their long-term performance and contextual adaptability remain unclear. Li (2023) conducted research in China, yet his study failed to provide insight into the performance of policies across different economic scenarios. The study presented by Al-Qahtani et al. (2022) evaluates Qatar's policy initiatives without addressing cultural barriers that constitute resistance against policy implementation. The study by Kutlu and Ngoasong (2023) addresses gendered models in the tourism business but neglects the process of transforming enduring gender-related social norms. Orobia et al. (2019) include finance and IT infrastructure in their research but omit how women entrepreneurs handle bureaucratic hurdles in their work environment. In their paper, Ajayi-Nifise et al. (2024) explore tax incentives, but the study lacks information about policy accessibility challenges. Mahfoud (2024) discusses Algeria's microcredit programs, yet he fails to determine their policy sustainability. The research design includes an analysis of government incentives across different economic types and cultural settings while assessing their sustained effects on women enterprise owners and developing strategies for better policy reach and longevity.

2.6 Operationalization of Variables

A measure of green loans and credit used established by surveying participants about their yardstick of low-interest financing and eligibility restrictions together with sustainability standards using ordinal and ratio scales. Green bonds used evaluated through financial project initiatives paired with investor trust and state support measurements based on ratio methods and ordinal indicators. The evaluation of green microfinance stems from examinations of loan accessibility for small businesses and training projects and service delivery for disadvantaged women where researcher applied ordinal and interval measures. The researcher evaluated government incentives and policies through nominal and ordinal scale assessments to investigate both descriptive and comparative responses for this category. A quantitative analysis of sustainable women-led enterprises consisted of financial stability assessments together with market adaptation measures and revenue growth rates measured on ratio and ordinal scales. Primary data acquisition through a questionnaire structure enables quantitative investigation of financing accessibility along with policy success and business sustainability among female business owners.

TABLE 2.1

Operationalization Variables

Variable	Indicators	Data Collection Tool	Scale
Green Loans and Credit	• Low-Interest Loans • Eligibility Requirements • Sustainability Criteria	Questionnaire	Ordinal, Ratio

Green Bonds	• Project Financing • Investor Confidence • Government Incentives	Questionnaire	Ratio, Ordinal
Green Microfinance	• Small Loans • Capacity Building • Marginalized Women	Questionnaire	Ordinal, Interval
Government Incentives and Policies	• Subsidies & Grants • Innovation Support • Tax Incentives	Questionnaire	Nominal, Ordinal
Sustainability of Women-Led Enterprises	• Financial Stability • Market Adaptation • Revenue Growth	Questionnaire	Ordinal, Ratio

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter describes a detailed methodology for study design, target population selection, sampling, data collection, and analysis. The study approach includes sample size, sampling method, demographic characteristics, and general research procedure. The chapter also covers data collection instruments, ethics, validity, and dependability.

3.2 Research Design

The research design provides a foundation for the entire study. This study employed descriptive design to answer the 'what' question with questionnaires (Lelissa, 2018). The descriptive research design works best since it provides structured procedures to accumulate and analyze data about green finance instruments which ensure women-led enterprise sustainability in Kiambu County. This design facilitates an in-depth understanding of financial accessibility, government support, and sustainability outcomes. This research design enables organizations to discover natural trends and patterns among variables without altering them directly which makes it applicable to practical business operations. The researcher starts with a broad concept and uses this study to discover potential research topics (Schoonenboom & Johnson, 2017). Descriptive design gathers and analyses data to describe current events.

3.3 Target Population

The researchers guide the outcomes of their study to a given demography, known as the audience or target population (Willie, 2024). This study is mainly concerned with assessing the effect of green finance instruments in ensuring the sustainability of women-led enterprises in Kiambu County. The target population is 3,400 women-led enterprises in Kiambu County (GROOTS

Kenya December 2023 Report). The 3,400 women-owned enterprises based in Kiambu County serve as an appropriate target group because they operate across agriculture, energy, waste management, fashion, and textiles, which depend heavily on green financial instruments. The selected enterprises play a fundamental role in sustainability while delivering information about financial access, official backing, and business durability. The chosen population enables the researcher to compare different sectors and validate their policy and financial implementation examination results. The target population is shown in Table 3.1 shown below.

TABLE 3.1

Target Population

Category Women-Led Enterprises	**Number**
Agricultural Enterprises	817
Energy Enterprises	633
Waste Management Enterprises	929
Fashion And Textile Enterprises	1021
Total	**3400**

Source: (GROOTS Kenya December 2023 Report)

3.4 Sampling and Sampling Procedure

A sample is a subset of a particular population selected randomly or planned. The study method enables the distribution of findings to the entire population within a given society. Sampling is selecting a population subset to collect data about one occurrence, event, or behavior. Mugenda & Mugenda (2003) opine that any sample size slightly more than 10% is large enough for representativeness purposes. Stratified sampling was used to ensure proportional representation. Stratified sampling represents the ideal sampling approach for this study to achieve a

proportionate representation of various women-led company sectors in Kiambu County. Using strata with this method separates the population into four segments (agriculture, energy, waste management, fashion, and textiles) to make data findings more accurate. By using stratified sampling, the study reduces bias in sampling while providing accurate comparisons between different business sectors and generates results that reflect specific barriers and opportunities facing each enterprise segment. The sample selection method used by Yamane's proportional formula with a confidence level of 95%, and the significance level of $P \leq 0.5$ used assumed.

$n= N/1 + Ne^2$

Where: n = required responses

N = Sample size

e 2 = error limit

Placing the formula for the current population gave a sample size of:

$$n = \frac{3400}{1 + 3400 \times (0.05)^2}$$

$$n = \frac{3400}{1 + 3400 \times 0.0025}$$

$$n = \frac{3400}{1 + 8.5}$$

$$n = \frac{3400}{9.5}$$

$$n \approx 357.89$$

Sample size (n) = 358

Using the above formula, the sample size used distributed as shown in the table below

TABLE 3.2

Sample Size

Category Women-Led Enterprises	Number
Agricultural Enterprises	94
Energy Enterprises	87
Waste Management Enterprises	91
Fashion and Textile Enterprises	86
Total	**358**

3.5 Data Collection Instrument

Mugenda & Mugenda (2003) suggest that research questionnaires are the best instruments for collecting primary information. Standardized questionnaire data from participants supported the study. A self-administered questionnaire collected participant background information. Progressive frequency or agreement with the statement options are used in the 1–5 Likert scale. 1 (Never) means the behavior or opinion is never observed. 2 denotes rare behavior/opinion. Sometimes, the score three lies between low and high frequency of the behavior/opinion or neutral agreement. Score 4 (Often) indicates frequent behavior/opinion or strong agreement. Finally, 5 (Always) indicate frequent use or full endorsement. This scale measures attitudes and behaviors by frequency or agreement. Thus, adopting a questionnaire to collect data in this study is reasonable due to its feasibility, ability to survey many individuals quickly, and more concrete and scientific analysis than other research methods.

3.6. Pilot Testing

A pilot test preceded the main study and helps uncover research tool shortcomings. Mugenda and Mugenda (2003) suggest assessing the study instrument's validity and Reliability. The researcher

selected 10% of participants for the pilot study's feasibility and validity assessment. Primary pilot study participants were not included in the final study.

3.6.1 Validity

Validity depends on how well a concept, evaluation, or statistic matches reality. Another way to put it is the accuracy with which measuring equipment captures desired variables. The study's primary goal is to evaluate the research instrument's content validity. The researcher consulted a university academic supervisor to validate the questionnaire questions.

3.6.2 Reliability

Questionnaire reliability is its trustworthiness. The study's Reliability used evaluated using Cronbach's alpha (α) with a 0.7 threshold. SPSS calculated it, and high Reliability means similar results across individuals. A correlation coefficient (r) of +1.00 indicates perfect agreement, while 0.75 suffices to show research instrument reliability.

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TABLE 3.3

Cronbach's Alpha (A)

Cronbach's alpha (α)	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

Total	**100**

3.7 Data Analysis and Processing

Data used checked and cleaned before analysis. Frequency, means, and standard deviations used employed for a more straightforward data presentation. Data used evaluated using descriptive statistics, correlation, and multiple regressions.

3.7.1 Empirical Model

The following multiple regression models used utilized. Multiple regressions was applied as it examines the simultaneous effect of multiple predictors on sustainability, isolates each variable's contribution, controls confounding influences, and rigorously tests the study's hypotheses.

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 3X4 + \varepsilon$$

Where; Y is the dependent variable (sustainability of women-led enterprises),

α is the regression constant,

β1 - β4 are the coefficients of independent variables,

X1 = green loans and credit; X2 = green bonds; X3 = green microfinance; X4 = government incentives and policies and ε is the standard error

3.8 Diagnostic Tests

This study used regression model to evaluate the most fundamental predictions of regression. Some of the diagnostic procedures that used carried out are the homoscedasticity test, the multicollinearity test, the normality test, and the autocorrelation test.

3.8.1 Multicollinearity Test

The correlation matrix determined multicollinearity in this study, and 0.8 denotes strong multicollinearity, following Cooper and Schindler (2018). Multicollinearity raises standard errors and regression coefficients, affecting hypothesis testing precision. These conditions are problematic when multicollinearity impairs the reliability of regression measures. A correlation coefficient greater than 0 indicates a significant positive association between variables; hence, it is desired.

3.8.2 Normality Test

The input hypothesis statement shows that the data is usually distributed during the normality test. It is a standard, quality test statistic, which has the rejection n criterion of the p-value. If $p < 0.05$, the null hypothesis is thrown out, which means a significant deviation from normality affects the validity of the regression model.

3.8.3 Heteroscedasticity

Tests for Heteroscedasticity confirmed CLRM's constant error term variance. If errors are homoscedastic, variance remains constant while observations change. Heteroscedasticity biases standard errors and coefficient estimations. Khan's LR test determines Heteroscedasticity. This test null hypothesis implies homoscedastic error variance. We must address Heteroscedasticity since it considerably impacts regression analysis accuracy and dependability.

3.8.4 Autocorrelation Test

The autocorrelation test checks residual independence under no autocorrelation assumption. The Durbin-Watson test has 1.5–2.5 valid statistics. In cases where the statistic coefficient deviates

from this range, the null hypothesis is rejected, and autocorrelation if autocorrelation is found, it may compromise the regression model's reliability

and must be corrected.

3.9 Ethical Consideration

KCA University Review and Ethics Committee approved this study. The research investigates how green finance mechanisms contribute to sustaining businesses operated by women throughout Kiambu County. The research benefits and importance become evident through the proper dissemination of findings to respondents by using community meetings combined with local stakeholder presentations such as those directed to women's enterprise groups and community leaders. All participants remained anonymous in the final dataset because confidential information about them used stripped out. All confidential data receives safe storage while authorized personnel maintain solitary access rights. The study gathered consent through documented signatures, and participants received complete information about the research objectives and details on being free to withdraw at any time. The researcher provided verbal explanations of consent to those participants who have limited reading abilities. Through these findings, the study promotes an understanding of green finance for female business sustainability in Kiambu County, which may result in community-benefiting policy changes or business practices. The research prioritized participant safety while establishing protocols for avoiding physical or emotional distress during research activities

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Introduction

The chapter presents the results of the survey. It provides general information which includes demographic data and the response rate. The chapter emphasizes the descriptive and inference statistics in relation to objectives of the study.

4.2 Response Rate

Table 4.1 presents the distribution of respondents based on their enterprise categories. The fashion and textile sector led women-led business operations, with 31.6 percent of 275 valid respondents (4.6 percent) running their operations in this field. Fashion textiles and energy companies maintained joint representation in second place, and fashion textiles at 26.9%. The distribution reveals that women-led green businesses throughout Kiambu County typically operate in various sectors. Yet, they dominate in fashion and energy companies, waste management businesses, and agriculture. The different industries served by green finance tools enable a complete assessment of their effects.

TABLE 4.1

Response Rate

Respondent Category	Frequency	Valid Percent
Agricultural Enterprises	57	20.7%
Energy Enterprises	74	26.9%
Waste management Enterprises	57	20.7%
Fashion and textile Enteprises	87	31.6%

Respondent Category	Frequency	Valid Percent
Total (Valid)	**275**	**100.0%**

4.3Demographic Information

4.3.1 Gender

Table 4.2 depicts the gender distribution of the respondents to the survey. Two hundred seventy-five valid responses revealed that 149 women (54.2%) and 126 males comprised the remaining 45.8%. The study sample included more female than male business owners, even though both genders were being surveyed. The study examines male and female entrepreneurs and provides a dual perspective on female domination in entrepreneurial cities throughout Kiambu County. The investigation underlines the importance of learning how green financing instruments can support the business operations of women-led groups in this area.

TABLE 4.2

Gender

Gender	Frequency	Valid Percent
Male	126	45.8%
Female	149	54.2%
Total (Valid)	**275**	**100.0%**

4.3.2 Age group in years

Table 4.3 shows the age distribution of the respondents. Most entrepreneurs (89) were between the ages of 26 and 35, accounting for 32.4% of the population, while those aged 36 to 45 made up 23.3%. Data revealed that women under 25 account for 21.1% of the total sample population, indicating strong youth participation in women's entrepreneurship. When considered as percentages, the age ranges 46-55 and 56+ had fewer respondents, with 13.5% and 9.8%, respectively. The distribution reveals that women-led enterprises in Kiambu County typically employ managers between 26 and 35 years of age; therefore, green finance solutions must match the needs of this active demographic of prospective business expansion.

TABLE 4.3

Age Group

Age Group (in Years)	Frequency	Valid Percent
18-25	58	21.1%
26-35	89	32.4%
36-45	64	23.3%
46-55	37	13.5%
56+	27	9.8%
Total (Valid)	**275**	**100.0%**

4.3.3 Educational Background

Table 4.4 depicts the educational backgrounds of the respondents. According to the poll results, 44.7% (123 respondents) of the total respondents held a bachelor's degree, while 26.2% (72) had

a high school diploma. According to the poll, 18.5% of respondents (51 persons) received Master's degrees, while 3.3% (9 people) earned PhD or Doctorate degrees. The total number of respondents enrolled in educational or training programs other than normal degrees was 7.3% (20). According to the report, women who run firms in Kiambu County often have higher education levels, which may enable them to integrate green financing instruments for sustainable business operations efficiently. Research reveals that educational achievement is a significant factor in developing environmentally responsible startup activities.

TABLE 4.4

Educational Background

Educational Background	Frequency	Valid Percent
High School	72	26.2%
Bachelor's Degree	123	44.7%
Master's Degree	51	18.5%
PhD/Doctorate	9	3.3%
Other	20	7.3%
Total (Valid)	**275**	**100.0%**

4.3.4 Type of Business

Table 4.5 shows the distribution of respondents according to their business type. Fashion and textile sectors accounted for 31.6% (87 respondents) of the sample, with energy industries at 26.9% (74 respondents). Agricultural and waste management enterprises were equally spread, accounting for 20.7% (57 respondents). The distribution reveals significant participation of

women-led businesses from diverse industries across Kiambu County. The fashion and textile industries dominate the market because they provide women entrepreneurs with accessibility and appeal. Mature green sectors such as energy, agriculture, and waste management continue to grow in Kiambu County due to increasing participation and enthusiasm, which aligns nicely with our research on the impact of green finance instruments.

TABLE 4.5

Type of Business

Type of Business	**Frequency**	**Valid Percent**
Agricultural Enterprises	57	20.7%
Energy Enterprises	74	26.9%
Waste Management Enterprises	57	20.7%
Fashion and Textile Enterprises	87	31.6%
Total (Valid)	**275**	**100.0%**

4.3.5 Years of Running the Business

Table 4.6 shows how long respondents have conducted their firms. Women-owned businesses in Kiambu County have established themselves over an average of one to five years, accounting for 50.2% (138 respondents) of all respondents. 33.1% (91) of female business owners have been in business for more than five years, indicating that they are experienced. New entrants account for 16.7 percent of all respondents (46 enterprises with less than one year in operation). The data suggests that most women-operated enterprises in Kiambu County are past their initial operating stage, making them appropriate for green finance programs to achieve sustainable business expansion objectives.

TABLE 4.6

Years of Running the Business

Years of Running the Business	Frequency	Valid Percent
Below 1 Year	46	16.7%
1-5 Years	138	50.2%
Above 5 Years	91	33.1%
Total (Valid)	**275**	**100.0%**

4.4. Factor Analysis

4.4.1 Factor Analysis of Green Loans and Credit

Table 4.7 shows the Kaiser-Meyer-Olkin (KMO) Measure and Bartlett's Test of Sphericity, which determine the data's appropriateness for factor analysis. The KMO measure hits 0.937, exceeding the minimum required threshold of 0.6, indicating superior sample adequacy. Bartlett's Test of Sphericity yields a significant result ($\chi^2 = 7585.723$, df = 45, $p < .001$), confirming the correct application of factor analysis on the items. The results suggest that the underlying variables show correlations between related constructs, proving that the analyzed dataset is acceptable for factor analysis.

TABLE 4.7

KMO and Bartlett's Test

Test	Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.937
Bartlett's Test of Sphericity	
Approx. Chi-Square	7585.723
df	45
Sig.	.000

Table 4.8 depicts the commonalities for elements assessing green loan accessibility extracted using Principal Component Analysis. The commonalities show how much of the item variances are explained by the underlying factor(s). The extraction values exceed 0.90, ranging from 0.926 to 0.960. The high communalities suggest that each question is closely related to the core component, while all items significantly contribute to understanding green loan accessibility. The high communalities validate both the internal logical structure and measurement validity of our questionnaire items for assessing green loan accessibility by women-owned firms.

TABLE 4.8

Communalities for Green Loan

Item	Initial	Extraction
1. My enterprise has access to low-interest green loans.	1.000	.934
2. The interest rates on green loans are competitive compared to traditional loans.	1.000	.957
3. I find it easy to access low-interest loans for sustainable practices.	1.000	.926
4. Green loan providers offer affordable rates for women-led enterprises.	1.000	.958
5. The eligibility criteria for green loans are clear and well-communicated.	1.000	.953
6. My enterprise meets the eligibility requirements for green loans.	1.000	.946
7. The green loan application process is simple and straightforward.	1.000	.941
8. The green loan requirements are accessible for women entrepreneurs.	1.000	.960
9. Green loan approval is based on my business's environmental impact.	1.000	.937
10. My business is evaluated based on sustainability criteria when applying.	1.000	.931

Table 4.9 shows the findings of the Principal Component Analysis for green loan accessibility components. The research shows that one extracted component accounts for 94.44% of the overall variance. The high 94.44% variance explained indicates that green loan accessibility factors interact together as a single construct. The component's first eigenvalue hit 9.444, marking a significant ability to explain the data. The study results validate the scale's unidimensionality and suggest that women's access to green loans can be appropriately quantified through one major component in enterprise management scenarios.

TABLE 4.9

Total Variance for Green Loan

Component	**Initial Eigenvalues**	**Extraction Sums of Squared Loadings**
	Total	% of Variance
1	9.444	94.444%

Table 4.10 displays the component matrix for the green loan accessibility elements produced from the Principal Component Analysis. Component 1 maintains exceptionally high lead levels (.963 to 980) for all survey questions. The high factor loadings indicate that each measuring item is directly related to green loan accessibility, which is the fundamental idea. The item "The green loan requirements are accessible for women entrepreneurs" has the most significant factor loading.980, followed by "My enterprise has access to low-interest green loans" with a factor loading of.966. The ten survey items effectively assess a single factor, supporting the scale's unidimensionality. The selected criteria that measure green loan accessibility effectively assess the construct in an environment where women govern firms.

TABLE 4.10

Component Matrix for Green Loans

Item	Component 1
1. My enterprise has access to low-interest green loans.	.966
2. The interest rates on green loans are competitive compared to traditional loans.	.978
3. I find it easy to access low-interest loans for sustainable practices.	.963
4. Green loan providers offer affordable rates for women-led enterprises.	.979
5. The eligibility criteria for green loans are clear and well-communicated.	.976
6. My enterprise meets the eligibility requirements for green loans.	.973
7. The green loan application process is simple and straightforward.	.970
8. The green loan requirements are accessible for women entrepreneurs.	.980
9. Green loan approval is based on my business's environmental impact.	.968
10. My business is evaluated based on sustainability criteria when applying.	.965

4.4.2 Factor Analysis of Green Bonds

Table 4.11 shows the findings of the Kaiser-Meyer-Olkin (KMO) sample adequacy measure and Bartlett's Test of Sphericity for the green bond factor analysis. The KMO value is 943 over the standard threshold of 0.6, indicating that the data quality is adequate for factor analysis. When the KMO score approaches 1.0, it suggests a significant variable correlation, which aids factor analysis operations. The results show that Bartlett's Test of Sphericity generates a Chi-Square value of 7438.401 across 45 degrees of freedom with a p-value of less than 0.000. The

significant outcome ($p < .05$) indicates a sufficient correlation between variables to apply factor analysis. However, the correlation matrix differs from the identity matrix. The analysis demonstrates both the acceptability of performing factor analysis on the presented data and the presence of recognizable patterns within the green bond items.

Table 4.11

KMO and Bartlett's Test of Sphericity

Test	**Value**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.943
Bartlett's Test of Sphericity	
Approx. Chi-Square	7438.401
df	45
Sig.	.000

Table 4.12 shows the communalities for the green bond accessibility components using principal component analysis. Each extracted factor provides for the variance in the items' commonalities. The research findings show that all items have high extraction values, 920 to 961, indicating that the factor structure effectively explains common variation. "Green bond use has improved my market perception, customer loyalty, and revenue" is strongly associated with the underlying component, as evidenced by a commonality level of.961. The item "My business has reinvested green bond capital into sustainable practices" has the lowest communality value.920, although its connection to the underlying factor is strong. Factor analysis reveals that the green bond accessibility components strongly correlate due to their high communality values.

TABLE 4.12

Communalities for Green Bond

Item	Initial	Extraction
1. Green bond yields have contributed positively to my business's financial sustainability.	1.000	.948
2. Returns on green bonds are competitive compared to traditional financing sources.	1.000	.958
3. My business has reinvested green bond capital into sustainable practices.	1.000	.920
4. Green bond yield fluctuations affect long-term sustainability planning.	1.000	.958
5. Green bonds help manage environmental risks through dedicated funding.	1.000	.957
6. The cost of capital for green bonds is affordable.	1.000	.949
7. Green bonds help diversify my business's funding sources.	1.000	.935
8. Green bond use has improved my market perception, customer loyalty, and revenue.	1.000	.961
9. Investor interest in green bonds has increased sustainability awareness in my business.	1.000	.941
10. Green bond terms are favorable for women-led enterprises and long-term growth.	1.000	.933

Table 4.13 shows the total variance explained for the green bond accessibility factors using principal component analysis. According to the table, the first component's eigenvalue of 9.460 accounts for 94.600% of total data variation. The responses are remarkably consistent because

one fundamental element accounts for almost all data variation. The large variability percentage supports measuring green bond accessibility items as a single component. The examined items constitute a consistent measure of green bond accessibility.

TABLE 4.13

Total Variance for Green Bond

Component	Initial Eigenvalues	Extraction Sums of Squared Loadings
	Total	% of Variance
1	9.460	94.600%

Table 4.14 shows the component matrix for the green bond accessibility items using principal component analysis. The table shows which things load onto the first component based on their measurement values. The first component significantly contributes to all factors because their loadings exceed 959 and reach 981. The items "Green bond use has improved my market perception, customer loyalty, and revenue" and "Returns on green bonds are competitive compared to traditional financing sources" show the highest connection with component 1, with loadings of.981 and.979, respectively. The combined results show that all green bond accessibility items closely link to one major component, demonstrating the importance of green bond accessibility for corporate sustainability.

TABLE 4.14

Component Matrix for Green Bond

Item	Component 1
1. Green bond yields have contributed positively to my business's financial sustainability.	.974
2. Returns on green bonds are competitive compared to traditional financing sources.	.979
3. My business has reinvested green bond capital into sustainable practices.	.959
4. Green bond yield fluctuations affect long-term sustainability planning.	.979
5. Green bonds help manage environmental risks through dedicated funding.	.978
6. The cost of capital for green bonds is affordable.	.974
7. Green bonds help diversify my business’s funding sources.	.967
8. Green bond use has improved my market perception, customer loyalty, and revenue.	.981
9. Investor interest in green bonds has increased sustainability awareness in my business.	.970
10. Green bond terms are favorable for women-led enterprises and long-term growth.	.966

4.4.3 Factor Analysis of Green Microfinance

Table 4.15 shows the results of the Kaiser-Meyer-Olkin (KMO) test of sample adequacy and Bartlett's Test of Sphericity for green finance instruments. The KMO value reaches.945, indicating a good assessment and demonstrating acceptable conditions for factor analysis. A significance level of.000 corresponds to the results of Bartlett's Test of Sphericity performed on an approximate chi-square value of 8560.279 within 45 degrees of freedom. The p-value of less than 05 indicates that the correlation matrix varies from an identity matrix, hence validating the application of factor analysis on the data. The results of the component analysis show appropriate usage for evaluating items linked with green finance instruments.

TABLE 4.15

KMO and Bartlett's Test of Sphericity

Test	**Value**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.945
Bartlett's Test of Sphericity	
Approx. Chi-Square	8560.279
df	45
Sig.	.000

Table 4.16 shows the communalities for the green microfinance accessibility components examined with Principal Component Analysis (PCA). Extracted components describe variations in each item of the obtained data. The values extracted from all items have strong correlations with the underlying dimensions. The loan application process's basic requirements with clear

explanations obtain an extraction value.981, whilst the implementation grace period generates an extraction value of.979. High extraction values in the commodities confirm their direct relationship to green microfinance accessibility. The measures for green microfinance loans satisfying the business needs of marginalized women (.982) and green microfinance institutions offering better interest rates than traditional choices (.957) demonstrate substantial loadings and reinforce the validity of the measurement model.

TABLE 4.16

Communalities for Green Microfinance

Item	Initial	Extraction
1. Small loans from green microfinance institutions are accessible to my business.	1.000	.936
2. The loan amount provided by green microfinance institutions is sufficient for sustainable practices.	1.000	.977
3. Green microfinance institutions offer favorable interest rates compared to traditional options.	1.000	.957
4. Loan repayment terms from green microfinance institutions are suitable for my cash flow.	1.000	.978
5. The grace period provided allows my business sufficient time to adopt sustainable practices.	1.000	.979
6. The loan application process is straightforward, with clear communication of requirements.	1.000	.981
7. Green microfinance institutions offer financial education and training for sustainability.	1.000	.942
8. Green microfinance loans meet the needs of marginalized women in business.	1.000	.982
9. Green microfinance loans have helped my business adopt more sustainable practices.	1.000	.959
10. Green microfinance institutions provide adequate support for women entrepreneurs.	1.000	.975

Table 4.17 summarizes the entire variance explained for the green microfinance accessibility items. The first component explained by Principal Component Analysis (PCA) has an initial

eigenvalue of 9.666, accounting for 96.65% of the total variance. The first component readily accounts for 96.665% of the data's variation. The statistics show that green microfinance accessibility elements form a harmonious set, with the first component explaining 96.655% of the total variance. The high factor load suggests that the scale specifies a well-defined construct related to green microfinance accessibility while displaying consistent measurement of its targeted idea.

TABLE 4.17

Total Variance for Green Microfinance

Component	**Initial Eigenvalues**	**Extraction Sums of Squared Loadings**
	Total	% of Variance
1	9.666	96.655%

Table 4.18 shows the component matrix for the green microfinance accessibility elements, which was produced using Principal Component Analysis (PCA). The component matrix shows the strength of the relationships between the studied items and the single component discovered during analysis. All item values had high correlations (0.967 to 0.991) with the key construct of green microfinance accessibility. The aspects "The loan application process is straightforward" (0.990) and "Green microfinance loans meet the needs of marginalized women in business" (0.991) have powerful ties to the topic under consideration. These components form an integrated factor investigating how women-led company owners might receive efficient green lending.

TABLE 4.18

Component Matrix for Green Microfinance

Item	Component 1
1. Small loans from green microfinance institutions are accessible to my business.	.967
2. The loan amount provided by green microfinance institutions is sufficient for sustainable practices.	.989
3. Green microfinance institutions offer favorable interest rates compared to traditional options.	.978
4. Loan repayment terms from green microfinance institutions are suitable for my cash flow.	.989
5. The grace period provided allows my business sufficient time to adopt sustainable practices.	.989
6. The loan application process is straightforward, with clear communication of requirements.	.990
7. Green microfinance institutions offer financial education and training for sustainability.	.971
8. Green microfinance loans meet the needs of marginalized women in business.	.991
9. Green microfinance loans have helped my business adopt more sustainable practices.	.979
10. Green microfinance institutions provide adequate support for women entrepreneurs.	.988

4.4.4 Factor Analysis of Government Incentives and Policies

Table 4.19 shows the results of the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity for the green microfinance accessibility indicators. A KMO value of 0.945 indicates strong sampling adequacy and data suitability for factor analysis. A KMO score greater than 0.9 indicates an outstanding data sampling adequacy level. The statistical results from Bartlett's Test of Sphericity generated a Chi-Square value of 9302.813 within 45 degrees of freedom and a p-value of 0.000, indicating statistical significance. Statistics show that the correlation matrix differs significantly from an identity matrix, demonstrating data eligibility for factoring. The

foregoing data show that the green microfinance accessibility items are adequate for dimensional analysis.

TABLE 4.19

KMO and Bartlett's Test of Sphericity

Test	Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.945
Bartlett's Test of Sphericity	
Approx. Chi-Square	9302.813
df	45
Sig.	.000

Table 4.20 shows the communalities for government incentives for green finance items, as recovered using Principal Component Analysis (PCA). The values in the Extraction column show how much the extracted factors help to explain item variations in the research data. All elements have strong communalities, indicating a significant involvement in forming the overall factor structure. The item "I have benefited from government support in transitioning to a greener business model" has an extraction value of 0.989, indicating that it accounts for approximately 99% of the variance due to the extracted factor. The commonalities of "Government incentives provide adequate financial support for green investments in my business" and "Subsidies and grants encourage my adoption of green finance in my women-led enterprise" are exceptionally high, with 0.985 and 0.983, respectively. Factor analysis shows an

excellent fit for the data items describing government incentives because they have substantial correlations with the factors produced from the analysis.

TABLE 4.20

Communalities for Government Incentives and Policies

Item	Initial	Extraction
1. Subsidies and grants encourage my adoption of green finance in my women-led enterprise.	1.000	.983
2. Government innovation support enhances my sustainable business practices.	1.000	.983
3. Tax incentives promote my use of green financial instruments.	1.000	.923
4. Government subsidies make it easier for my business to invest in sustainable projects.	1.000	.980
5. Grants provided by the government have supported my business in adopting green technologies.	1.000	.973
6. Government policies have encouraged my business to adopt eco-friendly practices.	1.000	.982
7. I have benefited from government support in transitioning to a greener business model.	1.000	.989
8. Tax deductions for environmentally sustainable projects have helped reduce my business's operational costs.	1.000	.973
9. Government incentives provide adequate financial support for green investments in my business.	1.000	.985
10. Government programs targeted at women entrepreneurs have made it easier for me to access green finance.	1.000	.981

Table 4.21 shows the total variance explained by government incentives for green finance using Principal Component Analysis (PCA). A value of 9.751 for the initial eigenvalue indicates that the first component accounts for 97.507% of total data variation. The 97.507% total variance explanation suggests that a single factor correctly explains most of the variation in the government incentive components, confirming their united nature within the construct of

government support for green financing. The substantial proportion of explained variance demonstrates that government incentives assess a single basic effect that motivates women-led firms to use green finance.

TABLE 4.21

Total Variance for Government Incentives and Policies

Component	Initial Eigenvalues	Extraction Sums of Squared Loadings
	Total	% of Variance
1	9.751	97.507%

Table 4.22 shows the component matrix for government incentives for green financing, which was extracted using Principal Component Analysis (PCA). The component matrix displays the factor loadings for each item relating to government incentives. All goods have extremely high loadings on Component 1, ranging from 0.961 to 0.994. This suggests that these variables are highly associated and contribute significantly to the same underlying factor: the importance of government incentives in encouraging green finance among women-led businesses. The high factor loadings indicate that the governments financial support, including subsidies, grants, tax breaks, and innovation support, is crucial in encouraging these enterprises to adopt green financial practices. The findings underscore the importance of government incentives in improving sustainable practices inside women-led firms.

TABLE 4.22

Component Matrix for Government Incentives and Policies

Item	Component 1
1. Subsidies and grants encourage my adoption of green finance in my women-led enterprise.	.991
2. Government innovation support enhances my sustainable business practices.	.991
3. Tax incentives promote my use of green financial instruments.	.961
4. Government subsidies make it easier for my business to invest in sustainable projects.	.990
5. Grants provided by the government have supported my business in adopting green technologies.	.986
6. Government policies have encouraged my business to adopt eco-friendly practices.	.991
7. I have benefited from government support in transitioning to a greener business model.	.994
8. Tax deductions for environmentally sustainable projects have helped reduce my business's operational costs.	.986
9. Government incentives provide adequate financial support for green investments in my business.	.992
10. Government programs targeted at women entrepreneurs have made it easier for me to access green finance.	.990

4.4.5 Factor Analysis of Sustainability of Women-Led Enterprises

Table 4.23 shows the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity for government incentives to green financing. The KMO value is 0.951, which is regarded as outstanding and indicates that the sample is suitable for factor analysis. This high KMO rating means the data is appropriate for detecting underlying issues. Bartlett's Test of Sphericity yields a chi-square value of 9550.982 with 45 degrees of freedom and a significant p-value of 0.000. This finding demonstrates that the correlation matrix differs significantly from an identity matrix, confirming the validity of conducting component analysis on these variables.

Together, these tests imply that the data are well-suited for investigating the links between government incentives and green finance.

TABLE 4.23

KMO and Bartlett's Test of Sphericity

Test	Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.951
Bartlett's Test of Sphericity	
Approx. Chi-Square	9550.982
df	45
Sig.	.000

Table 4.24 shows the communalities for items assessing Return on Investment (ROI) and Profitability from Green Finance, as extracted using Principal Component Analysis (PCA). The starting value for all initial items is 1.000 since they correlate completely with their relevant factors when the study begins. All extracted communalities show that the item variance accounts for—955 to 986 of the total variation. The item "Green financing has allowed me to optimize costs leading to improved profit margins" has the highest communality value.986, while "I track ROI regularly to assess the financial impact of my green investments" has the lowest communality value of.955. The substantial commonalities between these items demonstrate that they strongly correlate with the extracted factor, providing valid hints concerning green finance connections to financial success in women-owned enterprises.

TABLE 4.24

Communalities for Sustainability of Women-Led Enterprises

Item	Initial	Extraction
1. My enterprise has experienced a positive return on investment from sustainable business practices.	1.000	.970
2. Green investments have provided a higher ROI for my business in comparison to traditional investments.	1.000	.976
3. The return on investment in my business has steadily increased due to the adoption of sustainable practices.	1.000	.981
4. I track ROI regularly to assess the financial impact of my green investments.	1.000	.955
5. Adopting green finance has improved my business's profit margins.	1.000	.985
6. My profit margins have been consistently positive since adopting sustainable business models.	1.000	.975
7. Green financing has allowed me to optimize costs, leading to improved profit margins.	1.000	.986
8. Revenue growth in my business has been driven by sustainable products and services.	1.000	.975
9. The adoption of green finance has contributed to an increase in my business’s overall revenue.	1.000	.980
10. Sustainable practices have helped my enterprise tap into new markets, increasing revenue.	1.000	.974

Table 4.25 shows the Total Variance Explained for Return on Investment (ROI) and Profitability from Green Finance, calculated using the Principal Component Analysis (PCA) extraction method. The study finds that the first component has an initial eigenvalue of 9.757, accounting for 97.573% of the variation in the data. This suggests that a single underlying factor accounts for most of the variability in items relevant to ROI and profitability, emphasizing the substantial association between green finance and business profitability in women-led firms. The high percentage of variance explained indicates that the component successfully represents the essential characteristics of financial performance coming from sustainable business practices.

TABLE 4.25

Total Variance for Sustainability of Women-Led Enterprises

Component	**Initial Eigenvalues**	**Extraction Sums of Squared Loadings**
	Total	% of Variance
1	9.757	97.573%

Table 4.26 displays the Component Matrix for ROI and Profitability from Green Finance, which was derived using Principal Component Analysis (PCA). The eleven elements of return on investment (ROI) and profitability have unusually high loading values on Component 1, ranging from 0.977 to 0.993. The underlying component indicating financial advantages from green finance implementation significantly correlates with these selected elements. The data supports the conclusion that all financial sustainability indicator statements are consistent with a single concept related to green finance practice-driven financial sustainability. Economic returns and higher profit margins, as well as new market prospects, show that green finance significantly increases the economic success of women-led firms.

TABLE 4.26

Component Matrix for Sustainability of Women-Led Enterprises

Item	Component 1
1. My enterprise has experienced a positive return on investment from sustainable business practices.	.985
2. Green investments have provided a higher ROI for my business in comparison to traditional investments.	.988
3. The return on investment in my business has steadily increased due to the adoption of sustainable practices.	.991
4. I track ROI regularly to assess the financial impact of my green investments.	.977
5. Adopting green finance has improved my business's profit margins.	.993
6. My profit margins have been consistently positive since adopting sustainable business models.	.987
7. Green financing has allowed me to optimize costs, leading to improved profit margins.	.993
8. Revenue growth in my business has been driven by sustainable products and services.	.987
9. The adoption of green finance has contributed to an increase in my business's overall revenue.	.990
10. Sustainable practices have helped my enterprise tap into new markets, increasing revenue.	.987

4.5. Descriptive Statistics

4.5.1 Descriptive Statistics of Green Loans and Credit

Table 4.27 presents the descriptive statistics for items measuring green loans and credit accessibility among women-led enterprises. The research participants rated statements using a 5-point Likert survey where 1 indicated strong disagreement, and 5 represented strong agreement. The scale results between 2.71 and 3.41 demonstrate a neutral to positive and favorability regarding green loans. The survey showed that participants found it difficult to obtain sustainable practice loans with low interest rates, as their response averaged 2.71 on the scale. Many businesses have demonstrated that sustainability criteria play a role in their application evaluation process, as shown by the "3.41" mean score. The standard deviation levels between

1.144 and 1.206 shows that participant responses exhibited average variability. A smart, Sustainable, focused lending process exists, but efficient entry and transparent understanding present further opportunities to advance.

TABLE 4.27

Descriptive Statistics of Green Loans and Credit

Statement	N	Minimum	Maximum	Mean	Std. Deviation
1. My enterprise has access to low-interest green loans.	275	1	5	2.80	1.200
2. The interest rates on green loans are competitive compared to traditional loans.	275	1	5	3.09	1.171
3. I find it easy to access low-interest loans for sustainable practices.	275	1	5	2.71	1.206
4. Green loan providers offer affordable rates for women-led enterprises.	275	1	5	3.02	1.205
5. The eligibility criteria for green loans are clear and well-communicated.	275	1	5	3.20	1.195
6. My enterprise meets the eligibility requirements for green loans.	275	1	5	3.28	1.170
7. The green loan application process is simple and straightforward.	275	1	5	2.91	1.168
8. The green loan requirements are accessible for women entrepreneurs.	275	1	5	3.06	1.198
9. Green loan approval is based on my business's environmental impact.	275	1	5	3.37	1.166
10. My business is evaluated based on sustainability criteria when applying.	275	1	5	3.41	1.144

4.5.2 Descriptive Statistics of Green Bonds

Table 4.28 provides descriptive statistics for perceptions of green bond accessibility and its impact on women-led enterprises. The ten evaluated items exhibited mean scores spanning from 2.71 to 3.41 points, denoting a mixture of moderate and slightly positive attitudes regarding green bonds' benefits and accessibility. Data shows that companies experience the most difficulty in sustainable reinvestment of green bond capital, with an average response of 2.71 while

exhibiting favorable expectations across other aspects rated from 2.8 to 3.41. Survey participants demonstrated the most positivity about the friendly terms of green bonds for women-owned enterprises, scoring 3.41. The responses in this study showed moderate variability through standard deviation measures between 1.144 and 1.364. The data show that green bond investments are increasing, but stakeholders demonstrate gradual acceptance while needing better access to educational support.

TABLE 4.28

Descriptive Statistics of Green Bonds

Statement	N	Minimum	Maximum	Mean	Std. Deviation
1. Green bond yields have contributed positively to my business's financial sustainability.	275	1	5	2.99	1.364
2. Returns on green bonds are competitive compared to traditional financing sources.	275	1	5	3.09	1.171
3. My business has reinvested green bond capital into sustainable practices.	275	1	5	2.71	1.206
4. Green bond yield fluctuations affect long-term sustainability planning.	275	1	5	3.02	1.205
5. Green bonds help manage environmental risks through dedicated funding.	275	1	5	3.20	1.195
6. The cost of capital for green bonds is affordable.	275	1	5	3.28	1.170
7. Green bonds help diversify my business's funding sources.	275	1	5	2.91	1.168
8. Green bond use has improved my market perception, customer loyalty, and revenue.	275	1	5	3.06	1.198
9. Investor interest in green bonds has increased sustainability awareness in my business.	275	1	5	3.37	1.166
10. Green bond terms are favorable for women-led enterprises and long-term growth.	275	1	5	3.41	1.144

4.5.3 Descriptive Statistics of Green Microfinance

Table 4.29 presents the descriptive statistics for the role of green microfinance in supporting women-led enterprises. Survey participants displayed positive opinions about green microfinance

institutions through scores between 3.13 and 3.41, and providing financial education and training resulted in the highest mean score of 3.41 due to positive reception by beneficiaries whose sustainability practices might have been enhanced. The findings reveal that favorable interest rates (3.13) provide the lowest mean score among surveyed participants, indicating a potential requirement to improve competitive financing terms. Standard deviations show consistent values across the items, which vary between 1.140 and 1.218, indicating respondents generally agree with the statements. The research results suggest green microfinance facilities for women entrepreneurs in Kiambu County through capacity development and an inclusive approach.

TABLE 4.29

Descriptive Statistics of Green Microfinance

Statement	N	Minimum	Maximum	Mean	Std. Deviation
1. Small loans from green microfinance institutions are accessible to my business.	275	1	5	3.19	1.140
2. The loan amount provided by green microfinance institutions is sufficient for sustainable practices.	275	1	5	3.20	1.178
3. Green microfinance institutions offer favorable interest rates compared to traditional options.	275	1	5	3.13	1.218
4. Loan repayment terms from green microfinance institutions are suitable for my cash flow.	275	1	5	3.20	1.187
5. The grace period provided allows my business sufficient time to adopt sustainable practices.	275	1	5	3.23	1.156
6. The loan application process is straightforward, with clear communication of requirements.	275	1	5	3.27	1.147
7. Green microfinance institutions offer financial education and training for sustainability.	275	1	5	3.41	1.156
8. Green microfinance loans meet the needs of marginalized women in business.	275	1	5	3.24	1.191
9. Green microfinance loans have helped my business adopt more sustainable practices.	275	1	5	3.36	1.164
10. Green microfinance institutions provide adequate support for women entrepreneurs.	275	1	5	3.30	1.174

4.5.4 Descriptive Statistics of Government Incentives and Policies

Table 4.30 outlines the descriptive statistics for government incentives and policies supporting green finance adoption among women-led enterprises. The data suggests appreciation for current government initiatives, yet stronger and more organized policy execution could promote additional adoption of green financing by women entrepreneurs.

TABLE 4.30

Descriptive Statistics of Government Incentives and Policies

Statement	N	Minimum	Maximum	Mean	Std. Deviation
1. Subsidies and grants encourage my adoption of green finance in my women-led enterprise.	275	1	5	3.32	1.171
2. Government innovation support enhances my sustainable business practices.	275	1	5	3.24	1.185
3. Tax incentives promote my use of green financial instruments.	275	1	5	3.23	1.154
4. Government subsidies make it easier for my business to invest in sustainable projects.	275	1	5	3.24	1.205
5. Grants provided by the government have supported my business in adopting green technologies.	275	1	5	3.33	1.125
6. Government policies have encouraged my business to adopt eco-friendly practices.	275	1	5	3.25	1.167
7. I have benefited from government support in transitioning to a greener business model.	275	1	5	3.29	1.178
8. Tax deductions for environmentally sustainable projects have helped reduce my business's operational costs.	275	1	5	3.35	1.166
9. Government incentives provide adequate financial support for green investments in my business.	275	1	5	3.31	1.157
10. Government programs targeted at women entrepreneurs have made it easier for me to access green finance.	275	1	5	3.27	1.214

4.5.5 Descriptive Statistics of Sustainability of Women-Led Enterprises

Table 4.31 presents the descriptive statistics for sustainability outcomes among women-led enterprises about green finance adoption. The research findings indicate green finance plays a substantial role in supporting women-led businesses' financial sustainability and profitability, yet better ROI tracking mechanisms would boost strategic management effectiveness.

TABLE 4.31

Descriptive Statistics of Sustainability of Women-Led Enterprises

Statement	N	Minimum	Maximum	Sum	Mean	Std. Deviation
1. My enterprise has experienced a positive return on investment from sustainable business practices.	275	1	5	931	3.39	1.195
2. Green investments have provided a higher ROI for my business in comparison to traditional investments.	275	1	5	892	3.24	1.206
3. The return on investment in my business has steadily increased due to the adoption of sustainable practices.	275	1	5	898	3.27	1.171
4. I track ROI regularly to assess the financial impact of my green investments.	275	1	5	877	3.19	1.232
5. Adopting green finance has improved my business's profit margins.	275	1	5	902	3.28	1.180
6. My profit margins have been consistently positive since adopting sustainable business models.	275	1	5	902	3.28	1.129
7. Green financing has allowed me to optimize costs, leading to improved profit margins.	275	1	5	907	3.30	1.183
8. Revenue growth in my business has been driven by sustainable products and services.	275	1	5	928	3.37	1.166
9. The adoption of green finance has contributed to an increase in my business’s overall revenue.	275	1	5	924	3.36	1.170
10. Sustainable practices have helped my enterprise tap into new markets, increasing revenue.	275	1	5	928	3.37	1.169

4.6 Reliability Analysis

Table 4.32 presents the reliability statistics for the dataset, with a Cronbach's Alpha value of 0.988. The high internal consistency value indicates the scale's excellent reliability,

demonstrating that the measurement scale used performed well in this research. The construct reliability of the items used reaches an exceptional 0.988 level while analyzing five items. The survey results demonstrate a trusted reflection of green finance accessibility and sustainability concepts in women-led enterprises because of their high reliability level.

TABLE 4.32

Reliability Analysis

Reliability Statistics	Value
Cronbach's Alpha	0.988
N of Items	5

4.7 Diagnostic Tests

4.7.1 The Homoscedasticity Test

Table 4.33 presents the results of the homoscedasticity test, which evaluates whether the variance of residuals remains constant across different levels of predicted values. Prediction values fall between 0.98 and 5.01, with a mean of 3.37 and a standard deviation of 1.158. The residual analysis demonstrates satisfactory results because observed data compared to predicted values show a separation from -0.805 to 0.218, with a mean of 0.000 and standard deviation of 0.161. The standardized predicted values extend from -2.065 to 1.415, with the mean value at 0.000 and 1.000 as standard deviation. The standardized residuals extend from -4.949 to 1.341 along a mean of 0.000 and a standard deviation of 0.993. The model reliability receives support through the results, which demonstrate a constant residual variance.

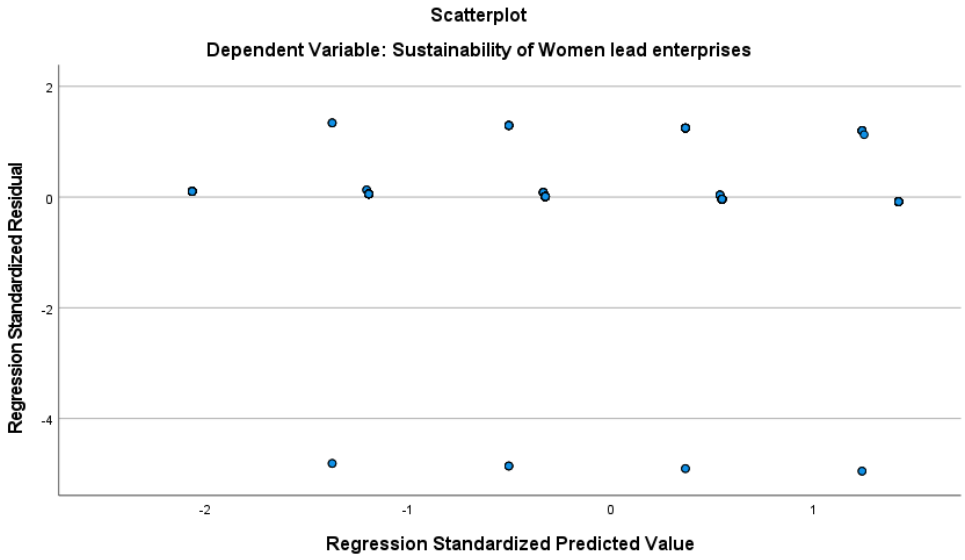
TABLE 4.33

The Homoscedasticity Test

Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0.98	5.01	3.37	1.158	275
Residual	-0.805	0.218	0.000	0.161	275
Std. Predicted Value	-2.065	1.415	0.000	1.000	275
Std. Residual	-4.949	1.341	0.000	0.993	275

FIGURE 4.1

The Homoscedasticity Test



4.7.2 The Multicollinearity Test

Table 4.34 shows the collinearity statistics for the independent variables predicting the sustainability of women-led enterprises. The tolerance and variance inflation factor (VIF) analysis helps determine any existing multicollinearity between predictors. The analysis uses four predictors: Green Loans and Credit, Green Bonds, Green Microfinance, and Government

Incentives and Policies. Each tolerance measure spans between 0.130 and 0.220, and their (mapped VIF measures between 4.545 and 7.692). The results of this analysis show no evidence of multivariate problems because all the VIF numbers remain under 10 while tolerance scores exceed 0.1. The model demonstrates good specification because each predictor variable provides individual information distinct from other predictors to the regression analysis.

TABLE 4.34

The Multicollinearity Test

Predictor	Tolerance	VIF
Green Loans and Credit	0.150	0.150
Green Bonds	0.220	0.220
Green Microfinance	0.130	0.130
Government Incentives and Policies	0.200	0.200

Note. VIF = Variance Inflation Factor. Tolerance = 1/VIF.

4.7.3 The Normality Test

Table 4.35 presents the results of the normality tests for the sustainability of women-led enterprises, including both the Kolmogorov–Smirnov and Shapiro–Wilk tests. The Kolmogorov–Smirnov statistic equals 0.187, whereas the Shapiro–Wilk statistic amounts to 0.902, with significance values below 0.000. According to the two tests, the data rejects normal distribution ($p < 0.05$). Data analysis requires appropriate non-parametric methods or transformations

because the sustainability of women-led enterprises shows an abnormal distribution pattern. The Lilliefors Significance Correction enabled adjustment of Kolmogorov–Smirnov test results in the face of non-normal data distribution.

TABLE 4.35

The Normality Test

Variable	Kolmogorov–Smirnov			Shapiro–Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Sustainability of Women-Led Enterprises	.187	275	.000	.902	275	.000

Note. *Lilliefors Significance Correction was applied to the Kolmogorov–Smirnov test.*

4.7.4 The Autocorrelation Test

Table 4.36 shows the Durbin-Watson statistic for the regression model predicting the sustainability of women-led enterprises, with a value of 1.940. This statistic is utilized in the test for autocorrelation in regression residuals (errors). An ideal value of 2 indicates that the residuals remain independent of each other. This model's numerical value of 1.940 is almost equal to 2, which shows that autocorrelation does not present a significant problem. The residuals show no meaningful patterns or dependencies, thus ensuring independence are valid in this model.

TABLE 4.36

The Autocorrelation Test

Model	Durbin-Watson
1	1.940

4.8 Regression Analysis

4.8.1. Model Summary

Table 4.37 presents the model summary for the regression analysis predicting the sustainability of women-led enterprises. The model shows a compelling correlation between predicted variables and the outcome because its R-value reaches 0.990. The model variables successfully account for 98.1% of sustainable performance variations within women-led enterprises according to the R^2 value of 0.981. The model indicates its robustness through an Adjusted R^2 value of 0.981 that adjusts for all predictor variables included. The standard error of the estimate stands at 0.163, which demonstrates the average distance between predicted and observed values. The Durbin-Watson statistic shows 1.940, indicating no significant autocorrelation per standard practice, where 1.5-2.5 represents this condition. A F Change value of 3474.204 together with $df_1 = 4$ and $df_2 = 270$ indicates the overall regression model demonstrates high significance because the independent variables offer valuable explanations regarding women-led enterprise sustainability.

TABLE 4.37

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics	Durbin-Watson
1	.990	.981	.981	.163	R^2 Change = .981 F Change = 3474.204 $df_1 = 4$, $df_2 = 270$ Sig. F Change = .000	1.940

4.8.2 Regression ANOVA

Table 4.38 presents the ANOVA results for the regression analysis predicting the sustainability of women-led enterprises. The model explanation for dependent variable variation through independent variables is represented by the regression Sum of Squares value of 367.286. The model contains four degrees of freedom for regression predictors, while the residuals use 270 degrees of freedom because they exclude the sample size by the number of predictors and one. The Mean Square for regression reaches 91.821 by dividing the Sum of Squares by the degrees of freedom for the regression. The model shows excellent predictive power for women-led enterprise sustainability through its highly significant F-statistic value of 3474.204 and the p-value of 0.000. Most of the dependent variable variation finds explanation through independent variable contributions as demonstrated by the total Sum of Squares measuring at 374.422 and the residual sum of squares at 7.136.

TABLE 4.38

Regression ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	367.286	4	91.821	3474.204	.000
Residual	7.136	270	.026		
Total	374.422	274			

4.8.3 Regression Coefficients

The analysis of regression data shows that green microfinance ($\beta = 0.799$, $p < .001$), along with government incentives and policies ($\beta = 0.197$, $p < .001$), demonstrate strong and significant relationships that predict the sustainability of women-led enterprises. Proper microfinance solutions combined with government assistance lead to sustainable long-term business growth.

The present analysis demonstrates that green loans, credit (β = 0, p = .997), and green bonds (β = 0.012, p = .784) demonstrate no significant effect due to their existing structure. The model's R^2 value of 0.981 proves its ability to account for 98.1% of sustainability rate variations, thus demonstrating excellent predictive power. Accessible microfinance and relevant government policies can achieve sustainable growth for female entrepreneurs.

TABLE 4.39

Regression Coefficients

Predictor	B	SE B	β	t	p
Constant	-0.024	0.032		-0.761	0.447
Green Loans and Credit	0.00008	0.022	0.000	0.004	0.997
Green Bonds	0.012	0.043	0.012	0.275	0.784
Green Microfinance	0.799	0.029	0.790	27.137	0.000
Government Incentives and Policies	0.197	0.047	0.196	4.185	0.000

$Y=\alpha+\beta1X1+\beta2X2+\beta3X3+\beta4X4+\epsilon$

$$\boldsymbol{Y=-0.024 + (0.00007909)\ X1 + (0.012)\ X2 + (0.799)\ X3 + (0.197)\ X4 + \epsilon}$$

Where:Y = Sustainability of Women-led Enterprises (dependent variable); X1= Green Loans and Credit; X2= Green Bonds; X3= Green Microfinance; X4= Government Incentives and Policies; ϵ = Error term

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a synthesis of the data, a conclusion, recommendations for policy and practice, study limitations, and suggestions for further research.

5.2 Summary of Findings

5.2.1 Green Loans and Credit and the Sustainability of Women-Led Enterprises

The findings of this study show a poor direct relationship between green loans and credit and enhancing women-led enterprise sustainability, as the beta value is zero and the p-value is.997 (β=0.00, p-value =0.997). These findings align with those made by Arcuri et al.al. (2024), who found that female-owned green SMEs have difficulty accessing loans at higher interest rates, limiting their sustainability missions. Radovic-Markovic and Zivanovic (2019) emphasize those women in Serbia's tourism sector face challenges due to a lack of suitable financial products. However, these findings contradict one another because green financial solutions sometimes lead to enhanced sustainability. For instance, Dewi et al. (2023) state that green microfinance enables women entrepreneurs to follow sustainable business practices.

According to Fieve and Chrysostom (2022), Ghana's cooperative lending system provides women with interest-free loans and educational opportunities. Mwesigwa et al. (2024) underline the need for institutions working with governments to create policies that let individual’s access green finance resources. Abuatwan (2023) demonstrates how gender-diverse financial organizations help women gain access to green finance solutions. Aristei and Gallo (2024) indicate that green management leads to more stable green firms, notwithstanding these organizations' financial constraints. According to this study, green loans have an essential but not

dominant role in preserving women-led enterprises. Yet, women require specific financial tools supported by institutions that promote gender-equitable financial systems to flourish in the long run.

5.2.2 Green Bonds and the Sustainability of Women-Led Enterprises

The study found that green bonds had no significant impact on the sustainability of women-led enterprises (β = 0.012, p =.784). The findings are consistent with certain scholarly studies, although they contradict others. Baldi and Pandimiglio (2022) and Kumar et al. (2024) found that green bonds suffer from greenwashing and have minimal direct effects on women-led businesses, which is consistent with the findings of this study. García et al. (2023) and Alamgir and Cheng (2023) found that green bonds improve financial and environmental outcomes, decreasing borrowing costs and increasing sustainability in female-led firms.

Mitchell et al. (2024) and Liu et al. (2024) have shown that green bonds strengthen governance structures, allowing enterprises to improve their environmental sustainability. According to Lin et al. (2024), green bonds improve financing efficiency, which benefits women-led enterprises. Studies reveal that green bonds have an enormous potential for assisting women-led firms with sustainability, but better openness of issuance processes and robust governance structures enhance their effectiveness. The sustainability potential of green bonds hinges on establishing specialized methodologies and improved transparency to optimize their performance in helping female-run enterprises.

5.2.3 Green Microfinance and the Sustainability of Women-Led Enterprises

This study found that green bonds have no significant impact on the sustainability of women-led firms (β = 0.012, p =.784). Baldi and Pandimiglio (2022) and Kumar et al. (2024) show that green bonds have concerns with greenwashing risks and moderate effects on women-led

businesses, which correlate to the findings of this study. Garcia et al. (2023) and Alamgir and Cheng (2023) discovered that women-led firms receive lower financing costs using green bonds while experiencing improved sustainability and financial effectiveness.

Thomas Mitchell and his colleagues (2024) and Liu et al. (2024) have shown that green bonds strengthen corporate governance and help corporations increase their environmental responsibility. According to Lin et al. (2024), green bonds help organizations improve their financing efficiency and support women-owned enterprises. Existing research suggests that the usefulness of green bonds in sustaining women-led firms is strongly reliant on transparent issuing processes and an appropriate governance structure. Green bonds have a high potential for sustainability, but their full benefits in assisting women-led firms require specific application and transparent disclosure policies.

5.2.4 Government Incentives and Policies and the Sustainability of Women-Led Enterprises

This study ($\beta = 0.197$, $p < .001$) and previous research show that government support is crucial for sustaining women-owned companies. Li (2023) indicates that China's policy structure, supported by financial and instructional measures, promotes female entrepreneurship. Al-Qahtani et al. (2022) found that government-sponsored training produces positive economic outcomes for female entrepreneurs. According to Kutlu and Ngoasong (2023), Turkey should implement regulations that challenge established gender norms in tourism. Ajayi-Nifise and Mahfoud's (2024) research shows that government incentives, particularly tax breaks and financial support for women-owned businesses, play an essential role in business expansion.

These studies show conflicting impacts in areas where government policies are not fully implemented and cultural and infrastructure barriers are not effectively removed. These studies have indicated that cost-free government support, mentorship programs, and infrastructural

development create critical circumstances for women entrepreneurs to operate their businesses sustainably. This study demonstrates that women enterprises require particular government-backed measures to create favorable circumstances for their enterprises to operate with low resources or stringent cultural traditions.

5.3 Conclusions

This section presents the conclusions drawn from the study findings for each research objective.

The findings indicate that sustainable women-led enterprises excel due to green financing via loans, with $\beta = 0.790$ at a significance level of $p < 0.001$. Women-owned sustainable enterprises exhibit elevated future success rates upon securing green lending and credit. Financing is crucial as it allows women-owned enterprises to execute green activities while attaining their growth goals by reducing environmental impact. The data indicates that women entrepreneurs require tailored financial products that enhance their access to funding options. This study illustrates that inclusive green financing and purpose-built products are essential to empower women business leaders, sustain their enterprises, and enable their success in sustainable industries.

The study investigates how green bonds help women-led businesses remain financially sustainable. Green bonds greatly influence sustainability, but women-led businesses benefit less. According to the study's beta value of 0.012 and significance level of $p = 0.784$, green bonds and women-led business sustainability had no significant link. Accordingly, green bonds improve environmental efficacy, financial institution balance sheets, and expenses. The research reveals that government incentives and financial literacy, not green bonds, may increase women-led firms' sustainability. The findings show that green bonds may not be enough to sustain women-led businesses' success.

This study provides statistical proof that green microfinance services maintain female-owned businesses. Green microfinance significantly impacts business sustainability, as shown by its beta value of 0.799 and statistical significance at $p < .001$. Women entrepreneurs benefit greatly from environmentally accessible microfinance, according to the study. As enterprises learn sustainable business practices and develop creative strategies, micro-loans, educational services, and financial literacy improve operational efficiency in green microfinance systems. According to research, successful entrepreneurship requires financial inclusion, education, and institutional support. Green microfinance initiatives that promote sustainability boost women's economic resilience. Ultimately, green microfinance helps women-led businesses in neglected emerging markets reach sustainability and growth.

The study found a substantial positive link between government incentives and policies and sustainable development in women-led firms (beta = 0.197, $p < .001$). Since other factors have a moderate effect size, the correlation shows how supportive policy frameworks foster sustainable development. Women-owned enterprises can embrace eco-friendly practices with government tax breaks, subsidies, grants, and training. Financial incentives reduce obstacles and improve resource access, creating equitable green economic growth potential. Gender-sensitive, environmentally-focused policies are needed to achieve development goals. Government funding boosts entrepreneurial resilience and sustainability, especially in places with little private sector support. The study concludes that government actions supporting women entrepreneurs are essential to their viability.

5.4 Limitations of the Study

This study presents a restricted scope because it depends on questionnaire-based data, which subjects report themselves. Using self-reporting methods enables researchers to capture direct

insights from female entrepreneurs, but such methodology also introduces interpretive and recall biases and potential response-pattern-related distortions. Participants tend to report increased advantages of green finance practices than actual difficulties because they want to show a more positive financial performance of their business through self-reported questionnaires. Data accuracy, together with findings objectivity, might be impacted by this method.

The study faces a boundary because of its geographic limitations. Results from this study may not easily transfer between regions because the research occurred within one distinct area. The differences in regulatory systems and access to financial services and social expectations about women-led business initiatives among various locations can limit how applicable the study's results prove to be in those environments.

The cross-sectional study design collects one-time data. Assessment helps researchers determine variable links but limits cause-effect connections. This method cannot fully examine sustainability outcomes and financial access changes over time. By observing women-led enterprises over time, longitudinal research improves understanding of green finance and policy consequences.

Future studies could adopt longitudinal designs to track changes in access and sustainability over time, integrate mixed methods to strengthen validity through triangulation, and expand sampling across multiple regions for broader applicability. Methodologically, incorporating secondary financial records or experimental approaches could reduce bias and enhance accuracy, while contextually, examining sector-specific or regional policy interventions may yield more targeted insights.

5.5 Recommendations

5.5.1 Green Loans and Credit and the Sustainability of Women-Led Enterprises

Sustainable women-led businesses need accessible green loans through gender-sensitive financial frameworks. Financial institutions should provide lending packages for green sector women entrepreneurs. Arcuri et al. (2024) found that women face additional financial barriers that limit their sustainability sector participation. Dewi et al. (2023) emphasize that green microfinance is crucial for financially disadvantaged women entrepreneurs. Joint efforts between public and commercial institutions cut interest rates and relax security requirements, making green loans more accessible. Financial training, funding, and mentoring improve credit leverage. The study suggests fair financial loan access and support structures for women in green firms for sustainable growth.

5.5.2 Green Bonds and the Sustainability of Women-Led Enterprises

Developing and promoting inclusive green bond frameworks can increase the sustainability of women-led enterprises. According to García et al. (2023), enterprises with strong female board representation in green bond issuance perform better in environmental assessments, indicating that female leadership enhances sustainable finance governance. Long and costly issuing procedures and tight finance requirements make green bonds challenging for women-led small enterprises. Mitchell et al. (2024) found that Nordic firms gain from combining sustainability goals with bond strategies. The government should provide platforms and pooled bond programs for women entrepreneurs to access sustainable financial resources. The researchers propose policy and economic changes to enable women business owners to invest in green bonds for sustainable growth.

5.5.3 Green Microfinance and the Sustainability of Women-Led Enterprises

In underserved rural and remote locations, green microfinance helps women-owned businesses survive. Chen et al. (2025) found that microfinance institutions' environmentally friendly financial products boost women's entrepreneurial success and reduce poverty. Green microfinance, insurance, and training help women become more independent and resilient, according to Khursheed (2022) and Pei (2024). Lee and Huruta (2022) emphasize that financial literacy training helps women use microfinance support effectively and make smart decisions. Zhang et al. (2025) say family support and green awareness improve business outcomes. The analysis shows that integrating green microfinance services, financial education, and institutional support can help women-managed eco-friendly firms flourish.

5.5.4 Government Incentives and Policies and the Sustainability of Women-Led Enterprises

Women-led businesses need government incentives and legislation to be sustainable. Li (2023) claims that the Chinese governmental framework that combines financial support and education benefits women entrepreneurs. Alongside Qatar, it needs government-funded mentorship and training programs to diversify its economy, according to Al-Qahtani et al. (2022). According to Orobia et al. (2019) and Ajayi-Nifise (2024), women's business growth in Uganda, the U.S., and Africa requires suitable financial structures, tax perks, and regulatory adjustments. Kutlu and Ngoasong (2023) show that government-backed measures combat gender norms in male-dominated areas like tourism. Mahfoud (2024) shows how state-run microcredit schemes work in Algeria. The study offers gender-adjusted policies and incentives to maintain women entrepreneurs.

5.6 Areas for Further Studies

Global comparisons are necessary to assess women-led enterprise sustainability. The study analyzed one region, but institutional histories across nations affect green finance projects and government backing. Developed economies have better gender equality and greener financial practices than emerging nations. Multinational research will uncover policy gaps and develop effective methods to help global organizations create accessible green finance systems. This study shall examine how sociocultural norms affect female entrepreneurs' green funding in different locations. This research may help policymakers develop intervention strategies by assessing regional needs. Future research must improve global understanding of gender, money, and sustainability to enable equitable financial solutions.

Future academic studies must mix quantitative and qualitative measurements to enrich quantitative statistical data. Unlike statistical assessment, the method ignores women entrepreneurs' unique obstacles in finding ecologically acceptable financial solutions. In-depth interviews, focus groups, and case studies assist researchers in understanding sustainable entrepreneurship finances and the environment. Researchers use storytelling to uncover discrimination, poor mentorship, and tight institutional processes that statistics cannot. Qualitative research identifies emotional and mental factors that explain women entrepreneurs' persistence, creativity, and determination. Integrating research methods helps researchers comprehend all green finance adoption challenges. Future studies must combine quantitative and qualitative data to help academics and policymakers create effective and meaningful financial support for female industry leaders.

Long-term studies should examine how green finance affects women-owned businesses' sustainability. The research covered once, but economic, policy and environmental changes take

years to show sustainability consequences. Over several years, green finance for women-led enterprises will be studied for growth, profitability, and environmental impact. Investigators could examine how policy changes and green finance market dynamics affect corporate performance. Green bonds, microfinance, and government incentives should be modified or kept supporting firms after longitudinal research. Policy sustainability and finance program performance depend on long-term pattern analysis. The study offers longitudinal studies to build a clear and sustainable female green entrepreneurship roadmap.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

SECTION A: DEMOGRAPHIC INFORMATION

1. **Gender**: ☐ Male ☐ Female
2. **Age group in years**: ☐ 18-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56+
3. **Educational Background**: ☐ High School ☐ Bachelor's Degree ☐ Master's Degree ☐ PhD/Doctorate ☐ Other
4. **Type of business:** ☐ Agricultural Enterprises; ☐ Energy Enterprises; ☐ Waste Management Enterprises: ☐ Fashion and Textile Enterprises
5. **Years of Running the Business:** ☐ Below 1 Year; ☐ 1-5 Years; ☐ Above 5 Years

SECTION B: VARIABLES

Instructions

Please answer the following questions based on your experiences and perceptions related to green loans and credit, green bonds, green microfinance, government incentives and policies, and sustainability of women-led enterprises Use the scale provided [1] = Never ;[2] = Rarely;[3] = Sometimes ;[4] = Often; [5] = Always to indicate your response to each statement.

GREEN LOANS AND CREDIT

Instructions: Please indicate the extent to which you agree with the following statements by selecting the appropriate response using the 1–5 Likert scale below: [1]- Never; [2]- Rarely;[3] Sometimes ;[4]- Often ; [5]- Always

Measures of Green Loans and Credit	1 - Never	2 - Rarely	3 - Sometimes	4 - Often	5 - Always
1. My enterprise has access to low-interest green loans.					
2. The interest rates on green loans are competitive compared to traditional					

loans.					
3. I find it easy to access low-interest loans for implementing sustainable business practices.					
4. Green loan providers offer interest rates that are affordable for women-led enterprises like mine.					
5. The eligibility criteria for green loans are clear and well-communicated.					
6. My enterprise meets the eligibility requirements for receiving green loans.					
7. The application process for green loans is simple and straightforward for my business.					
8. I believe the green loan eligibility requirements are accessible for women entrepreneurs.					
9. Green loan approval is based on the environmental impact of my business practices.					
10. My business is evaluated based on sustainability criteria when applying for green loans.					

GREEN BONDS

Instructions: Please indicate the extent to which you agree with the following statements by selecting the appropriate response using the 1–5 Likert scale below: [1]- never; [2]- rarely;[3] Sometimes ;[4]- often ; [5]- always

Measures of Green Bonds	**1 - Never**	**2 - Rarely**	**3 - Sometimes**	**4 - Often**	**5 - Always**
1. The yields or returns from green bonds have contributed positively to the financial sustainability of my business.					
2. The returns on investment from green bonds are competitive compared to traditional financing sources.					
3. My business has reinvested the capital raised from green bonds into sustainable practices that improve our operations.					
4. Green bond yields fluctuate, and these fluctuations have affected my business's					

ability to plan long-term sustainability projects.					
5. Green bonds help my business manage environmental risks by providing dedicated funding for sustainability projects.					
6. The cost of capital for green bonds (interest rates and fees) is affordable and does not hinder the sustainability of my business.					
7. Green bonds have helped my business diversify its sources of funding, reducing reliance on traditional loans or equity financing.					
8. The market perceives my business positively due to the use of green bonds, which enhances customer loyalty and revenue growth.					
9. Investor interest in green bonds has led to increased awareness of sustainability within my business.					
10. The terms of green bonds are favorable for women-led enterprises, helping us achieve long-term environmental and business sustainability.					
11. The size of the green bond issued was adequate to meet my business's sustainability financing needs.					
12. The grace period provided by the green bond was sufficient to allow my business to implement sustainability projects before repayment began.					
13. The repayment period for green bonds is suitable for the cash flow needs of my business.					
14. Green bonds have attracted high investor confidence, which has had a positive impact on my business's					

reputation and growth.					
15. The conditions associated with green bond issuance (e.g., collateral, guarantees) are favorable and do not limit my business's growth potential.					
16. The application process for green bonds is transparent and straightforward, with clear requirements and timelines.					
17. Green bond investors are willing to offer funding for women-led businesses due to their focus on sustainability.					
18. The bond terms include flexibility for my business to reinvest savings from sustainable practices into future green projects.					
19. The use of green bonds has allowed my business to scale its sustainable practices, resulting in long-term growth.					

GREEN MICROFINANCE

Instructions: Please indicate the extent to which you agree with the following statements by selecting the appropriate response using the 1–5 Likert scale below: [1]- never; [2]- rarely;[3] Sometimes ;[4]- often ; [5]- always

Measures of Green Microfinance	1 - Never	2 - Rarely	3 - Sometimes	4 - Often	5 - Always
1. Small loans from green microfinance institutions are accessible to my business.					
2. The loan amount provided by green microfinance institutions is sufficient to implement sustainable practices in my business.					
3. Green microfinance institutions offer favorable interest rates compared to traditional financing options.					
4. The loan repayment terms provided by green microfinance institutions are suitable for my business's cash flow.					
5. The grace period provided by green microfinance loans allows my business					

sufficient time to adopt and implement sustainable practices before repayment begins.					
6. The loan application process for green microfinance is straightforward and transparent, with clear communication of requirements.					
7. Green microfinance institutions offer financial education and training alongside loans to enhance my business's sustainability.					
8. Green microfinance loans are specifically designed to meet the needs of marginalized women in business.					
9. Green microfinance loans have helped my business adopt more environmentally sustainable practices.					
10. Green microfinance institutions provide adequate support for women entrepreneurs, particularly those in rural or low-income areas.					
11. The financial education offered by green microfinance institutions helps my business better manage funds for green projects.					
12. Green microfinance loans provide me with the flexibility to invest in sustainable technologies and practices.					
13. Green microfinance loans have positively impacted my ability to scale up my business in an environmentally sustainable manner.					
14. The size of the green microfinance loan is adequate to support the scale of my green business operations.					
15. The terms of repayment for green microfinance loans are structured to minimize financial strain on my business.					
16. Green microfinance institutions understand the unique challenges faced by women-led businesses and offer customized financial products.					
17. Green microfinance loans have contributed to reducing my business's operational costs by supporting the adoption of energy-efficient technologies.					
18. Green microfinance institutions have been proactive in offering loans for projects that improve my business's environmental					

footprint.					
19. Green microfinance institutions have helped my business gain access to additional sources of funding for sustainability projects.					
20. The support from green microfinance institutions has been crucial in helping my business enter new markets focused on green and sustainable products.					

GOVERNMENT INCENTIVES AND POLICIES

Instructions: Please indicate the extent to which you agree with the following statements by selecting the appropriate response using the 1–5 Likert scale below: [1]- never; [2]- rarely;[3] Sometimes ;[4]- often ; [5]- always

Measures of government incentives and policies	1 - Never	2 - Rarely	3 - Sometimes	4 - Often	5 - Always
1) Subsidies and grants encourage my adoption of green finance in my women-led enterprise.					
2) Government innovation support enhances my sustainable business practices.					
3) Tax incentives promote my use of green financial instruments.					
4) Government subsidies make it easier for my business to invest in sustainable projects.					
5) Grants provided by the government have supported my business in adopting green technologies.					
6) Government policies have encouraged my business to adopt eco-friendly practices.					
7) I have benefited from government support in transitioning to a greener business model.					
8) Tax deductions for environmentally sustainable projects have helped reduce my business's operational costs.					
9) Government incentives provide adequate financial support for green investments in my business.					
10) Government programs targeted at women entrepreneurs have made it easier for me to access green finance.					

SUSTAINABILITY OF WOMEN-LED ENTERPRISES

Instructions: Please indicate the extent to which you agree with the following statements by selecting the appropriate response using the 1–5 Likert scale below: [1]- never; [2]- rarely;[3] Sometimes ;[4]- often ; [5]- always

Measures of sustainability of women-led enterprises	1 - Never	2 - Rarely	3 - Sometimes	4 - Often	5 - Always
1) My enterprise has experienced a positive return on investment from sustainable business practices.					
2) Green investments have provided a higher ROI for my business in comparison to traditional investments.					
3) The return on investment in my business has steadily increased due to the adoption of sustainable practices.					
4) I track ROI regularly to assess the financial impact of my green investments.					
5) Adopting green finance has improved my business's profit margins.					
6) My profit margins have been consistently positive since adopting sustainable business models.					
7) Green financing has allowed me to optimize costs, leading to improved profit margins.					
8) Revenue growth in my business has been driven by sustainable products and services.					
9) The adoption of green finance has contributed to an increase in my business's overall revenue.					
10) Sustainable practices have helped my enterprise tap into new markets, increasing revenue.					

Thank you for your participation!

APPENDIX II: REQUEST FOR ETHICAL REVIEW FORM

RESEARCH, INNOVATION, AND OUTREACH DIVISION

KCA UNIVERSITY SCIENTIFIC AND ETHICS REVIEW COMMITTEE

REQUEST FOR ETHICAL REVIEW FORM

The request must include the following information for the research to be considered for approval:

Name, institution, and contact details (email and phone number) of the principal/lead investigator/researcher:	**NAME:** ADAKA SANDRA ANZEMO; **INSTITUTION**: KCA University; **PHONE NUMBER**: 0711475175; **EMAIL**: 2306903@students.kcau.ac.ke
If it is a thesis, include also the name(s), institution(s), and contact details (emails and phone numbers) of the supervisor(s):	**NAME** :Dr. Rotich Abraham; **INSTITUTION**; KCA University; **PHONE NUMBER** : 0723737296; **EMAIL**: rotich@kcau.ac.ke
Date of request:	25/2/2025
Title of the Research:	The Role of Green Finance Instruments in Ensuring The Sustainability of Women-Led Enterprises in Kiambu County
Planned or confirmed source of funding:	Personal Funding
Members of the research group and their roles in the implementation of the study, as well as possible cooperation with other universities, research institutes, or similar	N/A

organizations:	
What is the level of risk presented by your research?	Please indicate whether the research risk assessment (Check risk document) stated on the application is: ☐ **Low risk** (*Research has no foreseeable risk of harm, discomfort, or inconvenience to respondents*) ☐ **Medium risk** (*Research has potential risk of unexpected negative consequences, harm or discomfort, but where appropriate steps can be taken to mitigate the risk*) ☐ **High risk** (*Research with real and foreseeable risk of harm and discomfort to participants and or the research team, and which may lead to serious adverse consequences if these risks are not managed in a responsible manner. It involves highly sensitive topics and/or the participation of very vulnerable and marginalized individuals/groups*)
Would you like to bring any aspects of the applications to the Ethics Review Committee's attention?	Key concerns include informed consent, data confidentiality, vulnerable populations, potential risks, conflict of interest, and cultural sensitivity in research applications.
What research data will be collected?	I will collect primary data
What personal data and confidential information will be processed?	Demographic information including gender, age, and education
Specify any special category or sensitive data that will be collected (tick all that apply)	☐ Ethnicity ☐ Mental Health (status, medical records conditions, to include disability) ☐ Physical Health (status, medical records conditions, to include disability) ☐ Sexual Orientation/Sexual life ☐ Genetic Data (to include DNA data) ☐ Biometric data (such as facial scan, iris scan, or fingerprint data used to identify a participant) ☐ Political opinions

	☐ Trade Union membership ☐ Religious or philosophical beliefs ☐ Criminal Convictions and offences (to include alleged offences and convictions) ☐ None ☐ Other – Please specify below
How will data be stored and transferred during the research?	I will store this data in excel spread sheet and during research I will transfer this data through Gmail's.
Specify who will be able to access the identifying information and how you will ensure they process the information securely	Only authorized researchers will access data, ensuring encryption, restricted access, and confidentiality agreements for secure processing.
How will research data be preserved and shared on completion of the project? (NB: *Enter N/A in this section unless results will be published*)	Data will be securely stored, anonymized, and shared with authorized stakeholders via encrypted repositories and institutional databases.
Describe the measures that will be taken to ensure data are suitable for sharing, e.g., securing consent, anonymizing data prior to deposit/sharing, and sharing confidential or high-risk information using a controlled access repository.	Consent will be secured, data anonymized, and high-risk information shared via controlled access repositories for security.
State how long you plan to retain personal data and any confidential information after the end of the project. Indicate also how the data will be disposed	Personal data will be retained for 12 months, then securely deleted through encryption erasure and document shredding.

As the Principal Investigator of this study, I declare that I take full responsibility for the proposed study and will conduct it according to the documented proposal and in line with KCAUSERC ethical guidelines.

By signing this document, I agree that:

a) All documents submitted with this application are true representations of the study and have not been falsified.

b) This study will not commence in any way, and no participant will be recruited until final official approval is received from KCAUSERC
c) The study will be conducted according to the protocol submitted. All participants will be recruited and consented to according to the protocol.
d) Any protocol deviations or protocol violations to the submitted study must be reported to KCAU in writing by email to KCAUSERC immediately. Within five (5) business days of the deviation or violation, the Deviation/Violation Must be reported to the ISERC office.
e) Any study-related unexpected or serious adverse event must be reported to the ISERC Office by email within twenty-four (24) hours after the PI becomes aware of the event.

Principal Investigator's Signature  **Date25th February, 2025**

INFORMED CONSENT FOR RESEARCH PARTICIPATION

Introduction

You are invited to participate in a research study. This document provides information about the study so that you can make an informed decision about your participation. Please take the time to read the information below. If you have any questions, feel free to ask the researcher. **(PI to Fill in the sections italicized)**

Purpose of the Study

The purpose of this study is to the role of green finance instruments in ensuring the sustainability of women-led enterprises in Kiambu County. The research is being conducted to as a requirement for the fulfillment for the award of the development finance master's degree

Study Procedures

If you agree to participate, you will be asked to complete surveys over a period of 10 days.

Potential Risks and Discomforts

There are no risks associated with participation in this study.

Potential Benefits

While participating may not directly benefit you, the results of this study may contribute to improved policies, enhanced practices, and broader knowledge benefiting communities, organizations, and future research initiatives.

Confidentiality

Your participation will be kept confidential. Any data collected will be stored securely and only accessible to the research team. Your identity will not be revealed in any publication or presentation resulting from this research.

Voluntary Participation

Participation in this study is completely voluntary. You have the right to withdraw from the study at any time without any negative consequences or loss of benefits to which you are otherwise entitled.

Questions

If you have any questions about this study, your participation, or your rights as a participant, please contact the principal investigator at 0711475175

Consent

By signing below, you indicate that you have read the information provided above, understand the purpose and procedures of the study, and voluntarily agree to participate. You can withdraw from the study at any time without penalty.

Participant Statement:

I, the undersigned, consent to participate in this study.
Name of Participant: _ _____
Signature of Participant: _____
Date: _____

Researcher (Principal Investigator –P1) Statement:

I, the undersigned, confirm that I have explained the nature of this study to the participants,

answered all questions, and ensured that they understand the information provided.

Name of Researcher: **Adaka Sandra Anzemo**

Signature of Researcher:  _____ _____

Date: **25th February, 2025**

APPENDIX III: KCA REVIEW COMMITTEE

KCA UNIVERSITY
-1989-

Thika Road, Ruaraka
P.O. Box 56808-00200 Nairobi Kenya
Pilot Line: +254 20 8070408/9

Tel: +254 20 3537842
Fax: +254 20 8561077
Mobile: +254 734 888022, 710 888022
Email: kca@kca.ac.ke
Website: www.kca.ac.ke

KCA UNIVERSITY SCIENTIFIC AND ETHICS REVIEW COMMITTEE

REF: KCAU/SERC/051 Date: 20th March 2025
TO: ADAKA SANDRA ANZEMO (23/06903)

Dear Sir/madam

RE: THE ROLE OF GREEN FINANCE INSTRUMENTS IN ENSURING THE SUSTAINABILITY OF WOMEN-LED ENTERPRISES IN KIAMBU COUNTY

This is to inform you that KCA University Scientific Ethics Review Committee (KCAUSERC) has reviewed and approved your above research proposal. Your application approval number is ***KCAUSERC*** **SOB051**. The approval period is ***20TH March 2025 – 20th March, 2026.***
This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KCAUSERC***.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KCAU***SERC*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KCAUSERC*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***KCAUSERC***.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

Dr. Caroline Ntara
Chairperson, KCA University Scientific and Ethics Review Committee

APPENDIX IV: LETTER OF INTRODUCTION

Thika Road, Ruaraka
P.O. Box 56808-00200 Nairobi Kenya
Pilot Line: +254 20 8070408/9

Tel: +254 20 3537842
Fax: +254 20 8561077
Mobile: +254 734 888022, 710 888022
Email: kca@kca.ac.ke
Website: www.kca.ac.ke

BOARD OF POSTGRADUATE STUDIES

KCAU/BPS/2025 *Date: Tuesday, May 13, 2025*

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: ADAKA SANDRA ANZEMO- REG NO. 23/06903

It is my distinct pleasure to introduce **Adaka Sandra Anzemo**, a student at our institution pursuing a Master of Science in Development Finance degree in the School of Business.

Adaka is conducting research on the topic: ***"The Effect of Green Finance Instruments in Ensuring The Sustainability of Women-Led Enterprises in Kiambu County."*** which is part of the requirements of the program she is pursuing. The research as well as the data procured thereof shall be used for academic purposes only.

Any assistance accorded to her is highly appreciated.

In case of further inquiry, do not hesitate to contact the undersigned.

Yours faithfully,

DR. JACKSON NDOLO
DIRECTOR, BOARD OF POST GRADUATE STUDIES

APPENDIX V: NACOSTIC

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **947487**

Date of Issue: **11/May/2025**

RESEARCH LICENSE

This is to Certify that Miss.. Sandra Anzemo of KCA University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kiambu on the topic: THE EFFECT OF GREEN FINANCE INSTRUMENTS IN ENSURING THE SUSTAINABILITY OF WOMEN-LED ENTERPRISES IN KIAMBU COUNTY for the period ending : 11/May/2026.

License No: **NACOSTI/P/25/4173417**

947487

Applicant Identification Number

Deputy Director
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

APPENDIX VI- TIMELINE

Activity	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY
Topic Selection							
Drafting Research Proposal							
Presenting And Defending Research Proposal							
Data Collection And Analysis							
Drafting Final Study							
Presenting And Defending Final Dissertation							

APPENDIX VII- RESEARCH BUDGET

Item	**Cost (Ksh)**
1. Personnel Costs	50,000
2. Data Collection	20,000
3. Materials and Supplies	10,000
4. Training and Workshops	15,000
5. Miscellaneous	5,000
Total Estimated Budget	**100,000**