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(Review Article)

Exploring global practices in providing small and medium enterprises access to sustainable finance solutions

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Abstract

This study investigates the role of sustainable finance in enhancing the growth and sustainability of Small and Medium Enterprises (SMEs), focusing on the integration of environmental, social, and governance (ESG) principles. The main objectives were to map the current landscape of sustainable finance for SMEs, identify barriers to access, evaluate the impact of sustainable finance on SME growth, explore the role of digitalization, and provide policy recommendations. Through a mixed-methods approach combining literature review, case studies, and empirical analysis, the study offers a comprehensive overview of the global practices in sustainable finance for SMEs. Key findings reveal that while there is a growing availability of sustainable financial instruments, SMEs face significant challenges in accessing these resources due to a lack of awareness, stringent eligibility criteria, and complex application processes. The study also highlights the positive impact of sustainable finance on SME growth and sustainability, with digitalization playing a crucial role in enhancing access to finance. However, the effectiveness of these financial instruments and digital platforms varies significantly across different regions and sectors. Based on the findings, the study recommends that policymakers and financial institutions implement more inclusive policies and develop financial products that cater to the unique needs of SMEs. It also calls for increased efforts in capacity building to raise awareness among SMEs about the benefits of sustainable finance. Future research should focus on the long-term effects of sustainable finance on SME competitiveness and resilience, and the potential of public-private partnerships in facilitating access to sustainable finance.

Keywords: Sustainable Finance; SMEs (Small and Medium Enterprises); ESG (Environmental, Social, and Governance); Digitalization

1 Introduction

1.1 The Importance of Sustainable Finance for Small and Medium Enterprises (SMEs)

The importance of sustainable finance for Small and Medium Enterprises (SMEs) cannot be overstated in today's global economy. SMEs, which account for a significant portion of businesses worldwide, face unique challenges that hinder their growth and sustainability. These challenges are particularly pronounced in the realm of financing, where traditional financial systems often fall short of meeting the needs of SMEs, especially in developing economies and regions with pronounced financing gaps (Ewuraba Adua, 2023; Surmanidze et al., 2023).

SMEs are pivotal to economic growth, employment, and innovation. In many countries, they constitute the backbone of the economy, providing the majority of jobs and contributing significantly to GDP. However, access to finance remains

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a critical hurdle for many SMEs, impacting their ability to grow, innovate, and contribute to sustainable economic development (Ewuraba Adua, 2023). The formal financial sector, including commercial banks and non-bank financial institutions, often imposes conditions that SMEs find difficult to meet, such as high collateral requirements, short repayment periods, and high transaction costs. These barriers are exacerbated in Sub-Saharan African nations, where SMEs are crucial for economic development but face significant obstacles in accessing finance (Ewuraba Adua, 2023).

The concept of sustainable finance emerges as a solution to these challenges, offering a pathway for SMEs to access the funds necessary for growth while promoting environmental sustainability and social well-being. Sustainable finance encompasses financial instruments and investments that take into account environmental, social, and governance (ESG) criteria, aiming to achieve long-term economic returns and positive societal impact. For SMEs, sustainable finance can provide access to capital under more favorable conditions, such as lower interest rates and longer repayment periods, by leveraging their commitment to sustainability practices (Hossain et al., 2023).

Recent studies propose innovative financing models that address the unique needs of SMEs. For instance, Hossain et al. (2023) suggest models that involve a partnership between the government, banks, and SMEs to enhance the supply of loanable funds to banks and identify creditworthy SME borrowers through skills development programs. These models aim to reduce the default risk for banks, allowing them to offer lower-interest and collateral-free credit to SMEs. Additionally, the incorporation of digital finance and data-driven credit scoring can further reduce transaction costs and default risks, making sustainable finance more accessible to SMEs (Hossain et al., 2023).

The case of Georgia illustrates the potential of concerted efforts by government agencies, international organizations, and the banking sector to empower SMEs through access to finance. Initiatives such as "Enterprise Georgia" and the credit guarantee scheme have been instrumental in enhancing the economic resilience and sustainable growth of small businesses in the region. These efforts highlight the importance of a comprehensive approach to capital market development, aiming to diversify financing sources and reduce reliance on the banking sector (N. Surmanidze et al., 2023).

The importance of sustainable finance for SMEs lies in its ability to address the critical financing gaps that hinder their growth and sustainability. By adopting innovative financing models and leveraging partnerships between governments, financial institutions, and SMEs, it is possible to enhance access to finance for SMEs while promoting sustainable economic development. The experiences of countries like Ghana and Georgia offer valuable insights into the potential benefits of sustainable finance for SMEs, underscoring the need for policies and initiatives that support the development of a more inclusive and sustainable financial ecosystem.

1.2 Defining Sustainable Finance: Principles and Practices for SMEs

Sustainable finance represents a transformative approach for Small and Medium Enterprises (SMEs), aligning financial growth with sustainable development goals. This alignment is crucial, as SMEs play a significant role in the global economy, contributing to innovation, employment, and social cohesion. Sustainable finance for SMEs involves integrating environmental, social, and governance (ESG) criteria into financial services and products, which in turn supports sustainable economic growth, reduces environmental impact, and promotes social well-being (Skunca & Pešić, 2023; Zamfiroiu & Pînzaru, 2021).

The principles of sustainable finance are rooted in the broader concept of sustainable development, which seeks to meet the needs of the present without compromising the ability of future generations to meet their own needs. For SMEs, this means adopting practices that are not only economically viable but also environmentally sound and socially responsible. The circular economy, life cycle assessment (LCA), and the United Nations Sustainable Development Goals (SDGs) provide a framework for SMEs to identify environmental hotspots in their value chain and implement mitigation strategies to enhance sustainability and cost-efficiency (Skunca & Pešić, 2023).

However, the application of sustainable finance principles in SMEs faces unique challenges. Unlike large corporations, SMEs often operate with limited resources and may lack the knowledge or capacity to implement comprehensive ESG practices. This gap highlights the need for tailored approaches that consider the specific characteristics and constraints of SMEs. Gönczi (2021) emphasizes that SMEs cannot be judged by the same measures as large enterprises when it comes to CSR practices, due to their inherently different nature, including aspects of financing, functioning, culture, and stakeholder relationships.

To address these challenges, sustainable finance practices for SMEs must be practical, accessible, and aligned with their operational realities. This includes providing financial products and services that incentivize sustainable practices, such as green loans, sustainability-linked bonds, and ESG-focused investment funds. Moreover, fostering partnerships between SMEs, financial institutions, and government bodies can enhance access to sustainable finance, offering SMEs the support needed to navigate the transition towards sustainability (Zamfiroiu & Pînzaru, 2021).

Education and capacity-building are also vital components of sustainable finance for SMEs. By increasing awareness and understanding of sustainable practices, SMEs can better identify opportunities for improvement and innovation within their operations. Financial institutions and policymakers play a crucial role in this process, offering guidance, tools, and resources to help SMEs integrate sustainability into their strategic planning and decision-making processes.

Furthermore, the adoption of digital technologies and fintech solutions can streamline the implementation of sustainable finance practices for SMEs. Digital platforms can facilitate access to finance, improve the efficiency of financial transactions, and enable the collection and analysis of ESG data. This technological advancement supports the development of more transparent, accountable, and sustainable financial ecosystems, where SMEs can thrive and contribute to the broader goals of sustainable development (Skunca & Pešić, 2023).

Sustainable finance for SMEs encompasses a set of principles and practices designed to align financial growth with environmental stewardship, social responsibility, and governance excellence. While challenges exist, the integration of ESG criteria into SME financing offers a pathway towards a more sustainable and inclusive economy. Through tailored financial products, partnerships, education, and technology, SMEs can overcome barriers to sustainability and play a pivotal role in achieving global sustainable development objectives.

1.3 Historical Overview: The Evolution of Sustainable Finance Solutions for SMEs

The evolution of sustainable finance solutions for Small and Medium Enterprises (SMEs) has been a dynamic and multifaceted journey, reflecting broader shifts in the global financial landscape towards sustainability and social responsibility. This historical overview traces the development of sustainable finance, highlighting key milestones and innovations that have shaped the accessibility and impact of financial solutions for SMEs.

The concept of sustainable finance has gained significant traction over the past decades, evolving from niche ethical investment strategies to mainstream financial practices. This shift is exemplified in the sustainable finance landscape in Germany, where a diverse array of stakeholders, including banks, insurance sectors, rating agencies, nonprofits, and academia, have contributed to mainstreaming sustainable finance. EU regulations have played a pivotal role in this transformation, driving change and promoting sustainable finance through new policy initiatives and regulations. The German experience underscores the importance of a collaborative approach among various stakeholders in fostering a sustainable finance ecosystem that supports SMEs.

The emergence of green bonds represents another significant milestone in the evolution of sustainable finance. Initially introduced at the end of the 20th century, green bonds have grown into a crucial instrument for financing sustainable and environmental projects. The development of the green bond market has been influenced by key events, standards, and regulations, highlighting the role of green bonds in mobilizing funds for projects that promote environmental sustainability and combat climate change. This evolution reflects the growing recognition of the importance of sustainable finance in addressing global climate challenges and supporting the Sustainable Development Goals (Bisultanova, 2023).

Throughout this evolution, sustainable finance solutions for SMEs have been characterized by a growing emphasis on ethical and sustainable principles, the development of innovative financial instruments, and the establishment of supportive regulatory frameworks. The transition towards sustainable finance has been driven by the recognition of the critical role of SMEs in economic growth, job creation, and the pursuit of environmental and social objectives. As sustainable finance continues to evolve, it offers SMEs new opportunities to access capital, invest in sustainable practices, and contribute to a more sustainable and inclusive global economy.

The historical evolution of sustainable finance solutions for SMEs underscores the importance of innovation, collaboration, and regulatory support in expanding access to finance. From the mainstreaming of sustainable finance in advanced economies to the development of green bonds and the establishment of DFIs in developing countries, these developments reflect a global shift towards more sustainable and responsible financial practices. As the landscape of sustainable finance continues to evolve, it holds the promise of supporting SMEs in their journey towards sustainability and resilience.

Aim and Objectives of the Study

The primary aim of this study is to explore and analyze the role of sustainable finance in supporting the growth and sustainability of Small and Medium Enterprises (SMEs). It seeks to understand how sustainable finance practices, including the provision of green loans, grants, and other financial instruments, can be effectively utilized to promote environmental, social, and governance (ESG) principles within the SME sector. This study aims to bridge the gap between the growing need for sustainable development and the financial challenges faced by SMEs in transitioning towards more sustainable practices.

The objectives are;

- To Identify the Current Landscape of Sustainable Finance for SMEs.
- To Analyze the Barriers to Accessing Sustainable Finance for SMEs.
- To Evaluate the Impact of Sustainable Finance on SME Growth and Sustainability.

2 Methodology

The methodology of this study is structured to systematically review and analyze the existing literature on sustainable finance for SMEs, focusing on the integration of ESG principles and the impact of digitalization. The approach combines a systematic literature review with content analysis to identify, evaluate, and synthesize relevant research findings.

2.1 Data Sources

The primary data sources for this study included academic journals, industry reports, and policy documents. Databases such as Scopus, Web of Science, Google Scholar, and specific financial databases were accessed to gather comprehensive literature on sustainable finance for SMEs. Additionally, reports from international organizations like the World Bank, IMF, and various sustainable finance networks provided valuable insights into global practices and policy recommendations.

2.2 Search Strategy

A structured search strategy was employed, utilizing a combination of keywords and phrases related to "sustainable finance," "SMEs," "ESG principles," and "digitalization in finance." Boolean operators (AND, OR) were used to refine the search and capture a broad spectrum of relevant literature. The search was limited to documents published in English from 2010 to 2024, to ensure the relevance and timeliness of the data.

2.3 Inclusion and Exclusion Criteria for Relevant Literature

Inclusion criteria were defined to select studies that specifically address sustainable finance in the context of SMEs, including empirical research, theoretical frameworks, case studies, and policy analyses. Excluded were studies focusing solely on large corporations or those not directly addressing the integration of ESG principles or the role of digitalization in sustainable finance.

2.4 Selection Criteria

The selection process involved an initial screening of titles and abstracts to identify potentially relevant studies, followed by a full-text review to ensure alignment with the study's objectives. Priority was given to peer-reviewed articles, comprehensive reports from reputable financial institutions, and studies that provide insights into the impact of sustainable finance on SME growth and sustainability.

2.5 Data Analysis

Content analysis was conducted on the selected literature to extract data on the types of sustainable financial instruments available to SMEs, barriers to access, and the impact of these instruments on SME sustainability. This analysis also focused on identifying trends in digitalization that enhance SMEs' access to sustainable finance. The findings were synthesized to highlight key themes, patterns, and gaps in the literature.

This methodology facilitated a comprehensive understanding of the current landscape of sustainable finance for SMEs, the challenges they face in accessing finance, and the potential of digitalization to improve access and integration of ESG principles.

3 Literature Review

3.1 Conceptual Framework for Sustainable Finance in SMEs

The conceptual framework for sustainable finance in Small and Medium Enterprises (SMEs) is an evolving paradigm that seeks to integrate financial performance with sustainable development goals. This integration is crucial for SMEs, which are pivotal to the global economy, contributing significantly to employment, innovation, and socio-economic development. The framework for sustainable finance in SMEs encompasses various dimensions, including access to finance, awareness of sustainability practices, management skills, and adherence to Environmental, Social, and Governance (ESG) criteria.

Bamata and Phiri (2022) developed a framework to enhance SMEs' capacity to obtain external financing by mapping the entrepreneurial awareness and management abilities with funding provider requirements. Their research highlighted the positive impact of start-up awareness and management skills on SMEs' access to various sources of financing, including government, corporate, and personal/social finance. This framework serves as a foundational model for SMEs to align their financing needs with suitable external finance sources, thereby optimizing their access to capital (Bamata & Phiri, 2022).

In the context of India, Alagpuria (2021) addressed the imminent sustainable financing conditionalities and the necessity for SMEs to adapt to sustainable financing norms and ESG disclosures. The study underscores the importance of early adoption of a sustainable finance framework by SMEs to balance financial requirements with mandatory obligations, benefiting not only the enterprises but also society and the economy at large. This gap analysis on SMEs in India reveals the critical areas interconnecting sustainable financing with UN Sustainable Development Goals (SDGs), emphasizing the need for SMEs to be resilient towards sustainable financing and ESG disclosures (Alagpuria, 2021).

Rao et al. (2022) proposed a conceptual framework identifying sustainable business practices for SMEs, particularly in the context of COVID-19. Their framework outlines macro and micro determinants necessary for designing sustainable business practices, enabling SMEs to navigate uncertain events or shocks. This comprehensive model covers areas such as ethical sensitivity, knowledge sharing intensity, access to ICT, and innovativeness, suggesting an empirical investigation to test the moderating effects of these factors on sustainable performance (Rao et al., 2022).

The conceptual framework for sustainable finance in SMEs is characterized by a multi-faceted approach that integrates financial access, sustainability awareness, and management capabilities with the broader objectives of sustainable development. By adopting this framework, SMEs can enhance their financial viability while contributing to environmental stewardship, social well-being, and good governance. The studies by Bamata and Phiri (2022), Alagpuria (2021), and Rao et al. (2022) collectively contribute to the understanding of sustainable finance in SMEs, offering insights into optimizing access to finance, the importance of ESG disclosures, and the development of sustainable business practices.

The conceptual framework for sustainable finance in SMEs provides a holistic approach to aligning financial strategies with sustainability goals. This framework not only facilitates access to capital but also encourages SMEs to adopt practices that ensure long-term viability and contribute to the global agenda of sustainable development. As the landscape of sustainable finance continues to evolve, these frameworks offer valuable guidance for SMEs to navigate the complexities of integrating financial performance with sustainability objectives.

3.2 Global Overview of Sustainable Finance Practices for SMEs

The global landscape of sustainable finance for Small and Medium Enterprises (SMEs) is undergoing a significant transformation, driven by the increasing recognition of the critical role that SMEs play in achieving sustainable development and combating climate change. This global overview of sustainable finance practices for SMEs highlights the initiatives, challenges, and progress in different regions, emphasizing the importance of sustainable finance in promoting green growth and sustainable development.

In India, sustainable finance has emerged as a key enabler for SMEs, facilitating their transition to green growth. Kadaba, Aithal, & Sharma, (2022) discuss the impact of sustainable finance on MSMEs, highlighting the role of institutions like SIDBI, NITI Aayog, and the World Bank in encouraging businesses to adopt sustainable practices. The study underscores the importance of sustainable finance in addressing climate change's adverse effects, which are projected to reduce India's GDP by nearly 3%. The research emphasizes the need for sustainable finance providers, including banks, corporations, and international financial institutions, to support SMEs in projects related to solar power, renewable energy, waste management, and electric vehicles, aiming for net-zero emissions by 2070 (Kadaba, Aithal, & Sharma, 2022).

The bibliometric overview by Purnomo et al. (2021) maps the international level sustainable finance studies, revealing the most productive countries, institutions, and researchers in the field. The study identifies the United Kingdom and the Rheinisch-Westfalische Technische Hochschule Aachen as leading contributors to sustainable finance research. This overview highlights the convergence of sustainable finance studies around themes such as banking, country-specific policies, finance, sustainability, and policy, offering insights into the body of knowledge generated over three decades of studies (Purnomo et al., 2021).

The Asian Development Bank's report (2023) on Asia's progress toward greater sustainable finance market efficiency and integrity provides an overview of policy and market practices aimed at enhancing transparency and integrity in sustainable finance. The report discusses efforts to align taxonomies and standards across regions, support transition finance, and adopt environmental, social, and governance (ESG) information disclosure requirements. This initiative reflects the growing efforts in Asia to develop a sustainable finance market that is standardized, transparent, and efficient, thereby fostering the market's development and supporting SMEs in their sustainable business practices (Asian Development Bank, 2023).

The global overview of sustainable finance practices for SMEs illustrates the diverse initiatives and progress across regions, highlighting the pivotal role of sustainable finance in supporting SMEs' transition to sustainable business models. The studies by Kadaba, Aithal, & Sharma (2022), Purnomo et al. (2021), and the Asian Development Bank (2023) collectively underscore the importance of sustainable finance in promoting green growth, enhancing market efficiency, and achieving sustainable development goals. As the landscape of sustainable finance continues to evolve, it offers SMEs new opportunities to access capital, invest in sustainable practices, and contribute to a more sustainable and inclusive global economy.

3.3 Financial Instruments and Solutions for Promoting Sustainability in SMEs

The integration of sustainability into the financial strategies of Small and Medium Enterprises (SMEs) is increasingly recognized as a pivotal element for promoting sustainable development. This section explores various financial instruments and solutions that have been developed to support SMEs in their sustainability efforts, highlighting the innovative approaches and the challenges faced in making sustainable finance truly sustainable.

Kadaba, Aithal, & Sharma (2022) discuss the significant role of sustainable finance in promoting green growth and sustainable development among MSMEs. The study highlights the contributions of institutions like SIDBI, NITI Aayog, and the World Bank in facilitating sustainable finance, which encourages businesses to transition from SMEs to large industries. Financial instruments such as climate funds, green bonds, impact finance, and microfinance are identified as key sustainable finance providers. These instruments support projects in solar power, renewable energy, waste management, and electric vehicles, aiming to achieve net-zero emissions by 2070. The study underscores the need for $280 billion for green infrastructure in India, proposing the creation of a Social Stock Exchange and the inclusion of green and sustainable projects under Priority Sector Lending (PSL) to support the green economy's growth (Kadaba, Aithal, & Sharma, 2022).

Broccardo and Mazzuca (2018) offer an alternative perspective on finance by focusing on innovative, sustainable financial instruments such as green bonds (GBs) and social impact bonds (SIBs). GBs are distinguished by their commitment to fund investments with specific environmental impacts, while SIBs represent a sophisticated approach to funding social investments by reallocating risks and responsibilities. The authors propose a conceptual framework for analyzing financial instruments available for financing sustainability, emphasizing the importance of understanding market dynamics and instrument functioning to improve their use. This analysis sheds light on the challenges and opportunities presented by GBs and SIBs in achieving economic goals and contributing to sustainability (Broccardo & Mazzuca, 2018).

Financial instruments and solutions such as climate funds, green bonds, impact finance, and social impact bonds play a crucial role in promoting sustainability within SMEs. The studies by Kadaba, Aithal, & Sharma (2022), and Broccardo and Mazzuca (2018) collectively highlight the innovative approaches and challenges in sustainable finance, offering insights into making sustainable finance a viable and effective tool for SMEs. As the landscape of sustainable finance continues to evolve, these financial instruments and solutions offer SMEs new opportunities to engage in sustainable practices, contributing to a more sustainable and inclusive global economy.

3.4 Case Studies: Success Stories of SMEs Accessing Sustainable Finance

The journey of Small and Medium Enterprises (SMEs) towards accessing sustainable finance is marked by diverse experiences across different regions, showcasing innovative approaches and strategic partnerships. This section delves into case studies that highlight the success stories of SMEs in leveraging sustainable finance to enhance their operations and contribute to sustainable development.

In Indonesia, the study by Imronudin and Hussain (2020) explores the sustainable supply chain finance process, emphasizing its critical role in delivering financing for SMEs. The research highlights the challenges faced by SMEs in accessing external capital and how the concept of sustainable supply chain finance can address these challenges by covering all three aspects of sustainable development: business, environmental, and social. Through in-depth interviews with supply chain managers in Central Java, the study uncovers three major themes: the financing evaluation process, obstacles to accessing Islamic financing, and decision-making. This case study underscores the importance of integrating sustainable supply chain practices into SMEs' operation strategies to improve their worthiness and access to finance.

Kadaba, Aithal, & Sharma (2022) discuss the impact of sustainable finance on MSMEs in India, highlighting the role of institutions like SIDBI, NITI Aayog, and the World Bank in facilitating sustainable finance. The study illustrates how sustainable finance encourages businesses to transition from SMEs to large industries, making a significant global impact. Financial instruments such as climate funds, green bonds, and microfinance are identified as key enablers, supporting projects in renewable energy, waste management, and electric vehicles. This case study exemplifies the transformative power of sustainable finance in promoting green growth and sustainable development among MSMEs.

The case of Danang City in Vietnam, analyzed by L. Hang and Nguyen Son Tung (2019), focuses on supply chain finance for SMEs. The study addresses the liquidity optimization challenges faced by Vietnamese SMEs, emphasizing the importance of financial sustainability in the supply chain. The research highlights the difficulties SMEs encounter in accessing financial sources and establishing long-lasting supply chains, pointing out the underdeveloped fund-raising information infrastructure and the weak connection between buyers and suppliers. This case study offers insights into the potential of supply chain finance in providing stability and sustainable business growth for SMEs.

These case studies from Indonesia, India, and Vietnam illustrate the diverse pathways through which SMEs can access sustainable finance, overcoming challenges and leveraging opportunities for growth and sustainability. The experiences of SMEs in these regions highlight the critical role of sustainable supply chain finance, institutional support, and innovative financial instruments in enabling SMEs to contribute to sustainable development goals. As the landscape of sustainable finance continues to evolve, these success stories offer valuable lessons and inspiration for SMEs worldwide in their pursuit of sustainability and financial viability.

3.5 Barriers to Accessing Sustainable Finance for SMEs and Mitigation Strategies

The quest for sustainable finance is a critical pathway for Small and Medium Enterprises (SMEs) aiming to integrate sustainability into their business models. However, SMEs face numerous barriers in accessing sustainable finance, which can impede their growth and sustainability efforts. This section explores the barriers to accessing sustainable finance for SMEs and proposes mitigation strategies, drawing insights from recent studies.

Gumel and Bardai (2021) highlight the challenges faced by Nigerian SMEs in accessing financial institutions' funding. Despite the socio-economic importance of SMEs, their growth is often hampered by difficulties in accessing external capital. Financial resources, a critical success factor for SMEs, are hard to come by due to various barriers imposed by financial institutions. The study identifies the need for policy reforms and strategic interventions to facilitate SMEs' access to finance, emphasizing the role of government and financial institutions in developing entrepreneurship and small businesses (Gumel & Bardai, 2021).

Chien et al. (2021) assess the mechanism of barriers towards green finance and public spending in SMEs from developed countries. The study examines the financial opportunities for SMEs in the United Arab Emirates to adopt green innovation methods, identifying significant hurdles, sub-barriers, and strategies to overcome impediments to green innovation. The research suggests that financial investment levels are the most significant barriers to SMEs adopting green practices. It proposes using research methodologies to provide green innovation in SMEs as the best strategy to overcome these barriers, thereby enhancing their economic contributions (Chien et al., 2021).

Hossain et al. (2023) propose two alternative financing models for SMEs to address borrowing constraints. The first model involves institutional mechanisms with the government, banks, and SMEs to enhance the supply of loanable funds and identify good SME borrowers through skills development programs. This approach aims to reduce default risk and allow banks to offer lower-interest and collateral-free credit to SMEs. The second model extends to accommodate digital finance, using a data-driven credit risk score to reduce banks' default risks and transaction costs. These models, based on a public-private partnership approach, offer viable solutions to the borrowing constraints of SMEs, supporting their access to finance and performance improvement (Hossain et al., 2023).

The barriers to accessing sustainable finance for SMEs are multifaceted, ranging from financial institutions' stringent requirements to the lack of awareness and skills among SMEs. The studies by Gumel and Bardai (2021), Chien et al. (2021), and Hossain et al. (2023) provide valuable insights into these challenges and offer mitigation strategies that involve policy reforms, green innovation, and alternative financing models. These strategies are crucial for enabling SMEs to overcome barriers to sustainable finance, thereby supporting their growth, sustainability efforts, and contribution to sustainable development goals.

3.6 Emerging Trends in Sustainable Finance for SMEs

Emerging trends in sustainable finance for SMEs are increasingly characterized by innovative financing models and the pivotal role of digitalization. This evolution is not only reshaping the landscape of financial services but also offering new pathways for SMEs to engage with sustainable finance. The integration of FinTech, InsurTech, and blockchain technologies is at the forefront of this transformation, enabling more efficient, transparent, and accessible financial solutions for SMEs (Puschmann & Leifer, 2020). These digital innovations are bridging gaps in traditional financial systems, offering SMEs novel approaches to funding that align with their sustainability goals.

The digital finance revolution, often termed the "FinTech Revolution," is changing the financial services industry through innovative solutions developed by startups and Big Tech companies. This revolution is crucial for sustainability, as the financial sector is a key pillar of all economic transactions, including those related to sustainable development. Innovative examples range from digital supply chain finance that bridges Western and African as well as Asian countries, to digital currency-fueled smart meters for schools in Africa, and digital investment marketplaces for forest tokens. These innovations are changing how financial resources can be accessed, distributed, and managed, indicating a significant emerging interest in the intersection of sustainability and digital finance (Puschmann & Leifer, 2020).

Comparative studies of SME finance models, such as those in the US, Japan, and Europe, reveal the importance of institutionalizing SMEs and developing appropriate financing tools to support sustainable development goals (SDGs). For countries like Bangladesh, which aims to transition to a high-income economy while achieving the SDGs, adopting and adapting these models to local contexts is crucial. The study by Kamrul (2018) suggests that understanding and implementing best practices from these models can provide valuable insights for enhancing SME access to sustainable finance, thereby contributing to economic growth and sustainability.

The platformization of finance, marked as FinTech 4.0, which began around 2019-2020, brings massive benefits and a range of risks to sustainable development. This new phase is characterized by the combination of digitization, new entrants (especially BigTechs), and the emergence of large digital finance platforms. These platforms are increasingly pursuing economies of scope and scale typical of finance and the network effects typical of data. However, the platformization of finance poses challenges for societies and regulators worldwide, necessitating new approaches to maximize the benefits of digital finance while monitoring and controlling the risks associated with its platformization (Arner et al., 2021).

Digital financial services are becoming increasingly important for SMEs, especially in emerging economies where access to traditional financial services is limited. The study by Siddiqui and Khan (2018) on SMEs in South Punjab, Pakistan, highlights the positive relationship between SME owners and managers' intentions towards the use and adoption of digital financial services. This adoption is crucial for SMEs to perform significant roles in national financial regulation systems, job creation, and contributing to innovation in financial regulation. Digital financial services, provided by microfinance institutions and other financial entities, offer a platform for inclusive finance and financial literacy, supporting economic growth and ecological sustainability.

The emerging trends in sustainable finance for SMEs, characterized by innovative financing models and the role of digitalization, present both opportunities and challenges. The integration of FinTech, InsurTech, and blockchain technologies offers new pathways for SMEs to access sustainable finance. Comparative studies of SME finance models provide insights into best practices that can be adapted to local contexts to support sustainable development goals. However, the platformization of finance necessitates new regulatory approaches to balance the benefits and risks associated with digital finance. As SMEs increasingly turn to digital financial services, understanding and facilitating their access to these services will be crucial for economic growth and sustainability.

3.6.1 Innovative Financing Models and Platforms

In the evolving landscape of sustainable finance, Small and Medium Enterprises (SMEs) are increasingly benefiting from innovative financing models and digital platforms. These developments are not only enhancing access to finance but are also aligning financial flows with sustainable development goals. This paper explores the emergence of these models and platforms, focusing on their implications for SMEs.

Hossain, Yoshino, and Tsubota (2023) propose two alternative financing models aimed at improving SMEs' access to finance. The first model suggests a collaborative approach involving the government, banks, and SMEs, where the government enhances the supply of loanable funds to banks and identifies credible SME borrowers through skill development programs. This approach is designed to reduce default risks and enable banks to offer lower-interest and collateral-free credit to SMEs, thereby fostering their growth and sustainability. The second model extends this approach to digital finance, utilizing data-driven credit risk scores to further reduce banks' default risks and transaction costs. These models, grounded in public-private partnerships, offer a blueprint for overcoming the borrowing constraints of SMEs, demonstrating the potential of innovative financing mechanisms to support SME sustainability (Hossain et al., 2023).

The impact of the COVID-19 pandemic on SMEs in Europe underscores the importance of innovative financing models. Gechbaia, Panchenko, & Rudukha (2018) highlights how the pandemic has exacerbated the financial vulnerabilities of SMEs, with many struggling to access traditional loans due to a lack of credit history or collateral. In response, businesses have turned to alternative sources of innovative financing, including digital platforms. The proliferation of these platforms across Europe reflects a significant shift towards alternative lending, offering SMEs new avenues for funding. The diversity in the financial landscape across European countries, from traditional banking institutions to digital loans, illustrates the varied approaches to SME financing and the growing role of innovative models in facilitating business resilience and recovery (Gechbaia, Panchenko, & Rudukha, 2018).

Reza-Gharehbagh et al. (2022) delve into the role of multi-sided FinTech platforms in supporting sustainable supply chain finance. They explore how these platforms offer a combination of equity and debt financing to SMEs, enabling the development of green and non-green products. The study emphasizes the importance of government intervention in creating a regulatory environment that supports green entrepreneurship through digital platforms. By balancing economic influence with social welfare priorities, governments can foster a conducive ecosystem for sustainable supply chain finance, highlighting the critical role of digital platforms in promoting green entrepreneurship among SMEs (Reza-Gharehbagh et al., 2022).

Innovative financing models and digital platforms are playing a pivotal role in transforming the financial landscape for SMEs. By facilitating access to sustainable finance, these developments are enabling SMEs to pursue growth and sustainability goals more effectively. The collaborative models proposed by Hossain et al. (2023), the adaptation to innovative financing in the wake of the pandemic as discussed by Gechbaia, Panchenko, & Rudukha (2018), and the support for green entrepreneurship through digital platforms explored by Reza-Gharehbagh et al. (2022) collectively underscore the dynamic interplay between finance, technology, and sustainability. As these trends continue to evolve, they offer promising pathways for SMEs to navigate the challenges of sustainable development in an increasingly digital world.

3.6.2 The Role of Digitalization in Enhancing Access to Sustainable Finance

The digital era has ushered in transformative changes across various sectors, with the financial industry being one of the most impacted. For Small and Medium Enterprises (SMEs), digitalization has emerged as a pivotal force in enhancing access to sustainable finance. This paper explores the role of digitalization in facilitating SMEs' access to finance, focusing on the implementation of digital channels, the impact of financial literacy and digital finance on SME performance, and the potential of blockchain technology in mitigating financing challenges.

Akhundzada and Rzayeva (2023) investigate the implementation of digital channels in business processes and their impact on access to finance for SMEs in Azerbaijan. Their study highlights the accelerated adoption of online services by firms following the COVID-19 pandemic, despite the existing challenges in digital technology adoption among the population and entrepreneurs. Through time series regression analysis, they establish a positive relationship between digitalization, exemplified by e-commerce, and the allocation of credit funds to SMEs. This finding underscores the significance of digital channels in improving financial inclusion for SMEs, although the authors also suggest the presence of other contributing factors to financial access (Akhundzada & Rzayeva, 2023).

Frimpong, Agyapong, and Agyapong (2022) delve into the relationship between financial literacy, access to digital finance, and the performance of SMEs in Ghana. Their study reveals that SMEs predominantly utilize mobile money over other digital platforms, indicating a preference for accessible and user-friendly digital financial services. The research further demonstrates that financial literacy significantly enhances access to digital finance, which in turn improves SME performance. This causal relationship is mediated by access to digital finance, suggesting that digital platforms play a crucial role in bridging the gap between financial literacy and SME performance. The authors advocate for improved advertising and user-friendliness of digital trading platforms to boost business performance (Frimpong et al., 2022).

Vijayakumar (2021) explores the potential of blockchain technology in alleviating the information asymmetry problems faced by SMEs and improving their access to finance. The study posits that the decentralized, immutable, and transparent nature of blockchain technology can reduce information asymmetry between SMEs and financing parties, making SMEs more credible to banks and investors. By providing a more transparent overview of businesses' operational information and financial conditions, blockchain technology can effectively reduce the cost of equity and bond financing for SMEs, addressing their financing difficulties in the big data era (Vijayakumar, 2023).

Digitalization plays a critical role in enhancing SMEs' access to sustainable finance. The implementation of digital channels, the importance of financial literacy and digital finance, and the innovative application of blockchain technology collectively contribute to overcoming the traditional barriers to financing faced by SMEs. As digital platforms continue to evolve, they offer promising avenues for SMEs to secure the financial resources necessary for sustainable growth and development (Awonuga et al., 2024; Okoye et al., 2023; Raji et al., 2023)).

4 Detailed Discussion and Analysis

4.1 Comparative Analysis of Global Practices in Providing SMEs Access to Sustainable Finance

The global landscape of sustainable finance for Small and Medium Enterprises (SMEs) is marked by diverse practices and regional variations. This comparative analysis delves into the global practices of providing SMEs access to sustainable finance, highlighting regional variations and best practices.

Stoika, Stoika, and Harnyk (2023) explore the innovative aspects of economic development for SMEs in the European Union and Ukraine, emphasizing the significance of technological re-equipment and investment activity for sustainable growth. The study identifies challenges in implementing innovations within the SME sector, including the low interest of the financial sector in financing small and microenterprises and underdeveloped mechanisms for cross-sectoral capital flows. The comparative analysis suggests that overcoming these obstacles is crucial for enhancing the competitiveness of national economies and SMEs in global markets (Stoika et al., 2023).

The comparative analysis of global practices in providing SMEs access to sustainable finance reveals significant regional variations and the necessity for tailored approaches to address specific challenges and leverage opportunities. The integration of sustainability into business practices, the importance of technological re-equipment and investment activity, and the strategic leverage of CSR practices emerge as key themes. These findings underscore the importance of adopting best practices and innovative solutions to enhance the access of SMEs to sustainable finance, thereby contributing to global sustainable development goals.

4.2 The Role of Policy and Regulatory Frameworks in Supporting Sustainable Finance for SMEs

The role of policy and regulatory frameworks in supporting sustainable finance for Small and Medium Enterprises (SMEs) is increasingly recognized as pivotal for economic sustainability and environmental stewardship. This analysis explores the impact of such frameworks in Serbia, Malaysia, and Indonesia, highlighting the importance of government support in facilitating access to sustainable finance for SMEs.

In Serbia, Kvrgić, Milosevic, and Ćorić examine the SME ecosystem and the support provided by banking finance. They note the liquidity crisis that threatened to evolve into a solvency crisis for many SMEs, exacerbated by the COVID-19 pandemic. The Serbian government's intervention, particularly in providing access to banking loans, played a crucial role in preventing a spike in bankruptcies. The study underscores the effectiveness of policy approaches that support SMEs without overburdening them with debt, emphasizing the need for improved service models enabled by technology and new propositions as clients. This approach not only aids in the survival of SMEs but also contributes to the national economy by creating more lucrative returns (Kvrgić et al., 2021).

In Malaysia, Razali, Hassan, and Mohd Zain explore the development of the regulatory framework for sustainable finance, highlighting the proactive role of Malaysian regulatory bodies in promoting the sustainable agenda through the capital market, banking, and takaful sectors. The introduction of this framework serves as a guide for industry players to participate in sustainable investment, acting as a driving force for Environmental, Social, and Governance (ESG) institutional investors. The study provides insight into the historical development of Malaysia's sustainable finance regulatory framework, emphasizing its significance in reshaping the ESG development landscape (Razali et al., 2022).

In Indonesia, Siregar, Rusiadi, and Efendi examine the green financial policy framework at Bank Indonesia, emphasizing its importance in supporting sustainable finance and development. Despite being relatively new, the green financial policy framework is integral to sustainable development, offering cheaper and more environmentally friendly financing options that can reduce air pollution. The study highlights the role of descriptive methods in analyzing the green policy framework, demonstrating the potential of such policies in facilitating sustainable development (Siregar et al., 2022).

These studies collectively illustrate the critical role of policy and regulatory frameworks in supporting sustainable finance for SMEs. By facilitating access to finance, these frameworks not only ensure the survival and growth of SMEs but also contribute to the broader goals of economic sustainability and environmental protection. The experiences of Serbia, Malaysia, and Indonesia offer valuable lessons on the importance of government intervention, the development of regulatory frameworks, and the potential of green finance policies in supporting sustainable development.

4.3 Stakeholder Perspectives: Financial Institutions, Governments, and SMEs

The discourse on sustainable finance for Small and Medium Enterprises (SMEs) is increasingly pivotal, given the urgent need for a transition to more sustainable economic practices. This transition is not only a matter of environmental necessity but also a significant opportunity for SMEs to innovate, grow, and contribute to the Sustainable Development Goals (SDGs). Stakeholder perspectives, including those of financial institutions, governments, and SMEs themselves, play a crucial role in shaping the landscape of sustainable finance.

Financial institutions are at the forefront of this transformation, offering various financial instruments to support SMEs in their sustainable endeavors. Santoso (2020) highlights the critical role of Islamic Financial Institutions (IFIs) in supporting SMEs towards achieving the SDGs, including poverty alleviation, economic growth, and industrial innovation. The study underscores the importance of financial literacy and government support in enhancing SMEs' access to sustainable finance. The findings suggest that while the intention of SMEs to access finance from IFIs is currently low, there is potential for growth if appropriate strategies, such as improving financial literacy and regulatory support, are implemented.

Moreover, the broader financial sector's engagement with sustainability issues is evolving. Haigh (2011) discusses the institutional and policy connections between financing and investment activities and their implications for sustainability. The journal emphasizes the need for an interdisciplinary approach to understand and harness capital markets for societal and ecological betterment. This perspective is crucial for financial institutions seeking to offer sustainable finance options to SMEs, as it calls for a reevaluation of investment principles to align with sustainability goals.

The banking sector, in particular, has a significant role in facilitating SMEs' participation in sustainable markets. Raji et al. (2023) provide an in-depth review of financial instruments available to SMEs in the cleaner vehicles market, a sector with high environmental impact and potential for sustainable innovation. The study identifies credit facilities, loans, grants, and other forms of financial assistance as key enablers for SMEs. However, it also points out the challenges SMEs face, including the need for tailored financial products and cooperative strategies between banks and SMEs. The research emphasizes the necessity of supportive policies and a more collaborative approach to ensure a successful transition towards sustainability.

Government policies and incentives are pivotal in creating an enabling environment for sustainable finance. By implementing supportive regulations, providing incentives for sustainable investments, and enhancing financial literacy among SMEs, governments can significantly influence the accessibility and effectiveness of sustainable finance. The collaboration between governments and financial institutions is essential to develop and promote financial products that meet the specific needs of SMEs aiming to engage in sustainable practices.

From the perspective of SMEs, access to sustainable finance is often hampered by a lack of awareness and understanding of available financial instruments and the benefits of engaging in sustainable practices. SMEs require not only financial support but also guidance and knowledge sharing to navigate the complexities of sustainable finance. Engaging with SMEs to understand their needs, preferences, and feedback is crucial for financial institutions and governments to tailor their strategies and policies effectively.

The stakeholder perspectives of financial institutions, governments, and SMEs are interlinked and essential for advancing sustainable finance. Financial institutions play a key role in offering suitable financial instruments, while governments are responsible for creating a supportive policy framework. SMEs, for their part, need to be proactive in seeking out sustainable finance options and engaging in sustainable practices. The collective efforts of these stakeholders are crucial for achieving a sustainable future, where SMEs can thrive while contributing to the broader goals of environmental sustainability and social well-being.

4.3.1 Financial Institutions: Strategies for Offering Sustainable Finance

The strategic role of financial institutions in offering sustainable finance to Small and Medium Enterprises (SMEs) is pivotal for promoting green growth and sustainable development. These institutions have developed various strategies to align their financial products and services with the principles of environmental sustainability, economic viability, and social equity. The strategies employed by financial institutions to offer sustainable finance are multifaceted, encompassing green bonds, sustainable finance schemes, and green financing, each playing a crucial role in supporting SMEs' transition towards sustainability.

Kadaba, Aithal, & Sharma (2022) discuss the significant impact of sustainable finance on MSMEs, highlighting the role of banks, corporations, and international financial institutions in facilitating this transition. The study emphasizes the importance of financial instruments such as climate funds, green bonds, impact finance, and microfinance in promoting green growth. Specifically, the Small Industries Development Bank of India (SIDBI), in collaboration with NITI Aayog and the World Bank, has been instrumental in providing sustainable finance schemes that encourage businesses to evolve from SMEs to large industries. This approach not only supports the economic growth of SMEs but also contributes to the global effort to mitigate climate change's adverse effects, underscoring the necessity of sustainable finance in achieving Net Zero Emissions by 2070 (Kadaba, Aithal, & Sharma ,2022).

Versal and Sholoiko (2022) explore the role of green bonds issued by supranational financial institutions as a strategy for sustainable development. Green bonds have emerged as a crucial financial instrument, enabling the funding of projects that contribute to renewable energy, energy efficiency, and clean transportation. The World Bank and the European Bank for Reconstruction and Development (EBRD) have been at the forefront of issuing green bonds, demonstrating a positive trend in their issuance and the implementation of green projects. This strategy not only facilitates the transition to a low-carbon economy but also supports SMEs in accessing finance for sustainable projects, highlighting the significance of green bonds in the broader context of sustainable finance (Versal & Sholoiko, 2022).

Furthermore, Zheng et al. (2021) investigate the dimensions of green finance and their effects on the sustainability performance of financial institutions in Bangladesh. The study reveals that private commercial banks have been the highest contributors to green financing, significantly impacting the economic, social, and environmental aspects of the Sustainable Development Goals (SDGs). The dimensions of green finance—social, economic, and environmental—have a strong positive effect on the sustainability performance of banks, indicating that green financing is an essential element in the development of banking strategies. This finding underscores the importance of green finance in enhancing the sustainability performance of financial institutions and, by extension, supporting SMEs in their sustainable development efforts (Zheng et al., 2021).

The strategies employed by financial institutions to offer sustainable finance to SMEs are critical in promoting green growth and sustainable development. Through the provision of financial instruments such as green bonds, sustainable finance schemes, and green financing, these institutions play a vital role in facilitating SMEs' transition towards sustainability. The collaborative efforts of banks, corporations, international financial institutions, and governments are essential in creating an enabling environment for sustainable finance, ultimately contributing to the achievement of the SDGs and the global effort to combat climate change.

4.3.2 Government Policies and Incentives to Promote Sustainable Finance

Government policies and incentives play a crucial role in promoting sustainable finance, particularly for Small and Medium Enterprises (SMEs). These policies and incentives are designed to encourage SMEs to adopt sustainable practices by providing financial support, reducing barriers to access finance, and creating a conducive environment for green growth. The effectiveness of these policies and incentives is evident in various countries, where they have significantly impacted SMEs' ability to contribute to sustainable development and green growth.

Kadaba, Aithal, & Sharma, (2022) highlight the significant role of government initiatives in India, such as the SIDBI Sustainable Finance Scheme and the Priority Sector Lending (PSL) guidelines, which aim to support SMEs in their transition to green and sustainable practices. These initiatives are part of a broader strategy to promote green growth and sustainable development by providing financial support to SMEs involved in projects related to renewable energy, waste management, and energy conservation. The Indian government's commitment to achieving Net Zero Emissions by 2070 and its pledge during the Climate Summit in Glasgow underscore the importance of sustainable finance in the country's economic and environmental strategies. The study emphasizes that such government-led initiatives can make a substantial impact on SMEs by facilitating access to sustainable finance and encouraging the adoption of green practices (Kadaba, Aithal, & Sharma, 2022).

Kumar and Kumar (2023) discuss the role of environmental protection laws and policies in fostering sustainable green development. The study introduces the Environmental Regulations-based Sustainable Green Development (ER-SGD) strategy, which uses environmental regulation as a moderator to explore the influence of political competitions on the efficacy of green development. This approach underscores the importance of government policies in optimizing energy savings, reducing emissions, and promoting business technology R&D. By implementing policies that align with Sustainable Development Goals (SDG) performance, governments can leverage budgets as effective tools to drive sustainable finance and green development, highlighting the critical role of public policy in achieving sustainable development objectives (Kumar, P., & Kumar, S., 2023).

Bayram et al. (2022) provide insights into how fintech solutions, supported by government policies, can promote sustainable finance in emerging market economies, using Turkey as a case study. The Turkish government's efforts to increase financial inclusivity for underbanked individuals and SMEs through fintech solutions have shown remarkable progress. These initiatives include providing contactless payment systems, microfinance by mobile carriers, and online platforms, which have been instrumental in promoting the responsible consumption goal for sustainable development. The study suggests that with the upcoming developments in the sandbox environment in Istanbul Financial Center, fintech solutions utilizing Big Data, AI, and blockchain could emerge much faster. This would be facilitated by collaboration between the banking and fintech sectors and regulatory institutions, further enhancing the assessment of climate-related financial risks and forming a national carbon trading mechanism (Bayram, O., Talay, I., & Feridun, M., 2022).

Government policies and incentives are pivotal in promoting sustainable finance for SMEs. By providing financial support, facilitating access to sustainable finance, and creating a conducive environment for green growth, governments can significantly influence SMEs' ability to contribute to sustainable development. The examples from India, the strategic approach towards environmental protection laws, and the integration of fintech solutions in Turkey illustrate the diverse ways in which government policies and incentives can impact the promotion of sustainable finance for SMEs.

4.3.3 SMEs: Needs, Preferences, and Feedback on Access to Sustainable Finance

The discourse on sustainable finance for Small and Medium Enterprises (SMEs) is increasingly pivotal, given the urgent need for a transition to more sustainable economic practices. This transition is not only a matter of environmental necessity but also a significant opportunity for SMEs to innovate, grow, and contribute to the Sustainable Development Goals (SDGs). Stakeholder perspectives, including those of financial institutions, governments, and SMEs themselves, play a crucial role in shaping the landscape of sustainable finance.

Financial institutions are at the forefront of this transformation, offering various financial instruments to support SMEs in their sustainable endeavors. Santoso (2020) highlights the critical role of Islamic Financial Institutions (IFIs) in supporting SMEs towards achieving the SDGs, including poverty alleviation, economic growth, and industrial innovation. The study underscores the importance of financial literacy and government support in enhancing SMEs' access to sustainable finance. The findings suggest that while the intention of SMEs to access finance from IFIs is currently low, there is potential for growth if appropriate strategies, such as improving financial literacy and regulatory support, are implemented.

Moreover, the broader financial sector's engagement with sustainability issues is evolving. Haigh (2011) discusses the institutional and policy connections between financing and investment activities and their implications for sustainability. The journal emphasizes the need for an interdisciplinary approach to understand and harness capital markets for societal and ecological betterment. This perspective is crucial for financial institutions seeking to offer sustainable finance options to SMEs, as it calls for a reevaluation of investment principles to align with sustainability goals.

The banking sector, in particular, has a significant role in facilitating SMEs' participation in sustainable markets. Raji et al. (2023) provide an in-depth review of financial instruments available to SMEs in the cleaner vehicles market, a sector with high environmental impact and potential for sustainable innovation. The study identifies credit facilities, loans, grants, and other forms of financial assistance as key enablers for SMEs. However, it also points out the challenges SMEs face, including the need for tailored financial products and cooperative strategies between banks and SMEs. The research emphasizes the necessity of supportive policies and a more collaborative approach to ensure a successful transition towards sustainability.

Government policies and incentives are pivotal in creating an enabling environment for sustainable finance. By implementing supportive regulations, providing incentives for sustainable investments, and enhancing financial literacy among SMEs, governments can significantly influence the accessibility and effectiveness of sustainable finance. The collaboration between governments and financial institutions is essential to develop and promote financial products that meet the specific needs of SMEs aiming to engage in sustainable practices.

From the perspective of SMEs, access to sustainable finance is often hampered by a lack of awareness and understanding of available financial instruments and the benefits of engaging in sustainable practices. SMEs require not only financial support but also guidance and knowledge sharing to navigate the complexities of sustainable finance. Engaging with SMEs to understand their needs, preferences, and feedback is crucial for financial institutions and governments to tailor their strategies and policies effectively.

The stakeholder perspectives of financial institutions, governments, and SMEs are interlinked and essential for advancing sustainable finance. Financial institutions play a key role in offering suitable financial instruments, while governments are responsible for creating a supportive policy framework. SMEs, for their part, need to be proactive in seeking out sustainable finance options and engaging in sustainable practices. The collective efforts of these stakeholders are crucial for achieving a sustainable future, where SMEs can thrive while contributing to the broader goals of environmental sustainability and social well-being.

5 Conclusions

The study has illuminated the pivotal role of sustainable finance in supporting SMEs across various global contexts. Key findings reveal that both developed and emerging economies are increasingly recognizing the importance of integrating environmental, social, and governance (ESG) criteria into financial services. Financial institutions, governments, and SMEs themselves are crucial stakeholders in this ecosystem. Innovative financial instruments, such as green bonds, sustainability-linked loans, and ESG-focused investment funds, have emerged as key enablers for SMEs to pursue sustainable growth. However, the study also identifies significant barriers, including a lack of awareness among SMEs about sustainable finance options, the perceived high costs of transitioning to sustainable practices, and a complex regulatory landscape.

The future of sustainable finance for SMEs appears promising, with several trends indicating a shift towards more inclusive and environmentally conscious financial practices. Digitalization and fintech innovations are expected to play a significant role in democratizing access to sustainable finance, offering SMEs more tailored and accessible financial products. Furthermore, the increasing emphasis on climate change and social equity is likely to drive more investors and financial institutions to incorporate ESG criteria into their decision-making processes. This shift is anticipated to create a more favorable environment for SMEs to access finance that supports sustainable development goals.

To enhance SME access to sustainable finance, the study recommends a multi-faceted approach involving policy reforms, financial innovation, and capacity building. Governments should consider implementing clear regulatory frameworks and incentives that encourage both financial institutions and SMEs to engage in sustainable practices. This could include tax incentives, grant schemes, and subsidized loans for SMEs undertaking sustainable projects. Financial institutions are encouraged to develop more SME-friendly products that align with sustainability criteria, supported by digital platforms that simplify the application and management process. Additionally, capacity-building initiatives are crucial to educate SMEs on the benefits of sustainable finance and how to integrate sustainability into their business models effectively.

This study underscores the critical importance of sustainable finance in enabling SMEs to contribute to a more sustainable and equitable global economy. While significant progress has been made, there remains a vast potential for growth and innovation in this area. Future research should focus on exploring the impact of digital finance solutions on SME access to sustainable finance, the role of public-private partnerships in facilitating sustainable projects, and the long-term effects of sustainable finance on SME competitiveness and resilience. Additionally, comparative studies across different regions and sectors could provide deeper insights into best practices and challenges in implementing sustainable finance for SMEs.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Akhundzada, N., & Rzayeva, I. (2023). The Implementation of Digital Channels in Business Processes and Access to Finance for MSMES in Azerbaijan. Agora International Journal of Economical Sciences, 17(2), 1-9. DOI: 10.15837/aijes.v17i2.6435

[2] Alagpuria, M. (2021). Sustainable financing for the entrepreneurship continual growth: A gap analysis on small and medium enterprises in India. Virtual Economics, 4(2), 104-119. DOI: 10.34021/ve.2021.04.02(6)

[3] Arner, D. W., Buckley, R. P., Charamba, K., Sergeev, A., & Zetzsche, D. A. (2022). Bigtech and platform finance: Governing fintech 4.0 for sustainable development. Fordham Journal of Corporate and Financial Law. DOI: 10.2139/ssrn.3915275

[4] Awonuga K. F., Nwankwo E. E., Oladapo J. O., Okoye C. C., Odunaiya O. G, and Uzondu C. S. (2024). Driving sustainable growth in SME manufacturing: The role of digital transformation, project, and capture management. International Journal of Science and Research Archives (IJSRA). DOI: https://doi.org/10.30574/ijsra.2024.11.1.0270

[5] Bamata, N. H., & Phiri, M. A. (2022). Optimizing access to external finance by small and medium-sized enterprise start-ups: Towards the development of a conceptual framework. Journal of Governance and Regulation/Volume, 11(1). https://dx.doi.org/10.22495/jgrv11i1art12.

[6] Bayram, O., Talay, I., and Feridun, M. (2022). Can Fintech Promote Sustainable Finance? Policy Lessons from the Case of Turkey. Sustainability, 14(19), 12414. https://dx.doi.org/10.3390/su141912414

[7] Bialus, D., Tam, L., Nguyen, T. T. H., & Minh, C. H. (2022). Financial Access of Women-Owned Small and Medium-Sized Enterprises in VietNam. https://dx.doi.org/10.22617/wps220612-2

[8] Bisultanova, A. (2023). Green” bonds: historical aspects of implementation. In E3S Web of Conferences, Vol. 458, p. 05013. EDP Sciences. DOI: 10.1051/e3sconf/202345805013

[9] Broccardo, E., & Mazzuca, M. (2018). An alternative way to think of finance: the case of innovative, sustainable financial instruments. In Research Handbook of Investing in the Triple Bottom Line, pp. 185-211. Edward Elgar Publishing. DOI: 10.4337/9781788110006.00017

[10] Chien, F., Ngo, Q. T., Hsu, C. C., Chau, K. Y., & Iram, R. (2021). Assessing the mechanism of barriers towards green finance and public spending in small and medium enterprises from developed countries. Environmental Science and Pollution Research, 28(43), 60495-60510. DOI: 10.1007/s11356-021-14907-1

[11] Ewuraba. N.A. (2023). Review on the Impact of Financial Institutions’ Systems on SMEs’ Access to Finance. Central European Management Journal, 31(2), 304-310. DOI: 10.57030/23364890.cemj.31.2.35

[12] Frimpong, S. E., Agyapong, G., & Agyapong, D. (2022). Financial literacy, access to digital finance and performance of SMEs: Evidence from Central region of Ghana. Cogent Economics & Finance, 10(1), 2121356. DOI: 10.1080/23322039.2022.2121356

[13] Gechbaia, B. A. D. R. I., Panchenko, Y., & Rudukha, N. (2018). Global determinants and models of innovations financing. International Economic Policy, (1), 7-32.

[14] Gönczi, J. (2021). Features of Sustainable Development at the Level of SMEs. The Annals of the University of Oradea. Economic Sciences, 30(2nd). https://dx.doi.org/10.47535/1991auoes30(2)015.

[15] Gumel, B. I., & Bardai, B. B. (2021). Barriers to accessing financial institutions funding for Nigerian SMEs. Babandi Ibrahim Gumel, Barjoyal Bin Bardai. Barriers to Accessing Financial Institutions Funding for Nigerian SMEs. International Journal of Business and Economics Research, 10(6), 219-226. DOI: 10.11648/j.ijber.20211006.12.

[16] Haigh, M. (2011). The Journal of Sustainable Finance & Investment. Journal of Sustainable Finance & Investment, 1(1), 3-4. https://dx.doi.org/10.3763/jsfi.2010.0001

[17] Hossain, M., Yoshino, N., & Tsubota, K. (2023). Sustainable Financing Strategies for the SMEs: Two Alternative Models. Sustainability, 15(11), 8488. DOI: 10.3390/su15118488

[18] Hossain, M., Yoshino, N., & Tsubota, K. (2023). Sustainable Financing Strategies for the SMEs: Two Alternative Models. Sustainability, 15(11), 8488. https://dx.doi.org/10.3390/su15118488

[19] Imronudin, I., & Hussain, J. (2020). Sustainable supply chain finance process in delivering financing for SMEs: the case of Indonesia. International Journal of Supply Chain Management, 9, 867-878.

[20] Kadaba, M. K., Aithal, P. S., & K.R.S. (2022). Impact of Sustainable Finance on MSMEs and other Companies to Promote Green Growth and Sustainable Development. International Journal of Applied Engineering and Management Letters (IJAEML), 6(1), 60-76. https://dx.doi.org/10.47992/ijaeml.2581.7000.0120

[21] Kamrul, H. A. (2018). SME Finance: A Comparative Study of European, Japan and US Model: What Bangladesh should do to Achieve Sustainable Development Goal 9?. International Journal of Business and Social Science, 9(12), 18-26. DOI: 10.30845/IJBSS.V9N12P3

[22] Khan, S. J. M., & Anuar, A. R. (2018). Access to finance: Exploring barriers to entrepreneurship development in SMEs. In Global Entrepreneurship and New Venture Creation in the Sharing Economy, pp. 92-111. IGI Global. https://dx.doi.org/10.4018/978-1-5225-2835-7.CH006

[23] Koraliev, T., & Oblomurodov, N. (2014). Growth of SME Sector and Ways of Improving Access to Financial Services in Uzbekistan. European Journal of Business and Economics, 9(1), https://dx.doi.org/10.12955/ejbe.v9i1.433

[24] Kumar, P., & Kumar, S. (2023). Research on Environmental Protection Laws and Policies for Sustainable Green Development. Journal of Law and Sustainable Development, 11(6), e1189-e1189. https://dx.doi.org/10.55908/sdgs.v11i6.1189

[25] Kvrgić, G., Milošević, D., & Ćorić, G. (2021). SMEs ecosystem and banking finance support in Serbia. Ekonomika, 67(2), 35-46. DOI: 10.5937/ekonomika2102035k

[26] **Okoye C. C.,** Nwankwo D. O., Okeke N. M., Nwankwo E. E., Eze S. U., (2023). Electronic commerce and sustainability of SMEs in Anambra State, Malaysian E Commerce Journal (MECJ), https://myecommerecejournal.com/archives/mecj-01-2023-32-41/

[27] Purnomo, A., Sari, A. K., Susanti, T., Mannan, S. S. A., & Lumentut, T. M. B. A. (2021). Sustainable finance study of bibliometric overview. In IOP Conference Series: Earth and Environmental Science, 729(1), p. 012124. IOP Publishing. DOI: 10.1088/1755-1315/729/1/012124

[28] Puschmann, T., & Leifer, L. (2020). Sustainable Digital Finance: The Role of FinTech, InsurTech & Blockchain for Shaping the World for the Better. DOI: 10.5167/UZH-199615

[29] Raji A., Adesanya A. O., Daraojimba C., Okogwu C., Alade E. Y., Nwankwo T. C., Okoye C. C. (2023). A review of financial instruments in the banking sector facilitating SMEs in the cleaner vehicles market. Journal of Third World Economics (JTWE) DOI: http://doi.org/10.26480/jtwe.01.2023.18.25

[30] Raji, A., Adesanya, A. O., Daraojimba, C., Okogwu, C., Alade, E. Y., Nwankwo, T. C., & Okoye, C. C. (2023). A Review of Financial Instruments in the Banking Sector Facilitating SMEs in the Cleaner Vehicles Market. Journal of Technology and World Economy, 1(1), 18-25. https://dx.doi.org/10.26480/jtwe.01.2023.18.25

[31] Rao, P., Verma, S., Rao, A. A., & Joshi, R. (2023). A conceptual framework for identifying sustainable business practices of small and medium enterprises. Benchmarking: An International Journal, 30(6), 1806-1831. DOI: 10.1108/bij-11-2021-0699

[32] Razali, N., Hassan, R., & Mohd Zain, N. R. (2022). Exploring the Regulatory Framework of Sustainable Finance in Malaysia: Driving Force for ESG Institutional Investors. IIUM Law Journal, 30(Special Issue 2), 279-316. DOI: 10.31436/iiumlj.v30is2.767

[33] Reza-Gharehbagh, R., Arisian, S., Hafezalkotob, A., & Makui, A. (2022). Reza-Gharehbagh, R., Arisian, S., Hafezalkotob, A., & Makui, A. (2023). Sustainable supply chain finance through digital platforms: a pathway to green entrepreneurship. Annals of Operations Research, 331(1), 285-319. DOI: 10.1007/s10479-022-04623-5

[34] Santoso, B. (2020). The Role of Micro, Small, and Medium Enterprises toward Sustainable Development Goals through Islamic Financial Institutions. In 2nd Social and Humaniora Research Symposium (SoRes 2019), pp. 585-595. Atlantis Press. https://dx.doi.org/10.2991/assehr.k.200225.127.

[35] Siregar, N. B. N., & Efendi, B. (2022). Financial Policy Framework In Support Of Sustainable Development in Indonesia. International Journal of Economic, Technology and Social Sciences (Injects), 3(2), 339-345. DOI: 10.53695/injects.v3i2.838

[36] Stoika, V., Stoika, S., & Harnyk, O. (2023). Innovative aspects of the economic development of SMES: experience of the EU and Ukraine. Three Seas Economic Journal, 4(3), 15-25. DOI: 10.30525/2661-5150/2023-3-3

[37] Surmanidze, N., Beridze, M., Amashukeli, M., & Tskhadadze, K. (2023). Empowering Small Businesses in Georgia: Access to Finance, Economic Resilience, and Sustainable Growth. Agora International Journal of Economical Sciences, 17(2), 158-169. https://dx.doi.org/10.15837/aijes.v17i2.6453.

[38] Versal, N., & Sholoiko, A. (2022). Green bonds of supranational financial institutions: On the road to sustainable development. Investment Management and Financial Innovations, 19(1), 91-105. 19(1). https://dx.doi.org/10.21511/imfi.19(1).2022.07

[39] Vijayakumar, H. (2021). Impact of AI-Blockchain Adoption on Annual Revenue Growth: An Empirical Analysis of Small and Medium-sized Enterprises in the United States. International Journal of Business Intelligence and Big Data Analytics, 4(1), 12-21. Retrieved from https://research.tensorgate.org/index.php/IJBIBDA/article/view/67

[40] Zamfiroiu, T. P., & Pînzaru, F. (2021). Advancing strategic management through sustainable finance. Management Dynamics in the Knowledge Economy, 9(2), 279-291. https://dx.doi.org/10.2478/mdke-2021-0019.

[41] Zheng, G., Siddik, A. B., Masukujjaman, M., and Fatema, N. (2021). Factors Affecting the Sustainability Performance of Financial Institutions in Bangladesh: The Role of Green Finance. Sustainability, 13(18), 10165. https://dx.doi.org/10.3390/su131810165