Stockholm School of Economics
MSc Thesis

MSc program in Business and Management

SMEs: The dynamic spider weaving the web of the blended finance ecosystem

A single case study of how a green-SME can navigate and engage in the blended finance ecosystem to access necessary funding for growth in a developing country

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Abstract

Blended finance has gained considerable traction recently due to more pressure from the international community to mobilize capital for SDG-aligned investments to reach the ambitious 2030 agenda. Despite this initiative, private capital mobilization has not reached the required scale. Notably, green -SME projects in developing countries with a high potential for impact-aligning SDGs have been historically neglected within blended finance due to high perceived risk from investors' perspectives. These barriers in a blended finance context stem from significant mismatches between green-SMEs and the current structure of the blended finance ecosystem. Additionally, significant financial barriers originate from a misalignment between diverse stakeholders' preferences of concessional and commercial nature. The misalignment and the several barriers identified that increase the perceived risk of green-SMEs, are exacerbated because of concepts such as information asymmetry stemming from underdeveloped markets and the limited track record of enterprises. Paradoxically, green-SMEs need capital to enable pilot projects to demonstrate their business models to advance scaling. To cover this gap, this study adopts a bottom-up approach, looking at a single-case study on a SME in Ghana of four clean-energy pilot projects through blended finance. The key findings of the case study, enhanced by stakeholder views and conceptualized by theory, results in nuanced contributions to the previous research gap. That is, the lack of strategic insights from an SME perspective to effectively utilize an ecosystem to make blended finance more inclusive and aligned to facilitate effective and well-targeted project investments aligned with the community's needs.

Keywords: SMEs, developing countries, blended finance, SDGs, ecosystems

Acknowledgements

We would like to express our sincere gratitude to Stella Futura for their invaluable support and collaboration throughout the course of this research. Their commitment to green investments and dedication to achieving Sustainable Development Goals (SDGs) provided a rich context for the exploration and analysis conducted in this thesis. The insights gained from Stella Futura practices have greatly contributed to the depth and relevance of this study and which hopefully will provide insights for future research.

Furthermore, we want to express our deepest gratitude to our thesis supervisor, Emma Sjöström, whose guidance and unwavering support have been invaluable throughout this research journey. Emma Sjöström provided invaluable insights and constructive feedback, which significantly enhanced the quality and rigor of this work.

Table of content

Definition of terms 6

1. Introduction and problematization 8

1.2 Purpose, Aim and Expected Contribution 10

1.2.1 Research Question 10

2. Literature review 11

2.1. Research gap in blended finance 11

2.2 The application of blended finance instruments 12

2.2.1 Cluster 1: Grants and technical assistance 13

2.2.2 Cluster 2: Outcome funding, impact bonds and impact-linked finance 14

2.2.3 Cluster 3: Market-rate, subordinated and concessional debt and equity 14

2.2.4 Cluster 4: first-loss and guarantees 15

2.3 Emerging concepts and themes in blended finance 15

2.3.1 Robust ecosystem for effective blended finance initiatives 15

2.3.2 Scalability challenges and innovation 16

2.3.3 Transparency, monitoring, and reporting ensures accountability and trust 18

3. Theoretical framework 20

3.1 Resource dependence theory 20

3.2 Network theory 21

3.3. Social network theory 22

4. Methodology 24

4.1. Research approach 24

4.1.1 Research approach abductive reasoning 25

4.2 Introduction to the single case study 26

4.3 Data Collection and sampling 27

4.4 Interview design 28

4.5 Data analysis 30

4.6 Research quality 31

4.7 Ethical consideration 32

5. Empirical findings 33

5.1. Single-case study of green-SME overview 33

5.1.1 Contract structure of pilot projects 33

5.1.2 Innovative financing structure 34

5.2 Emerging themes from empirical findings 35

5.2.1 Financing challenges for SMEs 35

5.2.2 Stakeholders perception of blended finance and its innovation 38

5.2.3 Blended finance as an ecosystem 40

5.2.4 Information management in blended finance 44

6. Analysis 47

6.1 Identified mismatches, gaps and paradoxes 47

6.2 How can green-SMEs navigate in the blended finance ecosystem 48

7. Conclusion 52

7.1 Conclusion 52

8. Discussion 54

8.1 Contributions 54
8.1.1 Methodological contribution 54
8.1.2 Empirical contribution 54
8.1.3 Theoretical contribution 55
8.2 Implications for SMEs 56
8.3 Limitations and future research 57
9. List of references **59**
Appendices 72

Definition of terms

Term	Definition
Aid	"Aid activities include projects and programmes, cash transfers, deliveries of goods, training courses, research projects, debt relief operations and contributions to non-governmental organizations" (OECD, n.d.).
Blended finance (BF)	"Blended finance is the strategic use of development finance for the mobilization of additional finance towards sustainable development in developing countries. It attracts commercial capital towards projects that contribute to sustainable development, while providing financial returns to investors" (OECD, n.d.).
Commercial finance	"Commercial finance includes both public and private sources – for example investment by publicly or privately owned pension funds, insurance companies, banks and businesses as long as their motivation is commercial." (OECD, 2020)
Concessional finance	"Concessional includes finance with more generous terms than market loans or no expectation of repayment. These generally include below-market interest rates, grace periods in which the loan recipient is not required to make debt payments for several years or a combination of low interest rates/grace periods." (USAID, n.d.)
Developing countries	"A country which, relative to other countries, has a lower average standard of living" (Kulik, n.d.). We refer to developing countries as African countries, particularly Ghana in relation to the case study.
Development finance	"Development finance is the effort to support, encourage and catalyze expansion through public and private investment in physical development, redevelopment and/or business and industry. It is the act of contributing to a project or deal that causes that project or deal to materialize in a manner that benefits the long-term health of the community" (CDFA, n.d.)
Development finance institutions (DFI)	"Development finance institutions are specialized development organizations that are usually majority owned by national governments. DFIs invest in private sector projects in low- and middle-income countries to promote job creation and sustainable economic growth " (Edfi, n.d.).
Green-SME	In this thesis green small medium enterprises are operating in developing countries that require funding through a blend of commercial and concessional funding with a particular focus on the Sustainable Development Goals.

Philanthropy	"Philanthropic impact investment aims to create impact by supporting social enterprises, building viable organizations and unlocking sustainable social innovations." (Farber, 2019)
Private capital	"Private capital is the umbrella term for investment, typically through funds, in assets not available on public markets". (Preqin, n.d.)
SME	Small medium enterprise in developing countries.
Sustainable development goals (SDG)	**"**The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity." (UNDP, n.d.)
Off-taker	Off-takers refer to the ultimate beneficiaries of a blended finance transaction who agree to purchase or use the outcomes of financed projects. Often characterized by critical market demands and needs, and are assumed as key targets for financed projects to achieve the most impact.

1. Introduction and problematization

> *"The financial structure of development finance is wrong. The credit agencies themselves make the cost of capital so high for deals in Africa because of perceived risks that African deals are set up for default as soon as those high interest loans are issued. We NEED a new system that takes into account the reality of today's world, as well as the real opportunities in Africa. If we bring down the cost of lending in Africa, development can accelerate".*
> President of Kenya speaking at the US-Africa Investment Forum (Herscowitz, 2023).

Small and medium enterprises (SMEs) form the backbone of the global economy, accounting for most businesses in Africa. In Ghana, SMEs account for approximately 80% of employment and most of the country's GDP, representing nearly 92% of all businesses (Statista, 2022). Despite their importance, 51% of these enterprises face credit constraints, limiting their access to capital (IFC, 2018). Local banks impose high-interest rates, often exceeding 20–25%, and alternative finance providers charge interest rates as high as 40–50 % (Runde et al., 2021). These financial barriers are the primary obstacles to SMEs' growth (Wang, 2016), which directly hinders poverty reduction and broader economic development – a pressing concern given the context of the 2030 Agenda for Sustainable Development and the Paris Agreement (Koirala, 2018).

Emerging academic literature identifies several general barriers and challenges that hinder potential investors from financing SME projects in developing countries. To name a few barriers and challenges: restricted access to capital because of high-interest rates (Wang, 2016; World Bank, 2021; Runde, Savoy, 2017), substantial start-up costs including burdensome licensing and registration requirements (Abor & Quartey, 2010), asymmetric information and lack of transparency between stakeholders (Du et al. 2020; Yong, 2012), regulatory structures (Abor & Quartey, 2010), weak institutional capacity (Kouadio and Gakpa, 2022), lack of management skills and training (Nqala and Musikavanhu, 2023), and economic instability of developing countries (Green et al., 2007).

In response to these challenges of insufficient capital flow in developing countries, the international community integrated various global agendas for poverty reduction and sustainable development in 2015 into the 2030 Agenda of the SDGs, including the Addis Ababa Action Agenda (AAAA) on development financing[1], and the Paris Agreement on climate change (Ministry for Foreign Affairs, 2019). In this context, blended finance (BF) emerged as a promising strategy to address SMEs' challenges regarding access to needed capital for growth to unlock their untapped potential (Convergence, 2019). At its core, BF leverages public development finance to mobilize additional commercial capital, primarily

[1] The AAAA is a global framework for financing sustainable development, adopted in 2015 at the Third International Conference on Financing for Development and endorsed by the UN General Assembly. It aligns financial flows and policies with economic, social, and environmental priorities to support the implementation of the 2030 Agenda for Sustainable Development.

from private sources, aligning investors and investment instruments with a shared set of financial and impact objectives within the SDG framework (Smith et al., 2022). Three main features can characterize BF:

1. Leverage: It involves the systematic and strategic use of development finance and philanthropic funds to engage private capital on a large scale.
2. Impact: It ensures that investments yield measurable social, environmental, and economic benefits.
3. Returns: It provides market-based risk-adjusted returns for private investors that align with their business objectives. (IDFC, 2019; Pereira, 2017)

These three features make green-SMEs in developing countries ideal projects to invest in, as they are balancing impact with profit (Convergence, 2019). However, developing countries tend to be reluctant to invest in, develop, and adopt new technologies (Schoenmaker and Volz, 2022). Green-SMEs face the same general challenges in procuring capital as previously mentioned. In addition to these challenges, green-SMEs experience high investment costs of green technology and they operate in underdeveloped markets, and are associated with a limited track record. These challenges complicate their access to financing even further, resulting in heightened interest rates and increased perceived risks (Runde et al., 2021; Boubekeur et al., 2023; Tonkonogy, 2018).

Furthermore, despite growing interest from institutional investors in sustainability-focused projects, their focus remains predominantly on low-risk, guaranteed-return projects (Majmudar, 2023). This reveals an evident contradiction: while green-technology SMEs hold substantial potential for impact, they are often overlooked and remain underserved due to inappropriate financing models. The contradiction acknowledges a gap, needing further research in mitigating risk to enable financing in green-SMEs through BF.

The review of previous literature in BF, shows a historical emphasis on a top-down approach, focusing primarily on the roles of governments and large financial institutions as investors utilizing BF as a tool (Habbel, 2021). Equivalent in practice, there needs to be more consideration and involvement of end recipients, such as green-SMEs, during BF transactions. Kwon et al. (2022) states that this perspective often neglects the unique contributions and needs of ultimate beneficiaries, such as green-SMEs and their off-takers. This is in line with one of the critical findings by Bartz-Zuccala et al. (2021), recognizing the need to increase the engagement of local actors in BF transactions. The authors further argue for making the BF ecosystem more inclusive beyond a transaction-based approach to be more effective.

The literature review shows a notable research gap, building upon the findings of Bartz-Zuccala et al. (2021). Given a lack of focus on a bottom-up perspective, there is a limited emphasis on how local green-SMEs can effectively engage within the BF ecosystem to procure needed capital for growth. Hence, this study proposes a bottom-up approach, emphasizing the inclusion of green-SMEs as critical stakeholders in BF transactions and

ecosystems. Kwon et al. (2022) argue that this shift is crucial; leveraging green-SMEs with their unique insights to shape BF transactions will achieve more targeted and effective outcomes in BF initiatives.

1.2 Purpose, Aim and Expected Contribution

The primary objective of this study is to understand how green-SMEs can effectively engage with stakeholders within a BF ecosystem. This research will center on two key areas: (i) understanding the complexities and challenges green-SMEs face in capital acquisition and (ii) exploring strategic insights green-SMEs can leverage to engage in a broader BF ecosystem to secure necessary capital for growth.

The expected contributions of this research are twofold. First, it aims to enrich existing knowledge in the field of BF, with a particular focus on the perspectives of green-SMEs in a BF ecosystem. Second, by conducting a single-case study of a green-SME in Ghana, combined with expert interviews from various stakeholders, the study will uncover critical issues and insights from different perspectives. These findings anticipate addressing gaps in the current literature on BF and help frame a research agenda for future research.

1.2.1 Research Question

In alignment with the study's objectives, the research question is designed to guide the investigation into the modalities of how green-SMEs in developing countries can effectively engage with a blended finance ecosystem. This implies understanding how green-SMEs can navigate the complex ecosystem of concessional and commercial funding sources, to overcome financial barriers and secure necessary funding. An essential aspect of this investigation is examining how green-SMEs balance the diverse objectives of profit and impact within the ecosystem, thereby contributing to sustainable and inclusive economic development.

Research question:

How can green-SMEs in developing countries effectively engage with stakeholders in a broader blended finance ecosystem to overcome financial barriers and secure necessary funding for growth?

2. Literature review

2.1. Research gap in blended finance

The previous literature on BF predominantly takes a top-down approach, with a strong focus on influential entities like governments, international organizations, and large financial institutions, who play a pivotal role in driving and implementing BF initiatives (WEF, 2015; Horrocks et al., 2020; Convergence, n.d; Kwon et al., 2022; IFC, 2018). This approach emphasizes the effectiveness of financial instruments in mobilizing private investment in a broadly defined development context, rather than addressing specific problems or achieving targeted outcomes (Kwon et al., 2022). While this macro-level perspective certainly provides valuable insights contributing to the advancement of BF, it overlooks the perspectives and needs of a pivotal stakeholder group, the SMEs.

Furthermore, the top-down approach has been used in the majority of BF transactions to this date, where the decision-makers have predominantly been development agencies or intermediaries representing catalytic capital providers (Pereira, 2017). These actors are usually responsible for shaping projects, selecting funding instruments, and directing the entire transaction (Kwon et al., 2022). In contrast, private capital providers often find themselves participating in transactions that have already been set up by others (Kwon et al., 2022). Consequently, this structural bias in decision-making emphasizes the views and priorities of development agencies and other powerful actors (Pereira, 2017).

Another element reinforcing this top-down approach is the process of selecting BF projects. Often, this selection process arises from the cooperation of various institutions, each having its mandates, criteria, and systems for choosing projects. Consequently, the selection process may reflect the interests and perspectives of development finance institutions (DFIs) and donor agencies (Pereira, 2017).

This can be seen as problematic, especially considering that a significant barrier to BF is negotiating deals, which often involves distant and unfamiliar territory for development institutions and private investors. Given their limited local understanding and knowledge, this uncertainty raises questions about the ability of donor agencies and other BF actors to effectively choose projects in foreign economies (Savoy and Milner, 2018).

A potential solution to address this issue is to pivot the focus towards including SMEs as vital stakeholders within the BF context. Recognizing the significance of SMEs in shaping these transactions can be critical, as their perspectives are often marginalized in the decision-making processes (Kwon et al., 2022). As Kwon et al. (2022) argue, we must empower those closest to the challenges to fully actualize BF's mission to make a substantial impact and attain its desired outcomes. SMEs and their off-takers, as the ultimate beneficiaries, should assume a more central role in shaping these transactions.

2.2 The application of blended finance instruments

The aforementioned power and influential imbalance in section 2.1 explains a hierarchical structure dominating BF transactions. To address this, Dey and Mishra (2022) suggest that local green-SMEs counterbalance this influence by leveraging their proximity, thereby changing the relationship dynamics into a more networked structure. However, before establishing relationships with various stakeholders, green-SMEs must assess their capabilities and the stakeholders before establishing partnerships to require the necessary resources for their growth and sustainability (Kwon et al., 2022).

The optimal choice of BF instrument varies significantly depending on their development stage. In the early stages, where the focus is on proving the business model through various pilot projects, the capital is primarily concessional to be designed to support innovation and risk-taking. As the business progresses to the scaling phase, the capital becomes more commercial, reflecting the increased stability and reduced risk (Kwon et al., 2022). This shift from concessional to commercial capital emphasizes the importance of green-SMEs being strategic and adaptable in their approach to financing. It involves aligning their funding strategies with their current developmental needs and future growth plans in regards to the financial instruments and available investors (see Figure 1) (IDFC, 2019).

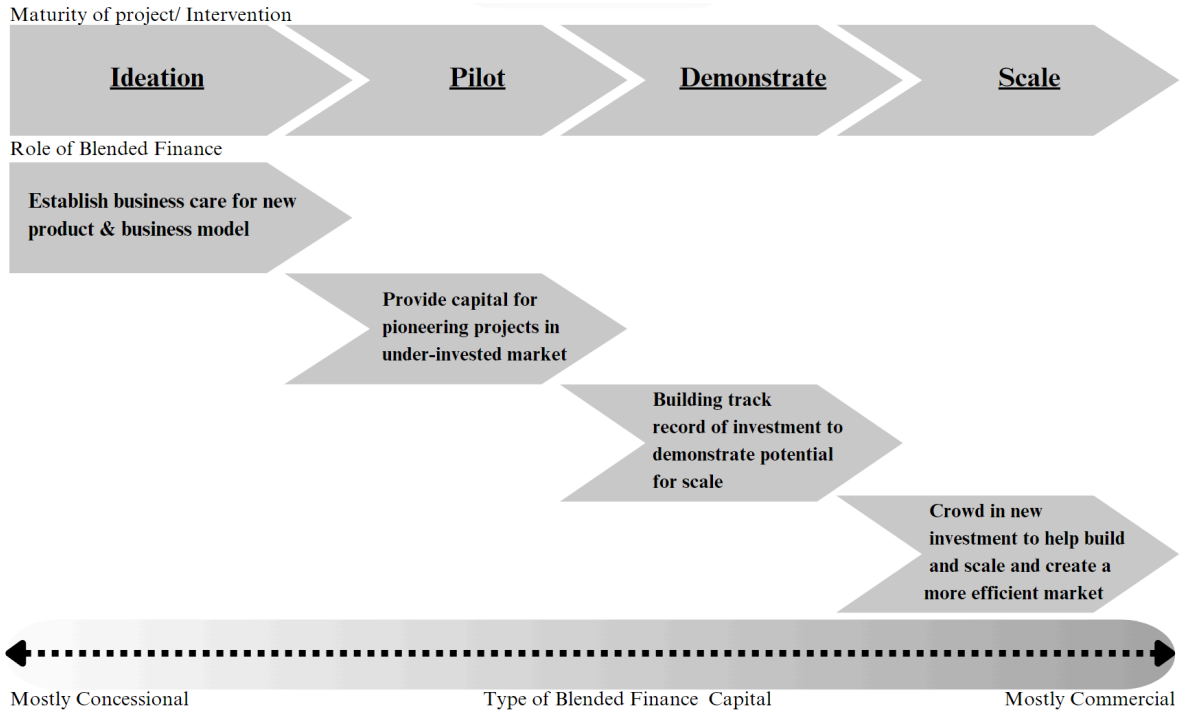


Figure 1. Exploring blended finance instruments through various phases. Adapted from "Blended Finance: When to use which instrument?" by T. Kwon et al., 2022, from *University of Zurich*, 1, p.47, (https://www.csp.uzh.ch/en/research/Practitioner-Research/Blended-Finance-When-to-use-which-instrument.html) *2023 by Universität Zürich*

To offer a better overview and a deeper understanding of the available instruments for green-SMEs, Kwon et al. (2022), introduce four distinct clusters categorizing a diverse range of BF instruments. These clusters assist practitioners, such as green-SMEs, on how to

navigate and strategically utilize them and cooperate with the associated stakeholders. This involves understanding the power dynamics and unique contributions each instrument and associated stakeholder can offer. For green-SMEs, it is crucial to be aware of various instrument preferences that may emerge during the implementation phase due to differences in objectives and existing power imbalances between stakeholders (Dey and Mishra, 2022).

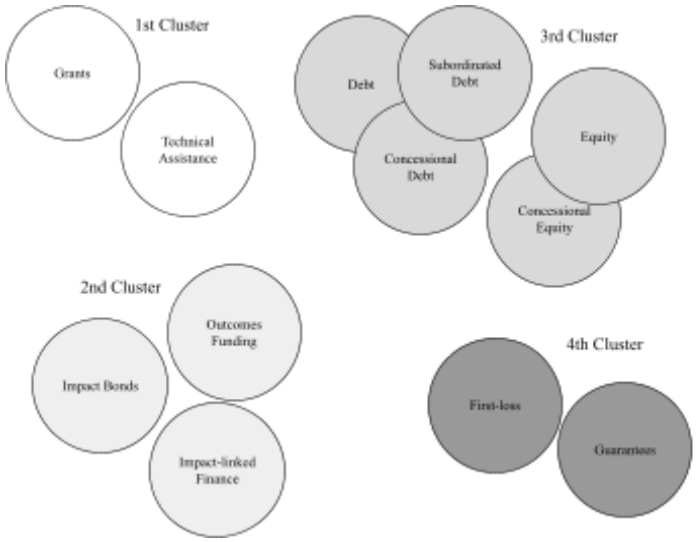


Figure 2. Four clusters of blended finance instruments. Adapted from "Blended Finance: When to use which instrument?" by T. Kwon et al., 2022, from *University of Zurich*, 1, p.13, (https://www.csp.uzh.ch/en/research/Practitioner-Research/Blended-Finance-When-to-use-which-instrument.html) *2023 by Universität Zürich*

2.2.1 Cluster 1: Grants and technical assistance

These instruments are often provided by development and philanthropic actors to advance impact objectives with no financial return. This makes these instruments very effective for SMEs considering utilizing them in new market ventures and investment activities (Kwon et al., 2022). Taskforce (2018) highlights grants as particularly useful for market research and development, as they facilitate exploring new opportunities to aid in developing investment pipelines. On the other hand, the technical assistance instrument contributes with expertise for project preparation, such as feasibility studies, to improve project quality through detailed impact assessments and lower transaction costs (Pereira, 2017). Pereira (2017) elaborates on the value for SMEs operating in underdeveloped markets to use these instruments to lower financial barriers by improving the risk and return profile of investments crowding in private capital. These address financial barriers by decreasing operational risks, high transaction costs, lack of bankable pipeline and insufficient capacity of developing countries (Taskforce, 2018).

However, green-SMEs need to know the specific terms associated with the implementations of these instruments. Kwon et al. (2022) highlights the rigorous bureaucracy of these instrument stakeholders. It will be necessary to consider the benefits of a grant with

administrative complexities in terms of time and money for SMEs. However, they are considered valuable instruments for SMEs during the initial development phase to secure funding for the first pilot projects (Kwon et al., 2022).

2.2.2 Cluster 2: Outcome funding, impact bonds and impact-linked finance

Kwon et al. (2022) distinguish this cluster by its focus on structuring transactions by result-based financing with specific pre-agreed outcomes. It differs from traditional activity-based grants by uniting stakeholders with different interests around impact-specific needs with measurable targets. This means that cluster two instruments' ability lies in directly connecting financial payments to the creation of impact, strengthening the relationship between impact and financial payment.

Taskforce, (2018), holds that these instruments are designed to incentivize actions for achieving specific outcomes in projects with clear climate benefits. Hence, they address operational and output risks of the investors by rewarding SMEs after successful project implementation (Taskforce, 2018). Additionally, result-based financing is often characterized as smaller in size but more complex, reflecting the specificity of the impact they target (Kwon et al., 2022). This can impose financial barriers for green-SMEs if philanthropic organizations choose a pay-for-success system to avoid bearing the implementation risk, as they will need to lay out high costs until payment (Kwon et al., 2022).

Furthermore, these instruments also require rigorous impact reporting but in a more regular and informative manner. Due to this, they offer better visibility of the impacts achieved, but imply higher costs related to reporting. Green-SMEs should review the risks of a payment-for-success scheme and the added reporting costs compared to the financial reward. Furthermore, Kwon et al., (2022) continue arguing about the complexity of structures involving more stakeholders, which might make scaling too expensive and challenging.

2.2.3 Cluster 3: Market-rate, subordinated and concessional debt and equity

Kwon et al., (2022) interpret these instruments as interrelated yet distinct regarding the implementation phase, depending on the maturity and risk profile of the enterprise. Equity is usually required at earlier stages of enterprise development, allowing investment in growth projects without immediate demands of generating a return. The equity investors are characterized by their willingness to take higher risks with the potential for a higher impact and financial return. In contrast, debt is more suited to later stages of the green-SME’s development stage. Debt investors generally accept lower risks in exchange for lower returns, often followed by collateral requirements and regular interest payments (Kwon et al., 2022).

Alternative versions of the instruments above are subordinated debt and junior equity. These protect senior investors as subordinated debt covers first losses (Pereira, 2017). This subordination, which can also be structured through grants or guarantees, addresses multiple risks such as off-taker, construction, and reputational risk (Taskforce, 2018). As a result, with the interest rate adjusted to the market rate in combination with the subordination of first losses in cases of project failure, it can often crowd in other investors, facilitating green

SMEs' access to other sources of capital (Pereira, 2017). Furthermore, concessional refers to accepting lower returns and longer timelines with the backside of investors' reluctance to high-risk projects (Kwon et al., 2022). In comparison to the second cluster, these investors need more market knowledge for due diligence to invest. However, they require less post-evaluation of impact and accountability for green SMEs not reaching pre-stated impact objectives (Kwon et al., 2022).

2.2.4 Cluster 4: first-loss and guarantees

Kwon et al., (2022) emphasize these instruments as essential in de-risking transactions, particularly impact-driven investments to crowd in additional capital. This additional capital includes investments from entities that might typically be hesitant to invest, such as institutional investors, insurance and pension funds, sovereign wealth funds and family offices. Hence, this instrument can be combined with other instruments in cluster three to reach the size of a transaction needed (Kwon et al., 2022). Pereira (2017) emphasizes that loan guarantees serve as a protective safeguard for investors against potential losses, while also reducing financing costs. The providers of these instruments do not require a financial return.

Furthermore, Taskforce (2018) explains versions of guarantee instruments such as first loss, partial risk, and credit guarantees to address risks, including off-take and construction risks, thereby enhancing the creditworthiness of an investment. However, despite their efficacy in de-risking, green-SMEs still need to find other investors contributing additional capital to reach the aspired investment size (Kwon et al., 2022).

2.3 Emerging concepts and themes in blended finance

2.3.1 Robust ecosystem for effective blended finance initiatives

A recurring concept in previous literature is that blended finance initiatives should strive for a more inclusive ecosystem. The member-based network Convergence for BF emphasizes the crucial role of robust ecosystems in the success of BF initiatives (Convergence, 2021). Bartz-Zuccala et al. (2021) emphasize the need to involve local entities, including financial institutions and private enterprises, in order to promote a more long-term perspective, preventing a transaction-by-transaction approach. This approach will improve individual transactions and contribute to overall market development. However, as noted by Bartz-Zuccala et al. (2021), there is a lack of guidance on how to implement such a method.

In the context of SMEs, Freiburghaus et al. (2016) argue that BF provides a substantial advantage during the upscaling phase in SMEs lifecycle. This critical growth stage reveals financial deficits and more complex barriers that may not be solved entirely through innovative investment structures and technical assistance. Instead, Freiburghaus et al. (2016) state the need for a broader support system within this ecosystem that facilitates networking opportunities offering consultancy and expert insights.

The study conducted by Baloyi and Khanyile (2022) on South African SMEs, introduces three success factors that align with this ecosystem-building approach: Firstly, it emphasizes the necessity for improved access to external capital as it facilitates growth and development. Secondly, the development of local and accessible entrepreneurship and SMEs' value chains, enable a more resilient and interconnected ecosystem. Thirdly, formalized partnerships and collaborations to enable flexible and streamlined investment application processes.

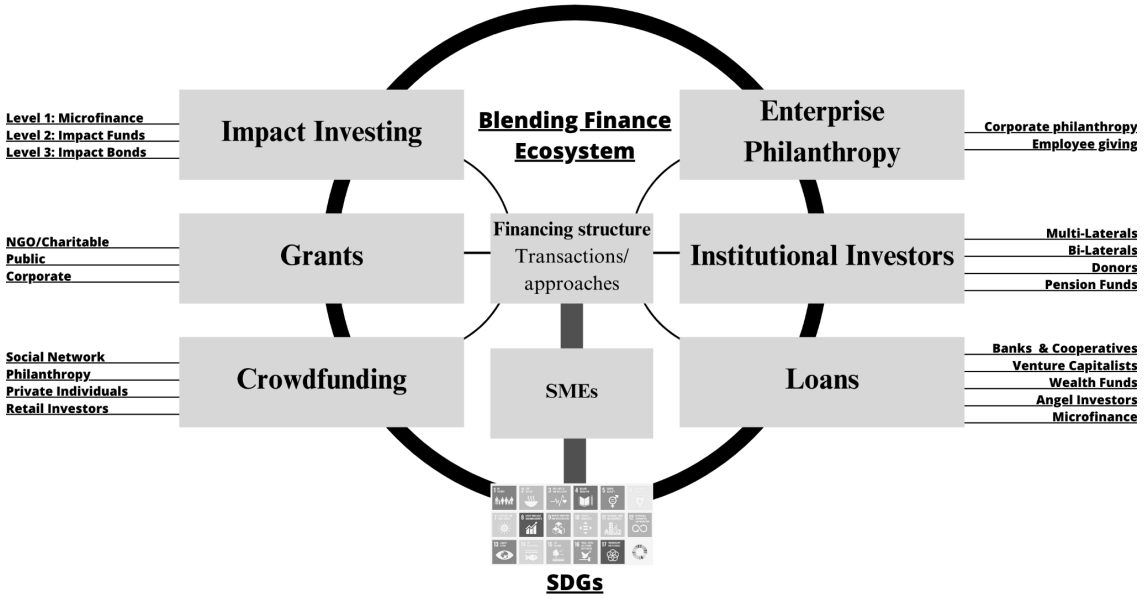


Figure 3. Blended finance ecosystem.

However, as the concept of BF gains prominence, the need for ecosystem designs tailored to the unique requirements of different regions and sectors becomes increasingly important (Convergence, 2021). This underscores the necessity for innovation in financial structuring and policy frameworks, risk mitigation strategies, and capacity-building efforts (Convergence, 2021). These efforts will enable developing countries to strengthen the abilities, processes, and resources of organizations and local communities to adapt to emerging changes (United Nations, 2021). However, Convergence (2021) recognizes a need for more guidance on how to implement these tailored ecosystem designs.

2.3.2 Scalability challenges and innovation

The report by Bartz-Zuccala et al. (2021), based on consultations with various stakeholders, cites several challenges private investors face when collaboratively investing in developing countries. These private investors mentioned challenges such as the perceived high risks, low returns on investments, the lack of feasible and bankable projects and the absence of financial innovation within institutional entities. Furthermore, private investors tend to perceive significantly elevated risks, especially in countries and sectors requiring the most support for impact projects. As a result, there is a limited mobilization of private finance in these specific areas, resulting in a lack of scalability in BF initiatives that contribute to the funding gap in reaching the 2030 agenda (Bartz-Zuccala et al., 2021).

Furthermore, the lack of financial intermediation in the BF market restricts SMEs' access to necessary funding. Although donors and investors are willing to allocate significant capital to projects aligned with the SDGs, SME projects are associated with small-scale transactions, resulting in a shortage of intermediaries to channel these funds effectively (Convergence, 2021). In addition to this, the concept of the investment's ticket size is often considered by commercial investors. They strive to find projects with appropriate risk-return profiles in their investment choices, aiming for larger projects to justify transaction costs. This intensifies the barrier for SMEs to acquire the capital needed for projects due to their small-scale project transactions (Bartz-Zuccala, 2021).

Lankes (2021) observes that BF initiatives, in climate adoption, often approach project development on a project-by-project basis, addressing specific challenges, such as off-taker, currency, early mover, or sponsor risks. While this can result in well-targeted support for smaller projects, the process is time-consuming and hinders replication and scalability due to the complexities and lack of transparency in financial structures. Customized project preparation in BF transactions includes legal, procurement, and financial documentation. Lankes (2021) suggests that DFIs and other investors should partner up with clean energy developers or utilities with expertise in developing projects in emerging and frontier markets to address these scalability challenges. These projects would still need individual review, but such partnerships would streamline project finance by requiring less detailed engagement in pipeline development (Lankes, 2021). According to Convergence (2021) annual report of BF, approximately 80% of investors have participated in only one BF transaction, underscoring the need for an increased long-term investor engagement.

Tonkonogy et al., (2018), identifies specific critical challenges in expanding private investment in clean energy within developing economies. These include mismatches in size, scale, off-taker risk, currency risk, policy risk, attractiveness of revenue, and liquidity risk. Climate adaptation efforts are particularly vulnerable, as they often present low financial returns with limited and small investment opportunities and lack incentives for private actors (OECD, 2023).

To overcome these barriers, Shirai (2023) encourages financial innovation and creativity within the context of BF structures to attract funding from institutional investors and private capital. Strategic partnerships with international public financial institutions and private enterprises can help adopt innovative financial structures to mitigate some idiosyncratic risks associated with investing in emerging markets, particularly in new technology initiatives (Marquis and Raynard, 2015; Berggren, 2023). Jung (2020), suggests utilizing or creating innovative and flexible financing methods to attract private investment and emphasizes the role of project manager to involve several actors at diverse levels within the ecosystem to ensure a streamlined process of embracing the methods. Convergence (2021) defines the purpose of innovative financial solutions in BF to address barriers to private climate finance that the market has not yet adequately addressed while remaining familiar and replicable to investors. These solutions should be actionable, demonstrate catalytic potential, ensure financial sustainability, and aim for long-term viability (Convergence, 2021).

It is important to note that introducing new funds or approaches often requires a lengthy process of design, fundraising, and partnership negotiation, which can extend up to three to four years (Savoy and Milner, 2018). Balancing innovation with the ability to reach the scale of transactions in a relatively short period remains a challenging yet essential task. Savoy and Milner (2018) emphasize that effective and reliable regulation systems must support the ecosystem and the initial investment and that the development approach must be agile and flexible. Many investors still hold traditional mindsets, highlighting the need for a shift in perspective (Savoy and Milner, 2018). Implementing incremental and not disruptive innovations will more effectively overcome barriers by traditional investors to embrace and scale BF initiatives to meet the SDG financing gap (Convergence, 2021).

2.3.3 Transparency, monitoring, and reporting ensures accountability and trust

Tonkonogy et al., 2018, study reveals several existing perceived and actual risks when exploring the investment barriers in clean energy. Perceived risks often arise due to a lack of understanding or a limited track record of the technology, investment strategy, the team behind the enterprise and their business model. This is particularly evident in projects with information asymmetry problems in developing countries, intensifying risk uncertainty (Choi and Seiger, 2020). Due to this, private investors are reluctant due to the uncertainty of the potential benefits of these projects, as the information asymmetry contributes to the imperfection of capital markets (Shirai, 2023). Consequently, private investors tend to perceive these projects as high-risk investments with a low likelihood of generating sufficient return, often resulting in unfeasible investment (Shirai, 2023).

Therefore, enhancing transparency among all stakeholders within the BF ecosystem is critical to building trust, sharing knowledge, and collaboratively designing and implementing effective financial structures aligned with their respective goals (Lolito, 2020). However, unfortunately, the current state of transparency in BF is not ideal. Specifically for climate investments, a lack of transparency persists regarding the actual distribution of capital, financial information, and impact data (Stadelmann et al., 2013; Choi and Seiger, 2020). A survey of over 500 such transactions revealed that nearly 40 percent do not publicly disclose impact outcomes (Savoy and Milner, 2018). Various reasons exist for this lack of transparency due to the commercial conditions of transactions with legal constraints preventing the disclosure of investors' organizational information (Lonsdal et al., 2019).

In the absence of proper disclosure of information and evaluation, it becomes challenging to determine the effectiveness, efficiency, and accountability of BF initiatives (Du et al., 2020). Furthermore, regarding the commercial use of capital, the absence of data on returns from completed projects hinders attracting new investors as it aggravates decision-making processes with no available information. Investors often cite the lack of transparency and a proven track record as reasons for reluctance to engage (Savoy and Milner, 2018). To address these issues, there is an obvious need for greater availability of information, including ex-post

evaluations of transactions of both financial and impact outcomes of BF projects (Jenkins, 2019; Taskforce, 2018).

The private sector's involvement in financing net zero-aligned projects in emerging markets and developing economies is also hindered by the lack of transparency in the risk projections of the project, capital flow and performance data (See, 2023). In these complex co-financing structures, access to information, especially qualitative information, can foster trust between partners, which is crucial for the success of BF initiatives (Lonsdale, 2017). This transparency is achieved through timely and detailed data reporting, to enhance the monitoring and evaluation of BF projects (Lonsdale, 2017).

Since BF frequently aligns with the SDGs involving publicly funded organizations, financial transactions are responsible for delivering accountability to the public and the intended beneficiaries. Jung (2020) states that the lack of transparency in the process, parties involved, contractual obligations, and the estimation of outcomes in BF, can damage public confidence in using these financial structures. Choi and Seger (2020) discuss the value of promoting transparency and informing stakeholders about the true impact and outcomes of BF initiatives. The data will help investors and donors justify and increase their involvement, which drives an increased amount of BF transactions. Dey and Mishra (2022) point out SMEs' unique position in the ecosystem with the opportunity to provide information flow among stakeholders and the public, to show the effect of the BF initiative to create incentives attracting additional investors.

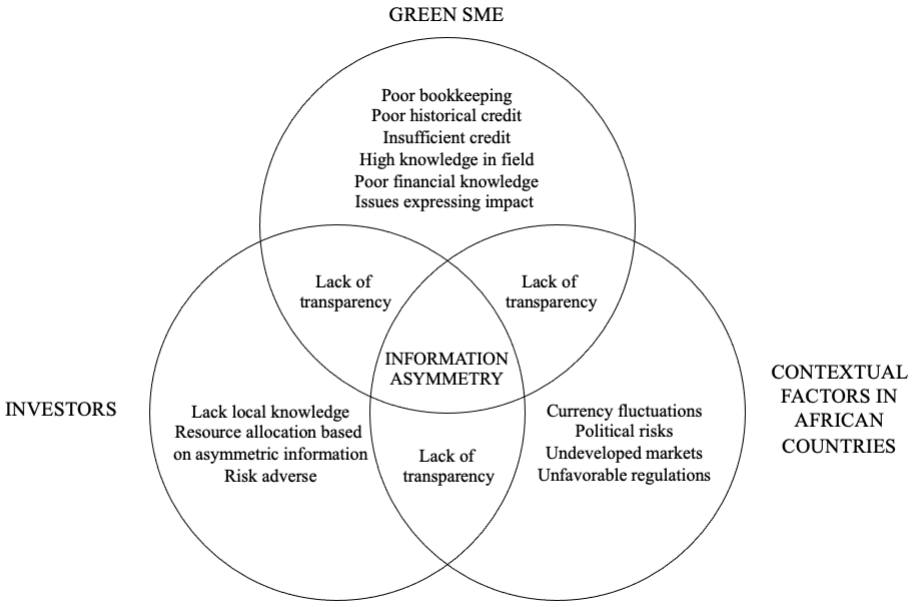


Figure 4. Illustrating investors' and green SMEs' issues and factors contributing to information asymmetry, as well as the contextual factors in an African country complicating achieving transparency in a BF ecosystem.

3. Theoretical framework

This thesis and its research question revolve around three pivotal theories, aligning with the aim of this paper. This study has applied the resource dependency theory (Pfeffer and Salancik. 2003) to understand why green-SMEs are underrepresented in the BF ecosystem. It conceptualizes how SMEs may manage and mitigate power relations hindering them from accessing these resources. Furthermore, to understand the dynamics of ecosystem interlinkages among stakeholders, we combine network theory (Myers,1984) with social network theory (Dunn 1983). Network theory allows us to map and analyze the structural relationships between various stakeholders, including SMEs and its off-takers as well as commercial and concessional investors. Social network theory will enable us to tap into the quality of these connections and explore how the strength, diversity, and strategy of SMEs social networks influence their ability to acquire information, and gain support in the BF ecosystem. Ultimately, information asymmetry is a consistently highlighted concept in our theoretical frameworks and provides this thesis with a valuable contextualization around SMEs' position in the BF network and associated resource dependence.

3.1 Resource dependence theory

This paper draws on the findings from the resource dependence theory (RDT) by Pfeffer and Salancik (2003) and Weber (1947). This idea suggests that organizations cannot operate independently, as they need resources from the world around them (Pfeffer and Salancik, 2003). Weber (1947) amplifies this by illustrating the perspective of the most powerful entities also being the most successful. In simpler terms, organizations are seen as coalitions that are dependent on, collaborating with and reacting to their external environment in order to access resources (Weber, 1947). Ulrich and Barney (1984) claim that organizations with a central role in the ecosystem and control over resources can influence the environment and the formation and stability of relationships. In addition, enterprises' ability to adopt and leverage big data analytics, especially with sustainability initiatives, is seen as a critical resource within an ecosystem and will increase their power according to Fiorini et al. (2018).

In the context of this thesis with a focus on green-SMEs, a key focus is placed on comprehending the power relationship dynamics during the funding stage for growth. This understanding emerges as particularly relevant for SMEs navigating through development stages of growth. Expansion not only enhances an organization's long-term viability by fostering stability, but also reduces uncertainty while establishing a foundation for effective management of inter-organizational dynamics (Pfeffer and Salancik, 2003). This growth phase often introduces challenges, such as increased need for external funding, as this cannot be met internally. Paradoxically, this growth-induced dependence on external sources might increase, rather than decrease, an organization's reliance on its surrounding environment (Pfeffer and Salancik, 2003).

Furthermore, RDT suggests that companies in an ecosystem should collaborate and depend on each other for long-term success. Ulrich and Barney (1984) propose a more individualistic perspective by claiming that “organizations attempt to alter their dependence relationships by minimizing their own dependence or by increasing the dependence of other organizations on themselves” (p.472).

As stated, according to the RDT, when companies lack the necessary resources to achieve their goals, they tend to form relationships with others to acquire those resources. This perspective emphasizes the significance of partner relationships, viewing them as crucial connections that help firms navigate uncertainties in their operating environment (Carter and Rogers, 2008; Cao and Zhang, 2010). Hence, this concept of the RDT aligns with network theory.

3.2 Network theory

The definition of the network theory (NT) originates from a mathematical perspective and exploration of graphs (Chen et al., 2016). Networks are defined broadly as a group of nodes and edges and the connections between them offer a valuable framework for understanding financial systems and relationships between organizations (Chen et al., 2016). In the context of finance investors, NT extends to highlight how financial relationships among entities create a network structure, influencing information flow and decision-making (Watts, 2004).

Furthermore, NT looks at symmetric relations or asymmetric relations among entities. These bodies can also represent people or organizations, where the common factor is that the connection between the two nodes is seen as a relationship, regardless of whether it is a friendship or an agreement between two companies (Allen and Babus, 2008). This theory dates back to 1845 when G.R. Kirchhoff introduced it, and it has brought many areas of application beyond mathematics and physics, reaching the social science field (*Theories and Applications in Network Science*, 2020).

Network analysis in economics has proven important in investigating the configuration and evolution of markets, offering valuable insights into collaborative efforts among firms and organizations (Groenewegen et al., 1999). An economic network, viewed as a collective of "autonomous" actors deliberately participating in shared group activities, involves specific relationships among members (Groenewegen et al., 1999).

This perspective on economic networks aligns with the exploration of social networks and their impact on investment decisions, providing a framework to understand and address information flows that can influence asset prices (Cohen et al., 2008). This holistic view, encompassing both economic and social networks, enriches the understanding of the complexities associated with information asymmetry in the financing context.

3.3. Social network theory

Social network analysis (SNT) has gained attention in various studies and has been applied to areas ranging from social media to trade agreement relationships (Borgatti and Lopez-Kidwell, 2011). SNT examines social relationships by conceptualizing them in terms of nodes and ties (Borgatti and Lopez-Kidwell, 2011; Libretexts, 2021). Nodes represent individual actors within the networks, and ties define the relationships between these actors (Libretexts, 2021). More specifically, Granovetter (2005) argues that the strength of ties is distinguished by time, emotional passion, intimacy, and reciprocal favors, which might result in economic effects. Granovetter (2005) elaborates that ties characterized by high strength often lead to more robust networks that facilitate the flow of information and resources essential to economic activity. Furthermore, they can enable access to unique opportunities, increase trust, and promote collaboration among the nodes in the network. These key factors are considered crucial in economic decision-making and success in various business activities. In essence, the SNT provides a framework for understanding the structure of social connections and the potential benefits that can arise from these interconnected relationships.

In these networks, Borgatti and Lopez-Kidwell (2011) argue that the ties can be assorted into two different categories. The first one "state-type ties", defined as existing continuously over some undefined time (Borgatti and Lopez-Kidwell, 2011). These ties can be measured by strength, intensity and duration. The second type of tie is "event-type tie", whose common description is given by "recurring pattern of ties "has a discrete and transitory nature and can be counted over periods of time" (Borgatti and Lopez-Kidwell, 2011, pg. 1170). The authors exemplify it by referring to emails, phone calls or other types of more sales related events. Generally, of essence is the notion that there are dyadic variables, such as, geographic closeness (Allen 1977, as cited in Borgatti and Lopez-Kidwell, 2011), behavior, beliefs, and attitudes (McPherson and Smith-Lovin 1987, McPhersonet al., 2001, as cited in Borgatti and Lopez-Kidwell, 2011) that influence the creation of ties or are the results of social ties.

State-type ties	Event-type ties
• Kinship ties (e.g., brother of)	• Interactions (e.g., giving advice to; sending e-mail)
• Other role-based ties (e.g., boss of or friend of)	
• Cognitive (e.g., knows)	• Transactions (e.g., signing treaty with; making a sale)
• Affective (e.g., likes or dislikes)	

Table 1. Showcasing the two different categorizations of social nodes. From "Network Theory" by S. Borgatti and K. V. Lopez-Kidwell, 2011, *The Sage Handbook of Social Network Analysis,* Vol 22. No 5. pg. 1170. http://dx.doi.org/10.1287/orsc.1100.0641

In the context of green-SMEs financial constraints for sustainable initiatives, the social relationships embedded in SNT can be leveraged by SMEs to navigate these barriers. Understanding and strategically utilizing social networks can enhance the ability to secure

funding for sustainable projects. Moreover, the network learning effects proposed by SNT suggest that directors and top executives within an organization can influence the adoption of sustainable practices (Sarkis et al., 2010).

In SNT, Cook and Emerson (1978) study factors of power in exchange networks. Bonacich (1987) and Laumann (1983) emphasize centrality in their network flow model, focusing on how central nodes gain advantages like receiving information quickly, determined by frequency and certainty. Conversely, Borgatti and Lopez-Kidwell (2011) caution that these theoretical outcomes might not always align with real-world empirical data. NT therefore, aims to correlate the observed characteristics of networks with tangible outcomes such as organizational performance, highlighting the influence of network structure on practical results.

Borgatti and Lopez-Kidwell (2011) elaborates on the perspectives of power and centrality with *"*being connected to well-connected others implies greater centrality, in power phenomena it can be the other way around: being connected to weak others makes one powerful, and being connected to powerful others makes one weak" pg. 1173. This is clear in experiments where the rules don't allow resources to be passed around. Also, power doesn't move from one node to another, so just being close to a powerful node doesn't make the neighboring nodes powerful too. Expanding on the perspective of centrality, Freeman (1979) posits that structural centrality can be defined by its underlying factors: degree, closeness, and betweenness. Freeman also proved that various network centrality types impact how information flows differently.

Through a corporate network example, Larcker et al. (2013) illustrate that companies fostering extensive connections within the network gain access to greater information regarding trends, market conditions, and regulatory changes. This enhanced connectivity provides a competitive advantage by facilitating more thought-through and strategic decision-making. The application of SNT provides a lens through which SMEs can strategically navigate funding challenges, build sustainable financial relationships and leverage their social capital for successful financing. This connection highlights social networks' importance in shaping SMEs' financial structures pursuing sustainability initiatives.

Research by Watts (2004) underscores how financial connections, akin to social networks, play a crucial role in shaping financial behaviors and decisions. Understanding these financial relationships becomes vital in addressing information asymmetry, particularly in the context of SME financing, where the complexity of financial connections can significantly impact decision-making processes. For instance, organizations with greater centrality in social networks may have more control over external pressures related to financing (Sarkis et al., 2010). This interconnected view of networks in both social and economic contexts adds a layer of complexity to the understanding of information flows and collaborative mechanisms within financial relationships.

4. Methodology

Within the methodology chapter the reader will be guided through the research approach with an explanation of the methodological choices (4.1 and 4.2). This explanation will proceed to the process of data collection (4.3), offering insights into the data sampling methodology (4.4) that consisted of both primary and secondary sources. Moving on to the interview preparation phase, where the interview design (4.5) will be clarified, followed by a presentation of how the data has been analyzed (4.6). Ending with a discussion about the quality of the study's research design (4.6), taking ethical considerations into account (4.7).

4.1. Research approach

This research has adopted a qualitative single-case methodology, emphasizing breadth and depth, to align our research approach with the empirical findings of SMEs pursuing capital acquisition in developing countries (Bryman and Bell, 2019). Existing research has studied the barriers identified in financing constraints for SMEs. Building upon previous literature, this research will cover the research gap on how local green-SMEs can effectively engage within the BF ecosystem to procure needed capital for growth. To identify these key findings answering the "how" and "why" questions in our research question for green SMEs in developing countries, Yin (2014) emphasizes that employing a specific case company is the most fitting method and effective for theory building and testing (Crowe et al., 2011; Eisenhardt, 1989). Furthermore, Flyvbjerg (2006) advocates adopting a single-case study method to facilitate an opportunity for an in-depth exploration of the experiences and perceptions unfolded in the empirical findings of the funding phenomena.

In our selected methodology, we ensure that our case study and each unit of analysis align with previous research while also introducing unexplored elements. This alignment is articulated in precise and well-defined terms, following the principles outlined by Yin (2014). This purposeful alignment allows the existing literature to serve as a guiding framework in explaining both the case and unit of analysis in our research, ensuring a cohesive and informed exploration of the blended financing landscape for SMEs in developing countries.

Furthermore, the explanatory case study method will be adopted to our single-case study to uncover the underlying mechanisms behind their efforts at capital acquisition through BF initiatives. As Yin (2014) describes, our research question tries to cover ″operational links needing to be traced over time" (p.10) by answering the question, "how" can green SMEs engage in a blended financing ecosystem to secure the necessary funding for growth, by first understanding the "why" do green SMEs not acquire funding.

A pivotal aspect of our study involves seeking analytic generalizations, going beyond the specific case setting, meaning that our findings will be "...generalized at a conceptual level, higher than that of the case" (Yin, 2014, p.41). Yin (2014) defines the objective of case study research as not deriving probabilities through statistical generalizations but extending and generalizing theories.

We have aligned our methodological approach with an interpretivist epistemology and a constructivist ontology. This choice reflects our focus on the subjective experiences and contextual realities of the stakeholders involved in this process (Welch et al., 2019). Furthermore, this perspective is evident in our approach, as we are exploring how different stakeholders within the SME ecosystem construct their understanding and experiences regarding capital acquisition and financing projects in developing countries. By focusing on a single case study, we are delving into the specific, contextualized reality of that case, rather than seeking a generalized, objective truth about capital acquisition for SME.

Furthermore, during the review of the method choice, it is crucial to consider the associated limitations. Qualitative and case study methods are often criticized for being based on smaller sample sizes, which limit the possibility of generalizing our findings (Yin, 2014). To reduce these adverse effects, we have conducted interviews from diverse perspectives, including the case company and other stakeholders, active or potential investors in BF transactions, to increase its explanatory breadth (Yin, 2014).

4.1.1 Research approach abductive reasoning

This thesis will not examine a singular event and not try to reject or justify in an inductive manner (Haig, 2005), nor will it commence choosing theories and trying to strengthen them by testing a hypothesis (Haig, 2005). Rather the abductive reasoning serves as the primary methodological approach of this thesis. This involves us researchers' own experience, creating a relation between researcher, the research question and theory (Thomas, 2010).
Moreover, in line with abductive reasoning, we begin by exploring the phenomena in its context through earlier cases and information about the case company and context instead of starting our study grounded in theories (Lukka and Modell, 2010).

Additionally, this study has considered environmental factors in line with the VUCA model (volatility, uncertainty, complexity, and ambiguity) regarding sustainability initiatives rapidly increasing, financial risks fluctuating, and new regulation initiatives. These factors affect the ongoing debate on BF as it is gaining more traction with recent innovations and articles continuously being released. This can reflect the author's tone against BF depending on the published year. In these conditions, an abductive approach is deemed appropriate, according to Ahrens and Chapman (2006).

> "The practice of qualitative field studies involves an ongoing reflection on data and its positioning against different theories such that data can contribute to and develop further the chosen research question." (as cited in Conaty, 2021, p.3)

An abductive approach allows for a continuous interplay between deductive insights and inductive observations. Initially, the process started with various observations about the thesis topic and gathered real time data of case examples in an attempt to develop explanations of BF financial practices, the industry dynamics, and contextual factors. This was followed by

an iterative process allowing the navigation through the complexities of the case company's financing strategies while ensuring that the approach remains grounded in real-world observations and conceptualized by theoretical frameworks. As Haig (2005) and Thomas (2010) claim, it represents a "reflective dialogue between the researchers, data, and theory" (as cited in Conaty, 2020, p.4). The abductive approach will cover some of the limitations of the deductive and inductive approaches (Mantere and Ketokivi, 2013).

Our methodology draws inspiration from Becker (1998), emphasizing deep familiarity with the subject. As the research field is complex and the BF method investigated is new, this requires systematizing ideas, checking them against gathered information, and adapting the research process based on the ongoing interaction between expected and found outcomes. Becker's (1998) approach aligns seamlessly with our commitment to a nuanced, adaptive, and thorough exploration of the case company's financing strategies.

In essence, our methodological approach forms a coherent framework crafted for a robust and insightful exploration of the case company's financing strategies. Grounded in theory and poised for analytic generalization, this methodological approach ensures a comprehensive and meaningful study.

4.2 Introduction to the single case study

In the selection of a case company, we followed three different criterias, in order to be able to answer our research question 1) Green-SME 2) Experience during the growth phase leveraging BF 3) This project has to be in a developing country.

Aligned with our three criterias Stella Futura Ltd. (SF) were chosen as our single-case study. The company was founded in 2018, specialized in renewable energy solutions in Ghana, focusing on solar-powered systems for healthcare facilities in rural areas. SF aims to electrify up to 400 healthcare centers and hospitals in Ghana, enhancing sustainable and reliable electricity access. SF is selected for this thesis due to its relevance in exploring BF from a bottom-up perspective, especially within green SME contexts.

SF's invaluable experience with four renewable energy pilot projects in Ghana provides this research with primary insights from a practical case study. These projects demonstrate accomplishments and barriers during the upscaling phase, including *ideation, pilot, demonstrate, and scale*. This offers rich insights into how SMEs can navigate and benefit from BF structures. Furthermore, as SF scales these initiatives, the company's experiences are expected to highlight green SMEs' dynamic roles and capabilities within BF ecosystems. Thus, SF provides a unique combination of empirical data and strategic insights, crucial for the in-depth exploration of green-SMEs involvement in BF transactions in sustainable development contexts.

4.3 Data Collection and sampling

In the context of SF, the empirical data for our study was derived from a dual source of information encompassing both primary and secondary data. The primary data retraction involved conducting semi-structured interviews with different employees at SF and other stakeholders within the BF ecosystem. The secondary data sources were derived from previous research, field reports, online sources, company reports, and previous case studies, fulfilling the three established criteria. Furthermore, by using multiple data collection methods and sources, often termed triangulation, aligns with the intent to enhance the internal validity and credibility of our research process while exploring social phenomena (Merriam, 1998; Yin, 2014). According to Yin (2014), a case study's validity is protected through triangulation, involving the conscious use of multiple data sources and evidence.

In exploring a particular case company, this thesis will contain internal and external connections to the case as sample units (Bryman and Bell, 2019). More specifically, the typical case sampling method and generic purposive sampling will be used, generating a snowball effect that broadens the sample reach by utilizing established network connections (Bryman and Bell, 2019). Furthermore, a critical case sampling approach is adopted to choose a suitable case company to provide information deeply connected to the research question (Yin, 2014). Additionally, as argued by Bryman and Bell (2019), according to the critical case sampling method, the informants will be chosen according to their probability of conveying the phenomenon of financing explored with the research question.

A noted limitation during the snowballing effect approach, is when one interview refers to another, which might sometimes bring subjectivity. This may arise due to referrals to their close partnerships organizations sharing like-minded views. Also, due to this, not all interviews were as relevant to the research question. However, the broad perspectives and new territories, well anchored in the specific circumstances that the snowballing effect reaches, might be hard to achieve with other methods.

The samples can be divided into two different groups. The primary group at SF consists of the founder, co-founder, CEO, and the head of business development. This gave our exploration access to profound knowledge, internal research material, and a historical perspective since they were founded in 2018. The second group is the external stakeholders, consisting of current and potential investors. In alignment with the critical case sampling method, the requirements were to have some relevance and knowledge as a financial financier in developing countries, direct connections to SF, or operate in the same context and environment as SF. The decision to include both parties who have invested and those who have opted not to invest in BF transactions or similar green enterprises as SF, extends the comprehension of the investment context, highlighting both opportunities and barriers.

4.4 Interview design

The interviews were conducted by using a semi-structured design, with open-ended questions, facilitating flexibility. The alternative of structured interviews, which many researchers prefer, may limit the depth of the analysis by relying on predetermined questions, potentially overlooking valuable insights that could emerge through more dynamic conversations (Bryman and Bell, 2019). Recognizing the need for a more thorough exploration, using semi-structured interviews has allowed us to delve deeper and obtain more nuanced insights (Bryman and Bell, 2019). These interactions consisted of personal observations, informal meetings, formal meetings, and workshops with stakeholders not linked to the case company but still operating in the same ecosystem and fulfilling our three criteria.

In alignment with the qualitative semi-structured format employed in the case study, an interview guide was pre-established, serving as the core structure for the interview proceedings. The interview guide was designed to align with the research question, previous literature findings, and the case company experiences. The various concepts covered were adjusted to address the specific characteristics of stakeholders. However, the general themes of the interview guide in the context of BF and developing countries were:

1. BF with particular focus on green energy.
2. Ecosystem approaches.
3. Challenges and opportunities for SMEs
4. Risk management and returns
5. Innovative financial solutions
6. Nature of transactions and partnerships
7. General advice for organizations and SMEs
8. Project types and outcomes
9. Relationships and partnerships dynamics
10. Investment strategies
11. Sustainability and impact
12. Scalability challenges
13. Transparency and communication
14. View on BF

Figure 5. Interview guide

This guide facilitated exploration while ensuring participants could freely express their perspectives with open-ended questions resembling conversations (Burgess, 1984). The questions were clear, gentle, open, steering, and critical, aligning with Kvale's (1996) criteria.

Additionally, regarding the aforementioned abductive approach adopted given the innovative nature of the research and the application of theoretical context, this approach allows for flexibility in case supportive themes emerge during the empirical phase. This flexibility enabled the deviation from the interview guide, facilitating the inclusion of follow-up questions for in-depth discussions or clarification of responses (Bryman and Bell, 2019).

The interviews were conducted in the interviewee's native language, either English or Swedish, enabling complex and deep content communication. However, this required the translation of the Swedish interviews into English, which poses a potential limitation as it could lead to translation errors or the loss of information during the process.

The majority of the interviews were conducted through digital video meetings, offering geographical flexibility in selecting interviewees. Physical interviews might be more favorable, due to more attention to subtle details in expressions and body language. However the digital format allowed us to overcome time and geographical barriers. Verbal and written consent were obtained from participants, and recordings were made for accuracy.

In the context of the SF case, individual interviews were conducted to thoroughly grasp each participant's perspective and reflections, fostering an environment that alleviated concerns about being overheard (Bryman and Bell, 2019). Both authors were present during the interviews to minimize biases; one author directed questions while the other documented responses, as well as recorded (Bryman and Bell, 2019). This approach aimed to maintain a natural conversational flow, allowing the note-taker to ask follow-up questions. The authors alternated between note-taking and questioning.

Following all the 16 data points, recurring patterns, similarities, and deviations were identified, until we met a point of empirical satisfaction in the snowballing approach. This point for us meant when the empirical results of the interviews became repetitive, thus not contributing to a more nuanced result or perspectives.

4.5 Data analysis

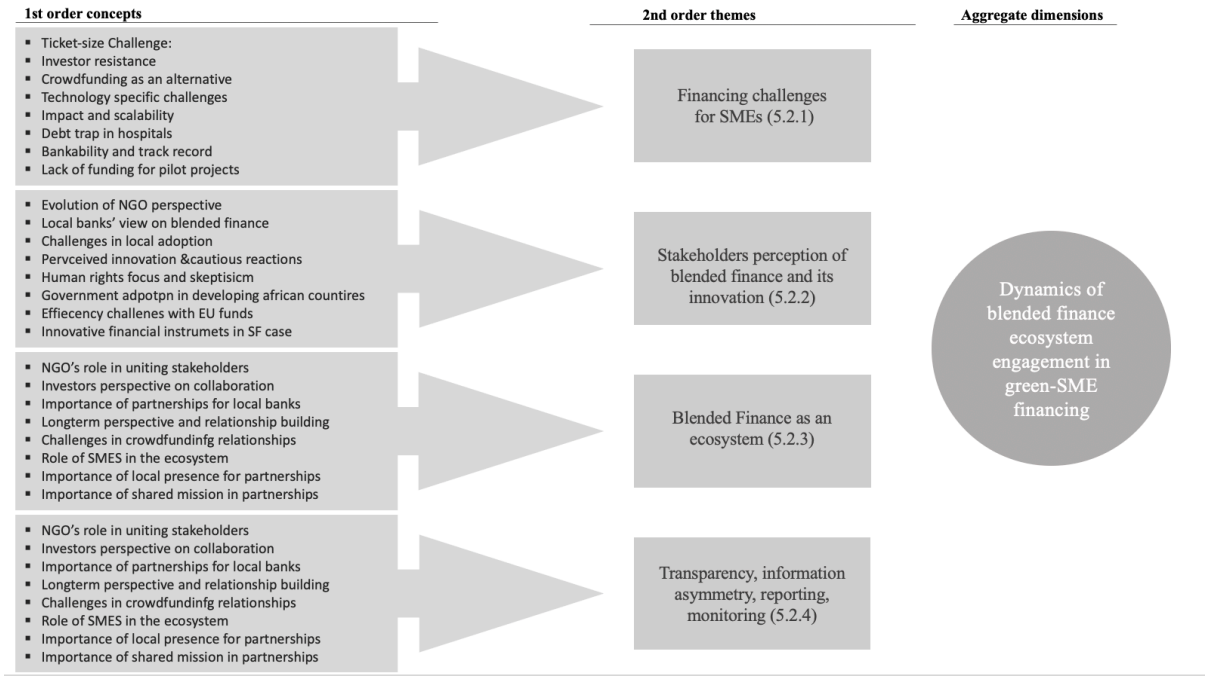


Figure 6. 1st order concepts, 2nd order themes and aggregate dimension

The qualitative interviews generated empirical data, which underwent voice and text analysis processing. Interviews were recorded and transcribed within 48 hours after an interview to prevent data sampling errors. The analytical process unfolded in two distinct steps.

The initial step involved an empirical analysis, aiming to logically structure the data into first-order concepts (see Figure 6). This phase sought to organize and categorize the information compiled from the interviews, identifying key patterns and relationships. To maintain objectivity and broaden interpretations, each researcher conducted the initial open coding process independently, following the approach outlined by Bryman and Bell (2019). Adhering to the principles of grounded theory building, the authors initially discerned general patterns in the data, coding them into first-order concepts to identify similarities and differences (Gioia et al., 2013).

In the second step, guided by the theoretical framework, the thematic analysis progressed to second-order themes that were subsequently aggregated into a dimension. This intertwined approach allowed for a comprehensive exploration of practical and theoretical dimensions. The two analytical approaches, empirical and theoretical, co-existed and evolved throughout the interview and post-interview phases.

A thematic analysis unfolded to align established theories with empirical findings, categorizing the novel concepts and themes at a higher level of abstraction and theory. Braun and Clarke (2006) state that thematic analysis is the central methodology for interpreting qualitative data. This approach facilitated identifying, analyzing, and reporting patterns or themes within the dataset. The selection of thematic analysis resonated with the nature of the single-case study, allowing for a nuanced exploration of the participant's experiences.

4.6 Research quality

Although there is no consensus regarding the criteria determining the quality of qualitative research, we will use one of Lincoln and Guba's (1985) and Guba and Lincoln's (1994) criteria, trustworthiness, as this fits our philosophical assumptions best. We will also apply some of Yin's (2014) logical tests. To ensure the trustworthiness of our research design, we apply logical tests encompassing credibility, transferability, dependability, and conformability (Yin, 2014). These tests, applied consistently throughout the case study, contribute to the robustness of the study (Bryman and Bell, 2019).

In order to achieve *credibility*, we ensured the case company was highly representative of the empirical research gap that we are studying, which aligned with the guidance of Lincoln and Guba (1985). This parallels Yin's (2014) notions of an internal validity test, essential when finding causal relationships, as in our explanatory study. One tactic to strengthen the *credibility* was including multiple data samples, including other stakeholders that brought new perspectives (Yin, 2014) in contrast to other findings retrieved in triangulation approach (Guba and Lincoln, 1984)

The reader of this study needs to consider the transferability of the thesis as a limited sample size that comes with a case study decides the level of *generalization* (Lincoln and Guba, 1985). Hence, in regards to testing its external validity (Yin, 2014), there is a risk that the results do not yield generalizable results as they represent a case, leading to limited external validity (Silverman, 2013; Flick, 2009). However, we posit that we have provided a "thick description," including cultural and social relationships that put them into context (Holloway, 1997). In our case, this means presenting an observation, description, interpretation, and analysis of the SME and BF context.

Lincoln and Guba (1985) define *dependability* as the steadiness of the results over an extended period, which they posit should be done in an auditing approach, documenting all the procedures. Bryman and Bell (2019) draw a parallel to *replicability*, which Yin (2014) defines as that another researcher should be able to use the same case design and reach the same results. To ensure this, the methodological approach and procedures have been thoroughly documented to create prerequisites for replicability.

Ensuring the *confirmability* of the study is trying to prevent biases and personal values from impacting the conduction of research and the results (Bryman and Bell, 2019). To address this concern of biases, we reflexively and actively documented the reflections of the observations in detail. Additionally, we aimed to provide a comprehensive and transparent account of the study, keeping the coding, explaining and justifying the methodological choices throughout the research process. Employing open-ended questions during interviews was another strategy used, hence communicating the content of the interviewees and not the interviewers (Arsel, 2017).

4.7 Ethical consideration

Ethical considerations are crucial to the qualitative conduct of this study. To uphold ethical standards, all potential interviewees were briefed on the purpose of the thesis, its procedures, and the confidential anonymity assured for participating individuals, both orally and in writing, in accordance with the standards of Bryman and Bell (2019). In compliance with the General Data Protection Regulation in Sweden and the ESRC Framework for Research Ethics, participants gave written consent to their involvement in the study and the temporary storage of personal data.

The ethical framework, as defined by Saunders et al. (2012), underscores the moral principles and values guiding researchers to conduct their work with honesty, fairness, and responsibility. Additionally, this was considered by anonymizing the interviewees to ensure transparency, fairness, and respect for the participants throughout the research process.

5. Empirical findings

The case study overview and sub-sections are based on internal reports and follow-up interviews with the co-founders to provide context to the case company and their financial structure. The following section on emerging themes of empirical results portrays the view of the management experiences and lessons from the case study in contrast to various stakeholders in a blended finance ecosystem context.

5.1. Single-case study of green-SME overview

The thesis investigates Stella Futura's (SF) initiatives in renewable energy solutions in Ghana. The focus is on its innovative project financing leveraging BF to address various challenges to acquire the needed financing for projects in Ghana. The company specializes in providing sustainable energy solutions, primarily through solar energy, to tackle the challenge of unreliable electricity access in health facilities in Ghana. This issue is critical as many health facilities, particularly in remote areas, lack reliable electricity supply, impacting the healthcare quality. To address these issues, SF as an SME in Ghana, initiated four pilot projects with four hospitals in collaboration with Christian Health Association in Ghana (CHAG). The objectives of these project are listed as follows:

1. Provide solar-as-a-service solutions to complement the national grid and reduce reliance on diesel generators, enhancing energy reliability.
2. Reduce hospital energy costs through innovative financing models, including equity, debt, grants, and carbon financing. SF collaborates with the Swedish Energy Agency to explore carbon mitigation agreements.
3. Decrease hospitals' carbon footprints by adopting green solar energy, contributing to environmental sustainability and potential carbon emission savings.
4. Improve healthcare efficiency, reduce maternal and neonatal mortality rates, and attract qualified health professionals by ensuring reliable power supply

SF's success in advancing SDGs is closely tied to its innovative use of BF models. The dedication to sustainability extends across a variety of the objectives, as demonstrated by their multifaceted approach targeting SDGs; 1-8, 10-13 and 17 (see Appendix 7).

5.1.1 Contract structure of pilot projects

The contract structure for these pilot projects, as depicted in Figure 7, covers project financing, implementation, off-take agreements, and maintenance. It involves the inflow of funds (a blend of equity, debt, carbon financing, and grants) from various partners into a Special Purpose Vehicle (SPV)[2] registered in Ghana. This structure also incorporates innovative solutions like mobility/electric bikes with chillers for cold chain vaccine delivery and medical treatments in remote areas. Outflows from the SPV include contracts for engineering, procurement, and construction (EPC), operations and maintenance (O&M) to

[2] A SPV is a separate legal entity created specifically for a purpose or project. It offers limited liability and helps to protect the joint venture's assets and liabilities from the parent companies

Stella, and Hire Purchase Agreements (HPA) with each healthcare facility. Under the HPA, the financing offer allows hospitals to make fixed monthly installment payments in local currency for the solar installation and maintenance over a period of 15 years with no (zero) down-payment or initial cash outlay from the hospitals. These monthly payments will cover project development, procurement, installation, and maintenance.

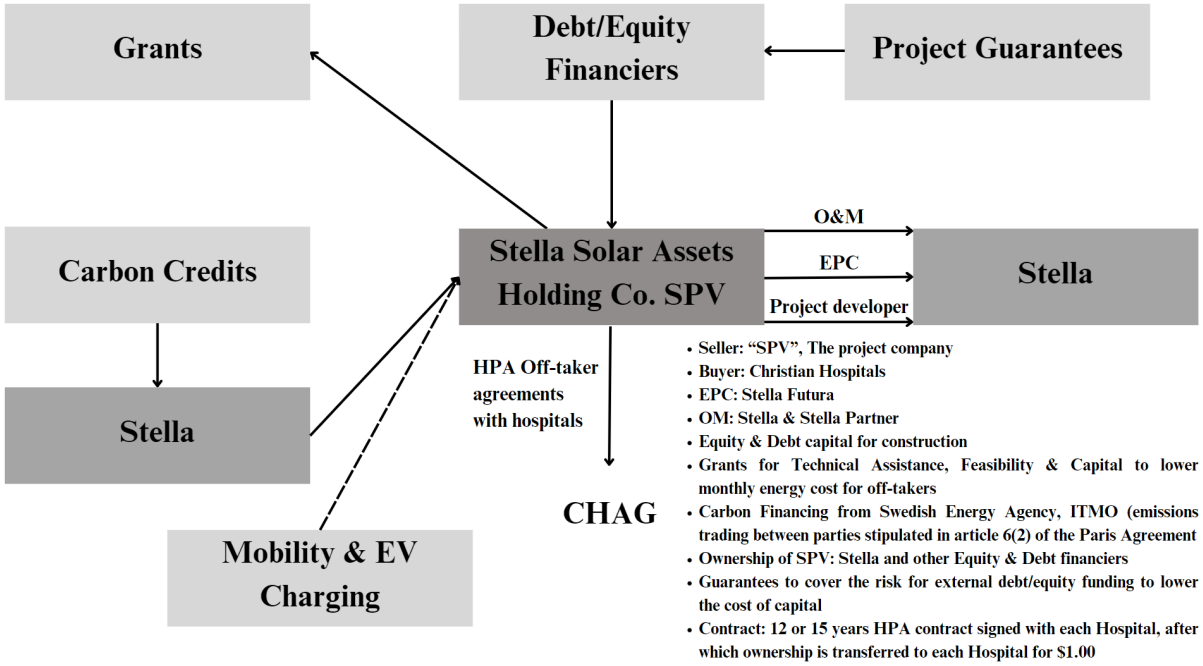


Figure 7. Stella Futuras financing structure

5.1.2 Innovative financing structure

SF's financing model is an innovative blend of equity, debt, carbon financing, and grants. This earned SF a place among the top three nominee for the "Deal Financing Program of the Year" award at AFSIA's annual ceremony in Nairobi[3]. This blend creates affordable financing options and mitigates risks, enabling healthcare facilities to adopt solar energy solutions. Crucial for the pilot projects was how SF collaborated and pooled financing sources together, including equity infusion from SF, a reduced capital expenditure grant received from a foundation, and project development support and technical assessments grant to support upfront costs from a global environmental authority in partnership with an university.

To address currency depreciation risks and enhance project feasibility, SF incorporated Distributed Renewable Energy Certificates (DRECs) into its financing model. These certificates monetize the electricity generated by renewable assets and are sold to global corporations, reducing capital expenditure and mitigating risks.

[3] The "Deal Financing Program of the Year" award, presented by the African Solar Industry Association (AFSIA), is a prestigious recognition of outstanding achievements in the field of financial innovation and investment within Africa's solar market. This distinguished honor acknowledges initiatives and programs that have effectively structured various financial principles, including traditional and non-traditional methods such as impact investment, crowdfunding, grants, micro-financing, and more.

The financing model has shown that grants can reduce the monthly cost of solar energy by 41%, with D-RECs contributing an additional 15%, leading to an affordable energy cost of $0.11/kWh in local currency. This is significantly lower than the grid and diesel costs of $0.23/kWh and $0.55/kWh, respectively. Moreover, partnerships with a Swedish e-mobility firm, have enhanced sustainability efforts by donating electric motorbikes for vaccine dissemination and remote healthcare service delivery, further reducing carbon emissions and operational costs. This pilot project strategy has placed Stella Futura in the FIGAP program[4] with the African Guarantee Fund, aiming to bridge the funding gap for SMEs in West Africa.

5.2 Emerging themes from empirical findings

The empirical results will present the key findings from our single-case study of SF during their collaborative efforts in four pilot projects with CHAG and into context to other interviews of diverse stakeholders to enhance various perspectives in a BF ecosystem. The findings are divided into four key themes based on the empirical data. The themes are presented in sections 5.2.1 Financing challenges for SMEs; 5.2.2 Stakeholders' perception of blended finance and its innovation; 5.2.3 Blended finance as an ecosystem; and 5.2.4 Information and communication management in blended finance.

5.2.1 Financing challenges for SMEs

In the process of the empirical compilation, a recurring challenge centered on the issue of the 'ticket-size' of projects was discussed among the interviewers. This aspect, critical to the financing for SMEs, highlights the complexities and challenges they face in securing necessary funding. The CEO of a crowdfunding platform (CP) acknowledges:

> "Government funding, whether it's development finance or from local governments, as always, they are focusing on the white elephant projects, the big." (CP)

The problem partly stems from the rigid demands of the international banks, larger institutions, development finance, and governments that usually require between 50 to 70 million euro to invest in a company, according to a Foundation (FO), CEO of an Impact Investor Network foundation (IF) and (CP). CP describes the problem of banks rejecting their small projects:

> "If a bank approves € 5 million of debt, they give you 70% debt of the total volume of project value. So basically means you still have to bring 1,5 million of equity and the total project volume must be around 6,5 million for the banks… The majority of our initial projects range from € 50,000 to 100,000 of investment. So it's a mismatch between the financial market and the actual project market." (CP)

[4]FIGAP is an initiative structured by The FRAGG Impact Growth Accelerator Program in partnership with the African Guarantee Fund. The aim is to close the financing gap for SMEs in West Africa, by providing support in the impact and climate sectors to projects and companies at expansion stage, to prepare them for the funding needed to scale.

Building upon this, a perspective from FO highlights the implications of the financial investments being skewed towards large-scale or tiny projects. This leaves medium-scale sustainable projects, such as solar power systems, in Africa underserved.

> “So, I see an opportunity for these social business ventures to be established, but I also see that it needs to be easier for them to raise capital from development finance institutions. That's a challenge and if you look at the African continent, it's either these huge projects or single-home solar home systems. So, finding that middle ground where an African company can develop and get assistance with business models so they can find a sustainable solution over time and provide their country with these. For this you need to find smart solutions that enable a mix of equity from both DFis investors, and other forms of equity, like from private investors, to find this blended financing.” (FO)

The Head of Business Development at SF (BD-SF) discussed the dilemma of the investors' resistance to small ticket-size projects because of their high transaction costs. A Nordic PE fund said that SF needed to excel at at least ten hospitals instead of four to justify the project prospect for their investment committee even to cover the administrative costs.

CP also addressed this by first looking into BF. However, they pivoted their approach to attracting alternative funding sources from retail investors by leveraging a crowdfunding platform. By aiming for retail consumers, they offer diffuse ownership with a lower equity stake while maintaining a lower yield requirement to investors. This enabled a more flexible and streamlined approach for their EPC solar projects, especially during their start-up and pilot phase.

Ticket size challenges may be general to all SMEs within BF, however, added complexity and challenges appear for SMEs leveraging new high-technology products. CP highlights that SMEs, especially those developing solar panels, face substantial capital CapEx. In this context, CP has focused purely on commercial viability without involving development funding and has selected projects with the highest return. CP recognizes a paradox of balancing profit and impact, "looking for projects where you have the greatest community impact, they're most likely the ones that are not financially viable, which is why there is blended finance, right?". On a similar note IF argues that they also found that "it is hard for SMEs that want both to achieve this social impact and have a kind of economically sustainable model. That's why we started a fund for impact investment as a network." In contrast, the strategy of SF differs on selecting their projects. SF concentrates on implementing solar panels for hospitals in rural areas, which may not be as commercially viable but offer a more significant impact.

Stakeholders in the aid sector do also acknowledge that the size of SME projects influences funding decisions. However, they place a higher priority on the size of the project's impact, concentrating on projects that promise the most significant impact outcomes. The head of innovation and digital transformation at an NGO (ID-NGO) claims that one solution for SMEs is to show the project's scalability potential. Illustratively, an SME can increase the

likelihood of funding if it can show a scalability plan by starting with the impact of one hospital and, in a later development stage, scaling the impact to 20 hospitals. Both from an impact and commercial point of view, it is important that a project from the start can show a long-term communication plan for growth and scalability.

The CEO of an NGO (C-NGO) adds context to this: "many hospitals in Africa, built in the 60s to 90s, suffer from a debt trap. Due to unfavorable loans and high-interest rates, these hospitals struggle with their financials and struggle to make strategic and sustainable investments." To address this, SF has created an SPV with CHAG and offers end-client hospital agreements through HPAs for building solar panels on their roofs. This allows the hospitals to pay for the CapEx investments on a monthly basis. However, this solution introduces complexities at the investor level, particularly concerning risk assessment. A local bank (LB) identifies two critical issues: the developer's ability to deliver the technology and the off-takers (hospital's) capacity to make payments. LB elaborates:

> "…when considering financing for solar projects, the bankability of the end client is crucial. Even if a developer approaches the bank for a loan, we always assess the financial stability of the off-takers. This is because the off-taker's ability to make payments directly impacts the developer's capacity to repay the loan. In cases like Stella Futura's, where the end beneficiaries are hospitals that might not be considered bankable, this becomes a challenge. The bankability of the end client is a key factor in our decision-making process for financing, as it directly affects the likelihood of loan repayment." (LB)

Furthermore, LB and IF emphasize the importance of project developers needing to build a track record and, similarly, the off-takers needing a proven track record before being considered bankable. Commercial banks typically only participate when there is a proven business model.

These perspectives and challenges align with the lessons learned from SF pilot projects. Large international institutions rejected them due to having a ticket size that was too small and no proof of concept. This forced SF to fund their pilot project with their equity to materialize the innovative financial approach. SF sees this as one of the most urgent challenges or gaps that today's structures need to address: finding capital for smaller SMEs to enable them to start their first pilot projects. The co-founder of SF (CF-SF) explains this further:

> "Scaling up is a general problem in this hospital pilot case. It would be easier for us if we then had a proof of concept done. But there is no fund structure to pick up, and unfortunately that venture capital has to be my own… Then we said, set some money aside for feasibility studies. So, when you're going to invest this much capital anyway, let one of these supporting grants go to riskier projects with high potential of impact. There should be money for people like us so that we can prepare the project, enabling

us to get a track record for future capital investments without risking equity from Stella Futura.” (CF-SF)

5.2.2 Stakeholders perception of blended finance and its innovation

BF, which has emerged as a novel approach since 2015, has been met with various reactions from different stakeholders, each bringing their unique perspectives of understanding and the implementability of this “innovative” financial approach. Although all interviewees are familiar with the concept and acknowledge both the novelty, the potential, and a willingness to embrace and implement it varies significantly across countries and sectors. For instance, NGO viewpoints have gradually shifted, recognizing BF as a necessary evolution from the traditional mindset of aid-focused methods.

> “However, a new view is seen on aid where 'aid is trade and trade is aid', and our perspectives are changing.” (ID-NGO)

Building upon this perspective, C-NGO explains:

> “Aid flow has for a long time been isolated and not integrated with other types of financial flows. This will be a necessity to go from project dependence on aid for survival to commercially functioning enterprises with more independence and sustainable projects in the future.” (C-NGO)

Agreed by SMF:

> “... but you have to think away of just getting grants. You have to have a deal that lasts but then small amounts may be grants along the way, but the deal has to last.” (SMF)

An empirical case illustrating the effectiveness of BF, where an NGO provided catalytic capital through a grant to a project in Congo within food supply. The NGO managed to engage institutional donors and an international development bank, which resulted in a budget of one million dollars, of which they contributed a smaller part.

In contrast, LB, representing perspectives from local banks, states that BF:

> “... is not yet a leading trend among local banks, but it's something that could be adopted more widely in the future. Banks, including ours, are not typically the forerunners in innovative financing structures... If we were to engage in such a blended financing arrangement, our condition would be that the bank holds the senior loan position. We would not actively seek out partners for these projects but might consider participating in a project if it comes with a pre-arranged blended financing structure and is only seeking a portion of debt financing.” (LB)

LB elaborates on the issue, stating that banks prefer traditional predominant methods and tools like loans, project finance, and syndications aligned with their risk management and secure investment strategies. These methods applied by local banks often result in more

extended processing, which might not align with the quick turnaround needed for projects like SF's. LB and IBF emphasize the issue of this inertia, combined with high local interest rates, making it challenging for SMEs to secure financing domestically and may hinder the adoption of BF among local financial institutions.

An additional perspective of BF is that its financial structure and models are often seen as innovative, and NGOs have observed cautious reactions to BF from different actors. In line with other interviewees, NGO emphasize the need to balance ambition and innovation with thorough risk assessment and responsible decision-making. The NGO recognizes that there remains a certain conservatism regarding this method of financing within the civil society and aid sectors.

> "There is a strong focus on human rights within the aid sector, and many organizations prioritize highlighting rights issues over financial innovations like blended finance. This perspective can sometimes lead to a degree of skepticism towards blended finance, as it may be perceived as less directly connected to human rights or not as 'attractive' to promote." (C-NGO)

Furthermore, the NGO distinguish different strategies regarding aid and development finance:

> "Humanitarian aid efforts require continuous access to resources and cannot be subject to experimental or risky financial methods. Here, it is critical to ensure that the aid is stable and sustainable. In our development projects, however, we are more open to experimenting and testing new ideas… innovation and visionary thinking are necessary to make progress and streamline processes within blended financing" (ID-NGO)

In contrast, IB mentions specific investors and EU funds with capital set aside intended to finance innovative projects for beneficial purposes. However, despite the availability of substantial EU funds for investment, IB identifies the lack of an effective platform to facilitate the matching process with private capital. IB states this inefficiency leads to underutilization of EU funds and is metaphorically described as "EU funds burning inside" (IB).

However, a new trend of adopting BF methods is seen within developing African countries on a government level. During a workshop (W3), a leading African politician underscored Ghana's successful approach to embracing innovative financial models. The politician noted an increasing governmental interest and potential wider adoption of diverse BF models with defined development goals, recognizing them as practical strategic approaches to stimulate social and economic growth.

In the case study of SF, the BF concept was unheard of when they started in 2018. Since they had no exposure to BF as a financial approach, they started their path of experimentation,

combining “warm money, such as grants from entities like Sida or the Red Cross, with cold money from loan funds and private equity.” However, according to CF-SF:

"there really isn't a viable financial model, and why is that? The reason, in short, is this: everyone who builds a financial model does it in a top-down manner. The banks need to feel secure, as do the funds, and so on. What was missing was an in-house tool to adapt these financial models for smaller projects and the kind of capital turnover seen in SMEs… After a lot of effort, we developed a model that works in theory, built from the bottom-up by combining various capital sources. This could be simulated, assuming we received all the necessary capital, to showcase a functional and sustainable financial model attractive to traditional financial institutions." (CF-SF)

LB, who often receives requests from solar developers to refinance their portfolios or finance new projects, addressed this concept of combining innovative financial instruments, referring to the SF financial model:

“Stella Futura seems to combine carbon credits and SDGs to attract impact investing and grants from different capital sources, which is appealing to impact investors and technology funds. However banks here, including ours, tend to be quite hesitant to rely on such a source of income. This hesitance comes from the novelty of carbon credits capital inflow and the uncertainty surrounding them. We do generally prefer more guaranteed and established sources of income” (LB)

5.2.3 Blended finance as an ecosystem

BF, viewed as an ecosystem in itself, brings together diverse stakeholders, each with unique motives and objectives that may have never worked together before or with similar organizations. The NGO highlights this challenge and sees its role and expertise in uniting these different actors and creating a functioning ecosystem. This is central to their work and the implementation of their projects:

"Each sector has its own language and way of working, authorities, the business community, financiers, and academia, all speaking different languages, and this is where we come in. Our role is to act as a platform where these different groups can collaborate and learn to work together. To serve as a link between these various sectors, we can help integrate different types of capital and expertise that each of these actors contributes…There is often a lack of understanding and recognition between these various organizations.“ (ID-NGO)

FO also has experience in this matter, emphasizing quadruple helix programs where business actors, academia, governments, communities, and NGOs communicate and collaborate on projects:

“It's all about relationships. That's what creates projects and business opportunities. There's really nothing else, and it's extremely important. Also, it's important to maintain and nurture

your relationships and take care of them. And, of course, networks as well which brings in all our business opportunities." (FO)

In contrast, FO, from the perspective of a foundation investor, places a different emphasis on relationships. FO's strategy involves identifying needs within a country and seeking the most relevant financial actors to address these needs, including investors, philanthropists, DFIs, and other development financing sources. The key for FO is ensuring these collaborations align with their primary own objectives.

LB highlights the importance of such partnerships as well, looking at "blended financing models involving a commercial bank and a development finance institution (DFI) could be feasible and effective…such partnerships, as projects pre-vetted or supported by technical assistance from DFIs, would likely be stronger and more credible"

" This approach is viable because it reduces risk for the bank, especially if the DFI or another technical partner pre-selects and presents projects. In addition, LB sees value in SMEs that have "robust partnership structures and good connections when approaching a bank for financing. We always consider the broader ecosystem in which the SME operates, including their suppliers, off-takers, and sponsors. Understanding these relationships help us assess the SME's business stability and potential for success, making them a more attractive candidate for financing." (LB)

Furthermore, the data collected reveals differences in how various stakeholders within the ecosystem perceive the long-term perspective when participating in a BF project. NGOs aim to build long-term relationships rather than engage in one-off transactions:

"Perhaps 10 to 15 years, but in relationships you need a deep understanding and respect for each other's goals and working methods. I believe this long-term view of relationships and collaborations is important for creating a successful ecosystem in blended financing, where different actors collaborate towards common goals". (ID-NO)

However, before committing to these long-term relationships, the NGO considers a range of factors, including financial, ethical, climate-related, and human perspectives. They emphasize within the human perspective, "particularly in projects in developing countries, who may lack clear data points or a proven successful history, such as the case of SF, we highly value the entrepreneurial spirit and innovation capabilities of the individuals involved." (ID-NGO)

LB, on the other hand, given banks' general aversion to new ventures, prefers extending and deepening existing business relationships over constantly seeking new project types. While innovating and expanding into new project types is important, most of their business is based on nurturing existing relationships. "It's a sweet spot compared to a new client who has never banked with us and approaches us solely for solar project financing. We still consider new clients and projects, but having an existing relationship makes the process easier and more manageable." (LB)

Crowdfunding, as an alternative structure to BF, contradicts the view of relationships with other stakeholders since their primary source of capital is retail investors. Their view and management of long-term relationships of investors are not as straightforward as they have no control over who is investing. For them, "the key thing is to build up trust and predictability. Regardless of the type of capital, blended finance, venture, growth or working capital, everyone wants to see that when they give you the capital, you are actually in a position to generate the returns. So what you need to do always is prove that in the past." (CP). On the other hand, SF, who adopts the BF model from a bottom-up approach, can screen and select their investors.

From the perspective of SMEs in the ecosystem, C-NGO recognizes the significant role SMEs play because of their local presence:

> "SMEs can enter the ecosystem at a more fundamental level by interacting directly with local actors and their specific clients in their African countries. This direct engagement on the ground provides SMEs with an advantage in understanding and addressing the specific needs and opportunities within these communities." (C-NGO)

This aligns with the viewpoint of the Honorary Consulate General of Sweden in an African country (HCG), who underscores that "local employees are favorable, closest to identify problems and verify and really know what happens on the ground, you can't expect everything to work just because it's standing somewhere, you really have to be there" (HCG). HCG's local insight was contrasted with the experience of a Nordic PE fund, which faced challenges in conducting due diligence for international investments due to its lack of local presence. This lack of "on-the-ground" engagement increases their own transaction and administrative costs, which led to extensive and expensive information requests from SMEs, which were both too burdensome and costly for the SMEs to fulfill.

ID-NGO adds to the potential of a close relationship and partnership with SMEs in their projects, extending beyond the benefits of local presence:

> "We see SMEs as part of a comprehensive partnership and financial ecosystem. SME is not just a standalone company but rather a part of a larger structure that includes various partners and sectors. And we can connect SMEs with other ecosystems due to our own extensive contacts across different sectors" (ID-NGO)

In SF's approach, when identifying and selecting local partnerships, the need for a bottom-up perspective was essential by actively involving local communities from the initial stages of the project. As these locals are the ultimate beneficiaries, engaging them from the start ensures that the project aligns with their specific needs and expectations. As these hospitals are often located in rural areas, they frequently need more knowledge about the technology, its various benefits, and the potential savings solar panels offer. To address this challenge, Stella's local presence was highlighted as a significant advantage in gaining project support. Additionally, as an SME, SF had to act as the *spider in the web* within the ecosystem,

leveraging their network of partnerships to convince the hospitals and local communities of the project concept and its broader positive impacts. The CEO of SF (C-SF) explains it as follows:

> "...working with CHAG revealed a knowledge gap. We had to educate the hospital owners and also introduce them to the contract structure and all the partnerships. We had to open up our grant foundation to present itself to the hospitals and to the UN environmental program power. Lastly, we had to bring all of them on board to present to the managers and his team, for them to really gain confidence not only in Stella, but also in those who were the sources of these grants and funding." (C-SF)

This aligns with the country director of an institutional bank foundation (IBF), who sees the value of green-SMEs' holistic approach to addressing barriers regarding off-takers. Specifically, IBF highlights the potential for green-SMES to help their clients with financial literacy in developing countries, which would also expand their social impact.

BD-SF reiterates the importance of having a local presence to foster these partnerships for the success of their projects. This is an important lesson as it will be crucial when scaling their operations to other African countries:

> "Establishing a local office or having a local staff is crucial when expanding to other countries. Without a local presence, finding the right partners, like a joint venture (JV) with another company or individuals who understand the local context, becomes essential." (BD-SF)

Furthermore, SF's approach to evaluating and selecting potential investors and financiers involves carefully considering the project's scale, nature, and specific industry requirements, along with the growth potential and post-implementation support needs. By aligning the financier's criteria with the project's specific needs and the client's interests, the company ensures that they select the most suitable financial partners for the long-term perspective of their projects. A critical factor in establishing these partnerships is the shared commitment to the company's mission, which is centered on making renewable energy more accessible and affordable for healthcare facilities. This shared mission facilitates better collaboration and ensures a high degree of transparency in all dealings. This can raise difficulties when seeking money from foundations as they have strict statutes of purposes or sectors they are willing to invest in, according to an institutional bank's head of the foundations and philanthropy division (IB). To address this, SF has implemented a strategy of applying a multifaceted approach of targeting several SDGS to enable access to various funding sources. This is seen as a novel and potentially lucrative strategy, according to C-NGO.

5.2.4 Information management in blended finance

> "By working with blended finance, one can address the entire financial model of a project, not just individual aspects. This provides a more comprehensive view regarding

transparency and information of a project's needs and enables more sustainable planning." (C-NGO)

C-NGO observes BF to be a facilitator for enhancing transparency in financial investments that are traditionally problematic. It unites diverse parties and creates new pathways for information flow, breaking down silos that have traditionally hindered comprehensive understanding of financial projects. C-NGO emphasizes BF's possibility of connecting new information nodes in the ecosystem. In such an ecosystem, communication and transparency become essential tools. They enable different actors to leverage the collective insights and expertise brought together through blended finance. Doing so allows all parties to make more informed decisions, align their goals, and work towards a more effective and sustainable outcome. This comprehensive visibility, offered by blended finance, ensures that even smaller contributors can understand the full scope and impact of the project, underscoring the importance of clear and open communication in these interlinked ecosystems:

> "We believe that transparency and clear agreements are crucial for managing information asymmetry and maintaining trust among different actors in blended financing. This helps ensure that all parties are aware of and agree on the terms and objectives of collaboration, which is crucial for building strong and sustainable partnerships." (C-NGO)

However, according to the ID-NGO, information asymmetry exists between stakeholders in a BF ecosystem. "Specifically in the case with Stella Futura, which is a smaller business compared to larger organizations like the Shell Foundation, balancing information asymmetry poses a challenge…We aim to create equilibrium in relationships with larger actors by ensuring transparency in all partnerships we engage in." (ID-NGO

However, LB observes that the problem of information asymmetry is less prevalent within the relationships between local banks and SMEs due to training programs provided to SMEs to increase their level of knowledge.

> "Generally, the issue of information asymmetry isn't significant in our dealings with clients. In our country, there are many instruments, project developers, and technical assistance programs, especially in the solar sector. These programs often provide free consultation for technical and financial assessments to those wanting to install solar systems. Hence, most clients come to us well-informed." (LB)

Perceived risk is the main factor considered in the financing stage for SMEs, often due to a lack of track record, making the communication of correct information between parties important. The data shows that reliable, correct, and honest information in the form of reporting is a demand from investors during their due diligence and for donors to ensure there is no corruption. FO describes the need for this:

"Yes, we need quite a bit of information if we take these EPC projects as an example again. We require a substantial amount of information to even make a decision about whether this is something we should delve into. We also need honest information from everyone involved so that we can conduct a review and screening of all the parties we are involved with. The entire compliance aspect is crucial, and, of course, from a sustainability perspective. So, it's everything from knowing organizational issues to questions about the project as a whole and detailed questions in the part where we get involved." (FO)

This problematizes the fact that most off-takers often do not have in-house competence in bookkeeping reporting in a standardized way. Nor do they have access to expensive consultants or can afford them to provide the financial statements required for due diligence for investors or donors, according to C-SF. In the case of SF, the due diligence of off-takers involved scrutinizing their financial statements, debt levels, and bill payment history. It was found that many of these hospitals had poorly maintained financial records and significant debts. HCG emphasizes, “This can be particularly challenging when starting from scratch, as SMEs must compile all the required information comprehensively. The collaboration with CHAG also faced delays due to the unique nature of the project and the need for detailed information in the form of reporting, which was challenging to compile.” (HCG)

As CP strategically has chosen to work with retail customers instead of governments, they highlight a different perspective, arguing that trust, power, and control are interchangeable with reporting. Thus having less pressure to use specific reporting standards and having more freedom of what information and how they want to convey it: “I call reporting a trust building function. They don't really want to see the data, they want to see that you are in control and that you know what's happening on the project.” (CP)

The empirical findings show that not only the initial phase is of importance in regards to transparency and trust building, but likewise the continuous and post-implementation phases. SF and FO strongly emphasized that it is of essence to show how the situation for these hospitals improved post-intervention in order to build trust in the post-intervention. This aligns with the NGO, which focuses on full transparency by following up with clear communication about the achieved effects of certain investments, both positive and negative. In this way, the investors get a sense of transparency, trust, and a feeling of contributing.

SF has started to recognize the crucial role of transparency, reporting, and monitoring in project management, as emphasized by many of its stakeholders. Consequently, SF has initiated a new approach that utilizes data-driven technology, including developing a *digital twin*. This digital twin leverages real-time data to provide insights, allowing investors and stakeholders to monitor the pre- and post-impact effects of renewable energy projects remotely. This method ensures information accuracy and makes it more applicable and tangible for current or future investors.

Furthermore, it was observed during workshops W1 and W5, where SF discussed innovative evaluation metrics to facilitate understanding and transparency disclosure of project results. By converting traditional financial Key Performance Indicators (KPIs) to novel impact KPIs, SF enhances the flow and quality of information within the network. The core of this idea is to use energy output from solar panels, quantified as 10,000 kWh for imagination, as a tangible KPI to demonstrate the impact of both concessional and commercial funds in terms of sustainability and social benefits. For example, implementing a solar project in a hospital that generates 10,000 kWh over a certain period can be translated into measurable outcomes such as the number of lives saved, the amount of CO2 emissions reduced, and other significant metrics.

6. Analysis

Our empirical findings are structured into two main sections. Section 6.1 focuses on identifying mismatches, gaps, and paradoxes within the Blended Finance (BF) ecosystem. Section 6.2 applies theoretical frameworks and key concepts central to our analysis to explore how green-SMEs can navigate the BF ecosystem.

6.1 Identified mismatches, gaps and paradoxes

Emerging academics from the literature review recognize BF as a key financial approach with the potential to support green-SMEs with financing, especially during their scale-up phase. However, our primary data presented in *section 5* identifies several paradoxes, gaps and mismatches within the BF ecosystem among stakeholders. These challenge green-SMEs' ability to effectively leverage BF for growth through the development stages: ideation, pilot, demonstration and scaling. It therefore becomes crucial for green-SMEs to understand how they can navigate through them to effectively engage with stakeholders in the ecosystem.

6.1.1 Investment size mismatch and scaling challenges

A mismatch identified in our primary data, *section 5.2.1,* is the investment ticket size in green-SMEs' projects. Both commercial and concessional investors typically seek larger ticket sizes, aligning with their preferences for risk-return optimization or significant impact outcomes. This preference leaves green-SME projects in the middle-ground, as financial investments tend to be skewed towards large-scale or microprojects. This gap hinders green-SMEs from finding the support needed to develop and validate their business models over time which mirror SF experiences.

Mismatch above relates to the paradox of green-SMEs facing difficulties in attracting necessary capital during their up-scaling phase to enable pilot projects for demonstration. This involves resistance from investors, according to our empirics, to invest in projects for green-SMEs which often lack a proven track record operating in underdeveloped markets. Contrarily, as observed in the SF case, these enterprises can not validate their business model without the needed capital.

6.1.2 Risk and outcome balancing in impact projects

Another challenge our empirics show is the added complexity of balancing perceived risk and outcomes between profit and impact projects among stakeholders. The stakeholders providing concessional funding were observed to focus on the areas with the most challenging conditions since their aid support is often the most impactful. Paradoxically, these areas tend not to be financially viable due to a higher perceived risk. Hence, commercial investors responded that they tend to invest in more commercially viable areas but with a lower impact.

6.1.3 Innovative approaches and traditional mindsets in blended finance

From our empirical data, we can derive that in the BF ecosystem there is another mismatch between the innovative approaches of BF transactions and the traditional mindsets of financial stakeholders. In section 5.2.1 we observed an unanimous perception that green-SMEs often exhibit agility and a drive for innovative solutions, however, they are frequently constrained by traditional financial structures. This misalignment emerges because SMEs, striving for innovation and rapid adaptation, typically seek funding for projects that are seen as high-risk or untested by conventional financial institutions. As a result, we have observed that traditional investors often overlook these SMEs, who prefer more predictable, established projects with a lower perceived risk (5.2.2).

Consequently, we can derive that green-SMEs' such as SF's innovative potential is hindered by a lack of access to capital, which hinders their ability to bring impactful changes to challenging sectors or exposed regions. This creates a challenging scenario as conventional investors were interpreted to tend to focus more on secure investments with shorter payback time and return, neglecting the green-SMEs valuable qualities of agility, innovative capacity, and new technology for climate adoption. This reinforces the need for a shift in the mindset and approach of financial stakeholders within the BF ecosystem, focusing on the long-term perspective.

Lastly, each type of investor in our data has its own diverse views on perceived motives and objectives of investing in developing country projects, which creates challenges in coordinating an ecosystem of various stakeholders. More specifically, different investors have their own method of assessing and approaching investments, considering risk assessment, projections, scalability potential, and social impact. This diversity leads to a lack of understanding and recognition between stakeholders, each with its own language and operational way, which is highlighted in *section 5.2.3*. Therefore, a dynamic intermediary is needed to link these stakeholders and integrate the varying types of capital and expertise each stakeholder contributes.

6.2 How can green-SMEs navigate in the blended finance ecosystem

In response to the challenges identified, this section integrates and applies key concepts from our theoretical framework to our empirical results. Through the lens of the tripartite theoretical framework of Resource Dependence Theory (RDT), Network Theory (NT), and Social Network Theory (SNT), we strive to in a constructive way interpret our empirical findings and the complex dynamics that green-SMEs face and how to navigate these within the BF ecosystem.

6.2.1 Navigating power dynamics and dependency from a RDT perspective

As stated in the literature review section (2.1), both within the research field and practical cases in BF has predominantly focused on large entities at the investor and policy level, often overlooking the role of SMEs in the ecosystem and BF transactions. This oversight is also

apparent in our practical case study of SF's experiences and the empiric result from conducted interviews of other stakeholders. The RDT offers a lens to understand these dynamics, suggesting that such transactions lead to a dependency on power relationships within the ecosystem (Weber, 1947). Applying Weber's (1947) concept on SMEs' dependency on larger entities and external factors, marginalizes them in decision-making processes, creating a bias towards more prominent financiers and actors, potentially overlooking green-SMEs' contributions.

By drawing on the concept of RDT, our empirical findings reveal that green-SMEs must build collaborative solid networks to secure necessary resources for growth, supporting Ulrich and Barney's (1984) concept of managing dependency in relationships. This approach is vital for creating a more inclusive financial ecosystem, allowing SMEs to access appropriate funding sources and reduce their dependence on external factors. As Ulrich and Barney (1984) suggest, organizations strive to minimize their dependence while maximizing their influence. By drawing on this concept to our findings in the SF case, we can see that their strategic actions where they actively seek to build networks and collaborations indeed help to mitigate the power imbalances imposed by their reliance on external resources.

As implied by RDT, central to these dynamics is the concept of power in controlling vital resources (Pfeffer and Salancik, 2003). Ulrich and Barney (1984) add depth to this concept, highlighting how organizations strive to alter their dependence relationships by increasing their influence and reducing their dependence. This concept is particularly relevant to help us to interpret information as a critical resource in an ecosystem. Our empirical findings resonate with this, identifying information asymmetry as a significant challenge for green-SMEs, especially in less developed financial markets.

Our empirical data of stakeholders reveals that investors acknowledge their limited knowledge of local conditions, which creates an information asymmetry gap. We identify that this gap could provide strategic leverage for green-SMEs like SF, which have local know-how and presence, highly valued by stakeholders. More specifically, SF's direct engagement on the ground in African countries offers an advantage in understanding and addressing specific community needs. To decrease the dependency, aligning with Ulrich and Barney (1984), leveraging information transparency becomes critical for SMEs to make the risks and benefits of impact projects visible to ecosystem partners.

Drawing from RDT, our primary data illustrates how SF's emphasis on enhancing transparency, sharing knowledge and building trust represents a strategic application of managing dependencies. This nuanced approach, in the lens of RDT, demonstrates SF's progression through collaboration, underlining the importance of strategic engagement with diverse stakeholders to navigate and adapt to ecosystem complexities. Such insights demonstrate RDT's value in interpreting SF's efforts to mitigate dependencies by increasing their understanding of differences and collaboration among stakeholders.

6.2.2 Strategic blended finance network engagement: a NT and SNT perspective

In response to these challenges, SF's introduction of innovative evaluation metrics to improve transparency aligns well with Watts (2004) principles of NT, regarding the concept of network structures influencing information flow and decision-making. It was observed during workshops W1 and W35, where SF discussed innovative evaluation metrics in this context to facilitate understanding and transparency disclosure of project results (5.2.4). By converting traditional financial Key Performance Indicators (KPIs) to novel impact KPIs, SF enhances the flow and quality of information within the network. As Watts (2004) notes in NT, the structure and dynamics of a network significantly influence the distribution and reception of information. By using tangible metrics, such as the energy output from solar panels, SF is providing quantifiable and understandable data that can facilitate informed decision-making across the network. This approach improves transparency and strengthens the network's integrity and functionality.

Utilizing SNT, we see these innovative KPIs as a strategic tool for fostering effective communication and coordination among diverse stakeholders. Borgatti and Lopez-Kidwell (2011) emphasize the importance of information sharing in building strong network ties. By translating complex financial data into understandable metrics that demonstrate projects' sustainability and social benefits, SF is effectively utilizing SNT principles. This method enhances transparency and facilitates the alignment of goals and evaluation of outcomes across different stakeholders in the BF ecosystem. Such clear and transparent communication is vital in building trust and reciprocity within the network, critical elements identified by Granovetter (2005) within SNT for sustaining healthy and productive relationships.

From a NT perspective, green-SMEs' ability to access various financial sources positions them to influence resource access through a more central role in the interconnectivity between partnerships (Watts, 2004). This concept of central position implies information flow and transparency going through green-SME nodes between investor partnerships. This enables better access to information about funding opportunities, market trends, and potential partnerships in the ecosystem (Larcker et al., 2013). The theory implies that more central or well-connected SMEs are more likely to have greater access to diverse funding sources, thereby improving their chances of securing appropriate financing (Sarkis et al., 2010). This corresponds well with local institution investor statements in section 5.2.3 regarding SMEs being more creditable with strategic partnerships representing a well reputed network.

Green-SMEs leveraging social networks to build trust and credibility, aligned with the SNT perspective (Borgatti and Lopez-Kidwell, 2011), are essential for attracting investment and partnerships according to stakeholder views in the empirical results. The SNT emphasizes that relationships with other stakeholders, customers, and local communities can open doors to new opportunities and resources (Granovetter 2005). A perspective highly valued by stakeholders for its reciprocal benefits.

"We see SMEs as part of a comprehensive partnership and financial ecosystem. SME is not just a standalone company but rather a part of a larger structure that includes various partners and sectors. And we can connect SMEs with other ecosystems due to our own extensive contacts across different sectors" (ID-NGO).

In the lens of SNT, SMEs' ability to establish strategic partnerships through social networks beyond the core focus of financial transactions is crucial. These partnerships may involve knowledge sharing, joint ventures, and collaborative projects, aligned with Borgatti and Lopez-Kidwell's (2011) concept of leveraging network ties for mutual benefit. By partnering with other social or green businesses, SMEs can aggregate experiences and resources, which is a strategic application of Granovetter's (2005) idea of the strength of weak ties in diversifying risk and enhancing the project's appeal to a broader range of investors.

In the case of SF, partnering with other social or green businesses can be a strategic move as this will aggregate their experiences and resources to diversify risk in the eyes of investors and increase the appeal as the project increases the target of multiple SDGs. During W12 when SF presented its multifaceted approach to targeting SDGs, this was seen as a novel strategy but has yet to be widely applied. This approach contributes to the NT concept by Groenewegen et al., (1999), offering valuable insights into collaborative efforts among firms and organizations by maximizing the utility of network connections for collective advantage.

SF's Digital-Twin initiative is a prime example of using technological advancements to enhance transparency in data reporting, monitoring, and evaluation. This contributes to the concept of Bonacich's (1987) and Laumann's (1983) network flow model, focusing on how central nodes gain the advantages of receiving and distributing information frequently and with certainty. By leveraging real-time data, this digital platform allows investors and stakeholders to monitor the effects of renewable energy projects remotely, addressing the gap in transparency. This contributes to the concept of corporate network example by Larcker et al. (2013) as green-SMEs can foster extensive connections within the network by gaining access to greater information regarding trends and market conditions by leveraging big data through the Digital-Twin.

This improved transparency in disbursement of impact data and real-time data availability enhances the network's overall effectiveness by improving information flow, a key principle in NT that facilitates informed decision-making and fosters trust among network participants (Larcker et al., 2013). Additionally, in the lens of RDT, within sustainability, according to Fiorini et al. (2018), the concept of leveraging big data analytics can also be seen as a critical resource in increasing their power.

7. Conclusion

How can green-SMEs in developing countries effectively engage with stakeholders in a broader blended finance ecosystem to overcome financial barriers and secure necessary funding for growth?

Through a qualitative in-depth case study of SF that has successfully adopted a BF financing structure and interviews with stakeholders in the BF ecosystem we could identify mismatches and contradictions (6.1), particularly affecting green-SMEs in developing countries. Touched upon by emerging consensus in academic literature, our empirics explained and deepened with our chosen theoretical frameworks RDT, NT and SNT, emphasizes the bottom line: green-SMEs need to take a more central role within the BF ecosystem.

Our concepts in the theories demonstrate that a pivotal strategy for redefining the role of green-SMEs within this ecosystem involves leveraging information asymmetry, enhancing transparency and building strategic partnerships, which also has proven to be successful in the case study and suggested by several stakeholders in our primary data.

In the lens of RDT, green-SMEs can strategically use their internal resources, such as unique market knowledge or innovation capabilities, to balance the dependency of external stakeholders resulting in having more power and access to funding from larger entities. Proved by the insights from SF suggesting green-SMEs can transform their dependency into a source of strength, thereby reducing the power asymmetry to external stakeholders by creating a mutual resource dependence.

Furthermore, integrating the concept of NT and SNT provides a richer understanding of how strategic network engagement, facilitated by improved information flow and social networks, enables green-SMEs like SF to leverage a central role in the ecosystem. This adds nuance to our understanding of how these relationships affect resource flow, decision-making processes and effective collaboration in the SF case. The primary data, implicating leveraging tools as tangible KPIs, creating transparency and trust, can according to NT and SNT, as result of improved network structures and ties through collaboration facilitate accessing investors in a BF structure of dual objectives balancing profit and impact.

To conclude our empirical results in the lens of our theoretical framework, our key findings advocate that green-SMEs should secure a more central role and ties to the connecting nodes within their ecosystem. The principals from RDT, NT and SNT conceptualized all insights from the interviews indicating that such a central position will improve green-SMEs' capacity for strategic partnerships with various financiers and organizations. This enhanced network position facilitates improved coordination of potential partnerships by understanding associated characteristics, and aligning their distinct objectives. As a result, green-SMEs will gain more significant influence in the ecosystem and alignment of various objectives to local needs, thus attaining well-targeted BF transactions. The strategic actions for green-SMEs,

summarized in *Section 7.2*, will ultimately, not only benefit green-SMEs and their immediate ecosystem but also contribute to the broader objectives of sustainable development and economic growth, aligning with the SDGs.

8. Discussion

8.1 Contributions

8.1.1 Methodological contribution

The identified mismatches and gaps that present barriers to adopting BF models for green-SMEs, (6.1), may explain why green-SMEs' viewpoints are underrepresented in BF transactions and why there has been a limited emphasis on their perspective in academics (2.1). To address this research gap, our study adopted a bottom-up approach for a nuanced exploration of how green-SMEs can redefine their roles in a BF ecosystem. Implementing a triangular approach of previous literature findings, empirical findings, and theoretical framework, contributes to our bottom-up perspective in BF. This perspective uniquely positions green-SMEs as the acting dynamic spider weaving the web of the BF ecosystem.

8.1.2 Empirical contribution

The empirical findings of our single-case study, in tandem with perspectives from additional stakeholders, highlight unique viewpoints and insights linked to the “how” and “why” question posed in our research question. These findings confirm and reinforce the identified financial challenges of SMEs in previous literature and highlight new ones. In addition, this study builds upon identified challenges and findings through the choice of single case study, exploring constructive recommendations on how to proactively address these barriers as a green-SME. This involves practical insight or guidance for an inclusive BF ecosystem that facilitates an effective alignment of stakeholders' different objectives encouraging a long-term perspective of BF transactions which could enable future scaling.

8.1.3 Theoretical contribution

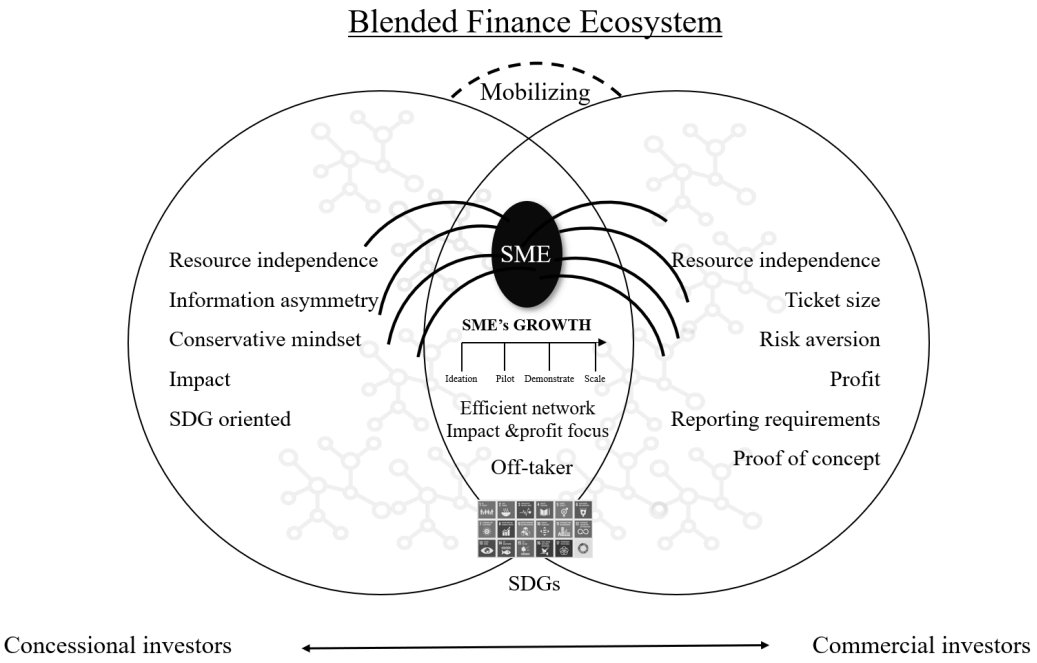


Figure 8. Inclusive blended finance. Showcasing the blended finance ecosystem with factors included from literature review, empirical findings and theoretical frameworks. Illustrating the growth phases of a SME affecting their concessional capital dependence.

To analyze the empirical results we have applied a theoretical lens on our findings. These theoretical frameworks introduce new linkages in theoretical contributions in an unexplored context of the BF ecosystem, aligning with the research question (see Figure 6). Our novel model, developed from comprehensive previous research and our empirical data, conceptualized by the theoretical framework, presents a nuanced approach to an inclusive BF ecosystem. It positions SMEs in the centrality of the network, acting as a dynamic spider connector between concessional and commercial investors. This model offers a new aggregated perspective on how green-SMEs can navigate and engage their ecosystem by applying RDT, NT and SNT simultaneously on our empirical findings.

Our model's core provides a new perspective of SMEs as the central node within the BF ecosystem engaging and directing transactions, which previous research has not yet addressed. This model visualizes the ecosystem as a two-sided network: concessional investors with a primary focus on impact and social benefits and the other commercial investors driven by financial returns and risk management. The ecosystem is made up of the exchange of stakeholders, thus bridging these two is not solely done by the green-SME. But through the strategic partnerships, they can facilitate the web of nodes to other ecosystem webs. Highlighted in each bubble, representing the diverse stakeholders, are key concepts and stakeholder differences, previously mentioned in this research, to consider for aligning a common goal for the green-SME project and their off-taker community needs.

Furthermore, the nodes illustrate information flow, enhancing transparency, decreasing dependency and promoting a more inclusive and effective approach to BF. All these key findings from *Section 5* analyzed in *section 6* and enablers will build trust and credibility. Finally, by forming strategic partnerships and collaborative projects, SMEs can enhance their appeal to concessional and commercial investors, thus attracting diverse funding sources for their development stage.

8.2 Implications for SMEs

The practical implications for green-SMEs, based on our conducted research from secondary and primary data, including the lessons learned from the SF case study, can be aggregated in five key strategic dimensions. We have designed these dimensions for SMEs to leverage in their potential partnerships in the BF ecosystem, to increase motivation and interest at investors while mitigating perceived risk. Additionally, using these dimensions green-SMEs can significantly improve their positioning within the BF ecosystem, enhancing their ability to secure funding and scale their impact.

Firstly, of importance is the ability to effectively demonstrate pilot projects. This involves green-SMEs making risks and opportunities transparent and highlighting the successes and learnings from pilot projects. This transparency results in enhanced credibility and trust with potential investors, demonstrating the viability and impact of their projects. Exemplified by SF's pilot projects in renewable energy providing tangible data points of both technological effectiveness and market feasibility, to be able to validate the business model and financial model for both commercial and concessional investors.

Secondly, green-SMEs should have a strategy on developing and maintaining diverse partnerships. This entails managing complex relationships with various stakeholders such as off-taker networks, concessional funding and commercial funding investors. The ability to manage these multifaceted relationships is a key competence and experience that is requested by investors. For SF this involved close collaborations with the off-taker (hospital) to understand community needs and expectations. Simultaneously, involving a close partnership with a NGO to leverage reciprocal benefits of their respective ecosystem to enable scaling of project scope, but also align respective objectives with common goals for the projects.

Thirdly, sustainability and scalability of the business model are critical concerns for investors. Green-SMEs need to prove their capacity for effective scale-up and long-term sustainability. This involves demonstrating resilience in operations and business models with a scalability plan, involving an initial aid dependence but with the aim for commercial stand alone funding in the future. SF lacked experience regarding this initially and got rejected by investors. However, through partnerships, they progressively gained knowledge and iteratively refined their investor pitches.

The fourth implication is the use of innovative financial instruments. The innovation in the SF case of proposing the prepayment model for carbon financing is one example. When such

models involve reputable organizations as bondholders, they can significantly lower perceived risks and gain investor trust. This approach demonstrates financial innovation to address barriers in a BF context and a commitment to risk management. Involving reputable organizations can help shift traditional mindsets among institutions, overcoming the resistance often associated with being a first-mover.

The fifth, operational transparency is critical throughout a SME's lifecycle. Green-SMEs must provide tangible data of the effectiveness of their technology or services. Investors want documentation of both the implementation and the long-term operational success of these projects. Demonstrating these results and the outcomes achieved is crucial for solidifying investor trust and securing ongoing support. In the SF case, their focus on transparency, including the innovative use of a Digital-Twin tool for reporting, monitoring and evaluation, has been well-documented in previous sections.

By integrating these strategies, green-SMEs can better position themselves within the BF ecosystem, enhancing their ability to secure funding and scale their business and impact.

8.3 Limitations and future research

In reviewing this thesis, it is important to acknowledge certain limitations that may impact the generalizability and applicability of our study. Firstly, while the utilization of a case-company method enhances thoroughness and a deeper understanding, it limits generalizability (Bryman and Bell, 2019; Yin, 2014). The case study method limits the transferability and can decrease the robustness, since data sample size is relatively small, including interviews with SF and other stakeholders in the ecosystem. Nevertheless, we have proactively tried to mitigate this by checking our empirical findings with previous literature, providing a layer of verification to our research outcomes. Using a bigger sample size, all factors kept constant in future research, could strengthen the findings of this thesis further.

The case study can in certain parts be seen as taking a normative stance, such as assuming BF is the ideal structure and advocating specific approaches to mitigate barriers, which should be critically inspected. The normative stance or generalization has been used, to be able to contribute to existing literature with a novel bottom up perspective and specific examples and pathways for green-SMEs to success. However, certain assumptions could neglect alternative perspectives and potential trade-offs and therefore bring limitations to the study.

The specific case company was deliberately chosen, with characteristics allowing for a high transferability. The findings, answering the research question of how to navigate in a BF ecosystem, could be influenced by contextual factors. Maintaining these factors constant and transferable to other settings, such as the prerequisites of an individual company, its sector's infrastructure and the country's economic stability were out of this study's scope. Furthermore, in a dynamic landscape, with evolving regulations and multi-dimensional risks, including geopolitical conflicts and global pandemics, the financial environment for SMEs

remains complex and uncertain, prohibiting application of one-sided recommendations, thus mitigated in this study.

The conducted interviews, as well as the case company, focused on Ghana, which introduces a geographic limitation, making a direct one-to-one transferability to other African nations or other developing countries uncertain. Additionally, differences among organizational cultures and views on adoption of BF may differ depending on organizations and its country inheritance. This may reflect on respondents' answers if this study would be replicated in another context, which is a general limitation in applicability when conducting a single-case study.

The primary objective of this single-case study is to highlight barriers and possible pathways to provoke new areas for future research. This entails investigating how the knowledge and methods used in the BF context, as demonstrated in the SF case, can be adapted and applied to other sectors or countries. The objective for future research would be to research the potential of implementing similar strategies and financial models in different environments. Such research would contribute significantly to understanding how SMEs can scale their involvement in BF transactions across developing countries, which will help to close the funding gap in achieving the 2030 agenda of SDGs.

Additionally, our focus on BF as a structural approach is a conscious choice driven by its perceived relevance and emergence for projects combining concessional funds to mobilize commercial funds. For future research it would be interesting to investigate how these enterprises after the scale-up phase can transition from this mix to purely commercial funds, moving away from aid dependency.

To conclude, our research sets the stage for green-SMEs seeking funding in developing countries, paving the way for future research aiming to apply these results in a broader concept.

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Appendices

Appendix 1. *Key findings of concepts, challenges and solutions/consideration*

Themes	Concepts	Challenges	Solution/consideration	Reference
2.3.1	Emphasizes the need for ecosystems that include local enterprises and financial institutions.	Lack of guidance on implementing such ecosystems.	Inclusive ecosystem of various stakeholders for a long-term perspective in BF initiatives.	Convergence (2021), Bartz-Zuccala et al. (2021)
	The critical role of SMEs during the upscaling phase.	Financial deficits and complex barriers during growth stages.	Provide broader support systems, including consultancy and networking opportunities.	Freiburghaus et al. (2016), Baloyi and Khanyile (2022)
	Importance of specific ecosystem designs for different regions and sectors.	Need for innovation in financial structuring and policy frameworks.	Develop tailored designs to adapt to regional and sectoral needs.	Convergence (2021), United Nations (2021)
2.3.2	Challenges posed by perceived high risks and low returns on investment.	Limited mobilization of private finance in high-risk areas.	Encourage financial innovation to enhance risk-return profiles.	Bartz-Zuccala et al. (2021)
	Lack of intermediaries to channel funds to SDG-aligned projects.	SMEs' limited access to necessary funding because of smaller transactions.	Increase the number of intermediaries to facilitate funding for SMEs.	Convergence (2021), Statista (2022)
	Suggests adopting innovative financial structures.	Complexities in scaling BF initiatives and traditional investor mindsets.	Create strategic partnerships and use innovative financial solutions.	Shirai (2023), Marquis and Raynard (2015), Berggren (2023)
2.3.3	Lack of transparency in BF transactions.	Difficulty in determining the effectiveness and efficiency of BF initiatives.	Enhance transparency among all BF stakeholders.	Tonkonogy et al. (2018), Choi and Seiger (2020), Shirai (2023)
	Necessity for timely and detailed data reporting.	Lack of trust and accountability due to insufficient reporting.	Implement comprehensive and detailed reporting mechanisms.	Lolito (2020), Stadelmann et al. (2013), Savoy and Milner (2018), Lonsdale (2017)
	Responsibility of BF initiatives to deliver accountability.	Risk of undermining public confidence due to lack of transparency.	Promote transparency and inform stakeholders about BF initiatives' impact.	Du et al. (2020), OECD (2018), Jenkins (2019), Taskforce (2018), Jung (2020), Dey and Mishra (2022)

Appendix 2. Data points including interviews and workshops.

Interview date	Data points	Position	Organization type	Pseudonym	Description	Mode
2023-09-28	1. Interview	Co-founder	Case company	(CF,SF)		In person
2023-09-30	2. Interview	CEO	Case company	(C,SF)		Online
2023-09-31	3. Interview	Head of Business Development	Case company	(BD,SF)		Online

2023-10-2	4. Interview	Honorary Consul General of Sweden in African country	Swedish Governemnt	(HCG)		Online
2023-10-2	5. Interview	CEO	NGO	(C-NGO)		Online
2023-10-6	6. Interview	Head of unit for innovation and digital transformation	NGO	(IDT,NGO)		In person
2023-10-13	7. Interview	Senior manager	Foundation	(FO)		Online
2023-10-16	8. Interview	Relationship manager	Local bank in Africa	(LB)		Online
2023-10-20	9. Interview	Head foundations & philanthropy	Institutional bank	(IB)		Online
2023-10-27	10. Interview	Country director	Institutional bank foundation in Africa	(IBF)		Online
2023-11-1	11. Interview	Co-founder & CEO	Crowdfunding platform	(CP)		Online
2023-11-2	12. Workshop	Co-founder, CEO, and Managers	Case company and NGOs	(W1)	Introduction between the partnership of SF and NGOs and various targets of SDGs.	Online
2023-11-3	13. Workshop	Co-founder, CEOs, and Managers	Case Company, NGOS and Foundation	(W2)	Discussing various challenges and opportunities of long term partnership and BF investments in Africa	In person
2023-11-8	14. Workshop	Co-founder, CEOs, Managers and Politician	SF, NGOs, Foundation and Top Politician in Africa	(W3)	Discussing various contextual challenges in specific developing country and the overall governmental adoption of investments in scalable project	Online
2023-11-10	15. Workshop	Co-founders, Founders, CEOs, Managers and Honorary Consul General of Sweden	Case company, E-bike enterprise partnership, NGOs and HCG	(W4)	Discussion of growth phase after proven pilot projects and various milestones to make the project scalable.	Online
2023-11-13	16. Workshop	Co-founders, Founding president, CEOs	Case company, NGO and Faith investor fund, E-bike enterprise partnership	(W5)	Discussion blending grants with equity for future scalability agenda regarding involving fund for first-loss guarantees versus direct investment	In person
2023-11-13	17. Interview	Impact investor network fund	Impact foundation	IF		Online

Appendix 3. Empirical results – *Financing challenges for SMEs*

Stakeholder	**Perspective on financing challenges**	**Proposed solutions/strategies**	**Additional notes**

Case company (CF-SF), (C-SF), BD-SF	Acknowledge ticket size as a major challenge for SMEs.	Seeking alternative funding, focusing on impactful yet feasible projects.	Emphasis on balancing impact and feasibility in projects.
Swedish Government (HCG)	Focus on large-scale projects, often overlooking SME needs.	-	-
NGO (C-NGO, IDT-NGO)	Recognize the need for scalability and impact in projects.	Encourage SMEs to show scalability and impact potential.	Highlight the importance of long-term growth and scalability plans.
Foundation (FO)	Observe the neglect of medium-scale sustainable projects.	Advocate for blended financing solutions.	Stress on finding a middle ground in project financing.
Local Bank in Africa (LB)	Concerned with the bankability of project off-takers.	Rigorous assessment of financial stability of off-takers.	Focus on the developer's ability to deliver and off-taker's payment capacity.
Institutional Bank (IB)	Rigid demands; require substantial investment sizes.	-	-
Crowdfunding Platform (CP)	Small projects often rejected by banks; mismatch in market needs.	Pivot to attracting funding from retail investors via crowdfunding.	Focus on commercial viability and high-return projects.

Appendix 4. Empirical results – *Stakeholder perception of blended finance and its innovation*

Stakeholder	Perception of BF	Proposed solutions/strategies	Additional notes
NGOs (C-NGO, ID-NGO)	Recognizing BF as a necessary evolution from traditional aid methods.	Encouraging integration with financial flows for sustainable projects.	Balancing ambition and innovation with risk assessment.
Local Bank (LB)	Cautious about adopting BF, preferring traditional financing methods.	Might consider BF if holding the senior loan position.	Concerns about high local interest rates and processing times.
Institutional Bank (IB)	Aware of EU funds for innovative projects but notes underutilization.	-	Identifies inefficiencies in matching EU funds with private capital.
African Governments	Increasing interest in adopting diverse BF models.	Emphasizing strategic approaches for social and economic growth.	-
Case company (SF)	Experimented with BF due to lack of exposure to established models.	Developed a bottom-up financial model combining various capital sources.	Struggle with the top-down approach of traditional institutions.
General Observations	BF seen as innovative, but met with cautious reactions.	Emphasis on responsible decision-making and thorough risk assessment.	Skepticism in aid sector due to focus on human rights over financial innovations.

Appendix 5. Empirical results – *Blended finance as an ecosystem*

Stakeholder	Role and perspective in BF ecosystem	Proposed solutions/strategies	Additional notes
NGOs	Act as a platform to integrate different sectors and capital types.	Encourage collaboration and understanding among diverse actors.	Focus on building long-term relationships.

Foundations (FO)	Emphasize relationships and quadruple helix programs.	Identify needs and relevant financial actors for collaboration.	Maintain and nurture relationships for project success.
Local Bank (LB)	Cautious about adopting BF, sees value in robust partnerships.	Prefers partnerships with DFIs to reduce risk.	Considers broader ecosystem in financing decisions.
Crowdfunding Platform	Contradicts traditional BF relationship models.	Build trust and predictability with retail investors.	Less control over investor relationships due to retail financing.
SMEs (incl. SF)	Enter ecosystem by interacting directly with local actors.	Focus on local presence and community engagement.	Must navigate various challenges, including financial literacy.
Institutional Bank Foundation (IBF)	Value green SMEs for their holistic approach.	Assist clients with financial literacy in developing countries.	-
Stella Futura (SF)	Acts as the 'spider in the web' in the ecosystem.	Educate stakeholders, align with local needs, select suitable investors.	Focus on renewable energy for healthcare facilities.
Honorary Consulate General of Sweden (HCG)	Emphasizes local insight for problem identification.	-	Contrast with challenges faced by Nordic PE funds due to lack of local presence.

Appendix 6. Empirical results – *Transparency, information asymmetry, reporting and monitoring*

Stakeholder	Perspective accountability	Proposed solutions/strategies	Additional notes
NGO (C-NGO, ID-NGO)	Highlights the importance of transparency for managing information asymmetry.	Foster clear agreements and communication for trust among actors.	Focus on long-term relationships and comprehensive information sharing.
Local Bank (LB)	Less concerned about information asymmetry due to client training programs.	Provides free consultation for technical and financial assessments.	Finds most clients well-informed when approaching for solar projects.
Foundations (FO)	Requires detailed and honest information for project assessments.	Emphasizes compliance and sustainability in information gathering.	Seeks organizational and project-specific information for decision-making.
Case company (SF)	Acknowledges challenges in compiling comprehensive information.	Utilizes data-driven technology like 'digital twin' for project monitoring.	Focuses on pre- and post-impact effects and investor insights.
Crowdfunding Platform (CP)	Less pressure on reporting standards due to retail customer focus.	Reporting as a trust-building function rather than data provision.	Strives for control and understanding of project outcomes.

Appendix 7 . Stella Futura multiple approach of various SDGs

- SDG 1: No Poverty - Stella's energy solutions empower infrastructure growth and job creation in Africa.
- SDG 2: No Hunger - Stella targets farmers in urban, peri-urban, and rural areas to lower electricity costs and promote sustainable food production.
- SDG 3: Good Health and Wellbeing - Stella focuses on making healthcare safe by providing reliable energy solutions to hospitals and healthcare centers.
- SDG 4: Quality Education - Stella collaborates with educational institutions to quantify CO2 emission reductions and provide safe, affordable energy to schools.
- SDG 5: Gender Equality - Stella promotes gender diversity and women empowerment through initiatives like "Women on the Roofs."
- SDG 6: Clean Water and Sanitation - Stella electrifies water research institutes, advancing technologies for clean water access.
- SDG 8: Decent Work and Economic Growth - Stella's solutions stimulate national infrastructure growth and job creation in Africa.
- SDG 10: Reduced Inequalities - Electrifying rural areas and facilities contributes to reducing inequalities.
- SDG 11: Sustainable Cities and Communities - Stella promotes sustainable electrification in public and private sectors, including rural microgrids.
- SDG 12: Responsible Consumption and Production - Stella incorporates recycling plans into projects and partners with environmentally conscious technology providers.
- SDG 13: Climate Action - Stella helps customers reduce fossil fuel utilization and educates facility managers on sustainable energy solutions.
- SDG 17: Partnerships for the Goals - Stella collaborates with partners to ensure SDG impact remains a top priority in their joint ventures.

Appendix 8 This thesis have leveraged Grammarly Inc. 2023

In preparation for this master thesis, the authors have used Grammarly, a digital writing assistance tool, to ensure grammatical accuracy. The aim of leveraging this tool is to enhance the readability and linguistic quality of the thesis. This acknowledgment is to disclose the use of Grammarly in our study transparently and to attribute its role in aiding the writing process.