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GREEN FINANCE AND SME INCLUSION IN ZIMBABWE: EVIDENCE FROM THE MANUFACTURING SECTOR IN BINDURA

Abstract

Green finance is increasingly promoted as an instrument for climate mitigation and sustainable development, yet limited evidence shows whether smaller enterprises in developing economies can access it. This study examines access to green finance among manufacturing enterprises in Bindura, Zimbabwe, and identifies firm-level and institutional conditions associated with inclusion and exclusion. The study uses a mixed-methods complementarity design combining a questionnaire survey of 36 manufacturing firms with semi-structured interviews involving 12 key stakeholders from financial institutions, government, development finance institutions, and business associations. Because only five firms reported green-finance access, the quantitative strand is treated as exploratory and descriptive rather than as a basis for multivariable inference. Qualitative data are analysed thematically to explain the observed patterns. Five firms (13.9%) reported having accessed green finance, while 69.4% were unaware of

such products. Lack of collateral (M = 4.52), high interest rates (M = 4.31), and limited information (M = 4.18) were the most severe reported barriers. Interviews point to collateral and documentation requirements, perceived project risk, transaction costs, and product designs oriented toward larger projects as important institutional constraints. The findings suggest that green-finance access remains narrow within the study setting and that SME inclusion requires risk-sharing instruments, simpler product designs, and targeted information and technical support.

Keywords: Green finance; SME financial inclusion; Financial exclusion; Credit rationing; Information asymmetry; Zimbabwe

Introduction

Achieving global climate and sustainable development goals depends in part on mobilising green finance for low-carbon technologies, renewable energy, and environmentally sustainable projects. Small and medium-sized enterprises (SMEs) are important actors in this transition. Zimbabwe's National Micro, Small and Medium Enterprises Policy 2020–2024 distinguishes micro, small, and medium enterprises using sector-specific employment, turnover, and asset criteria (Ministry of Women Affairs, Community, Small and Medium Enterprises Development, 2020). In this study, the term SME is used as an umbrella term for the sampled micro, small, and medium manufacturing enterprises, while the four micro-enterprises are identified separately because they fall below the policy's formal SME employment threshold.

Many SMEs nevertheless face persistent barriers to greening, including limited access to external finance, insufficient internal capacity, and perceived risks associated with sustainability investments (Organisation for Economic Co-operation and Development [OECD], 2025). These constraints are particularly relevant in developing economies, where climate investment needs are high and financial

intermediation remains uneven. African climate-finance flows have increased, but the investment required to meet national climate targets remains substantially larger than current flows (Climate Policy Initiative [CPI], 2024). The central issue is therefore not only the volume of green finance available, but whether its design and delivery enable smaller firms to participate.

Green finance encompasses a diverse portfolio of financial instruments designed to support environmentally beneficial projects. These include green bonds, which raise capital for renewable energy and energy-efficiency projects; green credit or concessional loans with below-market interest rates; green climate funds administered by multilateral institutions; and blended finance structures combining public and private capital to de-risk projects (OECD, 2025). International policy frameworks, particularly the Paris Agreement, the Sustainable Development Goals, and successive Conference of the Parties decisions, emphasize that mobilizing private green finance is essential for meeting climate targets while supporting inclusive development. Despite these mechanisms and policy commitments, empirical research consistently documents that SMEs struggle to access such finance.

Manufacturing is an important component of Zimbabwe's productive economy and provides a relevant setting for examining the intersection of SME finance and the green transition. Manufacturing SMEs—including agro-processors, metal fabricators, and construction-related suppliers—can potentially improve energy efficiency and reduce waste through technology adoption. Bindura, a mid-sized industrial town in Mashonaland Central province, hosts small manufacturers serving local and regional markets. These firms provide a useful setting for examining whether the design and delivery of green finance are aligned with the circumstances of smaller enterprises. This gap motivates the present study.

This study examines access to green finance among manufacturing SMEs in Bindura by: (i) describing the level and patterns of access, awareness, and perceived barriers; (ii) explaining the institutional mechanisms, barriers, and enabling factors that shape inclusion and exclusion in green finance. The study is significant in three ways. First, it provides firm-level evidence from a secondary industrial town in Zimbabwe, a context that is underrepresented in the green-finance literature. Second, it brings together firm-side evidence and

lender-side perspectives to examine how credit rationing and information asymmetry may operate in green-finance delivery. Third, it identifies operational barriers—collateral requirements, documentation burdens, information gaps, and product design features—that can inform more SME-responsive green-finance interventions. Given the purposive sampling and small sample, the study is intended to generate grounded and exploratory evidence rather than nationally representative estimates.

SME Financial Exclusion in Developing Economies

SMEs in developing countries encounter financial exclusion driven by both demand-side and supply-side constraints. On the demand side, smaller firms often lack formal accounting systems, acceptable collateral, and verifiable credit histories. Where firms operate semi-formally, information asymmetries can increase perceived risk because lenders have less information with which to assess repayment capacity. On the supply side, financiers may view small loans as costly to administer relative to expected returns, while green projects may involve unfamiliar technologies, longer payback periods, or additional monitoring requirements (OECD, 2025). These conditions can lead to restrictive lending terms or credit rationing for smaller firms.

Green finance programs, even those explicitly designed to support climate action, can require technical documentation and project feasibility studies that presume managerial expertise and institutional capacity beyond many small firms' capabilities. In Zimbabwe, MSME financial inclusion has improved in terms of formal access, but important challenges remain in the use of appropriate financial products, including credit, collateral requirements, documentation, and financial literacy (Reserve Bank of Zimbabwe [RBZ] & FinMark Trust, 2022). High inflation, capital market underdevelopment, and exchange-rate volatility can further constrain financing decisions.

Zimbabwe's economy exhibits high climate sensitivity, with livelihoods and production exposed to climate and energy constraints. Zimbabwe's 2015 NDC established a 33% reduction target for energy-related emissions by 2030, while the 2019 National Renewable Energy Policy proposed institutional mechanisms including the Zimbabwe Renewable Energy Fund (ZimREF) and the Infrastructure Development

Bank of Zimbabwe (IDBZ) Climate Finance Facility to channel concessional and blended climate finance into renewable energy and energy-efficiency projects (Ministry of Energy and Power Development, 2019; United Nations Framework Convention on Climate Change [UNFCCC], 2021). These institutional initiatives provide a relevant policy context for examining whether green-finance opportunities are accessible to smaller firms. Related research links financial inclusion with financial sustainability, but this does not imply that all forms of finance are environmentally aligned (Le et al., 2019; Zhao et al., 2022).

Literature review

Green Finance: Mechanisms and SME Access

Green finance refers to financial flows that support low-carbon, environmentally sustainable, and climate-resilient activities (Campiglio, 2016; Cai & Guo, 2021). Its instruments include green bonds, green credit lines with concessional interest rates, multilateral climate funds, and blended finance structures that combine public and private capital to de-risk environmental investments (OECD, 2025; Volz, 2018). While green finance volumes have grown substantially in recent years, particularly through sovereign and corporate green bond issuances, access remains highly concentrated among large-scale, bankable projects in high-income and upper-middle-income countries (OECD, 2025; Taghizadeh-Hesary & Yoshino, 2019). SMEs in developing economies are largely absent from these flows.

The barriers SMEs face in accessing green finance mirror and amplify those encountered in conventional credit markets. On the demand side, smaller firms may lack audited financial statements, bankable collateral, and verifiable credit histories required for formal lending (OECD, 2025; Yoshino & Taghizadeh-Hesary, 2018). This is compounded in the green-finance context by the technical complexity of sustainability projects, which may require feasibility studies and other documentation. On the supply side, financial institutions can perceive SME lending as costly to administer relative to returns, while green projects may involve additional uncertainty because of evolving

technologies and longer payback periods (Taghizadeh-Hesary & Yoshino, 2019).

The design of many green-finance instruments can also disadvantage SMEs. Green bonds typically involve minimum issuance sizes and verification requirements that are inaccessible to most small firms. Green credit lines administered through financial intermediaries may continue to apply conventional collateral and documentation criteria. Blended-finance mechanisms can be structured around larger projects with transparent revenue streams, limiting direct SME participation. These features raise a broader question about whether the architecture through which green finance is delivered is sufficiently adapted to the scale and institutional capacity of smaller enterprises.

Credit Rationing and Information Asymmetry Theories

The theoretical foundations for understanding SME exclusion from green finance lie primarily in credit rationing theory and information asymmetry. Stiglitz and Weiss (1981) established the seminal framework for credit rationing, demonstrating that under imperfect information, profit-maximising lenders may prefer to ration credit rather than raise interest rates, as higher rates attract riskier borrowers through adverse selection and exacerbate moral hazard. In this equilibrium, creditworthy but information-opaque borrowers—characteristics typical of SMEs—are denied credit not because they are unworthy but because lenders cannot distinguish them from higher-risk applicants at acceptable screening costs. Applied to green finance, this framework predicts that SMEs will be disproportionately credit-rationed due to their limited collateral, informal operations, and perceived repayment uncertainty (Cai & Guo, 2021).

Information asymmetry, as theorised by Myers and Majluf (1984), further intensifies exclusion by raising the cost of external finance for smaller firms. When external financiers cannot fully assess borrower quality—a condition endemic to SME lending—they demand risk premiums that may render formal credit prohibitively expensive. In green finance markets, this problem is compounded by lenders' limited technical capacity to evaluate sustainability-oriented projects, leading to systematic underinvestment in economically viable SME green ventures (Cai & Guo, 2021; Taghizadeh-Hesary & Yoshino, 2019). Geels' (2002) sociotechnical transition framework adds a complementary perspective, suggesting that incumbent financial institutions are embedded in established technological regimes that prioritize proven,

asset-intensive projects, creating institutional path dependence that works against the adoption of emerging green technologies, particularly at the SME scale.

Together, these theoretical perspectives suggest that firms with stronger asset positions, better documentation, and greater information access may be better positioned to engage with green-finance products. They also suggest that institutional design features—including minimum loan thresholds, documentation requirements, collateral requirements, and risk-assessment practices—can disadvantage smaller and less formal enterprises. These propositions guide the interpretation of the exploratory evidence.

Green Finance in Developing Economies and Africa

The challenge of green-finance access is particularly important in developing economies, where chronic capital constraints coincide with rising climate commitments. Africa's climate-finance flows have grown, but current investment remains below the level required to implement national climate targets (CPI, 2024). Research also indicates that financial inclusion does not automatically translate into environmentally aligned investment; the environmental consequences of expanded financial access depend partly on how financial resources are allocated (Le et al., 2019; Zhao et al., 2022). In Zimbabwe, the gap between climate-finance policy ambition and firm-level uptake therefore remains an important empirical question. The present study examines this question in a secondary industrial town, where the scale and institutional capacity of smaller firms may differ from those of firms in the country's major financial centres.

In Zimbabwe, the gap between climate-finance policy ambition and firm-level uptake remains an important empirical question. The establishment of ZimREF and the IDBZ Climate Finance Facility provides an institutional basis for mobilising concessional and blended finance (Ministry of Energy and Power Development, 2019; UNFCCC, 2021). Yet evidence from national MSME financial-inclusion research indicates continuing challenges around collateral, documentation, financial literacy, and access to appropriate financial products (RBZ & FinMark Trust, 2022). The extent to which these constraints shape access to specialised green finance in secondary industrial towns such as Bindura is therefore worthy of direct investigation.

Conceptual Framework

Drawing on credit rationing theory, information asymmetry, and the green-finance access literature, this study uses a conceptual framework in which access to green finance is shaped by firm-level characteristics and institutional supply-side conditions. On the firm side, size, collateral availability, formal registration, and information access may affect the ability to engage with available instruments. On the institutional side, lender risk perceptions, product design features—including minimum loan sizes, collateral requirements, and documentation standards—and the reach of information channels shape the effective supply of green finance available to SMEs. The interaction between these factors provides the analytical lens for interpreting the descriptive and qualitative evidence in this study.

Methodology

Research Design

This study employs a mixed-methods complementarity design. The quantitative strand describes the distribution of green-finance access and perceived barriers among 36 manufacturing enterprises. The qualitative strand draws on a separate group of 12 key stakeholders to explain the institutional mechanisms that may generate the observed patterns. The two strands therefore complement one another rather than forming a sequential design in which the qualitative participants are drawn from the survey sample. Combining the strands allows the study to connect firm-level experiences with lender-and policy-level explanations while keeping the distinct populations and evidentiary roles explicit.

Research Questions and Analytical Propositions

The study is guided by two research questions:

RQ1: What is the level of access to and awareness of green finance among manufacturing enterprises in Bindura?

RQ2: What institutional mechanisms explain the patterns of inclusion and exclusion observed in the study?

The theoretical framework also provides three analytical propositions. These propositions are not statistically tested. They guide interpretation of the descriptive survey evidence and qualitative accounts.

P1: Larger firms may face fewer financing barriers because they are more likely to possess the scale and documentation expected by formal lenders.

P2: Firms with acceptable collateral may be better positioned to engage with formal green-finance products.

P3: Better access to information about green-finance products may facilitate engagement with available financing opportunities.

Sampling and Data Collection

Quantitative data were collected through a structured questionnaire survey administered to manufacturing enterprises in Bindura. The initial sampling frame contained 110 enterprises identified through the study's local tax- and business-record sources. Thirty-six firms were ultimately included using a non-probability stratified purposive strategy to ensure variation across subsector, firm size, and ownership characteristics. The final analytical sample contains four micro-enterprises (1–5 employees), 22 small firms (6–19 employees), and 10 medium firms (20–100 employees). Although Zimbabwe's policy framework distinguishes micro-enterprises from small and medium enterprises, the study retained the four micro-enterprises to capture the smallest manufacturing firms operating in the study setting. They are identified separately in the results rather than treated as conventional SMEs. Because the sample was purposively selected, the reported percentages describe the study sample and should not be interpreted as prevalence estimates for all manufacturing SMEs in Bindura or Zimbabwe. All 36 firms in the final sample completed the questionnaire; unavailable initially approached firms were replaced during recruitment. The final sample should therefore not be described as having a 100% response rate.

Fieldwork, including survey administration and key-informant interviews, was conducted from March to April 2026. The access

question referred to any green-finance access obtained from enterprise establishment up to the survey date.

The survey instrument covered: (i) firm and owner characteristics; (ii) financing history and experiences with conventional and green finance; and (iii) awareness, application behaviour, and perceived barriers related to green-finance products. The pre-survey awareness measure was a single binary item asking whether the respondent was aware of financial products designed to support environmentally friendly or energy-efficient investments. The seven barrier items were measured on a five-point scale (1 = not a barrier; 5 = severe barrier), and their internal consistency was acceptable (Cronbach's $\alpha = 0.82$). Awareness was not combined into a multi-item composite and was not treated as an independent causal determinant of access.

Qualitative data were generated through semi-structured online interviews with 12 key stakeholders: branch managers and loan officers from four commercial banks operating in Bindura; two representatives from development finance institutions (IDBZ and ZimREF); three policy officials from the Ministry of Finance and the Ministry of Industry and Commerce; and three business association representatives. Interviews examined eligibility criteria, collateral requirements, information dissemination, project risk, transaction costs, and institutional barriers. Interview data were analysed using inductive thematic analysis (Braun & Clarke, 2006). Themes were developed iteratively from the interview material and checked across respondent groups. Ethical clearance was obtained from Bindura University of Science Education. Participation was voluntary, and all data were anonymised.

The sample size of 36 firms and the non-probability sampling approach limit the scope of inference. In addition, only five firms reported green-finance access. The quantitative results should therefore be interpreted as exploratory evidence from the selected firms, not as population-level estimates. The separate qualitative sample also provides explanatory context rather than statistical confirmation of the survey results.

Variables and Measurement

The study recorded green-finance access as a binary descriptive outcome (1 = firm reported having successfully accessed a green-finance product; 0 = otherwise). Firm size was measured using employment

category; collateral availability was recorded as a binary indicator based on possession of assets considered acceptable as collateral; formal registration was recorded as self-reported registration status; and ownership characteristics were captured through sex and age of the principal owner. Awareness was measured using the single pre-survey awareness item described above. Because successful access itself necessarily implies awareness of a relevant product, awareness is not interpreted as an independent causal determinant of access. Barrier severity was measured using seven five-point Likert items.

Analytical Strategy

Given the very small number of positive access cases (five firms), the study does not estimate a multivariable logistic regression model. The quantitative strand therefore uses frequencies, percentages, descriptive patterns, and mean barrier scores. These statistics are used to characterise the selected firms rather than to estimate population-level determinants or causal effects. The qualitative strand is used to explain institutional mechanisms suggested by the descriptive evidence.

Results

Sample Characteristics and Firm Profile

The study draws on survey data from 36 manufacturing enterprises operating in Bindura. Table 1 summarises the key firm and owner characteristics of the sample.

Table 1. Sample Characteristics of Surveyed Manufacturing Enterprises (n = 36)

Characteristic	Category	n	%
Firm size	Micro (1–5 employees)	4	11.1
	Small (6–19 employees)	22	61.1
	Medium (20–100 employees)	10	27.8
Subsector	Agro-processing	12	33.3
	Metal fabrication	9	25.0
	Construction-related	8	22.2

Characteristic	Category	n	%
	Other manufacturing	7	19.4
Ownership structure	Male-owned	24	66.7
	Female-owned	8	22.2
	Youth-owned (≤35 years)	4	11.1
Registration status	Formally registered	28	77.8
	Semi-formal or informal	8	22.2
Collateral availability	Has titled collateral assets	15	41.7
	No collateral assets	21	58.3
Green finance awareness	Aware of GF products	11	30.6
	Not aware	25	69.4
Green finance access	Accessed green finance	5	13.9
	Did not access green finance	31	86.1

Source: Author's survey data.

The sample is dominated by small enterprises (61.1%), with fewer medium-sized firms and limited micro-enterprise representation. The most common subsectors are agro-processing (33.3%) and metal fabrication (25.0%). Male-owned enterprises constitute two-thirds of the sample, while female- and youth-owned businesses account for 22.2% and 11.1%, respectively. Most firms (77.8%) are formally registered. However, only 15 firms (41.7%) report having titled collateral assets, and just 11 firms (30.6%) report awareness of green-finance products. These figures describe the selected firms and do not constitute prevalence estimates for the wider manufacturing SME population.

Access to Finance and Green Finance Participation

The results show a marked difference between conventional loan application and green-finance access within the selected firms. Seventeen firms (47.2%) reported having applied for a loan from a formal financial institution. Of these applicants, 8 (47.1%) reported that the loan was approved, while 9 (52.9%) reported that the application was not approved. Green-finance access was much less common: five firms

(13.9%) reported successfully accessing finance for environmentally related investments such as renewable energy or energy-efficient machinery. The access question referred to any such financing obtained from enterprise establishment up to the survey date. These figures suggest that participation in conventional finance does not necessarily translate into access to specialised green finance within the study setting.

The findings point to a possible segmentation within financial markets, where participation in conventional finance does not necessarily translate into access to specialised green finance. This is consistent with the broader observation that financial inclusion and green-finance initiatives may operate through different channels rather than as fully integrated policy domains. Within the study setting, this may leave smaller firms reliant on internal financing or conventional credit when considering environmentally relevant investments.

Perceived Barriers to Green Finance Access

Analysis of perceived barriers, based on Likert-scale responses, indicates that multiple constraints jointly limit SME access to green finance. Table 2 presents mean scores and standard deviations for each barrier, ranked by severity.

Table 2. Perceived Barriers to Green Finance Access: Mean Scores and Rankings (n = 36)

Barrier	Mean	SD	Rank
Lack of collateral assets	4.52	0.61	1
High interest rates	4.31	0.74	2
Limited information about available products	4.18	0.83	3
Complex application procedures	4.05	0.91	4
High cost of green technology	3.89	0.97	5
Lack of technical advisory support	3.74	1.02	6
Minimum loan size requirements	3.61	1.11	7

Source: Author's survey data.

Lack of collateral assets emerges as the most severe reported barrier (M = 4.52), followed by high interest rates (M = 4.31) and limited information about available products (M = 4.18). The prominence of collateral constraints is consistent with credit-rationing theory and suggests that access to green finance may be closely connected to asset ownership and the forms of security required by formal lenders. Information gaps and procedural complexity indicate that some firms may also face difficulties navigating application processes. Together, the quantitative findings point to interacting supply-side and demand-side constraints within the study setting.

Qualitative Findings: Institutional Mechanisms of Inclusion and Exclusion

Twelve key informants were interviewed to explain how green-finance products are experienced and administered in practice. Three interconnected themes emerged: (1) collateral and documentation as entry requirements; (2) lender risk perceptions and transaction-cost constraints; and (3) product-design and institutional barriers. The themes cut across bank, development-finance, government, and business-association respondents and help explain why formal presence in the financial system does not necessarily translate into access to specialised green finance.

Table 3. Qualitative Themes and Institutional Mechanisms Identified in Key Informant Interviews

Theme	Subthemes	Analytical finding
1. Collateral and documentation as entry requirements	Collateral; financial records; feasibility documentation	Access is shaped by requirements that many smaller firms struggle to meet, particularly where firms lack acceptable collateral or the documentation needed to demonstrate project viability.
2. Risk perceptions and transaction costs	Perceived project risk; uncertain returns; small loan economics	Lenders described green SME projects as costly to assess and monitor. Small loan sizes can make transaction costs relatively high, reducing incentives for active SME outreach.
3. Product design and institutional reach	Minimum project scale; technical requirements; funding lines; environmental certification	Informants indicated that available instruments are often organised around larger, bankable projects and can require technical or regulatory documentation beyond the capacity of smaller enterprises.

Theme 1: Collateral and documentation as entry requirements

The first theme concerns the extent to which conventional lending requirements shape entry into green finance. Respondents repeatedly referred to collateral, financial documentation, and project-preparation requirements. A loan officer (KI-B1, commercial bank) stated, “most SMEs cannot meet the documentation and collateral requirements for green loans, even when they are interested in adopting sustainable technologies.” This account complements the survey finding that lack of collateral was the most severe perceived barrier (M = 4.52). The evidence suggests that exclusion may arise not only because firms lack assets, but also because eligibility requirements rely on forms of evidence and security that smaller firms may find difficult to provide.

Theme 2: Risk perceptions and transaction costs

The second theme relates to lender perceptions of risk and the economics of small green loans. Informants described green investments as involving uncertain returns, evolving technologies, and additional assessment requirements. They also noted that transaction costs can be high relative to the value of small loans. These accounts provide a plausible explanation for lender caution toward small green-finance applications. The evidence is consistent with a credit-rationing interpretation, but the qualitative sample does not permit estimation of the strength or prevalence of these mechanisms.

Theme 3: Product design and institutional reach

The third theme concerns the design and institutional reach of green-finance instruments. A development-finance informant (KI-DFI1) reported that available green-finance products are often oriented toward larger, more bankable projects, with eligibility criteria that can be difficult for smaller manufacturing firms to meet. Respondents also referred to feasibility studies, technical documentation, limited dedicated SME funding lines, and regulatory requirements linked to environmental certification. These accounts suggest that the supply of green finance is shaped by institutional design as well as by firm-level capacity.

Across the three themes, the qualitative evidence points to a reinforcing process. Asset and documentation requirements can restrict eligibility; risk perceptions and transaction costs can reduce incentives to serve small firms; and product design can further narrow the range of projects considered bankable. The qualitative strand therefore provides a mechanism-based explanation for the patterns observed in the survey, while the limits of the sample require these mechanisms to be treated as contextual rather than population-wide findings.

Integration of Quantitative and Qualitative Findings

Taken together, the quantitative and qualitative evidence indicates that green-finance access was uncommon among the purposively selected firms in this study and was accompanied by high perceived barriers. The survey identifies collateral, financing cost, information

gaps, and procedural complexity as prominent constraints. Interviews provide contextual explanations centred on collateral, documentation, project bankability, risk assessment, and the economics of small loans. The convergence between the two strands strengthens the interpretation of green-finance access as an institutional and firm-level issue within the Bindura setting, while the small, non-probability sample limits broader inference.

Discussion

Interpreting SME Exclusion From Green Finance

The evidence from the selected firms suggests that access to green finance is uneven and closely connected to conventional financing conditions. Only five firms in the sample reported previous green-finance access, while 69.4% reported that they were unaware of such products. The convergence between low access, high perceived barriers, and lender accounts of collateral and documentation requirements supports the interpretation that specialised green finance is being delivered within existing financial structures rather than through a wholly separate inclusion mechanism. Because the sample is purposively selected, however, the result is best understood as a grounded case finding rather than a population-level estimate.

In the context of green finance, these constraints are intensified by the perceived uncertainty associated with environmentally oriented investments, including longer payback periods and evolving technological standards. As a result, SMEs face a dual exclusion: first from conventional finance, and second from more specialised green finance instruments. The results therefore reinforce the argument that “inclusive finance is not green, and green finance is not inclusive”, highlighting a critical disconnect between two policy domains that are often treated as complementary. Rather than broadening access, green finance initiatives in their current form may inadvertently deepen financial segmentation by favouring firms that are already better integrated into formal financial systems.

The Role of Collateral, Information, and Institutional Design

A central finding is the prominence of collateral constraints in shaping access to green finance among the selected firms. This suggests that lending decisions may remain strongly asset-based, with limited ability of smaller firms to satisfy the security requirements associated

with formal lending. This pattern is consistent with Taghizadeh-Hesary and Yoshino (2019), who identify collateral constraints as an important barrier to SME green-finance access in developing Asian economies; the Bindura evidence suggests a comparable mechanism may operate in this setting.

Information asymmetry emerges as another important barrier. Low reported awareness of green-finance products, combined with the qualitative accounts of complex application requirements, suggests that information and technical capacity may influence whether firms can engage with available products. Institutional design may further compound these challenges where products require feasibility studies, compliance documentation, or minimum project sizes that exceed the capacity of smaller enterprises. The qualitative findings suggest that transaction costs and risk perceptions may also reduce lender incentives to serve this segment, although these mechanisms are not statistically established by the present study.

Implications for SME Development and the Green Transition

The limited green-finance access observed among the selected firms has implications for both economic development and climate policy. Manufacturing enterprises can potentially improve energy efficiency and reduce waste through cleaner technologies, but financing constraints may limit their ability to make such investments. The study therefore raises a distributive concern: firms with stronger asset positions, better information, and greater capacity to meet lender requirements may be better placed to participate, while smaller or less-resourced firms may face more constraints. Further evidence is needed to establish whether this pattern extends beyond the Bindura sample.

Policy Implications and Recommendations

The findings point to the need for a fundamental reorientation of green finance frameworks to enhance SME inclusion. Table 4 maps the identified barriers to specific, actionable policy recommendations for key stakeholders.

Table 4. Barriers to Green Finance Access and Corresponding Policy Recommendations

Barrier	Mechanism	Policy Recommendation	Target Actor
Collateral requirements	Asset-based lending excludes uncollateralised SMEs	Introduce partial credit guarantee schemes; shift toward cash-flow- and project-based lending	Policymakers; Financial institutions
Information asymmetry	Low SME awareness; high lender risk perception	Invest in targeted awareness campaigns, advisory services, and financial literacy programs for SMEs	Financial institutions; Development partners
Complex procedures	Documentation burden exceeds SME capacity	Simplify application procedures; develop standardised green product offerings for common SME investments	Financial institutions; Regulators
High technology costs	Upfront capital requirements unaffordable for SMEs	Deploy blended finance, results-based financing, and subsidised green technology leasing instruments	Development partners; Policymakers
Minimum loan thresholds	Products designed for large-scale projects	Develop dedicated SME-scale green lending windows with reduced minimum loan sizes	Financial institutions
Weak policy integration	Financial inclusion and green finance operate in policy silos	Adopt integrated SME–green finance policy frameworks; align regulatory incentives for inclusive green lending	Policymakers; Regulators

Source: Author's analysis of quantitative and qualitative findings.

Beyond these targeted interventions, the evidence supports closer coordination between SME financial inclusion and climate-finance agendas. The practical implication is not simply to expand the volume of green finance, but to improve whether instruments are usable by smaller firms in secondary towns. This requires attention to eligibility thresholds, application costs, technical support, and lender risk-sharing arrangements.

Conclusion

Summary of Findings

This study examined access to green finance among manufacturing SMEs in Bindura, Zimbabwe, using a mixed-methods complementarity design

that combined survey evidence from 36 firms with interviews with 12 key stakeholders. Only five firms (13.9%) reported having accessed green finance, while 25 (69.4%) reported that they were not aware of such products. Lack of collateral, high interest rates, limited information, and complex procedures were the most prominent reported barriers. The interviews indicate that conventional collateral and documentation requirements, lender risk perceptions, transaction costs, and product designs oriented toward larger projects constrain SME participation. Given the purposive sample and small number of access cases, these findings should be read as exploratory evidence from Bindura rather than as nationally representative estimates.

Theoretical Contributions

The study contributes conceptually by showing how green-finance access can remain embedded in the same informational and risk-assessment structures that shape conventional SME finance. The evidence is consistent with the predictions of credit-rationing and information-asymmetry perspectives: firms facing asset, documentation, and information constraints may experience greater difficulty engaging with formal finance. The main theoretical implication is therefore not that these mechanisms have been conclusively identified as population-level determinants, but that the green-finance transition should be analysed as an institutional process operating through existing financial intermediation structures. This framing raises questions about whether alternative lending models and targeted technical assistance can reduce these frictions for smaller firms.

Limitations and Future Research

Several limitations are important. First, the study uses a purposive sample of 36 firms from one urban setting, which limits generalizability. Second, the number of positive green-finance access cases is small, so the quantitative evidence is necessarily exploratory and descriptive. Third, the qualitative and quantitative components involve different respondent populations, meaning that the interviews provide contextual explanation rather than direct follow-up of survey cases. Fourth, the study does not assess the outcomes of green-finance access for productivity, innovation, or environmental performance. Future research should therefore use larger probability-based samples, repeated observations over time, and direct comparisons across towns or sectors. Further work should also examine whether cash-flow-based

lending, credit guarantees, digital financial services, and technical assistance can reduce financing frictions without weakening environmental safeguards.

Conclusion and Practical Implications

The transition to a green economy can support cleaner production and industrial upgrading, but its financing architecture matters for who can participate. The Bindura evidence indicates that green finance remains difficult to access for many of the selected firms, particularly where collateral, information, documentation, and project-scale requirements are demanding. A more inclusive transition therefore requires finance providers and policymakers to adapt products and risk-sharing arrangements to the operating realities of smaller firms while maintaining credible environmental criteria.

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Appendix A: Key Informant Interview Guide

Study Title: Green Finance and SME Inclusion: Who's Left Behind in the Transition? Case of Bindura in the Zimbabwe Manufacturing Sector

Target Respondents:

Commercial banks
Microfinance institutions
Development finance institutions
Government ministries or regulatory bodies
SME associations and support organizations

Section A: Institutional Background

1. What role does your institution play in providing financing to SMEs in Zimbabwe?

2. Does your institution currently offer any financial products that support environmentally sustainable or "green" investments?

3. If yes, what types of green finance instruments are available? (e.g., green loans, concessional credit lines, renewable energy financing)

Section B: SME Access to Green Finance

4. To what extent do manufacturing SMEs in Zimbabwe access green financing from your institution?

5. Which types of SMEs are most likely to receive such financing?

6. Which categories of SMEs tend to be excluded or face difficulties in accessing these financial products?

Section C: Lending Criteria and Requirements

7. What are the key requirements SMEs must meet to qualify for green financing?

Possible areas to probe:

Collateral requirements

Financial records or audited statements

Minimum loan size

Technical feasibility of projects

8. Are these requirements different from those applied to conventional SME loans?

Section D: Barriers to SME Participation

9. From your experience, what are the main barriers preventing SMEs from accessing green finance?

Probe areas:

Lack of collateral

Lack of financial records

Limited awareness of green finance products

High transaction costs for small loans

Perceived risk of SME investments

10. Do you think SMEs have sufficient knowledge about green financing opportunities?

Section E: Institutional and Policy Constraints

11. What challenges do financial institutions face when lending to SMEs for green investments?

12. Are there regulatory, financial, or market barriers that limit the expansion of green finance in Zimbabwe?

Section F: Policy and Program Effectiveness

13. Are current government or donor-supported green finance programs effectively reaching SMEs?

14. What improvements would you recommend to ensure that SMEs are better included in green finance initiatives?

Section G: Future Outlook

15. How do you see the role of SMEs in Zimbabwe’s green transition over the next 5–10 years?

16. What policies or institutional changes would help increase SME participation in green financing?