International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Strategies for Upgrading SMEs for Inclusion and Poverty Reduction in Copperbelt and North-Western Zambia: Evidence from Mining Value Chains

Peter Kanyinji*[1], Sitali Nyambe[2], Richard Mwape[3], Anthony Kays Chishimba[4], Benith Sahayam JB[5]

[1]School of Business and Commerce, DMI-ST. Eugene University, Lusaka, Zambia
[2]Department of Operations and Administration, Walukan University Services, Lusaka Zambia
[3]School of Postgraduate studies, Africa Research University Lusaka, Zambia
[4]School of Postgraduate studies,Africa Research University Lusaka, Zambia
[5]School of Business and Commerce, DMI St. Eugene University, Lusaka, Zambia

Abstract

Zambia's copper output is expanding towards a national target of 3 million tonnes by 2031, yet small and medium-sized enterprises (SMEs) in the Copperbelt and North-Western provinces remain weakly integrated into mining value chains, and poverty remains high. This study examines how government, NGO and mining-sector support for SME upgrading relates to SME inclusion and poverty reduction, and which strategies could strengthen these links. A concurrent mixed-methods design combined a survey of 1,020 respondents from SMEs supplying mining value chains with qualitative interviews and focus groups. Data were analysed using regression, structural equation modelling in AMOS, multivariate analysis of variance and thematic analysis. NGO support ($\beta = .600$) and mining-sector support ($\beta = .175$) predicted SME upgrading ($R^2 = .52$), whereas government support had the weakest measurement loading (.437) and was not retained. Process upgrading ($\beta = .629$) and product upgrading ($\beta = .170$) predicted inclusion ($R^2 = .545$), while functional and inter-sectoral upgrading did not. Perceived inclusion and poverty reduction were almost perfectly associated ($\beta = .982$, $R^2 = .965$), which, together with overlapping measurement, calls for cautious interpretation. Outcomes did not differ by gender, education, location, age or premises ownership (all Pillai's trace $p > .14$), and the study had 80% power to detect standardised differences of 0.18 between two groups. Qualitative evidence identified limited access to affordable capital (high collateral, stringent loan terms and high interest rates), delayed payment by large buyers, and quality-assurance and certification requirements as binding constraints. The article proposes a multi-actor strategy framework comprising a supplier development platform, local content compliance monitoring, supply-chain finance, quality and certification support and inclusion targets, phased over four years and aligned with Zambia's 2025 local content regulations. Findings are cross-sectional and perceptual, and verification with objective outcome data is recommended.

Keywords: SME upgrading; value chain inclusion; mining; poverty reduction; local content; Zambia

1. Introduction

Mining is the engine of Zambia's economy, and its expansion is a stated national priority. Copper production reached 890,346 tonnes in 2025, 8% above the 825,513 tonnes of 2024 though short of the 1 million tonne target (Mining.com, 2026), and the government's national strategy aims to reach 3 million tonnes by 2031 (International Energy Agency [IEA], n.d.-a). The Copperbelt and North-Western provinces host most of this activity. Yet production growth has not translated into broad-based prosperity. National poverty stood at about 60% in 2022, and provincial estimates cited in the study that this article draws on put poverty at 35.9% in Copperbelt and 61.6% in North-Western Province (Zambia Statistics Agency [ZamStats], 2023). The question for policy is whether the mines' demand for goods and services can become a channel for local enterprise development and poverty reduction, or whether it remains an enclave.

The answer depends on what is meant by local. First Quantum Minerals reported spending more than US$1.7 billion with Zambian-registered businesses in 2024, equal to 84% of its in-country spending on goods and services (Mining Weekly, 2025). Registered, however, does not mean owned. The company's own officials have said that 44% of a US$1.6 billion procurement commitment would be sourced from Zambian-owned companies, with a significant portion of the rest coming from firms with minority Zambian ownership (Zambia Monitor, 2025a), and its spending with citizen-owned companies was reported at US$294 million in 2024, double the US$144 million of 2022 (Zambia Monitor, 2025b). Analysts have likewise noted that headline figures, such as Barrick's reported 73% of procurement from Zambian companies in the first half of 2025, are not broken down between majority Zambian-owned firms and local subsidiaries of foreign groups, so they do not show how much value stays under Zambian control (Ecofin Agency, 2026). Inclusion of Zambian-owned SMEs in mining value chains therefore has to be studied directly.

Policy has moved quickly. The Geological and Minerals Development (Local Content) (Preference for Goods and Services in the Mining Sector) Regulations, Statutory Instrument No. 68 of 2025, took effect on 1 January 2026 and require mining companies to reserve at least 20% of their annual procurement for Zambian-owned or citizen-empowered companies, with non-core goods and services reserved exclusively for such firms (Republic of Zambia, 2025; IEA, n.d.-b). They follow the Mines and Minerals Development Act No. 11 of 2015 (Republic of Zambia, 2015). The regulations also require at least 0.05% of annual procurement spending to go to a supplier development programme (Ecofin Agency, 2026), and supplier associations have argued that mining companies cite standards and capacity to exclude local firms from large contracts (Zambian Digest, 2025). The regulations create demand, but whether SMEs can meet it depends on whether they can upgrade: improve processes, products and functions to a standard that lead firms will buy. The evidence base reported here was collected before these regulations took effect and so provides a baseline against which their effect can be judged.

The global value chain literature explains why upgrading matters. Firms enter value chains at low-value activities and capture more value if they upgrade their processes, products, functions and, eventually, the chains they operate in (Humphrey & Schmitz, 2002; Gereffi, Humphrey & Sturgeon, 2005). Learning depends on capabilities that firms build with the help of lead firms, public institutions and support organisations (Morrison, Pietrobelli & Rabellotti, 2008; Pietrobelli & Rabellotti, 2011). For Zambian

mining suppliers, three groups can provide that help: government (training, registration and enforcement), non-governmental organisations (linkages, technical assistance and coaching) and the mines themselves (purchasing, mentoring and supplier development). What is unclear is which of these supports actually relates to upgrading, which forms of upgrading relate to inclusion, and whether inclusion relates to poverty reduction in the places where SMEs operate. Studies that examine one actor, or inclusion without upgrading, cannot answer these questions.

This article reports the evidence from a study of SMEs supplying mining value chains in the Copperbelt and North-Western provinces and turns it into strategies. It has five objectives: (1) to examine the role of government support in SME upgrading; (2) to examine the role of NGO support; (3) to examine the role of mining-sector support; (4) to identify the quality-assurance, financing and other constraints that limit SME participation; and (5) to propose strategies that strengthen upgrading, inclusion and poverty reduction. The study makes three contributions. Empirically, it provides survey evidence from 1,020 respondents on which supports and which forms of upgrading are associated with inclusion, together with qualitative evidence on constraints. Methodologically, it reports the limits of the measurement, including a near-perfect association between perceived inclusion and poverty reduction, and specifies the checks needed to resolve them. For policy, it translates the findings into a phased, multi-actor framework that fits the 2025 local content regulations. The paper proceeds as follows: Section 2 develops the conceptual model and hypotheses, Section 3 describes the method, Section 4 reports the results, Section 5 discusses them, Section 6 presents the strategy framework, Section 7 sets out the limitations and further research, and Section 8 concludes.

2. Conceptual Framework and Hypotheses

2.1 Upgrading in value chains

Upgrading is commonly classified into four types. Process upgrading raises the efficiency of internal operations, product upgrading moves firms to more sophisticated or higher-quality products, functional upgrading adds higher-value activities such as design, testing or distribution, and chain or inter-sectoral upgrading applies acquired competencies in new sectors (Humphrey & Schmitz, 2002; Gereffi et al., 2005). The first two typically come earliest and are most closely tied to meeting buyers' specifications, which in mining are set by quality, safety, delivery and certification requirements. The latter two require stronger capabilities and tend to follow. This ordering suggests that inclusion in mining value chains, understood as a supplier's participation in procurement by mines, is more likely to depend on process and product upgrading than on functional or inter-sectoral upgrading.

2.2 Support as external resources and institutions

Three theoretical perspectives guide the treatment of support. The resource-based view treats firm performance as depending on resources and capabilities, and a resource can create value only if the firm can deploy it effectively (Barney, Ketchen & Wright, 2021). SMEs lack many resources, such as certified quality systems, equipment finance and technical skills, and external support is a way to acquire them. Institutional perspectives emphasise that weaknesses in formal and informal institutions, including unclear rules and weak enforcement, hinder productive entrepreneurship (Webb, Khoury & Hitt, 2020), which points to government's role in registration, regulation and enforcement. Innovation-systems and value-

chain learning perspectives stress that capability building occurs through linkages with lead firms and supporting organisations (Morrison et al., 2008; Pietrobelli & Rabellotti, 2011), which points to the roles of mines and NGOs. Together these perspectives predict that support from different actors will relate to upgrading through different mechanisms: resources and linkages from NGOs and mines, and an enabling environment from government.

2.3 Inclusion and poverty reduction

Inclusion in this study means the extent to which local SMEs participate in the procurement and operations of mining value chains. Its link to poverty reduction operates through firm revenues, employment and incomes in surrounding communities, but this link is not automatic: it depends on whether SMEs retain value, whether they employ local labour and whether the benefits reach poorer households. This distinction matters for measurement, since perceived inclusion and perceived poverty reduction may be related but should not be treated as the same thing.

2.4 Hypotheses

Figure 1 presents the model and Table 1 the hypotheses. Government, NGO and mining-sector support are expected to relate positively to SME upgrading (H1). Upgrading is expected to relate to SME inclusion, with process and product upgrading expected to matter most (H2). Inclusion is expected to relate to poverty reduction (H3). An exploratory equity hypothesis (H4) states that outcomes do not differ systematically by gender, education, location, age or premises ownership, which would indicate that benefits are not concentrated in particular groups.

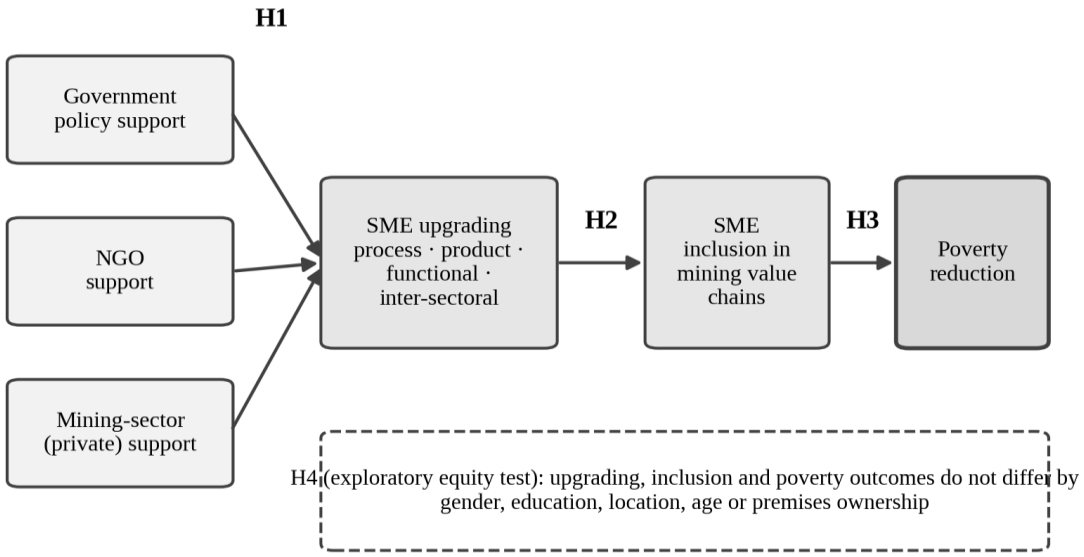


Figure 1. Conceptual model and hypotheses

Note. H1 to H3 are directional hypotheses; H4 is an exploratory equity test with a null expectation.

Table 1. Hypotheses, expected direction and tests

No.	Hypothesis	Expected direction	Test
H1a	Government support is positively related to SME upgrading	Positive	Structural path; item-level regression
H1b	NGO support is positively related to SME upgrading	Positive	Structural path; item-level regression
H1c	Mining-sector support is positively related to SME upgrading	Positive	Structural path; item-level regression
H2a–d	Process (a), product (b), functional (c) and inter-sectoral (d) upgrading are positively related to SME inclusion	Positive; strongest for a and b	Structural paths
H3	SME inclusion is positively related to poverty reduction	Positive	Structural path; R^2
H4	Upgrading, inclusion and poverty reduction do not differ by gender, education, location, age or premises ownership	No difference (exploratory)	MANOVA with Pillai's trace

3. Methodology

3.1 Design

The study used a concurrent mixed-methods design. A cross-sectional survey provided quantitative evidence on the relationships among support, upgrading, inclusion and poverty reduction, and qualitative interviews and focus groups provided evidence on the constraints and opportunities that SMEs face, which were integrated at interpretation (Tashakkori, Johnson & Teddlie, 2021; Creswell & Creswell, 2023). The survey followed a positivist orientation suited to testing hypotheses, and the qualitative strand an interpretivist orientation suited to understanding experience, and the two were combined pragmatically. The study area is the Copperbelt and North-Western provinces, which together account for most of Zambia's mining activity and its mining supplier base.

3.2 Population, sample and data collection

The target population comprised SMEs supplying goods and services to mining value chains in the two provinces, estimated at about 2,000 firms (range 1,800 to 2,200). A stratified random sample was drawn. A minimum of 333 respondents would satisfy a standard sample-size formula for a population of this size, but the target was set higher to meet the requirements of structural equation modelling and to support subgroup analysis, and 1,020 completed questionnaires were obtained, about 51% of the estimated population. With the finite-population correction, a proportion estimated from this sample has a margin of error of about ±2.1 percentage points at 95% confidence. Questionnaires were administered electronically and in person, depending on the respondent's preference and access, in order to reach firms in areas with limited connectivity.

The structured questionnaire used five-point Likert items adapted from prior measures and the local context. It was reviewed by an expert panel, with items retained if their content validity index was at least 0.80, and was piloted with 15 SME managers to refine clarity and relevance. The qualitative strand used purposive sampling of key informants from SMEs, government agencies, NGOs and mining-sector organisations, and comprised 20 in-depth interviews and 10 focus group discussions. All respondents gave informed consent, and the study followed the ethical guidelines approved by the institutional ethics review board, with confidentiality and anonymity maintained.

Table 2. Constructs and measures

Construct	Content of items	Role in model
Government support	Five items covering government training, licensing and registration, and related support	Predictor (H1a)
NGO support	Four items including linkages to mines and technical support	Predictor (H1b)
Mining-sector support	Four items including sales revenue from mines and mentorship	Predictor (H1c)
SME upgrading	Process, product, functional and inter-sectoral upgrading	Mediator (H2)
SME inclusion	Perceived participation in mining value chains	Outcome (H2) and predictor (H3)
Poverty reduction	Perceived poverty reduction associated with SME participation	Outcome (H3, H4)

Note. All items are five-point Likert scales (1 = strongly disagree; 5 = strongly agree).

3.3 Analysis

Quantitative analysis used IBM SPSS Statistics (version 28) for screening and descriptive statistics and IBM AMOS (version 28) for confirmatory factor analysis and structural modelling by maximum likelihood. Screening included checks for missing data, univariate and multivariate outliers (standardised scores and Mahalanobis distance) and normality (skewness and kurtosis within ±2). Model fit was judged by CFI and TLI above .90 and RMSEA and SRMR below .08 (Hu & Bentler, 1999; Kline, 2023), and reliability by Cronbach's alpha and composite reliability above .70. Regression was used to identify which components of each support type were most closely related to overall perceived support. Multivariate analysis of variance (MANOVA) with Pillai's trace tested whether upgrading, inclusion and poverty reduction differed by gender, education, location, age and premises ownership, after Box's M and Levene's tests. Qualitative data were analysed thematically (Braun & Clarke, 2021). To contextualise the quantitative results, this article adds 95% confidence intervals for means, effect sizes ($f^2 = R^2/(1 - R^2)$), a Fisher-transformed confidence interval for the inclusion–poverty association and sensitivity calculations for the group tests, all derived from the reported statistics.

4. Results

4.1 Sample profile

Table 3 shows the profile of the 1,020 respondents. Men made up 54.0% and women 46.0%. Two in five respondents were older than 36 (40.6%), 36.8% were aged 25 to 35 and 22.6% were aged 18 to 24. Respondents were well educated: 36.2% held a degree, 27.5% a master's degree and 28.6% a diploma. They were spread across mining areas (28.4%), rural areas (25.1%), urban areas (23.1%) and other towns (23.3%), and 59.9% operated from rented premises.

Table 3. Profile of respondents (N = 1,020)

Characteristic	Category	n	%
Gender	Male	551	54.0
	Female	469	46.0
Age (years)	18–24	231	22.6
	25–35	375	36.8
	Over 36	414	40.6
Education	Degree	369	36.2
	Diploma	292	28.6
	Master's degree	281	27.5
	Certificate	78	7.6
Location	Mining areas	290	28.4
	Rural	256	25.1
	Urban	236	23.1
	Other towns	238	23.3
Premises	Rented	611	59.9
	Owned	409	40.1

4.2 Descriptive statistics

Table 4 reports the means on the five-point scales. Government support had the lowest mean (2.70, 95% CI 2.63–2.77), followed by mining-sector support (2.88) and NGO support (3.06). The gap between NGO and government support is 0.36 points, a standardised difference of about 0.29, and the confidence intervals do not overlap. Among upgrading types, functional upgrading was lowest (2.73) and process upgrading highest (3.10), consistent with the expectation that functional upgrading is the hardest to achieve. Perceived inclusion (3.26) and poverty reduction (3.21) were slightly above the scale midpoint. All means lie within a narrow band around the midpoint, so respondents on average reported moderate levels of support and outcomes and not strong ones.

Table 4. Descriptive statistics with 95% confidence intervals (N = 1,020)

Variable	Mean	SD	95% CI	Rank (mean)
NGO support	3.06	1.427	2.97–3.15	5
Mining-sector support	2.88	1.286	2.80–2.96	8
Government support	2.70	1.059	2.63–2.77	10
Inter-sectoral upgrading	3.03	1.139	2.96–3.10	6
SME upgrading (overall)	3.25	1.392	3.16–3.34	2
Process upgrading	3.10	1.425	3.01–3.19	4
Product upgrading	2.89	1.272	2.81–2.97	7
Functional upgrading	2.73	1.064	2.66–2.80	9
SME inclusion	3.26	1.382	3.18–3.34	1
Poverty reduction	3.21	1.402	3.12–3.30	3

Note. Confidence intervals are the authors' calculations from the reported means and standard deviations. Ranks are by mean (1 = highest).

4.3 Support and upgrading

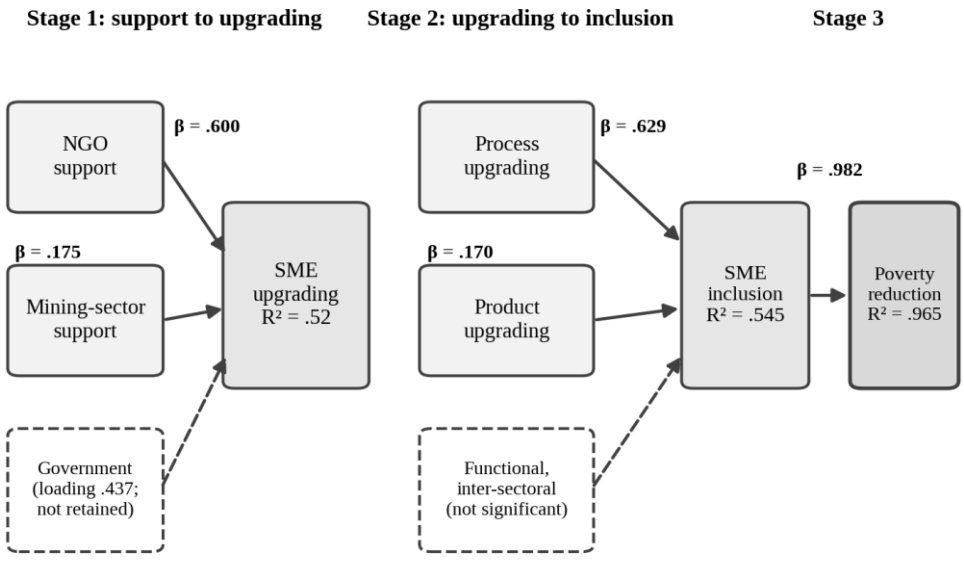
In the structural model of upgrading (Table 5; Figure 2), NGO support was the strongest predictor of SME upgrading (β = .600, t = 23.29) and mining-sector support a smaller but significant one (β = .175, t = 6.67), together explaining 52.0% of the variance in upgrading (f^2 = 1.08, a large effect by conventional benchmarks). The NGO coefficient is 3.4 times the mining-sector coefficient. Government support had the weakest measurement loading (.437) and was not retained in the final structural model, so H1a was not supported in this model, while H1b and H1c were supported.

Item-level regressions identify which components of each support type are most closely related to its overall rating (Table 6). Each model explained about half the variance (R^2 = .504 to .524). For NGO support, linkages to mines were the dominant component (β = .600), well ahead of technical support (β = .159). For mining-sector support, sales revenue from mining companies dominated (β = .682), with mentorship far behind (β = .066). For government support, training was the dominant component (β = .647), with licensing a distant second (β = .100). In each case, the component that connects an SME to buyers or builds skills carried most of the weight, and the more procedural components carried little.

Table 5. Structural model estimates (standardised coefficients, N = 1,020)

Path	β	t	R^2 (outcome)	Result
NGO support → SME upgrading	.600	23.29	.520	Supported (H1b)
Mining-sector support → SME upgrading	.175	6.67	.520	Supported (H1c)
Government support → SME upgrading	Loading .437	Not retained	—	Not supported (H1a)
Process upgrading → SME inclusion	.629	24.62	.545	Supported (H2a)
Product upgrading → SME inclusion	.170	6.65	.545	Supported (H2b)
Functional upgrading → SME inclusion	.016	Not significant	.545	Not supported (H2c)
Inter-sectoral upgrading → SME inclusion	.010	Not significant	.545	Not supported (H2d)
SME inclusion → Poverty reduction	.982	167.97	.965	Supported (H3), interpret with caution

Note. The final reduced models contain two indicators or are otherwise saturated, so fit indices such as CFI = 1.000 and RMSEA = 0.000 carry little diagnostic information. Dashes indicate not applicable.



Standardised coefficients, N = 1,020. Dashed boxes: dropped or non-significant. Stage 3 may reflect construct overlap (see Section 5.3).

Figure 2. Estimated structural relationships

Note. Standardised coefficients from the structural models in Table 5.

Table 6. Item-level regressions: components of each support type

Support type	Strongest components (β)	R^2	F	Interpretation
NGO support	Linkages to mines (.600); technical support (.159)	.524	279.21	Market linkage dominates
Mining-sector support	Sales revenue from mines (.682); mentorship (.066)	.504	257.93	Purchasing dominates
Government support	Training (.647); licensing (.100)	.512	212.68	Skills dominate

Note. Dependent variable is the overall rating of the corresponding support type. Degrees of freedom are (4, 1015) for NGO and (5, 1014) for government support. All models are significant at $p < .001$.

4.4 Upgrading, inclusion and poverty reduction

Process upgrading (β = .629, t = 24.62) and product upgrading (β = .170, t = 6.65) predicted SME inclusion, explaining 54.5% of its variance ($f^2 = 1.20$), whereas functional (β = .016) and inter-sectoral upgrading (β = .010) did not. The process coefficient is 3.7 times the product coefficient. This supports the expectation that earlier forms of upgrading, those tied to meeting buyers' specifications, matter most for inclusion (H2a and H2b), and it is consistent with the lower means for functional upgrading (2.73), which suggests few firms have reached this stage.

Inclusion predicted poverty reduction with a standardised coefficient of .982 (t = 167.97), explaining 96.5% of its variance ($f^2 = 27.6$). With N = 1,020, the 95% confidence interval for a correlation of .982 is .980 to .984, leaving only 3.5% of the variance in perceived poverty reduction unexplained. Section 5.3 discusses why a value this high should be read as evidence of overlapping measurement as well as of a strong relationship.

4.5 Differences between groups

MANOVA found no statistically significant multivariate differences in upgrading, inclusion and poverty reduction by gender, education, location, age or premises ownership (Table 7), and none of the interaction terms was significant. Box's M indicated equal covariance matrices except for age ($p = .017$), for which Pillai's trace, which is robust to such violations, was interpreted. These null results are informative because the design was sensitive: with 551 men and 469 women, the study had 80% power to detect a standardised difference of 0.18 between the genders, and, for the univariate equivalents, 80% power to detect effects of about $f = 0.10$ across four groups (education and location) and across three groups (age). Moderate group differences can therefore be ruled out, although small ones cannot. Outcomes appear not to be concentrated among particular demographic groups, which supports H4.

Table 7. MANOVA results by demographic factor (Pillai's trace)

Factor	Pillai's trace	F	p	Conclusion
Gender	.001	0.204	.894	No difference
Education	.005	0.563	.829	No difference
Location	.007	0.845	.574	No difference
Age	.009	1.595	.145	No difference
Premises ownership	Not reported	0.380	.768	No difference

Note. Dependent variables: SME upgrading, SME inclusion and poverty reduction. Pillai's trace for premises ownership was not reported in the source analysis.

4.6 Qualitative findings

The interviews and focus groups described how the three groups of actors support SMEs and what constrains SMEs (Table 8). Government instruments identified were training, simplified licensing and registration, quotas, targeted tax incentives and regulatory compliance support. NGOs provided technical assistance, market access through buyer introductions, trade fairs and platforms, advocacy and support for compliance with international standards. Mining companies ran supplier development programmes, supported certification and audits, and used commercial incentives to build reliable local suppliers. Participants identified three groups of constraints: limited access to affordable capital, with high collateral requirements, stringent loan conditions and high interest rates; delayed payment by large buyers, which destabilises cash flow; and the cost and difficulty of meeting quality-assurance and certification requirements. They also identified opportunities, notably supply-chain finance and factoring, a growing ecosystem of business development providers, and the local content initiative.

Table 8. Qualitative themes and links to the survey results

Theme	What participants described	Link to survey results
Government support	Training, simplified licensing, quotas, tax incentives, compliance support	Lowest mean (2.70); weakest measurement loading (.437); training the dominant component
NGO support	Technical assistance, buyer linkages, advocacy, standards compliance	Strongest predictor of upgrading (β = .600); linkages to mines dominant
Mining-sector support	Supplier development, certification support, purchasing	Significant predictor (β = .175); sales revenue from mines dominant
Access to finance	Collateral demands, stringent loan terms, high interest rates, limited tailored products	Consistent with low product and functional upgrading means (2.89, 2.73)
Delayed payment	Payment delays by large buyers cause cash-flow instability and financial fragility	Not measured directly in the survey
Quality assurance and certification	Cost and difficulty of meeting standards; support from NGOs and mines	Process and product upgrading predict inclusion (β = .629, .170)
Opportunities	Factoring and supply-chain finance; business development providers; local content initiative	Basis for the strategy framework in Section 6

4.7 Summary of hypothesis tests

Table 9. Summary of hypothesis tests

No.	Hypothesis	Result	Main evidence
H1a	Government support → upgrading	Not supported in the final model	Loading .437; lowest mean 2.70
H1b	NGO support → upgrading	Supported	β = .600; t = 23.29
H1c	Mining-sector support → upgrading	Supported	β = .175; t = 6.67
H2a	Process upgrading → inclusion	Supported	β = .629; t = 24.62
H2b	Product upgrading → inclusion	Supported	β = .170; t = 6.65
H2c	Functional upgrading → inclusion	Not supported	β = .016; not significant
H2d	Inter-sectoral upgrading → inclusion	Not supported	β = .010; not significant
H3	Inclusion → poverty reduction	Supported; interpret with caution	β = .982; R^2 = .965; construct overlap
H4	No differences by demographic factors	Supported (exploratory)	All Pillai's trace p > .14

5. Discussion

5.1 Which support relates to upgrading

The study's clearest result is that support which connects SMEs to buyers relates most strongly to upgrading. NGO support was the strongest predictor (β = .600), mining-sector support a smaller one (β = .175), and within each, the dominant components were linkages to mines and sales revenue from mines, not training or mentorship alone. This is consistent with value-chain accounts in which lead firms are the main source of learning, because buyers define specifications and give suppliers the incentive and feedback needed to upgrade (Humphrey & Schmitz, 2002; Morrison et al., 2008). Government support had the lowest mean (2.70) and the weakest measurement loading (.437) and was not retained in the structural model. Qualitative accounts describe a substantial set of government instruments, so the finding is better read as showing that these instruments are not yet experienced as effective by SMEs than that they are unimportant. Within government support, training was the dominant component (β = .647), which suggests that the quality and reach of training matter more than the number of instruments. A caution applies: firms that already have NGO or mine links may be stronger firms, so the coefficients describe association and may partly reflect selection.

5.2 Sequencing of upgrading

Process upgrading (β = .629) and product upgrading (β = .170) predicted inclusion, but functional and inter-sectoral upgrading did not (β = .016 and .010), and functional upgrading had a low mean (2.73). This

pattern fits the view that upgrading follows a sequence from meeting buyers' specifications towards higher-value functions (Gereffi et al., 2005): firms in the sample appear to be in the early stage, and inclusion currently depends on getting processes and products to standard. It implies that support should prioritise quality systems, certification and safety compliance first, rather than moving to design or inter-sectoral diversification, which only become relevant once firms are already reliable suppliers.

5.3 How to read the inclusion–poverty relationship

The standardised coefficient of .982 from inclusion to poverty reduction ($R^2 = .965$) is too high to be read as a distinct causal effect without further checks. A correlation above .90 between two latent constructs generally indicates that they are not empirically distinguishable (Rönkkö & Cho, 2022), and the shared variance of 96.5% leaves almost nothing specific to either. Three features of the measurement may contribute. First, both constructs are perceptual and were reported by the same respondents in one questionnaire, which invites common-method variance (Podsakoff, Podsakoff, Williams, Huang & Yang, 2024). Second, the inclusion and poverty constructs draw on overlapping content, so respondents who view their firm's participation favourably may report favourable poverty outcomes without distinguishing them. Third, the final reduced models were saturated or nearly so, so the fit indices reported for them (for example CFI = 1.000) do not test the model. The H3 result is therefore best described as a very strong association between perceived inclusion and perceived poverty reduction, supported statistically but not yet established as a separate effect.

Four checks would resolve the question: (i) discriminant validity tests using the Fornell–Larcker criterion and the heterotrait–monotrait ratio, with a chi-square difference test of a model in which the two constructs are constrained to correlate perfectly (Fornell & Larcker, 1981; Henseler, Ringle & Sarstedt, 2015; Rönkkö & Cho, 2022); (ii) a latent common-method factor or marker variable to estimate method variance; (iii) re-estimation with objective poverty-related outcomes, such as SME revenue, employment and wage bills from records, and household-level indicators in mining communities; and (iv) cross-validation of the retained items on a split sample or a new sample, because items were dropped on the basis of significance in the same data. Until these are done, the finding that inclusion relates to poverty reduction should be used to motivate inclusion strategies, not to forecast the size of poverty effects.

5.4 Equity

Upgrading, inclusion and poverty outcomes did not differ by gender, education, location, age or premises ownership (all Pillai's trace $p > .14$), and the study could rule out moderate differences (80% power for $d = 0.18$ between genders). This is a positive finding for inclusion: in this sample, women, rural firms and less educated respondents report outcomes similar to others. It should not be taken as showing that barriers are absent for these groups, since the outcomes are perceptual and the sample is well educated (36.2% degree holders and 27.5% master's holders) and relatively young, with 22.6% aged 18 to 24. Disaggregated records of contract value by owner characteristics would give a firmer basis.

5.5 Relevance to Zambia's 2025 local content regulations

The regulations reserve at least 20% of mining procurement for Zambian-owned or citizen-empowered firms and require supplier development spending of at least 0.05% of procurement (Republic of Zambia, 2025; Ecofin Agency, 2026). The results indicate what must accompany these rules for them to work. First, quotas create demand but not capability; the strongest upgrading relationships are with linkages to

buyers and with process and product upgrading, so supplier development must focus on meeting buyers' specifications. Second, finance and payment constraints identified in the qualitative evidence determine whether an SME can accept and finance larger orders, so access to supply-chain finance and prompt payment must be part of implementation. First Quantum's partnership with five Zambian lenders on supplier working-capital finance is an example of the kind of arrangement needed, though its effect on borrowing costs and on procurement from genuinely Zambian-owned firms remains to be shown (Ecofin Agency, 2026). Third, because reported local shares can include local subsidiaries of foreign groups, monitoring must distinguish ownership and value retained. The evidence reported here pre-dates the regulations and so offers a baseline against which their effect can be assessed.

6. Strategies and Framework for Upgrading, Inclusion and Poverty Reduction

Figure 3 presents the framework derived from the quantitative and qualitative evidence. It places a shared platform and governance structure above four groups of actors (government, NGOs and partners, mining companies, and finance providers), whose actions drive upgrading and inclusion, which are expected to lead to outcomes that are verified with records and not only perceptions. Table 10 translates the framework into seven strategies, each tied to the evidence, the lead actors, a timeline and an indicator.

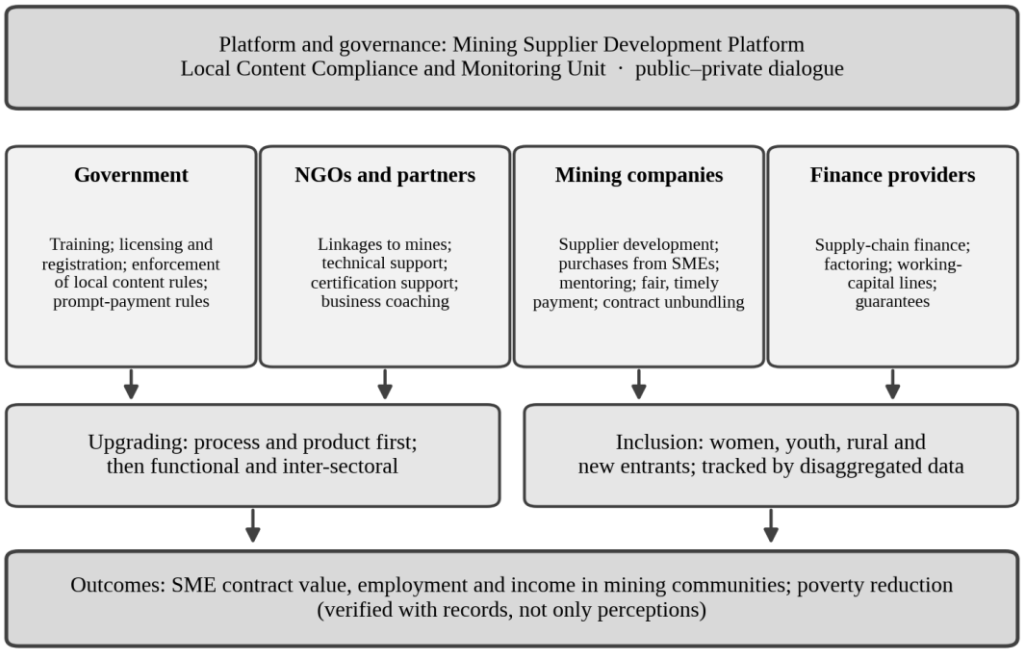


Figure 3. Framework for upgrading SMEs for inclusion and poverty reduction in mining value chains

Note. Drawn by the authors from the survey and qualitative evidence and the policy context in Section 1.

Table 10. Strategies, evidence basis, lead actors, timeline and indicators					
#	**Strategy and key actions**	**Evidence basis**	**Lead actors**	**Phase**	**Indicator**
1	Mining supplier development platform: register, verify and match SMEs to mine demand; publish forward procurement plans; link to NGO and BDS providers	NGO linkages to mines strongest component (β = .600); qualitative market-access findings	Government (ZDA); mining companies; NGOs	1 (0–12 months)	Number of SMEs matched; contracts awarded; share of SMEs registered and verified
2	Process and product upgrading programmes tied to buyers' specifications: quality systems, certification, safety and environmental compliance, with shared testing facilities	Process (β = .629) and product (β = .170) upgrading predict inclusion; functional upgrading lowest (2.73)	Mining companies; NGOs; standards bodies	1–2 (0–36 months)	Firms certified; rejection and rework rates; buyer audit scores
3	Mining-company purchasing and supplier development commitments: unbundle large contracts, set mentoring plans, meet the 0.05% supplier development spend	Sales revenue from mines dominant (β = .682); mentorship small (β = .066); SI 68 of 2025	Mining companies	1–3	Spend with Zambian-owned SMEs; supplier development spend as share of procurement
4	Finance and payment: supply-chain finance and factoring, credit guarantees, standard payment terms with monitoring of late payment	Qualitative: collateral, stringent terms, high interest rates, delayed payment; low product and functional upgrading	Banks; mining companies; government; development partners	1–2	Cost of finance; days to payment; share of invoices paid on time

Table 10. Strategies, evidence basis, lead actors, timeline and indicators					
#	**Strategy and key actions**	**Evidence basis**	**Lead actors**	**Phase**	**Indicator**
5	Government delivery: higher-quality training linked to buyer needs, simplified licensing, enforcement of local content rules and a compliance monitoring unit	Training dominant component of government support (β = .647); lowest mean (2.70); loading .437	Ministries; ZDA; regulators	1–2	Trainees certified and employed; licensing time; verified local content compliance
6	Inclusion targets and disaggregated tracking: women, youth, rural and new entrants; ownership-based reporting that separates Zambian-owned firms from local subsidiaries	No group differences in perceived outcomes (Pillai p > .14); ownership ambiguity in company reports	Government; mining companies; SME associations	1–3	Contract value by owner group; share of spend with majority Zambian-owned firms
7	Monitoring and learning: baseline before regulations, annual verification of revenue, employment and community outcomes with records; independent evaluation	Inclusion–poverty association .982 requires verification (Section 5.3)	Government; universities; development partners	3 (36–48 months)	Verified revenue and employment growth; poverty indicators in mining communities

Note. ZDA = Zambia Development Agency; BDS = business development services; SI = Statutory Instrument. Phases: 1 = foundation (0–12 months); 2 = scale-up (12–36 months); 3 = institutionalisation (36–48 months).

Sequencing follows the evidence. The first year establishes the platform, finance and payment arrangements and a baseline, because without buyer linkages and finance, upgrading programmes will not translate into contracts. The second and third years scale upgrading and purchasing commitments, with process and product upgrading first. The fourth year consolidates the arrangements into the routine work of institutions and evaluates results against verified indicators.

7. Limitations and Further Research

Several limitations qualify the findings. The survey is cross-sectional and based on self-reported perceptions from single respondents, so it shows association and not causation, and it may be affected by common-method variance. As discussed in Section 5.3, perceived inclusion and poverty reduction overlap to a degree that prevents a distinct effect from being estimated. Items were dropped on the basis of significance and the final models were saturated or nearly so, so fit indices are uninformative and the retained structure should be cross-validated. The sample was well educated and included a notable share of young respondents (22.6% aged 18 to 24), which may not reflect the typical decision-maker in the population, and the group tests, though sensitive to moderate differences, cannot rule out small ones. The qualitative evidence is described at the level of themes without quantified frequencies. The study covers two provinces and a period before the 2025 regulations, so results may not generalise to other regions or to the post-regulation environment.

Further research should (i) re-estimate the model with discriminant validity tests, a method factor and objective outcomes from records; (ii) follow a panel of SMEs through the implementation of the 2025 regulations using contract, revenue and employment data, with a comparison group; (iii) evaluate supplier development programmes with quasi-experimental designs; (iv) examine the experience of women-owned and young-owned firms qualitatively and with disaggregated data; and (v) analyse the distinction between registered, citizen-owned and citizen-empowered firms to determine who captures the value of local content.

8. Conclusion

Evidence from 1,020 SME respondents and qualitative interviews and focus groups in the Copperbelt and North-Western provinces shows that support which links SMEs to buyers is most strongly associated with upgrading, that process and product upgrading, rather than functional or inter-sectoral upgrading, are associated with inclusion in mining value chains, and that perceived outcomes do not differ across demographic groups. NGO support ($\beta = .600$) and mining-sector support ($\beta = .175$) explained 52% of the variance in upgrading, while government support was the least effective in the eyes of SMEs. Perceived inclusion and poverty reduction were almost perfectly associated, but overlapping measurement prevents this being read as a separate effect, and verification with objective outcomes is a priority. The article proposes a seven-strategy, four-year framework built on a supplier development platform, process and product upgrading tied to buyers' specifications, purchasing commitments by mines, supply-chain finance and prompt payment, better government delivery, inclusion targets with ownership-based tracking, and verified monitoring. As Zambia moves to implement local content regulations alongside a goal of tripling copper output, such strategies offer a route by which mining demand can build local enterprise capability and not only local registration.

Declarations

Data availability: The anonymised survey dataset and instruments are available from the corresponding author on reasonable request.
Funding: No external funding was received for this study.
Competing interests: The author declares no competing interests.

Use of AI-assisted tools: AI-assisted tools were used for language editing and for structuring parts of the draft and for computing derived statistics from the reported results. The author reviewed and revised all text, verified all data and citations, and takes full responsibility for the content.

Acknowledgements: The author thanks the co-authors, SME owners, officials and organisations that participated in the study.

References

1. Barney, J. B., Ketchen, D. J., Jr., & Wright, M. (2021). Resource-based theory and the value creation framework. *Journal of Management, 47*(7), 1936–1955. https://doi.org/10.1177/01492063211021655
2. Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE.
3. Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE.
4. Ecofin Agency. (2026). *Canada's First Quantum builds the credit link Zambia's mining suppliers lacked*. https://www.ecofinagency.com/news-industry/2808-58416-canada-s-first-quantum-builds-the-credit-link-zambia-s-mining-suppliers-lacked
5. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.
6. Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The governance of global value chains. *Review of International Political Economy, 12*(1), 78–104.
7. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115–135.
8. Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1–55.
9. Humphrey, J., & Schmitz, H. (2002). How does insertion in global value chains affect upgrading in industrial clusters? *Regional Studies, 36*(9), 1017–1027.
10. International Energy Agency. (n.d.-a). *National 3 million tonnes copper production strategy by 2031* [Policy database]. https://www.iea.org/policies/29665
11. International Energy Agency. (n.d.-b). *Geological and Minerals Development (Local Content) (Preference for Goods and Services in the Mining Sector) Regulations, Statutory Instrument No. 68 of 2025* [Policy database]. https://www.iea.org/policies/29702
12. Kanyinji, P. (2026). *Strategies for upgrading SMEs for inclusion and poverty reduction in Copperbelt and North-Western Zambia* [Doctoral thesis]. Graduate School of Business, University of Zambia.
13. Kline, R. B. (2023). *Principles and practice of structural equation modeling* (5th ed.). Guilford Press.
14. Mining Weekly. (2025, December 17). *First Quantum backs measures to up local participation in Zambia's mining sector*. https://www.miningweekly.com/article/first-quantum-backs-measures-to-up-local-participation-in-zambias-mining-sector-2025-12-17
15. Mining.com. (2026). *Zambia's 2025 copper production up 8%, misses target*. https://www.mining.com/web/zambias-2025-copper-production-up-8-misses-target

16. Morrison, A., Pietrobelli, C., & Rabellotti, R. (2008). Global value chains and technological capabilities: A framework to study learning and innovation in developing countries. *Oxford Development Studies, 36*(1), 39–58.
17. Pietrobelli, C., & Rabellotti, R. (2011). Global value chains meet innovation systems: Are there learning opportunities for developing countries? *World Development, 39*(7), 1261–1269.
18. Podsakoff, P. M., Podsakoff, N. P., Williams, L. J., Huang, C., & Yang, J. (2024). Common method bias: It's bad, it's complex, it's widespread, and it's not easy to fix. *Annual Review of Organizational Psychology and Organizational Behavior, 11*, 17–61.
19. Republic of Zambia. (2015). *Mines and Minerals Development Act No. 11 of 2015*. Government Printer.
20. Republic of Zambia. (2025). *Geological and Minerals Development (Local Content) (Preference for Goods and Services in the Mining Sector) Regulations* (Statutory Instrument No. 68 of 2025). Government Printer.
21. Rönkkö, M., & Cho, E. (2022). An updated guideline for assessing discriminant validity. *Organizational Research Methods, 25*(1), 6–14.
22. Tashakkori, A., Johnson, R. B., & Teddlie, C. (2021). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences* (2nd ed.). SAGE.
23. Webb, J. W., Khoury, T. A., & Hitt, M. A. (2020). The influence of formal and informal institutional voids on entrepreneurship. *Entrepreneurship Theory and Practice, 44*(3), 504–526.
24. Zambia Monitor. (2025a). *FQM claims $1.6 billion committed to local procurements*. https://www.zambiamonitor.com/?p=49660
25. Zambia Monitor. (2025b). *FQM moves to enhance transparency, inclusivity in procurement processes*. https://www.zambiamonitor.com/?p=68515
26. Zambia Statistics Agency. (2023). *2022 living conditions monitoring survey report*. Zambia Statistics Agency.
27. Zambian Digest. (2025). *FQML to procure US$1.6 billion from Zambian companies*. https://www.zambiandigest.net/?p=2817