

Supplier relationships and logistics management to reduce material supply disruptions among SME contractors in the Western Cape, South Africa

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Abstract

The purpose of this study is to investigate effective SME contractors' supplier relationship management and logistics strategies to prevent material supply disruptions and enhance construction project performance for SME contractors. This study adopted a quantitative research method. 75 survey questionnaires were distributed to respondents to investigate supplier relationships and logistics management to reduce material supply disruptions. To achieve the objectives of this study, the Statistical Package for the Social Sciences (SPSS) version 31 was used to analyse the data gathered, using both mean ranking and principal component analysis (PCA). To ensure the internal consistency of constructs, this study used Cronbach's Alpha. The findings reveal loyalty agreements with high-performing suppliers, long-term contracts with key suppliers, working closely with suppliers on project requirements, tracking shipments from dispatch to site, planning for alternative delivery routes or vehicles, ensuring that materials are delivered just-in-time, financial stability, logistics capability, and maintaining a database to reduce material supply disruptions. Furthermore, PCA findings reveal that SME contractors adopt supplier logistics coordination and implement strategic supplier and logistics management to reduce material supplier disruptions. This study shows that strengthening collaboration, enhancing logistics coordination, and promoting supplier development can significantly improve project outcomes. The research contributes to both theory and practice by providing a framework that supports SME contractors in achieving more efficient and reliable material supply, aligned with industry expectations and regulatory requirements. This study offers insights by integrating supplier relationship management and logistics strategies in the context of SME contractors.

Keywords: Construction procurement, logistics management, material supply disruptions, supplier relationship management, and Western Cape Province

1. Introduction

Small and medium-sized enterprises (SMEs) play an important role in the delivery of construction projects in South Africa, particularly in provinces such as the Western Cape (Oyegoke *et al.*, 2024). This contribution includes infrastructure development, local job opportunities, and Gross Domestic Product (GDP) (Manathunge *et al.*, 2021). Despite their role in job creation and infrastructure development, the majority of SME contractors' business performance continues to be affected by recurring material supply delays (Sogaxa & Simpeh, 2022; Chowdhury, Lau & Pittayachawan, 2019). According to research by Ali *et al.* (2021), these disruptions are often associated with poor supplier relationships, inadequate logistical systems, low bargaining power, and financial constraints, which all negatively affect the delivery of construction projects. Manathunge *et al.* (2021) reveal that material availability and timely delivery are critical contributors to SME contractors' ability to meet project schedules, control costs, and maintain quality standards in conformity with regulatory expectations. However, Madhavika *et al.* (2025) and Bak *et al.* (2021) argue that

SME contractors usually operate within limited supply chains with unreliable suppliers, poor coordination, and insufficient integration of logistics planning. Khuan, Shee and See (2023) note that SME contractors are affected by transportation inefficiencies, price volatility, and demand fluctuations, which worsen SMEs' ability to deliver, increasing sensitivity to delays and cost overruns. According to Sogaxa and Simpeh (2022), effective supplier relationship management and logistical coordination are widely acknowledged as critical enablers of supply chain resilience in construction. On the other hand, a robust collaboration with local suppliers may improve procurement planning, increase communication, and secure priority access to construction resources (Wloch, 2023). Similarly, Khuan, Shee and See (2023) reveal that efficient logistics systems can shorten lead times, decrease waste, and enhance on-site material availability during the implementation of construction projects. However, Donyavi (2009) and Kumar *et al.* (2025) claim that these practices remain immature and are inconsistently adopted among SME contractors in the Western Cape. Given that materials can constitute up to 70% of total project costs, any inefficiencies or

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delays in the procurement process can lead to substantial financial ramifications, hampering not only individual projects but also the long-term viability of SMEs within the construction industry (Parisi & Donyavi, 2025). The objectives of this study are stated as follows:

Against this backdrop, this study investigates supplier relationships and logistics management to prevent material supply disruptions and enhance the success of construction projects among SME contractors. The study aims to contribute to the body of knowledge related to the existing literature on supply chain management in developing countries by providing context-specific insights and practices to enhance performance, resilience, and sustainable SME contractors in the Western Cape Province. This study comprises six sections, namely: Section A, the introduction to the study, patterning supply chain disruptions; Section B, the literature review and the underpinning theories; Section C, research methodology; Section D, presentation of results; Section E, discussions of findings; and Section F, conclusions and recommendations.

2. Literature Review

2.1. Material supply disruptions in construction projects

Material supply disruptions are delays, shortages, or irregularities in the delivery of building supplies necessary for project completion (Panova & Hilletoft, 2018). Kissi *et al.* (2021) divulge that these disruptions significantly contribute to project delays, cost overruns, and poor quality, which could negatively affect business success. Heaton *et al.* (2022) reveal that supplier unreliability, inadequate inventory management, transportation delays, and contractor financial instability are all common causes of supply chain disruptions.

The impact on SME contractors is particularly severe due to limited capacity for buffering and limited access to alternative suppliers (Pamidimukkala, Kermanshachi & Karthick, 2020; Duong *et al.*, 2026). Disruptions frequently cause work stoppages, activity rescheduling, and increased labour costs (Duong *et al.*, 2026). Furthermore, Kisi and Sulbaran (2022) find that inconsistent material delivery may result in noncompliance with building standards, such as NHBRC criteria, thereby compromising project integrity and certification.

2.2. Supplier relationship management in construction

The concept of supplier relationship management in construction has become a pivotal strategic practice in supply chain and procurement, transforming transactional relationships into collaborative, value-oriented partnerships with suppliers (Jones, 2025).

SRM entails methodical interaction, lateral tracking, and collaborative issue resolution to achieve efficiency, durability, innovation, and future results (Jones, 2025). As the case in point, the studies in the area of procurement prove the existence of a positive and statistically significant correlation between SRM practices and the supply performance outcomes, including delivery reliability, cost efficiency, and quality improvement, which indicate that effective supplier engagement can advance the wider supply chain objectives (Ofori Issah, Aidoo-Acquah & Boafor, 2025). Likewise, the results from construction supply chains indicate that proactive SRM is associated with improved operational performance. This will involve improved inventory levels, standardised supplier analysis and monitoring of performance, which collectively will improve overall performance (Nakile, Kibuine & Kimemia, 2025).

2.3. Logistics management and its role in material supply

According to Buhaievskiy and Petrenko (2025), logistics planning significantly influences construction productivity, particularly when material flows are complex and time-sensitive. Furthermore, transport disruptions, driver shortages and infrastructure bottlenecks have emerged as major constraints in construction supply chains (AlTalhani, Ali & Al-Sheikh, 2025). Transportation risk management has therefore gained prominence, especially in post-pandemic contexts characterised by global instability (Nowakowski & Ryczyński, 2025). Machine learning approaches are increasingly used to predict transportation durations and mitigate uncertainty (Emerald, 2024). Moreover, logistics challenges under uncertainty require integrated planning among procurement, scheduling, and transport functions (Papadopoulos, Gunasekaran & Dubey, 2022). In addition, effective logistics management requires real-time monitoring systems, diversified transport strategies, and risk-adjusted planning models to ensure continuity of material flow (Popa *et al.*, 2025).

2.4. The link between supplier relationships, logistics, and project performance

The correlation between supplier management and logistics performance is critical for establishing consistent material flow in building projects (Kalubanga & Namagembe, 2022). Effective supplier relationships encourage early participation, open communication, and coordinated planning, all of which significantly contribute to aligning material production, dispatch, and delivery schedules with project requirements (Kalubanga & Namagembe, 2022; Prajogo & Olhager, 2012). Prajogo and Olhager (2012) further identified that when SME contractors maintain constant contact with suppliers, they are better able to anticipate future shortages, negotiate delivery priorities, and procure crucial goods within the required timeframes. Moreover, this alignment decreases

uncertainty while improving overall supply chain responsiveness (Costa *et al.*, 2019). Therefore, in the light of the supply chain integration concept, logistics and

information integration originally reflects two interrelated forms of integration which flow in opposite directions (Mitrega *et al.*, 2017). A study by Kalubanga and Namagembe (2022) highlighted that logistics efficiency is an operational strategy that translates these relationships into project outcomes. However, Emon, Khan and Siam (2024) claim that even with good supplier relationships, poor logistics planning, such as insufficient transport coordination, delivery scheduling, or site storage, leads to ineffective management of construction resources. In contrast, Butt (2019) reveals that well-structured logistics systems enable timely delivery, reduce material handling risks, and ensure the continuity of site activities. Integrating logistics planning with procurement decisions is critical for SME contractors to avoid delays that could lead to idle labour, longer project durations, and higher costs (Vaka, 2024; Schmelzle & Mukandwal, 2023).

3. Research Methodology

This study adopts a quantitative approach, using descriptive and inferential statistics, to investigate supplier relationship management, logistics practices, and material supply disruptions among SME contractors in the Western Cape (Saunders, Lewis, Thornhill & Bristow, 2015). According to Koshy (2008), quantitative research is advantageous for statistically analysing large amounts of information collected through prepared questionnaires and surveys. Quantitative research is a broad approach to studying a desired subgroup (Dawson, 2009). Furthermore, quantitative research was adopted in this research to collect information from the contractors due to its cost-effective nature (Creswell & Clark, 2011). The study focuses on SME contractors working on residential and general building projects, where the constant supply of materials is important for meeting time, cost, and quality targets (Mohajan, 2020).

The target population for this study was the management personnel of SME contractors in the Western Cape province, comprising the operational manager, procurement manager, quantity surveyors, and supply chain manager involved in the supply chain, making it convenient to distribute the questionnaire. SME contractors' management teams play an important role in running the construction business procurement. Management perspectives are critical in understanding the impact of supply chain disruptions in the delivery of construction projects. SME contractors operating under cidb Grade 1 to 4 are more exposed to supply chain interruptions, making them an important focus for examining productivity difficulties. The actual population size was determined using the most recent

cidb online database and related industry records. According to the most recent publicly accessible information from the cidb, there are 1369 GB contractors registered in Grades 1 to 4 in the Western Cape Province. These grades are often regarded as established SME contractors with demonstrated financial and operational capacity.

In its public reports for Grade 1, the cidb regards Grade 1 contractors as entry-level. However, to achieve the study objectives, Grade 1 contractors were included. Therefore, the confirmed total for formally graded SME contractors in the General Building category (Grades 1-4) is 1369, comprising 978 Grade 1 contractors, 182 Grade 2 contractors, 94 Grade 3 contractors, and 115 Grade 4 contractors. To ensure representativeness, a probability sampling method using a random. Primary data were obtained using a standardised questionnaire with closed-ended items, assessed on a Likert scale to ensure consistency and ease of analysis. To maximise response rates, the questionnaire was distributed both electronically and in hard copy on construction sites. The minimum sample size for the study is 300 SME contractors in the Western Cape Province. Out of 300 survey questionnaires sent to the respondents using email, 224 emails were successfully delivered to the respondents, and 31 questionnaires were not correctly completed. A total of 75 surveys were correctly completed and returned, which indicates a 25% response rate compared to a 300-sample size.

Descriptive statistics were used to summarise the data using SPSS version 31, while inferential techniques such as PCA were utilised to assess the strength and significance of correlations between variables. This study adopted mean score ranking to analyse the data. Furthermore, Loeb *et al.* (2017) reveal that the variables are ordered in descending order by mean, with the highest mean indicating the most relevant factors influencing supply chain relationships and logistics. Mean ranking offers a clear, methodical strategy for prioritisation and assists the researcher in decision-making, especially when assessing the impact of supply chain relationships and logistics on SME contractors' productivity within a certain demographic (Rücker & Schwarzer, 2015). This study adopted PCA to identify the most significant factors influencing supply chain relationships and logistics; it also assessed whether the data were suitable for factor analysis (Pallant, 2020). This research used the two popular measures that include Bartlett's sphericity test and the Kaiser-Meyer-Olkin (KMO) test (Kim & Mueller, 1978). When the data are suitable, researchers use PCA to extract factors (Pallant, 2020). The factor loading cut-off value for this study was 0.40. The factor loadings, which display the strength and direction of the correlations between the observed variables and the underlying factors, can be used to analyse the factors (Beavers *et al.*, 2019).

Cronbach's Alpha was used to assess the instrument's reliability, with an acceptable internal consistency of 0.7. Ethical considerations were carefully followed throughout the investigation. Participation will be voluntary, and respondents will be informed of the research objective. Confidentiality and anonymity were preserved, and all information was collected only for academic purposes.

4. Presentation of Results

4.1. Background information of the respondents

The results from this study present the gender distribution of respondents, and the results indicate a significant gender imbalance, with male respondents accounting for 81.3% (61) and female respondents comprising only 18.7% (14) of the sample. This reflects the continuing male dominance in the construction industry, although the presence of female respondents indicates a gradual but positive shift towards gender inclusion in the sector. The data indicate that 45.3% (34) of respondents were in the $>40 \leq 50$ age group, followed by 26.7% (20) in the $>25 \leq 40$ age group. Respondents aged $>50 \leq 60$ made up 22.7% (17) of the sample, while those aged >60 and above accounted for only 4% (3). A minimal 1.3% (1) of respondents were within the $>18 \leq 25$ age group. These findings suggest that the SME construction workforce in the Western Cape is largely composed of mature professionals in their mid to late careers.

The majority of contractors, 70.7% (53), were graded under grade 2, followed by 17.3% (13) under grade 4; on the other hand, 9.3% (7) under grade 1, and 2.7% (2) under grade 3. These results confirm that the study appropriately targeted SME contractors. The findings show that 37.3% (28) of respondents had >20 years of experience, followed by 30.7% (23) with $>10 \leq 15$ years, 16% (12) with $>15 \leq 20$ years, and 13.3% (10) with $>5 \leq 10$ years. Only 2.7% (2) had $>0 \leq 5$ years of experience. This distribution highlights a highly experienced workforce, suggesting that respondents were well-positioned to provide informed insights into the effects of supply chain disruptions on productivity.

The results show that 58.7% served as Operational Managers, followed by Quantity Surveyors (37.3%). Procurement Managers and Supply Chain Managers represented 2.7% and 1.3%, respectively. This shows that most responses were drawn from professionals with direct oversight of construction operations and procurement activities, key areas affected by supply chain disruptions, thus making their input particularly relevant to the research objectives.

4.2. Effective SME contractors' supplier relationships and logistics management to reduce material supply disruptions

Table 1 (Appendix 1) presents practices pertaining to SME contractors' supplier relationships and logistics to reduce material supply disruptions. The respondents were asked to rate the impact of the following mitigation practices on minimising supply chain disruptions and avoiding delays. Please note: On a scale of 1 (less impact) to 5 (high impact), please evaluate the role of supplier and logistics relationships in minimising supply chain disruptions within your organisation's construction projects. The results present the role of supply chain relationships. High-performing practices included loyalty agreements with suppliers (MV = 4.50), long-term contracts (MV = 4.42), and close collaboration on project requirements (MV = 4.42). This was closely followed by supporting supplier development and capacity building, as well as engaging in joint problem-solving with suppliers sharing the same MV of 4.40. The relatively lower practice involved suppliers in the project planning stages (MV = 4.35). With an average MV of 4.41, supplier collaboration is a very major mitigation practice, reflecting strong emphasis on trust and partnerships, but with less focus on early-stage supplier engagement. It is noticeable that shipment tracking from dispatch to site (MV = 4.42), alternative delivery routes or vehicles (MV = 4.34), and just-in-time deliveries (MV = 4.26) were prioritised as the most effective logistics strategies used by SME contractors. However, regular evaluation of logistics providers (MV = 3.83) was rated lowest. The overall mean of 4.03 indicates a major practice, with SMEs prioritising operational logistics control. Table 1 shows that the most valued criterion was financial stability (MV = 4.26), followed by logistics capability (MV = 3.94) and maintaining a preferred supplier database (MV = 3.85). The least emphasis was on assessing delivery timelines before appointment (MV = 3.00). The average of 3.71 indicates that supplier evaluation is a major practice, though it is weaker than other mitigation measures.

4.3. PCA for supplier relationships and logistics management to reduce material supply disruptions

FA was adopted in this study to identify and classify the most important SME contractors' supplier relationships and logistics, thereby reducing material supply disruptions. Dehkordi *et al.* (2021), Cureton and D'Agostino (2013), and Kline (2014) employed FA to validate the consistency of the quantitative analysis. Additionally, PCA was used to extract the variables. The data analysis for SME contractors' supplier relationship and logistics to reduce material supply disruptions revealed a KMO score of sampling adequacy of 0.746, which is more than 0.60 and indicates a viable sample for factor analysis (Shrestha, 2021). The Bartlett test for sphericity yielded 203.087 with a significance level of 0.001. KMO and Bartlett's

tests propose factor analysis for the data presented in Table 2. Using PCA, 2 latent components with eigenvalues greater than 1.0 were discovered from 21 SME contractors' supplier relationships and logistics to reduce material supply disruptions.

5. Discussion of Findings

As presented in Table 1, the quantitative findings pertain to supplier collaboration, including loyalty agreements with high-performing suppliers, long-term

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.746
Bartlett's Test of Sphericity	Approx. Chi-Square	203.087
	Df	22
	Sig.	<.001

Table 3 reveals that the extracted components have eigenvalues of 2.924 and 1.375, which account for 61.41% of the variance. The findings indicate values more than 0.40, while variables with values less than 0.40 are omitted. Furthermore, the most important components of SME contractors' supplier relationship and logistics to reduce material supply disruptions are Component 1, '*Supplier logistics coordination*', and Component 2 '*Strategic supplier and logistics management*'.

contracts with key suppliers, close collaboration with suppliers on projects, support for supplier development and capacity building, and joint problem-solving with suppliers. Supporting supplier development and capacity building improves supplier performance and long-term reliability, which is critical in the SME setting (Deep, Gajendran & Jefferies, 2021). Furthermore, Costa *et al.* (2019) indicated that engaging in collaborative problem-solving with suppliers enables the effective resolution of issues such as delays and shortages, thereby reducing supply chain-

Table 3: Component Matrix^a for contractors' supplier relationship and logistics to reduce material supply disruptions

	Component	
	1	2
Component 1: Supplier logistics coordination		
Planning delivery schedules in advance with suppliers	.967	
Maintaining a database	.932	
Supporting supplier development and capacity building	.910	
Engaging in joint problem-solving with suppliers	.841	
Storage facilities for critical materials	.732	
Planning for alternative delivery routes or vehicles	.703	
Financial stability	.634	
Tracking shipments from dispatch to site	.611	
Component 2: Strategic supplier and logistics management		
Working closely with suppliers on project requirements		.880
Assessing supplier delivery timelines		.849
Loyalty agreements with high-performing suppliers		.811
Comparing prices, quality, and delivery		.800
Use of logistics companies		.793
Involvement of suppliers in project planning stages		.750
Evaluating logistics providers regularly		.747
Long-term contracts with key suppliers		.689
Reviewing suppliers' past project performance		.631
Logistics capability		.517
Treating suppliers as strategic partners		.461
Ensuring that materials are delivered just-in-time		.406
Terminating relationships with non-performing suppliers		.400
<i>Eigen value</i>	2.924	1.375
<i>Proportion of variance (%)</i>	41.767	19.644
<i>Cumulative variance (%)</i>	41.767	61.411
Extraction Method: Principal Component Analysis.		
a. 2 components extracted.		

related project interruptions. These findings align with those of Nnaemeka and Chijindu (2023), who demonstrate that increased supplier engagement is associated with fewer material supply disruptions and better project performance.

The findings from Table 1 indicate tracking shipments from dispatch to site as the most significant practice used by SME contractors, aligning with the recommendations of Acquah *et al.* (2025). Gatobu and Moronge (2024) support this finding by stating that supplier relationships enhance contractors' confidence, achieved through tracking shipments from dispatch to site, thereby improving the ability to secure construction resources. According to Acquah *et al.* (2025), tracking shipments from dispatch to site increases material planning accuracy, minimises specification errors, and enables the contractor to meet construction deadlines. Furthermore, planning for alternative delivery routes or vehicles is ranked second as the most significant logistics management practice used by SME contractors. This finding is corroborated by the findings from Lasota *et al.* (2024), who posited that planning alternative delivery routes or vehicles is an important logistics risk-mitigation strategy in construction supply chains, especially for SME contractors, who are most affected by transportation disruptions, traffic congestion, and distance to suppliers, all of which can significantly impact material availability.

The quantitative findings revealed that ensuring materials are delivered just-in-time is the third most significant practice among SME contractors. These findings align with the literature from Biswas and Sarker (2020), who pointed out that ensuring that materials are supplied just-in-time (JIT) is an important logistics approach for increasing efficiency and decreasing waste in building projects.

Regarding supplier evaluation and selection, the findings reveal that SME contractors prioritised financial stability, logistics capability, and maintaining a database to reduce material supply chain disruptions. According to Ho, Xu and Dey (2010), suppliers with strong financials are better positioned to buy supplies in bulk, absorb market changes, and fulfil orders consistently, reducing the risk of disruptions. Furthermore, Lopes and Rodriguez-Lopez (2021) reveal that strong logistical capabilities, such as fast transportation, reliable delivery systems, and effective coordination, were found to significantly improve on-time material delivery to the site. Tavarna *et al.* (2016) add that suppliers' capacity to maintain continuous quality and delivery performance has also emerged as a vital issue, ensuring the continuation of construction activities and reducing delays. The findings indicate that SME contractors who prioritise financially stable and logistically capable suppliers are more likely to have improved overall material flow (Lammi, 2016).

PCA findings revealed two components, namely supplier logistics coordination and strategic supplier and logistics management, influencing SME contractors' supplier relationships and logistics to reduce material supply disruptions in the Western Cape Province. Component 1 supplier logistics coordination: this principal factor explained the most variance and was defined by eight variables: planning delivery schedules in advance with suppliers (0.8967); maintaining a database (0.932); supporting supplier development and capacity building (0.910); engaging in joint problem-solving with suppliers (0.841); storage facilities for critical materials (0.732), planning for alternative delivery routes or vehicles (0.703), financial stability (0.634), and tracking shipments from dispatch to site (0.611). Notably, each variable's appropriate factor loading has been contained in parentheses. This finding aligns with the findings from Kmiecik (2022) who revealed that supplier logistics coordination leads to enhanced delivery reliability, and the perspective suggests that its effectiveness among SME contractors is mostly restricted by informal and reactive practices used in the construction industry. Furthermore, Ashenbaum and Maltz (2017) reveal that supply chain coordination often relies on manual communication and supplier-driven arrangements to achieve consistency and control. This practice enhances SMEs' capacity to influence supply timetables and prioritisation during moments of strong demand (Vlachos & Dyra, 2020). Furthermore, effective integrated logistics planning during the early stages of a project enhances the overall effectiveness of coordination, as procurement and site operations (Vlachos & Dyra, 2020).

Component 2 Strategic supplier and logistics management: the second component includes 13 features, namely working closely with suppliers on project requirements (0.880), assessing supplier delivery timelines (0.849), loyalty agreements with high-performing suppliers (0.811), comparing prices, quality, and delivery (0.800), use of logistics companies (0.793), involvement of suppliers in project planning stages (0.750), evaluating logistics providers regularly (0.747), long-term contracts with key suppliers (0.689), reviewing suppliers' past project performance (0.631), logistics capability (0.517), treating suppliers as strategic partners (0.461), ensuring that materials are delivered just-in-time (0.406), terminating relationships with non-performing suppliers (0.400) as shown in (Table 3).

The findings align with the existing literature, including Harrison *et al.* (2019), who strongly support the significance of strategic supplier and logistics management in improving supply chain performance and minimising construction disruptions. Furthermore, Khan and Yu (2019) and Harrison *et al.* (2019) highlighted that SCM in construction is acknowledged as a significant driver of project efficiency,

incorporating essential areas such as logistical coordination, supplier relationships, and strategic planning to improve overall performance. In this context, supplier relationship management is described as the strategic management of supplier relationships to maximise value, with trust, collaboration, and a long-term focus identified as important drivers of effective partnerships (Gattorna, 2017).

6. Conclusion and Further Research

The purpose of this study was to investigate supply chain relationships and logistics management to reduce material supply disruptions while improving the success of construction projects in the Western Cape. This study employed a quantitative research method to achieve its objectives. The findings demonstrate that SME contractors adopt loyalty agreements with high-performing suppliers, long-term contracts with key suppliers, working closely with suppliers on project requirements, tracking shipments from dispatch to site, planning for alternative delivery routes or vehicles, ensuring that materials are delivered just-in-time, financial stability, logistics capability, and maintaining a database to reduce material supply disruptions.

The study demonstrates that adopting a structured approach to Strategic Supplier and Logistics Management significantly enhances reliability in material flow. Furthermore, this study indicated that SME contractors adopt supplier logistics coordination to effectively manage the material supply chain during the delivery of construction projects. This study recommends that SME contractors actively involve key suppliers during project planning and design to ensure effective delivery of construction materials during the construction stage. Furthermore, this study recommends that contractors should move away from transactional relationships and adopt long-term agreements with high-performing suppliers. SME contractors in the Western Cape province should develop and maintain supplier databases and implement basic material tracking systems.

Future research should explore how digital technologies and lean construction practices can be integrated into SME supply chains to improve supplier coordination, logistics efficiency, and overall project delivery performance within frameworks

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Appendix 1

Table 1: Supplier relationship and logistics management to reduce material supply disruptions

Category	Statement	Mean	Std.	Rank
Supplier collaboration <i>Cronbach's Alpha</i> = 0.86 Composite score = 4.41	Loyalty agreements with high-performing suppliers	4.50	.900	1
	Long-term contracts with key suppliers	4.42	.919	2
	Working closely with suppliers on project requirements	4.42	1.015	2
	Supporting supplier development and capacity building	4.40	.834	3
	Engaging in joint problem-solving with suppliers	4.40	1.002	3
	Treating suppliers as strategic partners	4.36	.977	4
	Involvement of suppliers in project planning stages	4.35	.932	5
Logistics management practices <i>Cronbach's Alpha</i> = 0.86 Composite score = 4.03	Tracking shipments from dispatch to site	4.42	1.045	1
	Planning for alternative delivery routes or vehicles	4.34	1.025	2
	Ensuring that materials are delivered just-in-time	4.26	1.115	3
	Storage facilities for critical materials	4.23	.990	4
	Use of logistics companies	4.16	1.290	5
	Planning delivery schedules in advance with suppliers	3.99	1.325	6
	Evaluating logistics providers regularly	3.83	0.973	7
Supplier evaluation and selection <i>Cronbach's Alpha</i> = 0.86	Financial stability	4.26	1.000	1
	Logistics capability	3.94	1.044	2
	Maintaining a database	3.85	0.984	3
	Comparing prices, quality, and delivery	3.85	1.333	4

Category	Statement	Mean	Std.	Rank
Composite score = 3.71	Reviewing suppliers' past project performance	3.78	1.445	5
	Terminating relationships with non-performing suppliers	3.28	1.518	6
	Assessing supplier delivery timelines	3.00	1.546	7