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A COMPARATIVE STUDY OF LOCAL AND GLOBAL CONSTRUCTION MATERIAL SOURCING STRATEGIES FOR ROAD PROJECTS IN NIGERIA

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ABSTRACT

This study is a comparative analysis of local and global sourcing strategies to determine the impact of strategic material sourcing on road construction project performance. The study aimed to evaluate the effects of material-sourcing strategies on the performance of road construction companies in Nigeria. A mixed-methods approach was used, incorporating both qualitative and quantitative research. Data collection involved sampling techniques using structured questionnaires and oral interviews. Regression analysis evaluated the relationship between strategic material sourcing and road construction performance. The results revealed that 87.5% of the materials used by road construction companies in the study areas were sourced from the local market, which indicates a high dependence on local resources and substantial investments and purchases within the local economy. Additionally, it was shown that local material sourcing was advantageous over global sourcing in terms of quick delivery and cost savings on road projects. However, the study also revealed that global material sourcing was necessary for projects requiring advanced and higher-quality materials. The study concludes that a high percentage of domestic material sourcing is essential for boosting the Nigerian economy through industrialization, employment generation, and a robust and self-sufficient economy. It is recommended that both government and private material suppliers explore ways to enhance the quality and availability of local road construction materials through advanced manufacturing technologies to improve service delivery by road project contractors. Furthermore, expanding the existing road material procurement process could create opportunities for construction companies beyond the local area and foster healthier competition among them by leveraging economies of scale.

Keywords: Comparative study; Global and local materials; Road construction projects; Sourcing strategies

1. INTRODUCTION

Sourcing construction materials for road projects can be a complicated process. It often includes, but is not limited to, material procurement, delivery, recognizing and defining needs, choosing vendors, ordering materials, receiving and inspecting supplies, auditing invoices, closing orders, and handling and storage of materials. Material procurement particularly requires specialized skills due to its technical nature (Alhammadi et al., 2023; Ibegbulem & Okorie, 2015). Furthermore, the rising costs of construction materials and project implementation have become common issues in Nigeria. Consequently, effective material sourcing strategies can bring considerable cost savings to construction projects (Marques et al., 2023; Ajayi & Oyedele, 2018; Amusan et al., 2017).

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Understanding the requisite material inputs for road projects will help project managers in successful sourcing and enhance project outcomes.

An on-site optimization sourcing strategy has the potential to improve overall road construction project outcomes while also reducing the costs associated with time and material losses. Material sourcing encompasses material supply, storage, handling, planning, implementation, and oversight (Logistics et al., 2020; Dong & Wang, 2018; Linden & Josephson, 2013). Difficulties arising from inadequate material sourcing include errors in ordering materials, issues with ordering small items, delays in material delivery, problems related to material transportation, handling, and storage, production of faulty materials, and general poor resource control (Albert et al., 2021; Muhammed & Saidu, 2021; Gulghane & Khandve, 2015).

This study fills knowledge gaps as there has been little research on operational performance, infrastructure quality, and material sourcing strategies for road construction projects in Nigeria. It aims to evaluate the sourcing of road construction materials, both locally and internationally, to achieve cost-effective operations, reduce risk, and improve the operational performance of road construction organizations. The specific objectives of the study are as follows: (1) to examine the relationship between local sourcing of road construction materials and the sourcing strategy deployed; (2) to determine the relationship between global sourcing of road construction materials and the sourcing strategy deployed; and (3) to assess the relationship between the performance of road construction projects and identified project performance indicators.

The following three null hypotheses were developed and tested based on these objectives. There is no statistically significant relationship between the local sourcing of road construction materials and sourcing strategy (Ho1), there is no statistically significant relationship between the global sourcing of road materials and sourcing strategy (Ho2), and there is no statistically significant relationship between the performance of road construction projects and identified project indicators.

This research is limited to rural road projects and intra-/intercity double-lane expressways within rural and semi-urban areas. Its scope does not include superhighways and multiple-lane road projects. Future research is recommended for superhighways and multiple-lane road projects.

2. LITERATURE STUDY

Roads are critical to harnessing the potential of developing economies by linking different clusters of economic activities (Adebanjo et al., 2023; Foster et al., 2023; Vahed et al., 2023; Ajiboye et al., 2021; Ogbu & Adindu, 2019). In recent years, there has been an increasing emphasis on road construction materials sourcing strategies to ensure the quality and cost-effectiveness of construction projects. Oluwajana et al. (2022) and Mishra and Koju (2020) assert that the cost attribute is a major determinant of construction projects. The cost of materials is a major factor in the success of a project, and proper sourcing strategies can help minimize costs and improve the quality of the project. Materials sourcing for road construction projects requires careful consideration of various factors, such as productivity, profitability, cost, schedule performance, customer and contractor satisfaction, technological capability, low/zero defects, cash flow, and quality.

Therefore, materials' availability, quality, cost, and delivery time must all be considered when sourcing materials (Awaad et al., 2024; Kannan et al., 2013). Additionally, environmental regulations, local regulations, and resource availability must also be considered. The most common road construction materials include asphalt, concrete, gravel, stone, and steel. Asphalt

is the most widely used material, as it is relatively cheap, durable, and easy to install (Kumar & Pal, 2018). Asphalt can be used in various applications, including roads, driveways, and parking lots. Concrete is another commonly used material for road construction. Concrete is strong, durable, and inexpensive (Kumar & Pal, 2018). However, using concrete in road construction can be labour-intensive, as the material must be laid and compacted properly to be effective. Gravel, stone, and steel are also commonly used materials for road construction. Gravel is usually used for roads in rural areas, as it is cheaper and easier to install than asphalt or concrete. Due to its strength and durability, stone is used for road construction in urban areas (Kamal & Bas, 2021; Kumar & Pal, 2018), while steel is used for bridges or other structures requiring higher strength and durability.

Research into the strategic sourcing of materials for road construction has been conducted, with few studies addressing their impact on organizational performance. Bernard and Willy (2017) revealed that procurement processes, communications, risk occurrences, and project financing contribute to completing construction projects. In a different study, Wang'Ombe (2017) investigated the profitability effects of sourcing as a supply chain function. Other researchers have examined material procurement and its impact on the performance of African road construction projects. Tougwa (2015) examined the issues and challenges associated with obtaining quality construction in Africa, concluding that insufficient capacity and corruption were two major issues faced in African construction projects. Sarpong (2017) studied the impact of strategic material sourcing on construction performance, comparing domestic and overseas sourcing strategies. They all concluded that when sourcing materials for road construction projects, it is important to consider cost, quality, availability, and delivery time factors. They also stated that environmental and local regulations must also be considered. By following proper sourcing strategies, construction projects can be completed cost-effectively and on time.

3. METHODS

A descriptive research design was used in this study, utilizing a simple random sampling technique to distribute questionnaires to users. Data were collected from both primary and secondary sources. A total of 60 questionnaires were employed for primary data collection, with a predetermined proportion from Alexi Construction Company Limited, comprising fourteen (14) site engineers, five (5) project managers, twenty-four (24) trade foremen, four (4) purchasing officers and procurement managers, four (4) storekeepers and inventory managers, and three (3) heavy-duty truck drivers, resulting in a total of 54 respondents to gather data to achieve the study's objectives. Secondary data were obtained from existing sources such as journals, the internet, and other research works related to the area of research. Descriptive statistics and regression analysis assessed the relationship between material sourcing and construction operations performance. The descriptive statistics included the mean and standard deviation, while regression analysis helped infer the response variable's dependence on the predictors. Tools in SPSS and Microsoft Excel software were used to generate tables with frequencies and percentages for descriptive analysis, providing proper visualization of the descriptive statistics.

Patigi Local Government Area (LGA) in Kwara State was used as the study area (see Figure 1), located at Latitude 8.7285100 and Longitude 5.7556100. Campanian and Maestrichtian sediments, mostly sandstone, cover the area. Granite-gneiss rocks make up the basement rocks (Geonames Geographical Database, 2016). As such, the area's geology is well-suited for sustainable road construction. Alexi Construction Company (ACC), established in 1981 as a Limited Liability Company, was used as a case study due to its long operational history

spanning 42 years in Nigeria. The company was registered under the Federal Ministry of Works Registration Board in 1982 as a wholly owned indigenous company. Their services include building construction, civil engineering works, renovations, interior and exterior designs, landscaping, and procurement. ACC comprises eight major departments: metal and carpentry, post-construction management, procurement and supply, exterior and interior, building and engineering, water and plumbing, electrical engineering, and mechanical engineering. These departments are responsible for roofing buildings, fixing bridges and offshores, maintaining roads, renovating dilapidated houses, supplying materials and machinery for construction, and furnishing interiors and exteriors.

Figure 1 Road Network of Patigi Local Government Area, Nigeria
(Source: Aderibigbe et al., 2017)

4. RESULTS AND DISCUSSION

4.1 Demographic Characteristics of the Respondents

The demographic background of the respondents was studied in terms of gender, educational background, professional qualification, years of work experience, and type of project undertaken. Of the respondents, 40 (74.1%) are males and 14 (26%) are females. There were no female engineers or heavy truck drivers. However, 20%, 50%, and 25% of the project managers, inventory managers, and purchasing managers, respectively, are female. The high disparity in these positions may be due to road construction projects' strenuous and hazardous nature.

Regarding the level of education, 31 (57%) have tertiary qualifications, while the remaining 23 (43%) have primary and secondary-level qualifications. Education was considered an important factor in understanding the sourcing of materials used in construction works. An educated workforce has more knowledge and experience to provide accurate information on road construction materials. As such, their responses were more reliable and informative, and they were better equipped to identify potential sources of quality materials, which helped the company save costs and improve the quality of road construction materials.

As shown in Figure 2, the respondents' professional backgrounds include trade foremen (40%), engineers (28%), project managers (10%), purchasing officers/procurement managers (8%), and storekeepers/inventory managers (8%). This breakdown indicates the types of professionals involved in sourcing road construction materials, either directly or indirectly. The highest percentage of respondents are trade foremen, suggesting a critical role in sourcing materials as they are responsible for the actual operation of the project. Engineers represent 28% of the respondents, highlighting the importance of their technical expertise in the material purchasing process. This implies that the researcher needs to assess the technical capabilities and knowledge of the engineers to ensure that the correct materials are sourced most effectively. Finally, project managers and purchasing officers/procurement managers represent 10% and 8%, respectively. This indicates that the project's organizational structure is also important when it comes to sourcing materials (Young & Osmani, 2013; Caldas et al., 2015). Project and procurement managers and officers will need to be consulted and involved in the purchasing process to ensure that the right materials are sourced (Figure 2).

Figure 2 Professional Background (in percentage)

Regarding the number of years the respondents have spent in the construction industry, 6% have less than 2 years, 30% have 2-3 years, 44% have 4-10 years, 16% have 11-15 years, and 4% have over 15 years of experience. Those with more than 4 years of experience make up a significant portion of 64%. The implications of these findings are far-reaching and should be considered when sourcing materials for road construction projects (Patel & Vyas, 2021). With the majority of industry professionals having considerable experience, it is likely that they are more familiar with suitable sources of materials and better able to assess their quality and suitability for a particular project. Furthermore, they may be more likely to negotiate better prices and secure more cost-effective materials.

Additionally, experienced professionals are likely to be better equipped to make informed decisions regarding the materials used in a project and may provide valuable insights into the potential impact of different materials on the project’s outcome. This can be particularly beneficial for complex projects, where the selection of materials can significantly influence the project's success. Finally, experienced professionals may also have access to a broader range of materials and suppliers (Osmani, 2013). This can be beneficial when sourcing materials for road construction projects, as it allows for a greater variety of options and makes it easier to find the most suitable materials for the job.

4.2 Case Study of Road Construction Projects in Patigi Area

Several types of roads are being constructed in the Patigi area, with rural roads constituting the majority of construction works (50%), followed by intra/intercity double-lane/expressways (40%), and other road works comprising 10% (Fig. 3). Specific examples of rural projects include the Bida/Sacci/Nupeko/Patigi Road, whereas intra/intercity double-lane/expressways include the Asphalt Pavement of Emirs' Road, Patigi, the Kaiama Roundabout, and others such as the Kpada/Patigi Road.

4.3 Sourcing Strategies

In this study, the sourcing strategies (local or international) used by the company to acquire various building materials are determined by percentage. The higher the frequency of the sourcing method, the greater the proportion. The industry's preferred technique for acquiring building materials, whether at the local or international level, is shown in Table 1. Of the 100% responses, the majority of the materials are sourced from local markets, including soil (100%), mineral aggregates (89.9%), cement (96.3%), water (100%), tar (53.7%), iron rods (79.6%), and wooden products (83.3%). In contrast, the industry sources asphalt (51.9%) from the global market. The results in Table 1 are noteworthy and can have significant implications for the sourcing of road construction materials. Local sourcing of materials is generally preferred for its cost-effectiveness and positive impact on the local community.

Table 1 Sourcing Strategies

Construction Materials	Sourcing Comparison	Strategies Frequency	Percent
Wooden Materials	Local	45	83.3
	Global	9	16.7
Soil	Local	54	100
	Global	0	0
Iron Rods	Local	43	79.6
	Global	11	20.4
Asphalt	Local	25	46.3
	Global	28	51.9
Mineral Aggregates	Local	48	88.9
	Global	6	11.1
Tar	Local	29	53.7
	Global	25	46.3
Water	Local	54	100
	Global	0	0
Cement	Local	52	96.3
	Global	2	3.7

(source: Authors' Computation)

However, in some cases, global sourcing is necessary to access certain resources or materials. The results suggest that local sourcing is the preferred strategy for most of the materials used in road construction. Soil, mineral aggregates, cement, water, and wooden materials all had over 80% responses indicating a preference for local sourcing. This implies that road construction materials are best sourced from local suppliers, which can help boost the local economy. However, the results also indicate that asphalt and iron rods should be sourced from the global market. Asphalt is a relatively cheap material and is often only produced in large-scale operations. Similarly, iron rods are often of higher quality when sourced from global suppliers. While sourcing from the global market is more expensive, it may be necessary to provide the best quality materials.

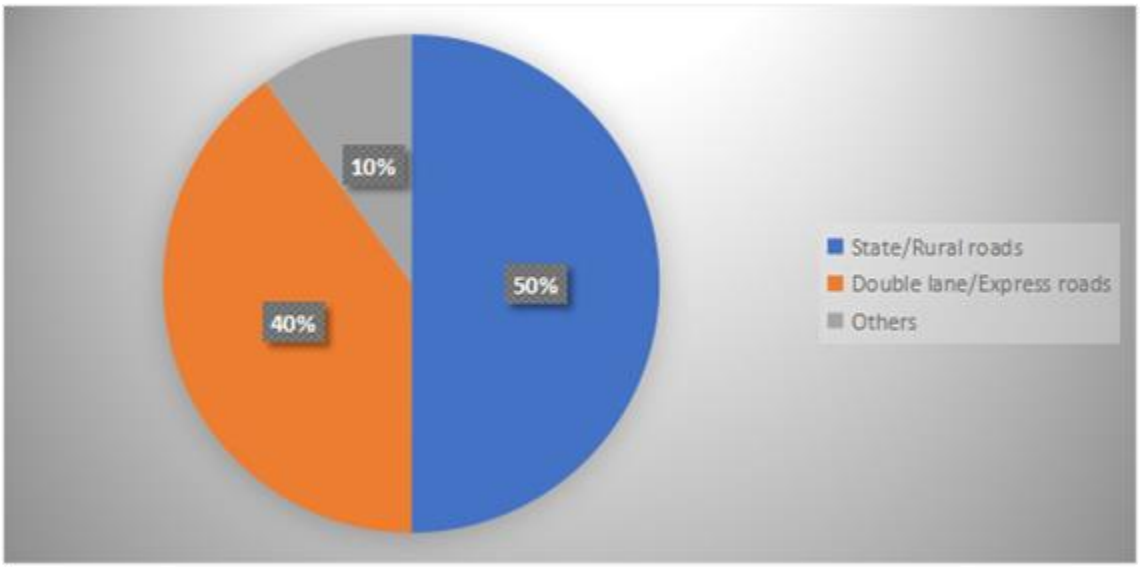

Figure 3 Type of Road Construction Projects Undertaken
(Source: Authors' Computation)

Figure 4 Bida/Sacci/Nupeko/Patigi Road

Figure 5 Kpada/Patigi Road

Figure 6 Kpada/Patigi Road

Figure 7 Asphalt Pavement of Emirs' Road Kaiama Round About, Patigi

4.4 Analysis of the Reasons for Sourcing Construction Materials Locally

Regression analysis, a set of statistical methods, was used to estimate the relationships between the dependent variable and one or more independent variables. This analysis was conducted for two purposes: firstly, to predict the value of the dependent variable based on some information concerning the explanatory variables, and secondly, to estimate the effect of some explanatory variables on the dependent variable.

According to the regression analysis shown in Table 2, the independent variables in the regression model account for 91% of the variation in the response variable. As a result, the model is well suited for regression analysis and gives the best account of how the independent variables in the model contributed. The "F-statistic" of the model is displayed in the second output table of significance. An independent variable (factor) more likely to be connected with the dependent variable than the probability of pure chance is not fundamentally significant for the F-statistic due to random sampling error.

Table 2 Regression Analysis

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.954[a]	0.911	0.902	0.11874

a. Predictors: (Constant), a_5, a_1, a_3, a_4, a_2

(source: Authors' Computation)

A regression model provides a function that describes the relationship between one or more independent variables and a response, dependent, or target variable. The significant statistic of the F-test is described in Table 3 as follows: the regression model's significance statistic indicates that there is almost no chance (less than 0.001) that the observed relationships are due to random sampling errors. This confirms that the independent variables significantly contribute to the model.

Table 3 Analysis of Variance

ANOVA[b]						
Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	6.929	5	1.386	98.284	0.000[a]
	Residual	0.677	48	0.014		
	Total (Reg + Res)	7.606	53			

a. Predictors: (Constant), a_1, a_2, a_3, a_4, a_5

b. Dependent Variable: Local Sourcing Strategy

(source: Authors' Computation)

Subsequently, the table's ANOVA results show that (F=98.284, P=0.000), indicating a significant relationship between the variables under the measure. Consequently, because $P \leq 0.005$, the null hypothesis (Ho) is rejected, and the alternative hypothesis (H1), which states that there is a significant relationship between the reasons for sourcing construction materials locally and the sourcing strategy, is accepted

The partial regression coefficients and significance tests for each of the model's independent variables are displayed in Table 4. The p-values (less than 0.05) indicate that each variable contributed significantly to the model. The results also imply that the model greatly benefits from the flexibility of the supply chain, the simplification of logistics, the reduction of time and cost of operation, the avoidance of currency risk, the reduction of environmental footprint, and the increase of local income. Notably, the analysis results highlight the importance of a strong supply chain in sourcing road construction materials. Strong control over the supply chain leads to time and operational cost reductions, risk avoidance, and expense savings. Additionally, it increases domestic income, benefiting the local economy.

Table 4 Unstandardized and Standardized Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.311	0.213		2.992	0.326
	(a_1) Strong Supply chain	0.178	0.019	0.425	9.185	0.000
	(a_2) Flexibility and simplified logostics	0.208	0.026	0.299	7.855	0.000
	(a_3) Reduce time and cost of opeartion	0.208	0.031	0.303	6.673	0.000
	(a_4) Avoid currency risk and reduce environmental foot prints	0.171	0.021	0.367	7.993	0.000
	(a_5) Increase domestic income	0.278	0.021	0.627	13.376	0.000

a. Dependent Variable: Local sourcing Strategy

Flexibility and simplified logistics are also important factors, as they can help reduce the amount of time and cost associated with sourcing materials. This is especially crucial for road construction projects, where materials need to be sourced from many different suppliers (Alumbugu et al., 2020; Choudhari & Tindwani, 2017; Phu & Cho, 2014; Tunji-Olayeni et al., 2017). By simplifying the process, companies can save time and money. Reducing environmental footprints can also be beneficial when sourcing materials for road construction projects. Companies can reduce their environmental impact by using more sustainable materials while still obtaining the necessary materials.

Overall, the analysis's findings indicate several key considerations when sourcing materials for road construction, including a robust supply chain, flexibility, streamlined logistics, decreased time and cost of operation, avoidance of currency risk, and enhanced domestic income. Companies should consider these factors when sourcing materials for their projects. Doing so can help them save money, reduce their environmental footprint, and support the local economy (Fernandez & Padgett, 2019).

4.5 Analysis of the Reasons for Sourcing Construction Materials Overseas

The independent variables explain the R Square value, which represents 95% of the total variation in the regression model in Table 5. This shows that the model is well-suited for regression analysis and provides the best explanation of the role played by the independent variables.

Table 5 Regression Analysis (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.974[a]	0.945	0.902	0.11874

a. Predictors: (Constant), b_1, b_2, b_3, b_4, b_5
(source: Authors' Computation)

The "F-statistic" of the model is displayed in the second output table of significance. This statistic and its significance are typically reported in the regression table, with the most crucial

statistic being .000. An independent variable (factor) that is more likely to relate to the dependent variable than the probability of pure chance is not significant for the F-statistic due to random sampling error.

The significant statistic of the F-test is described in Table 6 as follows: The regression model's significance statistic for the F-test indicates that there is no chance (less than 0.001) that the observed relationships are due to random sampling errors. Accordingly, the ANOVA results in the table show (F=98.257, P=0.000), denoting a significant relationship between the variables. Because $P \leq 0.005$, the null hypothesis is rejected, and the alternative hypothesis (H2), which states a significant relationship between the reasons for sourcing building materials abroad and the sourcing strategy, is accepted.

Table 6 Analysis of Variance (ANOVA[b])

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6.801	5	1.386	98.257	0.000[a]
	Residual	0.682	48	0.025		
	Total	7.706	53			

a. Predictors: (Constant), b_1, b_2, b_3, b_4, b_5
b. Dependent Variable: Global sourcing strategy
(source: Authors' Computation)

The partial regression coefficients of each model independent variable and the significance tests for each statistic are shown in Table 7. The study affirmed that high-quality goods with a rational price (0.017<0.05), minimizing the total cost of purchasing (0.025<0.05), stable purchasing channel (0.032<0.05), benefit from economies of scale (0.014<0.05), and technological standards and design of materials (0.022<0.05) all have a significant contribution to the model. These findings provide interesting implications for the sourcing of road construction materials.

Table 7 Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.241	0.213		3.992	0.315
	(b_1) Strong Supply chain	0.178	0.017	0.435	9.185	0.000
	(b_2) Flexibility and simplified logostics	0.208	0.025	0.399	7.855	0.000
	(b_3) Reduce time and cost of opeartion	0.208	0.032	0.303	6.673	0.000
	(b_4) Avoid currency risk and reduce environmental foot prints	0.161	0.014	0.367	7.993	0.000
	(b_5) Increase domestic income	0.278	0.022	0.527	13.376	0.000

a. Dependent Variable: Global sourcing strategy

When searching for materials for road construction, businesses should prioritize high quality and reasonable pricing, reduce overall purchasing costs, maintain a steady supply chain, take advantage of economies of scale, and ensure that the materials meet certain technological and design standards. If a company can meet all of these criteria, it should be able to source the best

materials for road construction. Moreover, this analysis serves as a valuable example for other companies looking for materials for different construction projects, as it provides them with an idea of what to look for to find the best quality materials and save on costs (Patel & Vyas, 2011). As such, any company looking to source materials should consider this analysis and tailor it to their needs to ensure they can find the best materials at the best prices.

4.6 Performance Indicator Regression Analysis

From Table 8, the regression model's independent variables account for R Square, which represents 98% of all model variance. As a result, the model is well-suited for regression analysis and provides the best account of the role played by the independent variables.

Table 8 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.990[a]	0.9480	0.976	0.03829

a. Predictors: (Constant), c_{10}, c_4, c_3, c_2, c_8, c_5, c_6, c_1, c_9, c_7

The "F-statistic" of the model is displayed in the second output table of significance. This statistic and its significance are typically reported in the regression table, with the most crucial statistic being 0.000. The F-statistic's significance indicates that there is almost no chance that the observed relationships are due to random sampling error, confirming that the independent variables significantly contribute to the model.

Table 9 Analysis of Variance (ANOVA[b])

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.132	10	0.313	213.678	0.000[a]
	Residual	0.063	43	0.001		
	Total	3.195	53			

a. Predictors: (Constant), c_{10}, c_4, c_3, c_2, c_8, c_5, c_6, c_1, c_9, c_7
b. Dependent Variable: Performance of construction operation
(source: Authors' Computation)

The significant statistic of the F-test is described in Table 9 as follows: There is almost no chance (less than 0.001) that the observed relationships are due to random sampling errors, according to the regression model's significance statistic for the F-test. Accordingly, the ANOVA findings in the table show a strong correlation between the variables (F=213.678, P=0.000). As a result, the null hypothesis is disproved, and a new hypothesis (H3) is proposed, suggesting a statistical correlation between construction operation performance and performance metrics.

Table 10 provides tests of significance for each of these statistics and the partial regression coefficients for each independent variable in the model. The data shows that Profitability (c1), Productivity (c2), Customer Satisfaction (c3), Time Schedule Performance (c4), Cost Performance (c5), Contractor Satisfaction (c6), Technological Capability (c7), Low/Zero Defects (c8), Cash Flow (c9), and Quality (c10) all have a significant contribution to the model, with p-values less than 0.05, as displayed in Table 10.

Table 10 Coefficients[a]

Model	Identified Performance Indicators	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.624	0.117		5.345	0.000
	(c_1) Profitability	0.077	0.010	0.281	7.519	0.000
	(c_2) Pproductivity	0.115	0.009	0.425	12.815	0.000
	(c_3) Customer Satisfaction	0.100	0.008	0.329	12.487	0.000
	(c_4) Time Schedulle Performance	0.032	0.007	0.114	4.529	0.000
	(c_5) Cost Performance	0.095	0.009	0.278	10.488	0.000
	(c_6) Contractor Satisfaction	0.104	0.010	0.378	10.325	0.000
	(c_7) Technological Capability	0.064	0.011	0.222	5.594	0.000
	(c_8) Low/Zero Defects	0.128	0.013	0.376	10.202	0.000
	(c_9) Cash Flow	0.035	0.011	0.126	3.287	0.002
	(c_{10}) Quality	0.107	0.012	0.219	8.948	0.000

a. Dependent Variable: Construction performance

When sourcing materials, it is important to ensure the suppliers have the necessary capabilities to meet the project's needs. This includes having the right technology, a good track record of producing quality materials with low or zero defects, and a strong financial background to support the project's cash flow. Additionally, suppliers should have a good reputation for customer satisfaction and contractor satisfaction, as these are key factors in the success of a project. Ultimately, this data suggests that the sourcing of road construction materials should consider all the factors reported in Table 10 to ensure success. All these factors are essential to the project's success, and any suppliers chosen should be able to meet the requirements.

5. CONCLUSION

The study's findings suggest a strong correlation between strategic material sourcing (local or international) and the construction performance of the road construction organization undertaking various rural roads, intra/intercity double-lane expressways, and other road works in the Patigi area. This indicates that businesses in the research area can gain from increased profitability, customer and client satisfaction, low/zero defects, and improved cost and time performance by leveraging the advantages of both local and global sourcing.

The study also found that local sourcing attained the highest number of positive measurement outcomes compared to global sourcing, making it the most effective technique for enhancing construction performance. This research implies that sourcing road construction materials should strategically consider local and global options. Companies should weigh the advantages of local sourcing, such as increased client and customer satisfaction and improved time and cost performance, while also leveraging the benefits of global sourcing, such as access to a wide array of materials and improved quality. Ultimately, combining local and global sourcing will likely result in superior construction performance.

Furthermore, the research indicates that 87.5% of the materials used by the construction company are sourced from the local market, highlighting the significant investments and purchases made in the local economy. Consequently, the research strongly recommends that road project practitioners maximize the strong correlation between strategic material sourcing and construction performance to improve productivity and enhance operational and financial performance.

Road project practitioners should leverage the benefits of both local and global material sourcing to grow their enterprise, particularly regarding profitability, customer and client satisfaction, low/zero defects, and overall time and cost performance. Government and private suppliers should explore ways to enhance the quality and availability of locally made road construction materials, such as through advanced technology, to provide better service to various contractors. Expanding the procurement process could open opportunities for construction companies beyond the local area and foster healthy competition. This would also benefit the local market by creating opportunities to meet the demands of larger construction companies and take advantage of economies of scale.

The research findings suggest that sourcing from the local market has numerous advantages over global sourcing. While the company may need to source globally for certain roads that require advanced and higher-quality materials, the research recommends a high percentage of domestic sourcing for the construction industry to help boost the Nigerian economy through increased gross domestic product. However, considering the high costs associated with road infrastructure constructed with locally made materials, the study recommends further research to assess the standard quality of locally produced construction materials.

The findings also show that the company's primary motivation for sourcing materials from abroad was the higher quality and lower cost of materials available on the international market. Given the dynamic environment of road construction, it is imperative to consider the indices examined in this study. Further study is recommended to explore the role of emerging technologies such as Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT) in improving material-sourcing strategies for road construction projects in Nigeria. Additionally, the study suggests that additional research be conducted on other organizations besides Alexi Construction Company for a comparative analysis.

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