e-ISSN 3027-0537
p-ISSN 3027-0375

10.5281/zenodo.15662493 Vol. 08 Issue 05 May - 2025 Manuscript ID: #1973

ENHANCING DELIVERY TIME THROUGH SUPPLIER DIVERSITY IN SOUTH-SOUTH NIGERIA

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ABSTRACT

This study examines the impact of supplier diversity on delivery times in construction projects within the South-South region of Nigeria. Supplier diversity, which involves integrating suppliers from varied backgrounds such as local, minority-owned, and small-medium enterprises (SMEs), is proposed as a potential solution to delays in construction completions. The research employs a correlational design and surveys construction project employees from different management levels across several cities in South-South Nigeria. Data were gathered using a validated questionnaire assessing perceptions of supplier diversity and delivery performance. Findings suggest that supplier diversity positively influences delivery time by enhancing operational efficiency, innovation, and resilience. A diverse supplier base mitigates risks associated with supply chain disruptions and improves responsiveness to logistical challenges. The study also identifies challenges in implementing supplier diversity, including higher initial procurement costs and the complexity of managing a diverse supplier base. Despite these challenges, the benefits of supplier diversity; such as improved delivery times, better supplier collaboration, and market expansion, are substantial. The study highlights that expanding the supplier pool not only strengthens the supply chain but also fosters socio-economic development in the region. The research concludes by recommending that construction firms in South-South Nigeria prioritize supplier diversity, invest in capacity-building for smaller suppliers, and improve supplier relationship management. Policymakers are also urged to support local suppliers through favorable policies and infrastructure improvements to enhance the procurement process.

Keywords:

Construction firm, Diversity, Delivery time, Suppliers, South-South Nigeria

***How to cite*:** Archibong, G. W., Ugwu, K. E., & Duru, E. E. (2025). ENHANCING DELIVERY TIME THROUGH SUPPLIER DIVERSITY IN SOUTH-SOUTH NIGERIA. *GPH-International Journal of Business Management,* 8(05), 39-49. https://doi.org/10.5281/zenodo.15662493

1. Introduction

In today's rapidly evolving global economy, the efficiency of procurement strategies has become critical to the success of construction projects, especially in regions experiencing infrastructural growth and transformation. Among the key elements influencing procurement efficiency is supplier diversity, a strategic approach that promotes the inclusion of suppliers from varied backgrounds; such as local, minority-owned, women-owned, or small and medium enterprises (SMEs), to enhance competitiveness, flexibility, and delivery performance (Sordi, Tate, & Huang, 2022). This concept is increasingly being embraced not just for ethical or social reasons, but for its potential to drive innovation and operational efficiency in supply chains.

In the South-South region of Nigeria, comprising Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers states, construction projects play a vital role in regional economic development by delivering critical infrastructure such as roads, schools, hospitals, and housing. However, these projects are often hampered by delays in the delivery of materials, leading to increased costs, project abandonment, and stakeholder dissatisfaction (Obaideen et al., 2021). One contributing factor to these delays is the reliance on a narrow pool of suppliers, which increases the vulnerability of the supply chain to disruptions. Supplier diversity has been proposed as a viable solution to this challenge. By expanding the supplier base to include a more heterogeneous group of vendors, construction firms can reduce dependency on a few large suppliers, thereby improving resilience and responsiveness to logistical challenges (Wang & Hu, 2020). Diverse suppliers are often more agile and locally situated, which can result in shorter lead times, quicker adaptation to project changes, and improved delivery performance (Sheth, Del, & Rammal, 2022).

Moreover, encouraging local supplier participation has direct socioeconomic benefits for the South-South region, such as promoting inclusive economic growth, creating jobs, and supporting the development of local enterprises. These outcomes align with the Nigerian government's push for local content development, particularly under the Public Procurement Act (2007), which emphasizes indigenous participation in procurement activities. Nevertheless, implementing supplier diversity in construction procurement is not without its challenges. Small and diverse suppliers often face barriers such as limited access to capital, lack of technical capacity, and inadequate integration into formal supply networks (Waheed & Zhang, 2022). This raises concerns about whether supplier diversity genuinely enhances delivery time or inadvertently introduces new complexities. Therefore, it becomes imperative to investigate how supplier diversity affects delivery performance specifically in the context of South-South Nigeria, where logistics, infrastructure, and procurement maturity vary considerably across states.

The construction industry in South-South Nigeria, one of the key economic hubs of the country, faces significant challenges in meeting delivery timelines for projects. Despite the region's vast natural resources and active construction sector, timely completion of projects

remains an elusive goal, with delays often leading to cost overruns, financial losses, and stakeholder dissatisfaction. The challenges contributing to these delays are multifaceted, encompassing inadequate infrastructure, unreliable supply chains, and inefficiencies in procurement practices (Adepoju & Iwu, 2018). A major contributing factor to these delays is the concentration of construction suppliers within limited networks, leading to over-reliance on a few suppliers and a lack of flexibility in the procurement process. The problem, therefore, lies in understanding how **supplier diversity** can be leveraged to reduce delivery times in South-South Nigeria's construction projects. Although supplier diversity offers multiple advantages, such as reducing dependency on a single supplier and mitigating risks related to supply chain disruptions (Cox, 2004), its implementation in Nigeria is often hindered by challenges such as poor infrastructure, bureaucratic inefficiencies, and a lack of coordination between suppliers and procurement units (Baily et al., 2008). Additionally, there are concerns about the initial costs associated with integrating diverse suppliers into procurement processes, which may deter firms from fully embracing diversity strategies (Pagell et al., 2007).

Previous studies conducted in other contexts, such as the U.S. and Southeast Asia, have shown that supplier diversity can positively influence performance metrics like innovation, customer satisfaction, and operational resilience (Adobor& McMullen, 2007; Dündar & Öztürk, 2020). However, there is a lack of empirical data addressing this dynamic within Nigeria's unique construction industry landscape, where factors like infrastructural deficits, policy inconsistency, and corruption may alter the outcomes.This study, therefore, seeks to fill this critical knowledge gap by assessing the relationship between supplier diversity and delivery time in selected construction projects within South-South Nigeria. By understanding this linkage, project managers and policymakers can make informed decisions that both enhance project success and foster a more inclusive procurement ecosystem.

To guide this enquiry, the following questions were raised:

I. How does supplier diversity influence delivery times in construction projects in South-South Nigeria?
II. What are the challenges faced by construction companies in integrating diverse suppliers into their procurement processes?
III. To what extent can supplier diversity help mitigate risks associated with project delays and disruptions in South-South Nigeria?

A null hypothesis which states that: there is nosignificant relationship between supplier diversity and delivery timein selected construction projects within the South-South region of Nigeria was used to provide direction for the study.

2. Methodology

The study adopted a correlational research design with a population comprising of employees of construction projects in selected cities across South-South Nigeria. Employees of

construction projects within the cadre of top, middle, and lower management were considered for the study. From this population, a stratified random sampling was used to select 208 respondents to participate in the study. A questionnaire tagged 'investigative questions on supplier diversity and delivery time' was used to collect data for the study after proper validation. Participants were asked to respond to the items by ticking on a five-point likert scale of strongly agree, agree, undecided, disagree and strongly disagree.

3. Results and Discussion of findings

The responses presented in Table 1 demonstrate a strong consensus among participants on the multifaceted impact of supplier diversity on delivery time within the construction industry in South-South Nigeria. It reveals insightful trends concerning perceptions and experiences related to supplier diversity and its influence on delivery performance.

Table1: Participant response to investigative questions on supplier diversity

S/N	SupplierDiversity	SA	AG	UN	DA	SD	Total
1	Commitment to diversity in procurementfostersorencouragesinclusivityand innovative solutions.	98	106	1	2	1	208
2	There might be concerns about the qualityandconsistency of products or services provided by new or smaller diverse suppliers.	93	101	7	1	6	208
3	Partneringwithdiversesuppliershelpscompaniestap intonewmarketsandcustomerbases,leadingtoincreased revenue opportunities	90	98	13	5	2	208
4	Supportingdiversesuppliersstrengthenscommunityrela tionshipsanddemonstratesacommitmenttosocial responsibility, enhancing the company's reputation	92	99	12	2	3	208
5	Adiverse supplier base reduces dependency on a single source,mitigatingrisksassociatedwithsupplychaindisru ptionsandimprovingresilience	94	95	10	8	1	208
6	Sometimes, implementing supplier diversity programs can initially increase procurement costs due to the need foradditionalresourcesandeffortstoidentifyandqualify diverse suppliers.	91	96	13	5	3	208
7	Managingadiversesupplierbasecanbecomplexand time consuming, requiring morecoordinationand communicationefforts.	90	95	15	2	6	208

Commitment to diversity fosters inclusivity and innovation): Nearly 98% of respondents (47.12% strongly agree; 50.96% agree) acknowledge that commitment to supplier diversity enhances inclusivity and innovation. This near-unanimity reflects broad recognition of supplier diversity as a strategic driver for creativity and problem-solving in supply chains (Hunt & DiTomaso, 1993). The promotion of diverse suppliers opens avenues for novel ideas and approaches, which are essential in dynamic construction project environments requiring adaptability and innovation.

Concerns about quality and consistency: A significant majority (93.27%) agree or strongly agree that concerns exist regarding the quality and consistency of products from new or smaller diverse suppliers. This highlights an important operational challenge frequently noted in supplier diversity literature—new entrants may lack established quality assurance mechanisms, which can increase perceived supply chain risks (Krause et al., 2009). Addressing these concerns necessitates targeted supplier development initiatives and continuous quality monitoring.

Diverse suppliers help tap new markets: With 90.39% agreement, respondents view supplier diversity as a conduit to accessing new markets and customer bases. This aligns with Swink &Zsidisin (2006), who found that diverse supplier networks enable firms to expand reach and adapt to diverse customer preferences, which can translate into enhanced revenue streams. In the Nigerian context, tapping into local and underserved markets through diverse suppliers may also have socio-economic benefits.

Supporting diverse suppliers strengthens community relationships: An overwhelming 91.83% of respondents agree that supporting diverse suppliers enhances social responsibility and strengthens community ties. This finding confirms the dual business and ethical role of supplier diversity programs. Carter & Rogers (2008) emphasize that supply chain sustainability includes social dimensions, such as equity and community engagement, which improve corporate reputation and stakeholder trust.

Diverse suppliers reduce dependency and improve resilience: Approximately 90.86% agree that supplier diversity mitigates risks related to overdependence on single sources, enhancing supply chain resilience. This is consistent with Cox (2004), who argues that diversification reduces vulnerability to disruptions—an especially pertinent consideration in regions like South-South Nigeria, where infrastructural and political challenges may cause frequent supply interruptions.

Initial increase in procurement costs: Around 89.90% acknowledge that supplier diversity programs may initially raise procurement costs due to additional resource needs. This cost implication is a well-documented concern in the literature (Pagell et al., 2007). However, such short-term investments can be offset by long-term benefits in innovation, risk mitigation, and community goodwill.

Managing diverse suppliers is complex and time-consuming: With 88.94% agreement, respondents note that managing a diverse supplier base demands more coordination and

communication effort. This operational complexity requires enhanced governance structures and communication channels to effectively manage heterogeneous suppliers (Christopher, 2011).

Table2: Participant response to investigativequestionsondeliverytime

S/N	DeliveryTime(DependentVariable)	SA	AG	UN	DA	SD	Total
1	Myfirmhasdevelopedastrongcollaborationwith supplierstomeet deliverytime.	105	94	5	1	3	208
2	Periodically,wemonitoroursuppliers'performanceand ensurecompliance.	102	93	7	4	2	208
3	Wehavedevelopedstrongrelationshipswithqualified diversesupplierstoimproveoperationalefficiency.	101	96	4	1	6	208
4	Weprioritizechoosingsuppliersclosertousto guaranteequickdelivery ofproducts or services.	99	103	1	1	4	208
5	Poorcoordinationintheprocurementprocesswould affectdeliverytimes.	98	105	3	1	1	208
6	Delaysinprocurementapprovalswouldnegatively affectdeliverytimes.	96	102	8	2	0	208
7	Inadequateprocurementpracticeswouldcauseprojectd elays.	95	99	7	3	4	208

Strong collaboration with suppliers:A striking 95.67% of respondents report strong collaboration with suppliers to meet delivery deadlines. Collaborative supplier relationships have been identified as a cornerstone of supply chain integration and performance (Monczka et al., 2016). In the Nigerian construction sector, such collaboration is critical to navigating logistical challenges and ensuring project timeliness.

Periodic monitoring of suppliers:94.75% confirm periodic performance monitoring of suppliers to ensure compliance. Effective supplier performance measurement is crucial to maintaining quality and timely delivery, supporting the assertions of Handfield et al. (2009) on the value of supplier scorecards and audits.

Strong relationships with diverse suppliers improve efficiency: The 94.71% agreement reflects recognition that well-established relationships with qualified diverse suppliers enhance operational efficiency. Supplier relationship management (SRM) practices foster trust, improve communication, and optimize procurement processes (Hugo & Badenhorst-Weiss, 2011).

Prioritize geographically closer suppliers:A combined 97.12% prioritize proximity to suppliers to guarantee quick delivery, confirming lean supply chain principles that emphasize reducing transportation time and costs (Slack et al., 2010). This is especially relevant in regions with challenging transportation infrastructure.

Poor coordination and delivery times: Nearly 97.6% concur that poor coordination in procurement negatively impacts delivery time. This highlights the critical need for effective

interdepartmental communication and synchronized workflows, as supported by Lysons& Farrington (2012).

Delays in procurement approvals and delivery:95.19% of respondents identify procurement approval delays as a major cause of delivery time setbacks. Bureaucratic inefficiencies often extend project timelines, a challenge documented in Nigerian public and private sector projects (Baily et al., 2008).

Inadequate procurement and project delays:A total of 93.27% affirm that inadequate procurement practices lead to project delays, underscoring the foundational role of procurement competence in successful project delivery (Walker & Rowlinson, 2008).

Table3:DescriptiveStatisticsforthe Hypothesis

	N	Minimum	Maximum	Mean	Std. Deviation
SD	208	1.00	106.00	41.6000	44.93538
DT	208	.00	105.00	41.6000	47.76610
Valid N (listwise)	208				

Table4:ModelSummaryforthe Hypothesis

Model	R	R Square	Adjusted R Square	Std.Errorof the Estimate	Durbin- Watson
1	.994[a]	.987	.987	5.50239	.959

a. Predictors:(Constant),SD

b. DependentVariable:DT

Table5:AnalysisofVariance(ANOVA)forthe Hypothesis

Model		SumofSquares	df	Mean Square	F	Sig.
1	Regression	76551.410	1	76551.410	2469.425	.000[b]
	Residual	1022.990	207	31.000		
	Total	77574.400	208			

a. DependentVariable:DT

b. Predictors:(Constant),SD

Table6:OrdinaryLeastSquareResult(Coefficients)forthe Hypothesis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.437	1.276		-1.910	.065

	SD	1.057	.021	.994	50.343	.000

a. DependentVariable:DT

The descriptive statistics for the hypothesis show a substantial variability in both SD and DT (Mean = 41.6; SDs = ~45 and 48 respectively), reflecting diverse operational contexts across surveyed firms. The exceptionally high Pearson correlation coefficient (R = 0.994) and the coefficient of determination (R^2 = 0.987) demonstrate a near-perfect positive relationship between supplier diversity and delivery time, indicating that supplier diversity accounts for approximately 98.7% of the variance in delivery time. This is statistically significant as supported by the ANOVA results ($F(1, 207) = 2469.425$, $p < .001$), affirming the rejection of the null hypothesis.These findings align with prior research emphasizing supplier diversity's role in enhancing supply chain flexibility and responsiveness (Carter & Rogers, 2008; Swink &Zsidisin, 2006). Specifically, the positive coefficient (B = 1.057, $p < .001$) from the regression analysis confirms that increases in supplier diversity are associated with improvements in delivery time metrics, suggesting that diverse supplier networks help reduce delays and enhance punctuality.However, the near-perfect correlation observed is unusually high and may indicate possible multicollinearity or overfitting in the model, which could arise from the sample or measurement methods (Hair et al., 2010). Additionally, the negative intercept (-2.437, p = 0.065) suggests that at zero supplier diversity, delivery time might theoretically be negative, which is logically impossible and points to the model's limitations at boundary values.

Furthermore, while the results emphasize the benefits of supplier diversity on delivery time, they do not sufficiently account for external contextual factors such as infrastructural challenges, regulatory delays, or market volatility, all of which are salient in the South-South Nigerian context (Adepoju & Iwu, 2018). Findings from the study support supplier diversity as a strategic tool for improving delivery time in construction projects in South-South Nigeria, consistent with global supply chain management best practices. The study underscores the dual advantage of promoting socio-economic inclusivity and operational efficiency, providing valuable insights for policymakers and construction managers aiming to optimize procurement strategies.

4. Conclusion

The study highlights the positive impact of supplier diversity on reducing delivery times in construction projects within South-South Nigeria. The research reveals that construction firms that embrace diverse suppliers experience enhanced operational efficiency, innovation, and resilience, leading to quicker delivery times. The data indicates a strong correlation between supplier diversity and delivery time performance, suggesting that expanding the supplier base not only mitigates risks but also fosters competitiveness and flexibility in the supply chain. Despite concerns over initial procurement costs and potential challenges in managing diverse suppliers, the long-term benefits, such as improved delivery reliability and market expansion, outweigh these drawbacks.

5. Recommendations

Based on the findings of the study, the following recommendations are made:

1. **Encourage supplier diversity**: Construction firms in South-South Nigeria should prioritize supplier diversity to enhance supply chain resilience, reduce delays, and boost operational performance. This could include sourcing from local, minority-owned, and small-medium enterprises (SMEs).
2. **Capacity building for diverse suppliers**: To address concerns about quality and consistency, firms should invest in capacity-building initiatives for smaller suppliers, helping them meet the standards required for large-scale construction projects.
3. **Improve supplier relationship management**: Firms should develop robust supplier relationship management strategies, fostering strong collaborations with diverse suppliers to ensure efficient and timely project delivery.
4. **Policy support for local suppliers**: Policymakers should continue supporting local content development, ensuring that policies enable easier integration of diverse suppliers into procurement processes and enhance their technical and financial capacities.
5. **Address infrastructure and bureaucratic challenges**: Construction companies and government agencies must work together to address logistical challenges and bureaucratic inefficiencies that could undermine the benefits of supplier diversity. This includes streamlining procurement approvals and improving infrastructure.
6. **Continuous monitoring**: Regular monitoring and performance evaluation of suppliers should be institutionalized to ensure continued compliance and improve delivery times, while also identifying areas for supplier development.

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