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Effect of Supplier Diversification on Procurement Performance of the Energy Sector State Corporations in Kenya

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ABSTRACT

Purpose: This study examined supplier diversification's effect on procurement performance in state-owned energy corporations in Kenya.

Methodology: Using the cross-sectional research design, data were gathered at one point in time of the study from the selected 198 respondents who were drawn through the stratified random sampling from supply chain, operations, and finance departments of five corporations: KenGen, KPLC, REREC, KPC, and NOCK. Primary data were collected using a structured questionnaire that sought prospects on supplier diversification and procurement results. The analysis of data was performed in SPSS version 26 using descriptive statistics, multiple linear regression and ANOVA to test relations and model fit.

Findings: Results found a significant positive linear relationship between supplier diversification and procurement performance with correlation coefficient (R) = 0.980, R 2 = 0.961, indicating that supplier diversification explains 96.1% of the variations in procurement performance. There was a statistically significant regression model, $F=2190.699$, $p<0.001$, and the supplier diversification coefficient had a significant, positive effect ($\beta=0.904$, $p<0.001$).

Unique Contribution to Theory, Policy and Practice: Based on these findings, the study suggests that supply chain managers should actively diversify supplier networks geographically and in terms of industries to decrease reliance on single sources and increase the efficiency of procurements. Furthermore, the regulatory bodies should formulate policies to enhance suppliers' procurement diversity and performance in the energy sector.

Keywords: *Supplier Diversification, Procurement Performance, Energy Sector State Corporation*

INTRODUCTION

With supply chain disruptions increasing steadily owing to natural catastrophes, political turmoil, or possible economic slowdowns, the value of creating resilient procurement procedures has become more evident. In the energy world, having a robust and flexible supply chain is essential in curbing the negative impact of such disruption and smooth operations. While much research is devoted to the strategies to enhance the supply chain resilience, such as supplier diversity and risk management, the direct effect of those strategies on the procurement performance is not adequately described.

Supplier diversification has been considered among the best strategies for resilience in alleviating the effects of supply chain disruption. Stewart, (2024), study serve as evidence for the importance of diversified supplier relations in the oil and gas sphere for the prevention of disruptions' threats in the process of risk management. Similarly, Zhang, Huang, and Xiao (2022) write about how Chinese energy corporations have exploited supplier diversification to address the issue posed by natural calamities and political uproar. However, there are significant gaps in empirical studies that determine the direct effect of supplier diversification on the procurement performance metrics. Despite proposing that a diversified supplier base is sound in resilience, it is still unclear whether the diversification will translate into any meaningful results in the procurement results, such as reduced lead times, better quality of suppliers, and cost effectiveness. Lack of empirical evidence makes it difficult to know the actual worth of diversification strategies in planning.

Another domain of significance that did not get an exhaustive empirical examination in detail was the relationship between the resilience strategies and procurement performance metrics. Examples of such studies are Zsidisin and Wagner (2017), who have shown that the impact of supply chain disruptions on financial performance is very high and is accompanied by increased cost and lost sales. However, the short-term effect of such strong practices in procurement, such as supplier diversification or risk management, to lessen the financial implications is not described in detail. In addition, the existing energy supply chain resilience framework (Munyi, 2024) does not align the practices with resilience to procurement performance indicators. The uncertainty in the role that resilience strategies play in procurement efficiency prevents businesses from making the best use of their efforts.

Other areas that remain hot topics in the literature, as important for the supply chain resilience development, are proactive risk management and supplier coordination. Zhang, Huang, & Xiao (2022) lay focus on risk management and collaborative supply chain for effective functioning. Although this is the case, there are limited quantitative research efforts to determine the implications of these practices on the procurement efficiency. For instance, Smidt, and Jokonya, (2022), show that, the improved communication and collaboration at the local levels of South Africa improved the procurement efficiency; however, how these practices influenced the procurement outcomes is poorly developed. More work is needed to understand how effective risk

management and the partnership aspect are in improving procurement performance, which is integral for businesses that are out to improve efficiency in their operations.

Besides, geopolitical and economic risks such as political instability and sanctions from economies are the significant threats to the strength of the supply chain as stipulated (Lashgari and Amin 2022). These research works highlight the issue of disruptions to supply chain operations from the outside but do not explore the impacts of the created risks on the procurement process, such as selecting suppliers and making choices. The knowledge of how the business can adjust the procurement strategy, for example, through diversification or having alternative sourcing, due to geopolitical or economic risk, is critical to maintaining the procurement efficiency. The capability to deal with these risks on the strategic level of procurement decisions remains unexplored in the world of supply chain resilience.

Lastly, the use of technology in reinforcing the resilience of supply chains is receiving acceptance, and some of the works in this regard include Zhang, Huang, and Xiao (2022), who touch upon the application of technological solutions to enhance resilience. However, a direct link between the technological expenditure and the procurement performance has not been deeply examined. Even though Oshilalu, (2024) speak of the role of technological infrastructure in preventing risks for the energy sector, the work does not elaborate on how some technological investments (such as real-time monitoring or supply chain analytics) can improve the success of procurements. A closer perspective on how technology can directly affect procurement efficiency through decreasing costs, increasing the performance of suppliers, or enhancing supply chain visibility is required.

Finally, notwithstanding what the previous research has shown regarding the role of supplier diversification, risk management, and technological investments towards building supply chain resilience, their direct association with the disbursement's performance has not yet been researched. Further research should cover the quantification of the impact of supplier diversification on procurement outcomes, as well as an extension on how proactive risk management and technological fixes help to make procurement efficient. From this attention to detail, businesses can learn much concerning the optimization of procurement processes and the enhancement of robustness of their supply chains.

STATEMENT OF THE PROBLEM

Efficient procurement is important for organizations' to obtain quality goods and services cost-efficiently, and reduce the cost and risk of supply disruptions. This process is especially critical in Kenya's energy sector, which has significantly grown from 1,738mw in 2013 to 2,818mw in 2019, but is still impacted by frequent supply chain disruptions that disrupt procurement performance and sector operation. Disruptions occasioned by droughts, floods and political instability, among other factors, have resulted in slow power production, driving costs up. KenGen's 2019 slowdown to 150 MW from low dam levels exemplifies this. Despite the acknowledged role of supply chain

resilience in addressing such challenges, there is an inadequate understanding of how it affects procurement effectiveness within Kenya's state-owned energy corporations. It is upon this premise that this study therefore sought to evaluate the impact of supply chain resilience on procurement performance in this strategic sector.

OBJECTIVE OF THE STUDY

i. To investigate the effect of supplier diversification on procurement performance of the energy sector State Corporation in Kenya

1.4 Significance

This study would be helpful to Kenyan energy corporations as it sheds light on how a supply chain's resilience can help avoid disruptions, ensuring more efficient operation, continuity management, and optimizing energy. For consumers, the findings highlight the need for stable and dependable electricity, meaning that eliminating risks to the supply chain will result in fewer power blackouts, stable tariffs, and an enhancement in service level. Also, the study presents a platform for other researchers on how to research supply chain resilience and procurement efficiency, as well as to guide the ways of dealing with such challenges in other fields and the development of best practices in procurement and supply chain in the developing nations.

LITERATURE REVIEW

Supplier Diversification on Procurement Performance

One way to lessen the impact of losing a key supplier is through a strategy known as "supplier diversification," which entails using multiple vendors to meet a company's needs. Many businesses have started using this approach to reduce supply chain risks and boost procurement efficiency. However, the effects of supplier diversification on procurement efficiency are debated in the academic literature.

Diversifying one's supply base is recommended because it has been shown in some research to boost procurement efficiency. According to research by Mishra, Singh, & Subramanian, (2022) for instance, having multiple sources for a product or service can improve agility during procurement and lessen vulnerability to supply disruptions. In a similar vein, Hopwood, (2018) posits that at broadening one's pool of potential suppliers' increases competition among them and decreases transaction costs, thereby enhancing the effectiveness of one's organization's purchasing operations.

Risk assessment's effect on energy procurement results has been studied through case studies. Risk assessment practices are used to manage procurement risks, as demonstrated by the case study of a large oil and gas company (Baker, 2022). It was discovered that by conducting a risk assessment, the company was able to better identify and mitigate risks, which in turn enhanced the efficiency with which it made purchases.

Data collection on risk assessment procedures in the energy industry has also made use of surveys. Sohrabi, & Noorzai, (2023), for instance, polled 218 energy industry construction professionals about their experiences with risk assessment procedures during the purchasing process. Researchers discovered that risk assessment is widely regarded as a useful method for lowering the potential downsides of procurement and raising the potential upsides in order to boost productivity.

The literature review and analysis of the connection between risk assessment and procurement efficiency in the energy sector have been guided by theoretical frameworks. Haiyun, Zhixiong, Yüksel, and Dinçer, (2021), for instance, used a theoretical framework to examine how risk assessment affects procurement efficiency in the renewable energy sector. They discovered that if businesses adopted risk assessment procedures, they would be better able to spot and eliminate threats to their procurement operations.

While some research has found that having multiple suppliers improves procurement efficiency, other research has found the opposite to be true. Farrington, and Lysons, (2020), found, for instance, that if a company has a wide variety of suppliers that can lead to an increase in the complexity of procurement operations, which in turn can increase transaction costs and decrease efficiency. Uddin, (2024), found that having a wide variety of suppliers can result in less supplier commitment and weaker supplier relationships, both of which can have a negative effect on procurement performance.

And research by Black, and Glaser-Segura, (2020), suggests that the effect of supplier diversification on procurement performance may change depending on the specifics of the situation. They determined that supplier diversification can lessen supply chain risks in volatile settings, but it may not provide much in the way of benefits in more stable settings.

Contradictory findings are found in the research on how much of an effect supplier diversity has on procurement efficiency. There is mixed research on the effects of supplier diversification on procurement performance, with some showing positive results and others negative. It's also possible that the circumstances under which supplier diversification is implemented affect its results. Therefore, businesses should weigh the pros and cons of supplier diversification thoroughly before committing to it as a procurement strategy

THEORETICAL FRAMEWORK

The article is base Resource-Based View (RBV)

Resource-Based View (RBV)

According to the Resource-Based View (RBV) theory (introduced by Barney (1991), a firm's competitive advantage and superior performance result mostly from its internal resources and capabilities, rather than the external market conditions. These resources-tangible as technology

and equipment, intangible in the form of knowledge or relationships-must be VRIN valuable, rare, inimitable, non-substitutable to provide sustainable competitiveness. In this study on Kenya's energy sector state corporations, RBV is quite applicable because it identifies how internal capabilities like supply chain flexibility, efficient risk management, and strong supplier relationships bring resilience to the supply chain. With the identification and development/utilization of such resources, organizations are better positioned to plan for, respond to, and recover from supply interruptions, improving overall procurement performance. Such an approach underlines the significance of nurturing internal competencies to sustain procurement effectiveness through operational life challenges. RBV is a proper framework for comprehending and improving supply chain resilience in the energy sector.

CONCEPTUAL FRAMEWORK

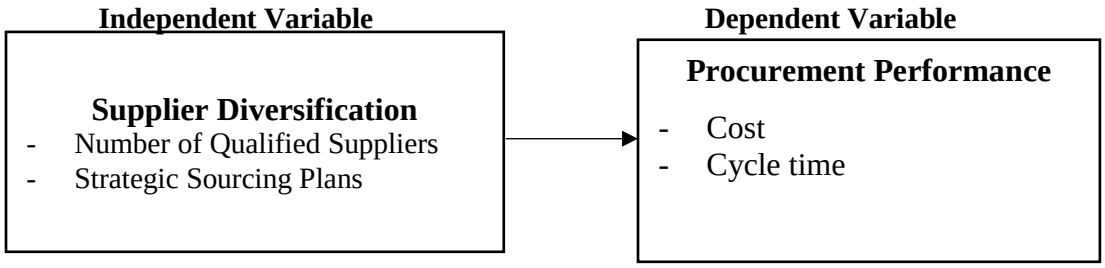

Figure 1: Conceptual Framework between Supplier Diversification and Procurement Performance

METHODOLOGY

Research Design

The study employed a cross-sectional research design to identify the association between supply chain resilience and the procurement performance of Kenya's state-owned energy corporations. Data from selected key organizations KenGen, KPLC, REREC, KPC, and NOCK – were collected at a single point in time, making it possible to assess the Supply Chain factors risk assessment, supplier diversification, crisis management planning, and technology optimization on procurement outcomes, promptly. This design was chosen because it effectively takes a snapshot of current practices and is cost-effective in implementing a single large-scale data collection tool.

Target Population

The target population was 407 employees from the five state-owned corporations' procurement, supply chain, operations, and finance departments. These are the leading procurement players in Kenya's energy sector, equipped with developed procurement frameworks reference and high degrees of operational scale, thus qualifying as subjects of inquiry in determining the impact of supply chain resilience.

Sample Size and Sampling Technique

A stratified random sampling method was used to represent different corporations and departmental functions stratified according to the organizations' sizes and historical supply chain disruption levels. At a confidence level of 95% and a margin of error of 5%, the initial sample size was obtained as 384 using Fisher's formula. In line with the finite population correction, this was estimated to a final sample of 198 respondents to increase the criterion of precision and reliability.

$$n = \frac{(Z^2 \, x \, p \, q)}{e^2}$$

Where:

n = sample size

Z = Z-score (determined by desired confidence level)

p = estimated proportion of the population that possesses the characteristic of interest (unknown, therefore estimated at 50%)

q = 1 - p

e = margin of error (determined by desired level of precision)

Therefore.

$n = \frac{(1.96^2 \, x \, 0.5(1-0.5)}{0.05^2} = 384$

The sample size was further adjusted using the Cronbach's Formula since the population of targeted individuals is less than 10000

$$nf = \frac{n}{1 + \frac{n}{N}}$$

$$nf = \frac{384}{1 + \frac{384}{407}} = 198 \; Respondents$$

Data Collection

The primary data was collected using a well-planned, structured questionnaire. The instrument targeted the four dimensions of risk chain resilience: risk assessment and management, supplier diversification, supply crisis management plans, and the questionnaire. In the questionnaire, the closed-ended questions were used for quantitative measurement. In contrast, the open-ended questions were used to give detailed qualitative insights into the data and the context, thus deepening the data and the context.

Data Analysis Procedures

Data were then screened, coded, and analyzed using SPSS version 26. Descriptive statistics, i.e., means, frequencies, and standard deviations, were used to describe the key variables. Inferential statistics such as multiple linear regression and one-way ANOVA were used to determine hypothesized relationships and overall assumptions of linearity, multicollinearity (measured by VIF), homoscedasticity, and normality of residuals, which were certified to guarantee robustness and reliability of the regression results.

$$Y = \beta_0 + \beta_1 X_1 + e$$

Where: Y = procurement performance,

β0 = Constant Term,

$\beta_0, \beta_1 \beta_2 \ \beta_3 \ and \ \beta_4 = Beta \ coefficients$

X_1= supplier diversification

ε = Error term

RESULTS

Pilot Study Results

A pilot test was conducted in August 2023 to ensure the reliability and validity of the questionnaire. The pilot test was done on 10% a sample of the overall sample of 198 respondents form 3 state corporations that is Geothermal Development Company (GDC), Kenya Electricity Transmission Company (KETRACO) and Nuclear Power and Energy Agency (NuPEA) in Kenya that are not part of the main study

Reliability of Research Instruments

Table 1: Reliability Analysis for Constructs

Construct	Cronbach's Alpha	No of Items	Decision
Supplier Diversification	0.748	5	Reliable

Source: Research Data (2024)

The Cronbach's alpha value for Supplier Diversification is 0.748. This also indicates a good level of reliability for the construct. The items in this construct measure the extent to which organizations have a diversified supplier base.

Validity of the Instrument

The researcher endeavored to establish validity of the research questionnaire before the actual study using the KMO and Bartlett's test sphericity

Table 2: KMO and Bartlett's Test of Sphericity Results

	No. of Items	KMO value	Bartlett's test	Sig.	Remarks
Supplier diversification	5	0.760	457.384	0.001	Valid

Source: Research Data (2024)

From Table 4.2, the KMO value of the supplier diversification construct was 0.760, implying a good sampling adequacy (values exceeding 0.7 are considered good). In addition, Bartlett's test of sphericity gave a value of 457.384 and a significance level of 0.001, which is below the 0.05 threshold. Thus, it confirmed that the correlation matrix was not an identity matrix and that the variables were sufficiently related for factor analysis. These findings support the questionnaire's strongest items on supplier diversification, which is acceptable for further statistical analysis.

Supplier diversification on procurement performance

The researcher sought to determine the impact of supplier diversification on procurement performance of state energy corporations in Kenya. Respondents rated various statements related to supplier diversification using a 5-point Likert scale, where 1= Strongly Disagree (SD), 2= Disagree (D), 3=Neutral (N), 4=Agree (A), and 5= Strongly Agree (SA). The responses were analyzed and the findings are presented in Table 3.

Table 3: Effect of Supplier Diversification on Procurement Performance

Supplier Diversification	N	Mean	Std. Dev
Our organization also ensures that it keeps checking and balancing the number of suppliers it deals with in a bid to avoid overdependence on certain suppliers, to boost the overall performance in the procurement function.	174	4.04	.933
By raising the number of suppliers it widens the chances and choices in use of more capable and competent suppliers which results in better procurement	174	4.14	.976
We design long-term supplier sourcing strategies which improve the supplier choice and use, and therefore improve procurement outcomes.	174	3.73	1.259
Promoting supplier innovation and capacity, one is provided with a stream of innovative products and capable services thus enhancing procurement.	174	4.45	.787
We contribute effectively to the improvement of procurement supply chain efficiency by diversifying suppliers across geographic locations. Thus, acting as the organization's watchdog against regional supply-related issues.	174	4.14	1.061
Valid N (listwise)	174		

Source: Research Data (2024)

Table 3 findings indicates that State-Owned Energy Corporations do place much emphasis on supplier diversification as a critical strategy towards improving procurement performance. Some key lessons have been obtained from the survey results in this regard. First, most of the respondents agreed that their organizations ensure a balanced number of suppliers not to over depend on specific suppliers, hence improving procurement performance overall. This is evidenced by the high mean score of 4.04 with a relatively low standard deviation of 0.933, suggesting a general consensus of the same from the respondents.

Also, increasing the number of suppliers makes the organization increase the choices and chances of using more capable and competent suppliers for better procurement outcomes. The mean score in this item was 4.14, with a standard deviation of 0.976, further showing more emphasis on supplier diversification. However, their views were varied on the aspect of the design of long-term supplier sourcing strategies. The implication of a mean of 3.73 and a standard deviation of 1.259 indicates a higher degree of dispersion, hence proving that not all organizations have effective strategies for long-term sourcing of suppliers in place.

One of the striking findings in this regard is the strong agreement of the respondents that fostering supplier innovation and capacity results in a continuous flow of innovative products and capable services, hence improving procurement performance. This item had the highest mean score of 4.45 with a low standard deviation of 0.787, hence indicating the need to foster supplier innovation and capabilities. Respondents agreed that their organizations contributed to the diversification of suppliers across geographic locations, hence making the procurement supply chain more efficient in mitigating against regional supply-related problems. Items had an average score of 4.14 with a standard deviation of 1.061, an indication of relatively high consensus among the respondents.

Research evidence demonstrates that expanding supplier networks produces better procurement results. Supplementary research by Mishra, Singh, and Subramanian (2022) confirms that more suppliers provide better agility to procuring operations and lower supply interruption risks. According to Hopwood (2018) supplier diversification creates stronger competition between suppliers which lowers procurement expenses and improves operational effectiveness. This matches the survey results about positive supplier diversification perceptions.

These research findings find strong justification through the Transaction Cost Economics (TCE) theoretical approach. The goal of firms under Transaction Cost Economics theory is to lower transaction expenses through the choice of effective suppliers together with supplier independence reduction (Williamson, 1981). State-owned energy corporations can protect themselves from supplier monopolies by expanding their sourcing options so they achieve lower transaction costs and better purchasing agreements with suppliers. The research findings validate TCE theory because participants demonstrated strong agreement regarding supplier number and geographic diversification which helps minimize transaction costs. Supplier diversity helps organizations build flexible supply chains which lowers disruption costs while taking advantage of market competition. The findings support supplier diversification as a successful approach which decreases procurement operations risk and optimizes procurement performance and operations.

Regression Analysis

The section hereunder establishes the relationship between supplier diversification on procurement performance of state energy corporations by performing a linear regression analysis. The data for analysis is presented in these tables.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.980a	.961	.961	14204

a. Predictors: (Constant), supplier diversification

Source: Research Data (2024)

Table 4. Findings with respect to Model summary on supplier diversification and Procurement Performance in state energy corporations in Kenya. The coefficient of correlation, R = 0.981, is very high and thus showing a perfect positive linear relationship between the independent variable being the supplier diversification and dependent variable, the Procurement Performance. The coefficient of determination, R Square = 0.962 shows that 96.2 % of the variance in Procurement Performance is accounted for by the predictor variable, supplier diversification. The adjusted R Square of 0.962 confirms that this model fits adequately enough to the data, adjusting for the number of predictors. The standard error of the estimate, 0.14193, is the average distance between the observed Procurement Performance values and the fitted or, in other words, the predicted value using the model.

Table 5: One Way ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	88.402	2	44.201	2190.699	.001
	Residual	3.450	171	.020		
	Total	91.852	173			

a. Dependent Variable: Procurement Performance
b. Predictors: (Constant), supplier diversification

Source: Research Data (2024)

The following is the ANOVA table resulting from a regression model with Procurement Performance as the dependent variable and 2 predictors. The total sum of squares is 91.852, indicating some substantial amount of variability in the dependent variable for explanation by the model. The 88.402 regression sum of squares with 2 degrees of freedom tells us that most of this total variability can be accounted for by the predictors. The residual sum of squares is 3.450, with 171 degrees of freedom, including the rest of the variance not explained.

The F-statistic stands very high at 2190.699, and, correspondingly, the $p < .001$ level is statistically significant. It thus indicates that, overall, the regression model is very effective in predicting Procurement Performance from the 2 predictor variables. Given its large F-value and small P-value, one has very strong evidence that at least one of the predictors in the model, supplier diversification, has a significant linear relationship with the dependent variable after accounting for the other predictors. In summary, this already suggests a model that really fits well with the data and that all predictors included are meaningful and important in explaining variations in procurement performance.

Table 6: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.346	.083		4.177	.001
	supplier diversification	.904	.014	.981	66.180	.001

a. Dependent Variable: Procurement Performance

Source: Research Data (2024)

The coefficient in table 6 for the unstandardized intercept, that is, the constant, was 0.346, with a standard error of 0.083. This means that if the Supplier Diversification were to be zero, the predicted Procurement Performance would be 0.346 units.

The b value for supplier diversification was 0.904 with a standard error of 0.014. This means that for every one-unit increase in the supplier diversification, a corresponding increase of 0.904 units in procurement performance is expected when all other variables are held constant.

The value for the standardized regression coefficient with respect to Supplier Diversification was 0.981. This very high Beta would suggest that Supplier Diversification is a very strong predictor of Procurement Performance. More specifically, it indicates that a 1 standard deviation increase in Supplier Diversification is related to a corresponding 0.981 standard deviation increase in Procurement Performance.

The constant term and the Supplier Diversification coefficient were significant at the $p < .001$ level: $t = 4.177$, $p < .001$, and $t = 66.180$, $p < .001$, respectively. This tells us we can be pretty confident that these relationships didn't occur by chance and that they are meaningful predictors of the dependent variable.

DISCUSSION AND CONCLUSION

The state energy corporation's procurement performance has been impacted by supplier diversification, the findings attest. This had been guided by the realization of these companies that increasing the share of diverse suppliers, such as small businesses and minority- and women-owned enterprises into their supplier base was strategic for improving their overall procurement performance.

One of the primary observations in this regard is that it is through the use of an indexed, structured, and systemic risk identification that has helped enable these state energy corporations to successfully drive supplier diversity and inclusion programs. In that regard, adopting a more holistic approach to risk assessment has given these organizations the ability to identify and

onboard much more diverse sets of suppliers that turned out instrumental in improving procurement performance.

The increased diversification of the supply base has had a number of impacts on the procurement function. First of all, state energy corporations have been better defending their interests from the risks of the supply chain. By means of such a network of suppliers, organizations have been in a position to develop an overall resilience to supply chains and to reduce the prospect of possible disturbances that could result from an over-dependence on a few suppliers.

What began to happen was that supplier diversity became aligned with the strategic goals of state energy corporations. Now, expanding the denominator to a more diversified basket of suppliers minority-owned, women-owned, and small businesses they are able to support broader economic and social objectives without deviating from the core vision, leveraging special capabilities and innovations that diverse suppliers bring to the table.

The findings also establish that this enhanced diversification of suppliers has had a direct impact on improving the procurement performance for these state energy corporations. In this regard, access to such diversified suppliers allowed the former to streamline their procurement procedures and bring better value for money, thereby improving the overall procurement outcome.

Said differently, the research highlights that this supplier diversification strategy is of importance to state energy corporations so as to enhance their procurement performance. By simply undertaking a planned and structured approach toward the identification of risk and onboarding suppliers, organizations can be assured of gaining benefit from a more diverse and resilient supply chain in improving procurement outcomes that are aligned with broader strategic objectives

RECOMMENDATIONS

i. Supply Chain Managers should diversify supplier networks by conducting evaluations to find suppliers from different geographical locations and industries which cuts down dependence on any one single supply source.
ii. Regulatory Authorities need to implement policy standards which support supplier variety selection together with efforts to engage different suppliers for strengthening procurement durability.

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