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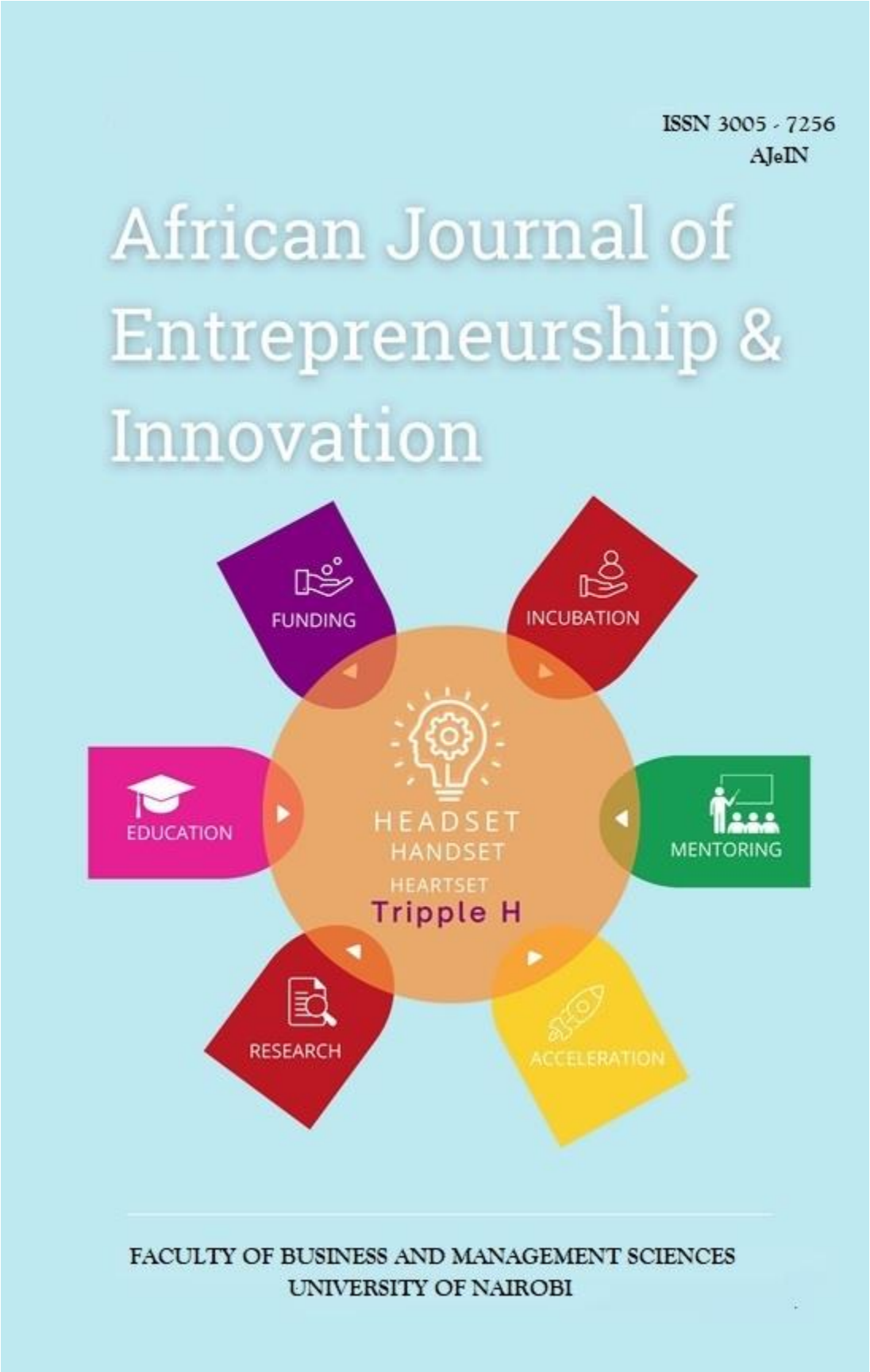

Environmental Considerations and Sustainability of Small and Medium-sized Enterprises in South-South, Nigeria

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Abstract

This research explores the relationship between environmental considerations and sustainability of Small and Medium-sized Enterprises (SMEs) in the South-South, Nigeria. The methodology employed was the descriptive survey design. Adopting the purposive sampling technique, data were collected from 317 respondents, consisting of 105 environmental analysts, 106 consumers, and 106 SMEs executives, through structured questionnaires. A linear regression model was employed to analyse the association between stakeholders' perceptions, environmental regulations, and business sustainability. The study finds that stakeholders' perception significantly correlate with business sustainability. Also, environmental regulations have a significant positive relationship with sustainability of small and medium enterprises. However, the relatively low explanatory power of the model suggests that additional factors contribute to business sustainability in emerging economies. The study recommends enhancing public awareness through targeted campaigns to educate stakeholders about sustainability and its benefits to businesses, especially SMEs.

Key Words: *Stakeholder, Sustainability, environmental concerns, regulations*

1. Introduction

Environmental considerations have become a focal point in global discussions on firm's sustainability, particularly among Small and Medium Enterprises (SMEs). These businesses, characterised by rapid growth, may be prone to setback relating to environmental degradation (Bajja, El-Bouayady, Çelik, Ahmed & Radoine, 2024; Çetin, M., Sümerli Sarıgül, Topcu, Alvarado & Karataser, 2023). As industries expand in response to increasing demand, environmental issues such as waste generation, deforestation, air pollution, water scarcity, and climate change are becoming more prominent. SMEs are experiencing unprecedented growth, though this growth often comes at the expense of environmental health (Bajja, El-Bouayady, Çelik, Ahmed & Radoine, 2024). Rapid industrialisation, urbanisation, and agricultural expansion have resulted in air and water pollution, loss of biodiversity, and increased carbon emissions. According to the World Bank (2021), air pollution alone is responsible for over 4 million deaths annually, many of which occur in low-and middle-income regions, where SMEs are located. Again, resource depletion, such as water shortages in regions like Sub-Saharan Africa, has compounded the environmental challenges faced by these SMEs (Matchawe, Bonny, Yandang & Yangoua Mafo, 2022; Mwoya Byaro, Nkonoki & Mafwolo, 2022). With rising

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awareness of environmental issues globally, the need to balance economic growth with sustainable environmental practices is gaining attention.

Entities that fail to integrate environmental considerations into their business strategies may face higher operational costs, reputational damage, and difficulties accessing markets that demand sustainable practices (Bansal & Roth, 2020). The increasing demand from customers for eco-friendly goods and services is one important factor pushing firms towards sustainability. As global awareness of climate change and environmental degradation increases, consumers are becoming more discerning in their purchasing decisions, preferring products that are sustainably sourced and produced (Claudy & Peterson, 2022; Milfont & Markowitz, 2016). The demand for sustainable products is not limited to local consumers. Multinational companies that source materials from SMEs are increasingly requiring their suppliers to meet international sustainability standards. For instance, companies like Unilever, Nestlé, and Coca-Cola have established sustainability guidelines for their suppliers, creating pressure for businesses in emerging economies to adopt cleaner production methods and reduce environmental impacts (Cui & Zhu, 2020). As consumers and businesses place more emphasis on sustainability, Small and Medium-sized Enterprises must adapt to these expectations or risk losing market share to competitors who are better aligned with sustainability trends.

1.1 Objectives of the study

The specific aim of the survey are to:

i. Determine the link between stakeholder's perception and sustainability of Small and Medium Enterprises in South-South, Nigeria.
ii. Ascertain the association between environmental regulations and sustainability of Small and Medium Enterprises in South-South, Nigeria.

1.2 Hypotheses of the study

$H0_1$ Stakeholders' perception has no significant relationship with sustainability of Small and Medium-size Enterprises in South- South, Nigeria.

$H0_2$ Environmental Regulations have no significant connection with sustainability of Small and Medium-size Enterprises in South- South, Nigeria.

Despite growing recognition of environmental challenges, many SMEs in South-South, Nigeria continue to prioritise short-term economic gains over environmental considerations (Abbas-Khan, & Ahmad, 2022; Guo, & Wang, 2023). This survey seeks to address this research gap by exploring how environmental factors, such as regulations and stakeholders' perception influence business practices and sustainability strategies among SMEs. It aims to provide perception into how entities can collaborate environmental considerations into their operations to ensure long-term viability and competitiveness while addressing the pressing environmental challenges facing these regions. The study provides valuable guidance on how to incorporate sustainable practices into business strategies, reduce operational risks related to environmental degradation, and capitalise on opportunities created by an overwhelming need for eco-friendly products and services. It will inform the development of more effective environmental policies that encourage continuity. Also, consumers in emerging economies will benefit from greater access to environmentally responsible and sustainable products. This could drive the demand for more eco-conscious goods, leading to improved consumer well-being. Lastly, the results of the investigation will prove useful to academics who study environmental economics, corporate social responsibility, and business sustainability since they can add to the body of information already in existence and guide future investigations into sustainable practices in developing economies.

2. Review of Literature

2.1 Conceptual Review

2.1.1 Small and Medium Enterprises

Small and Medium-sized Enterprises (SMEs) are defined generally by the number of employees and annual revenue. SMEs form the backbone of many economies, accounting for a significant proportion of jobs and contributing to innovation and industrial diversification (Okoye, 2022; Olisah, 2023; Wilson-Oshilim & Omoye, 2025). The essence of SMEs extends beyond employment, as they stimulate economic growth, foster competition, and are major contributors in the global supply chain. In many countries, SMEs represent over 90% of all businesses, underscoring their prominence in local and global markets (OECD, 2020). Governments and institutions have implemented policies to support SMEs through financial assistance, tax incentives, and training programs. Despite these initiatives, the growth potential of SMEs remains constrained due to factors like market competition and limited resources. Additionally, digital transformation is becoming a priority for SMEs as they

seek ways to compete in an increasingly technology-driven economy (Pinto, Kovaleski & Chiroli, 2024; Wang & Zhang, 2025).

2.1.2 Business Sustainability

Business sustainability has evolved from being a peripheral concern to a central strategic objective for companies worldwide (Ioannou, & Serafeim, 2021; Rodrigues & Franco, 2019). It connotes a company's ability to operate in a manner that ensures long-term profitability while considering environmental, social, and economic factors (Wright & Nyberg, 2018). Organisations face mounting desire to implement sustainable practices in today's globalised market as a result of strict government laws, increased customer demand for eco-friendly products, and increased public exposure of social and environmental concerns. Sustainability in business not only addresses the environmental impact but also incorporates corporate social responsibility (CSR), which emphasises the well-being of communities, employees, and stakeholders (Schneider & Brehm, 2020). The concept of sustainability in business is often framed through the triple bottom line (TBL) framework, which evaluates performance based on three pillars: profit, people, and planet (Loviscek, 2020). Businesses that prioritise TBL seek to balance financial profitability with positive social and environmental contributions, ensuring long-term viability (Elkington, 2018). This balanced approach is particularly vital in emerging economies, where rapid industrialisation and economic growth must align with environmental preservation and social equity to prevent unsustainable development patterns (Bansal & Roth, 2020).

2.1.3 Stakeholders' Perceptions and Business Sustainability

In the South-South, business sustainability is increasingly influenced by the perceptions and expectations of various stakeholders, such as consumers, employees, investors, government agencies, and local communities. These stakeholders play an essential role in shaping corporate strategies and determining the long-term viability of businesses. In these regions, where rapid economic growth and industrialisation are often accompanied by environmental and social challenges, stakeholders' attitudes toward sustainability can either drive or hinder business practices (Mitra & Schmid, 2020). Stakeholders in emerging economies are becoming more aware of environmental, social, and governance (ESG) issues, with growing pressure on companies to adopt sustainable practices that go beyond profit maximisation. Investors, for instance, are increasingly factoring ESG criteria into their decision-making processes, recognising the financial risks posed by unsustainable business operations

(Nielson & Choi, 2021). Meanwhile, consumers in these economies are also demanding environmentally responsible products and services, thus influencing businesses to adopt greener and more socially equitable practices (Kumar et al., 2020; Rath & Bansal, 2021).

2.1.4 Environmental Regulations and Business Sustainability

The relationship between environmental regulation and business sustainability is becoming increasingly significant as governments recognise the importance of balancing economic growth with environmental protection (Trevlopoulos, Tsalis, Evangelinos, Tsagarakis & Vatalis, 2021). As these economies experience rapid industrialisation and urbanisation, the strain on natural resources and ecosystems intensifies, leading to concerns about environmental degradation. To address these issues, many governments are introducing or strengthening environmental regulations aimed at curbing pollution, conserving resources, and promoting sustainable business practices. However, the implementation and impact of these regulations on business sustainability in emerging economies remain complex and multifaceted (López et al., 2020).

Environmental regulations in emerging economies are often shaped by both local challenges and global trends, with policymakers seeking to balance economic growth with environmental preservation. For businesses, these regulations can create both opportunities and challenges. On one hand, stringent environmental regulations can increase operational costs due to compliance requirements, such as investment in cleaner technologies, waste management systems, or emissions reduction measures (Liu & Liu, 2021). On the other hand, these regulations can also drive innovation, opening new markets for environmentally friendly products and technologies, which can contribute to long-term sustainability (Almeida et al., 2020). The impact of environmental regulations on business sustainability is also influenced by the level of enforcement and the regulatory capacity of governments in emerging economies (Global Green Growth Institute, 2014; Trevlopoulos, Tsalis, Evangelinos, Tsagarakis & Vatalis, 2021).

2.2 Theoretical Review

2.2.1 The Natural Resource-Based View (NRBV)

The Natural Resource-Based View (NRBV) theory, an extension of the Resource-Based View (RBV), emphasises the role of a firm's relationship with natural resources as a source of competitive advantage (Hart, 1995). NRBV focuses on how firms can leverage natural resources efficiently to meet

environmental challenges while ensuring long-term viability. This theory suggests that sustainable business practices, such as resource conservation, waste reduction, and the adoption of green technologies, not only enhance environmental stewardship but also improve operational efficiency, thereby contributing to business sustainability (Bello, 2020; Feng, Qamruzzaman, Sharmin & Karim, 2024). In emerging economies, where natural resources are often abundant yet vulnerable to depletion and environmental degradation, businesses face significant challenges in balancing economic growth with ecological preservation. According to NRBV, firms in these economies can gain a competitive advantage by developing capabilities to manage natural resources more effectively. For instance, firms can invest in clean technologies that reduce emissions or water usage, or they can redesign products to be more sustainable throughout their life cycle. Again, in emerging economies, businesses often operate under less stringent environmental regulations or enforcement, which can either encourage unsustainable practices or provide opportunities for companies to become leaders in sustainability (Bansal & Roth, 2020). NRBV suggests that firms can capitalise on this by proactively adopting sustainable practices, which may enhance their reputation, attract environmentally conscious consumers, and improve their long-term market position (Geissdoerfer et al., 2017; Iheanachor, et al,. 2023; Rodrigues & Franco, 2019).

2.3 Empirical Review

Ahmad, Yaqub, and Lee (2024) examined the following elements that affect commercial choices about ESG policy: leadership framework, gender, waste and contaminants, economic efficiency, sustainability of the environment, and corporate social responsibility. Taking into account the worldwide pandemic, belief, the extent and composition of the governing board, national interest, ESG reporting, and technical improvements, they examine the effects of these aspects. ESG disclosures of environmental, economic, and social sustainability performance have been shown in the literature to improve corporate efficiency and longevity. Businesses with a religious focus performed greater in terms of the socio-environment, but not governance. ESG disclosure is negatively impacted by dual-gender boards, while it is positively impacted by an independent governing board. A notable opportunity for diversification in ESG investing was noted during the COVID-19 epidemic. Firms' ability to innovate, innovate, create value, and perform financially are all improved by implementing an ESG strategy. The corporate economy and generating value for society are interdependent, as evidenced by the overall strong positive correlation between social and environmental performance and company sustainability.

Using a variety of panel data models, Hunjra, Bouri, Azam, Azam, and Dai (2024) investigate how environmental degradation is affected by economic growth and foreign direct investment (FDI) in 76 developing economies from 1991 to 2022. Primarily there is evidence to support the environmental Kuznets curve hypothesis, which states that cleaner technology and practices are adopted as the economy grows, lowering carbon emissions. Secondly, there is a significant correlation between foreign direct investment (FDI) and carbon emissions, indicating that regulatory frameworks and investment types need careful consideration. The impact of plentiful natural resources on emissions is highlighted in this analysis, along with the need of diversification tactics and the shift to cleaner technology. Furthermore, additional research incorporating interactive impacts shows that when significant FDI, ample resources, and rapid economic expansion all take place at the same time, environmental degradation rises. These results emphasise how crucial it is to create context-specific plans and regulations in order to strike the right equilibrium between environmental sustainability and financial expansion in emerging market.

By using perspectives from resource-based and dynamic capacities, Abid, Ceci, and Aftab (2024) examined the effect of entrepreneurial orientation (EO) on sustainable business performance (economic, environmental, and social). It further looks at how creative abilities mediate the relationship between EO and long-term profitability and how technology dynamics modifies the relationship between EO and innovation skills. Structural equation modeling was used to analyse data from 408 SMEs in Pakistan. The results show that EO directly improves sustainable performance. Additionally, the association between EO and sustainable performance has been demonstrated to be mediated by innovation capabilities, whereas the association between EO and innovation capabilities is enhanced by technology dynamism. These findings highlight how crucial it is to match EO with innovation capacities in order to adjust to changes in the industrial regime's technical landscape. Promoting EO-innovation capacity is crucial, as the theoretical contributions highlight. According to practical inputs, business owners should provide an atmosphere that encourages SMEs to innovate in order to improve their sustainable performance, particularly in developing contexts with limited resources. Additionally, the work provides a basis for future research in this field.

Since emerging nations face various difficulties than advanced nations with regard to of resource availability, government policies, and consumer behavior, Patwa, Sivarajah, Seetharaman, Sarkar, Maiti, and Hingorani (2021) look into the adoption of CE principles in these economies. This study

uses a sample of 183 customer answers to establish an experimentally validated CE adoption model. In order to promote the implementation of CE practices in emerging countries, the study emphasises the significant impact of elements like customer behavior on the acceptability of remanufactured goods and the use of products as a service. This study provides governments, customers and businesses with information about emerging economies' actions that adhere to CE principles.

3. Methodology

This investigation utilised a descriptive survey research design. This design was used to systematically explore the characteristics of variables relevant to the study, while linear regression analysis was adopted to examine the link between environmental consideration and SMEs' sustainability using the E-Views 10 software package. A sample size of 317 respondents, comprising 105 environmental analysts, 106 consumers, and 106 CEOs of SMEs, was purposively selected from a population of 855 respondents from the 6 states that make up the South-South region. The sample size was purposively selected from each of the 6 South-South State; 53 respondents from Akwa-Ibom state, 53 from Bayelsa state, 53 from Cross River state, 53 from Delta state, 53 from Edo state and 52 Rivers Sates, Nigeria. This study utilised primary data obtained through structured questionnaires to gather voluntary feedback from the respondents. Autocorrelation Test, Heteroskedasticity Test, Correlation Analysis, and least square regression analysis were carried out to analyse the data.

4. Data Analysis and Hypotheses Testing

Table 1: Sample size by geographical states in South-South

Sample size by States in the South-South, Nigeria		
Akwa Ibom State	53	16.72
Bayelsa State	53	16.72
Cross River State	53	16.72
Delta State	53	16.72
Edo State	53	16.72
Rivers State	52	16.40
Total Sample Size	317	100

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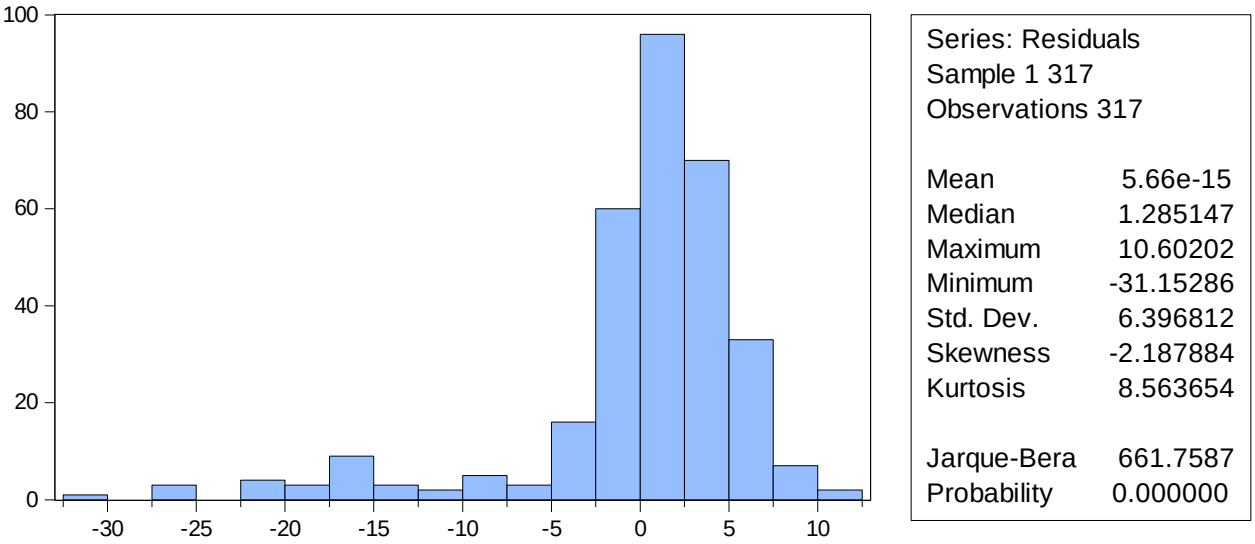

Figure 1: Result of the Histogram Normality Test

The histogram normality test outcome showed a leftward-tailed distribution with an adverse skewness of -2.187884. A leptokurtic distribution is suggested by the mean kurtosis of 8.563654, which is higher than the benchmark of three. In contrast to a normal distribution, this suggests that the data have fatter tails and a stronger peak. Given that the null hypothesis of normality is rejected, the mean Jarque-Bera statistic of 661.7587 and the probability value of 0.000000 indicate that the data do not follow a normal distribution.

Table 2: Result of the Correlation Analysis

Covariance Analysis: Ordinary
Date: 01/22/25 Time: 18:38
Sample: 1 317
Included observations: 317

Correlation t-Statistic Probability	BUSS	ENVR	STAP
BUSS	1.000000 ----- -----		
ENVR	0.143607 2.575469 0.0105	1.000000 ----- -----	
STAP	0.124064 2.219070 0.0272	-0.039293 -0.697914 0.4857	1.000000 ----- -----

Source: Eviews 10 (2025)

The result in table 2 above revealed the correlations between business sustainability (BUSS) and the independent variables stakeholders' perception (STAP) and environmental regulations (ENVR). Environmental regulations show a weak positive association with business sustainability (0.143607), which is statistically significant. Stakeholder perception has a positive relationship with business sustainability and a weak negative correlation with environmental regulations.

4.1 Regression Diagnostics

Table 3: Test of Heteroskedasticity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.344497	Prob. F(2,314)	0.2622
Obs*R-squared	2.691635	Prob. Chi-Square(2)	0.2603
Scaled explained SS	9.987543	Prob. Chi-Square(2)	0.0068

Source: Eviews 10 (2025).

The Breusch-Pagan-Godfrey test is used to determine heteroskedasticity. The F-statistic value is 1.344497, and the associated p-value is 0.2622. Since the p-value is significantly higher than the typical significance level (e.g., 0.05), it suggests that there is no evidence of heteroskedasticity. In other words, the null hypothesis that heteroskedasticity does not exist cannot be ruled out.

Table 4: Test of Serial Correlation

Results of the Breusch-Godfrey Test of Serial Correlation

F-statistic	1.541634	Prob. F(2,312)	0.2157
Obs*R-squared	3.102025	Prob. Chi-Square(2)	0.2120

Source: Eviews 10 (2025)

A regression model's residuals can be examined for serial correlation, also known as autocorrelation, using the Breusch-Godfrey Serial Correlation LM Test. The corresponding p-value is 0.2157, and the F-statistic is 1.541634. We are unable to reject the null hypothesis since the p-value exceeds the usual significance level of 0.05. This indicates that the residuals of the model show no signs of a serial correlation.

Table 5: Analysis of the Regression Analysis

Dependent Variable: BUSS
Method: Least Squares
Date: 01/22/25 Time: 18:37
Sample: 1 317
Included observations: 317

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ENVR	0.188627	0.070281	2.683907	0.0077
STAP	0.113917	0.048588	2.344541	0.0197
C	29.59526	3.646485	8.116106	0.0000

R-squared	0.037473	Mean dependent var	42.19558
Adjusted R-squared	0.031342	S.D. dependent var	6.520143
S.E. of regression	6.417151	Akaike info criterion	6.565244
Sum squared resid	12930.47	Schwarz criterion	6.600818
Log likelihood	-1037.591	Hannan-Quinn criter.	6.579454
F-statistic	6.112302	Durbin-Watson stat	1.848609
Prob(F-statistic)	0.002488		

Source: E-views 10 (2025)

According to the preliminary analysis, the independent variables taken into consideration in this study such as environmental regulations and stakeholders' perceptions account for 3.74% of the variation in business sustainability, with a coefficient of multiple determination of 0.037473 and an adjusted value of 0.031342. The error term, however, captures the remaining 96.26%. This suggests that little of the variation in business sustainability can be explained by the two independent variables taken into account in the current investigation. The two explanatory factors considered combined are statistically significant, as indicated by the F statistics value of 6.11, which is more than 2.

4.2 Test of Hypotheses

Hypothesis i: Stakeholders' perceptions have no significant connection with SMEs sustainability in South-South Nigeria.

The findings showed a significant positive correlation between stakeholders' perceptions and sustainability of the business, with a value of 0.113917. This indicates that an 11.39% increase in business sustainability will result from a one unit rise in stakeholder perception. A t-value of 2.344541, which is more than 2, was also found in the results, suggesting that stakeholder perception significantly

affects the sustainability of businesses. The p-value of 0.0197, which is less than 0.05, supports this. Thus, at the 5% level of significance, the null hypothesis that stakeholders' perceptions have no discernible impact on the viability of businesses in SMEs in South-South Nigeria, is rejected.

Hypothesis ii: Environmental Regulations have no significant link with SMEs sustainability in South-South Nigeria.

The outcomes demonstrated a significant and positive association between environmental legislation and corporate sustainability, with a value of 0.188627. This indicates that company sustainability will rise by 18.86% for every unit increase in environmental laws. A t-value of 2.683907, which is more than 2, was also found in the results, suggesting that environmental rules significantly affect the sustainability of businesses. The p-value of 0077, which is less than 0.05, supports this. At the 5% level of significance, the null hypothesis that environmental rules have no discernible impact on the sustainability of businesses in South-South Nigerian SMEs, is thus rejected.

5. Summary, Conclusion, and Recommendations

5.1 Summary of findings

i. The connection between stakeholders' perception and sustainability of SMEs in South-South Nigeria is positive and statistically significant at 5% level of significance.
ii. There exists a favourable significant association between environmental regulations and sustainability at 5% significant level.

5.2 Conclusion

This survey underscores the complexities of promoting business sustainability in emerging economies. While stakeholders' perception and environmental regulations significantly impact sustainability, the overall influence is constrained by structural and operational challenges. Public awareness of sustainability goals and effective enforcement of environmental regulations emerge as critical factors for success. The findings suggest that businesses must engage stakeholders meaningfully, demonstrating genuine commitment to sustainability to gain their trust and support. Similarly, governments need to enhance the regulatory environment by ensuring consistency in enforcement and providing incentives for compliance. By addressing these challenges, emerging economies can align their sustainability efforts with global best practices, paving the way for long-term environmental and economic benefits. The investigation adds to the expanding body of knowledge on sustainable

business practices by offering factual data on the influence of regulatory structures and stakeholder perspectives. It emphasizes the importance of collaborative efforts among businesses, governments, and stakeholders to achieve sustainability goals.

5.3 Recommendations

Businesses should prioritize building positive relationships with stakeholders by focusing on transparency, ethical practices, and corporate social responsibility initiatives. This will improve perceptions and support long-term sustainability. Companies should ensure adherence to environmental regulations by implementing sustainable practices such as reducing emissions and minimizing waste. This will strengthen regulatory compliance and operational efficiency.

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