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Business Resilience and Economic Sustainability of Agro-Allied SMEs in Osun State

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Abstract: The agro-allied industry plays a pivotal role in Nigeria's economic diversification by linking raw agricultural products with industrial processing. However, despite its potential, sustainability challenges such as inadequate infrastructure, inconsistent policies, and limited access to financing have hindered its growth. This study examines the influence of business resilience dimensions on the economic sustainability of agro-allied SMEs in Osun State. A cross-sectional survey research design was employed, targeting 120 owner-managers of agro-allied SMEs. Data were collected using a structured questionnaire and analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings indicate that business resilience dimensions significantly impact economic sustainability ($R = 0.697$, $R^2 = 0.486$, $F = 25.778$, $p < 0.05$). Specifically, operational resilience ($B = 0.484$, $p = 0.000$), behavioral resilience ($B = 0.270$, $p = 0.007$), and strategic resilience ($B = 0.045$, $p = 0.040$) had significant positive effects on economic sustainability, while business agility ($B = 0.163$, $p = 0.123$) was not statistically significant. The study concluded that fostering operational and behavioral resilience is crucial for enhancing economic sustainability in agro-allied SMEs. The study recommends targeted interventions such as investment in adaptive supply chain strategies, capacity building for resilience training, and policy reforms that promote financial accessibility and infrastructural improvements to sustain agro-allied enterprises in Nigeria.

Keywords: Business Resilience, Economic Sustainability, Agro-allied enterprises, Osun State

INTRODUCTION

The agro-allied industry in Nigeria is a critical component of the country's agricultural value chain, linking raw agricultural products with industrial processing while supporting economic diversification. This sector includes enterprises engaged in the processing of agricultural outputs, the manufacturing of inputs such as fertilizers and agrochemicals, and essential services such as transportation and storage. Despite its significant role in economic development, employment generation, and value addition, the industry's performance over time suggests that it has yet to reach its full potential in driving sustainable economic recovery. This raises important questions about what internal and industry-specific competencies can be leveraged to enhance the sustainability of the agro-allied industry in Nigeria.

Globally, the agro-allied industry remains relevant due to its role in food security and economic growth. According to the Food and Agriculture Organization (FAO), the sector employs nearly 27% of the global population and contributes substantially to GDP, particularly in developing nations. However, while countries in North America, Europe, and Asia have embraced advanced technologies and efficient policies to boost productivity, Nigeria's agro-allied industry continues to grapple with challenges such as inadequate infrastructure, inconsistent policies, climate change effects, and limited access to financing (Nnaji, 2020; Dada *et al.*, 2021).

In Nigeria, the government has emphasized the agro-allied sector as a means of diversifying the economy away from oil dependence (Olukunle, 2022). The National Bureau of Statistics (NBS) reported that in 2023, agriculture and the agro-allied industry contributed over 25% to Nigeria's GDP. The rising population and urbanization trends have increased the demand for processed food and agricultural products, presenting an opportunity for the sector to enhance value addition through agro-processing. Investments in rice milling, palm oil refineries, and cassava processing have contributed to food security while reducing reliance on imports. Additionally, the industry plays a key role in job creation, particularly in rural communities, by improving farmers' livelihoods and stimulating economic activities along the value chain (Liu *et al.*, 2021).

Despite these opportunities, the agro-allied industry in Nigeria faces several sustainability challenges (Oyedokun *et al.*, 2023). Inadequate infrastructure, including poor road networks and erratic power supply, continues to impede industrial processing efficiency, leading to high operational costs (Nnaji, 2020). The limited access to credit remains a significant barrier, with small and medium enterprises (SMEs) struggling to secure funding due to high interest rates and stringent collateral requirements. Additionally, the

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inconsistent policy environment, characterized by abrupt regulatory changes and weak implementation of agricultural policies, creates uncertainty for investors (Kyaw, 2022). For instance, the 2019 border closure impacted agro-allied businesses by restricting the export of processed goods, leading to significant financial losses (Udeh, & Nwokorobia, 2021).

Environmental and social challenges further complicate the sustainability of Nigeria's agro-allied industry (Akinroluyo *et al.*, 2024). Climate change, marked by irregular rainfall patterns, flooding, and desertification, disrupts agricultural supply chains and affects raw material availability for processing companies. Security concerns, particularly in northern Nigeria, have also limited farmers' access to farmlands, exacerbating production instability. Moreover, unsustainable farming practices, deforestation, and overuse of chemical fertilizers have contributed to soil degradation and water pollution, threatening long-term agricultural productivity.

To enhance the sustainability of the agro-allied industry in Nigeria, a multi-dimensional strategic approach is required. While accounting and finance literature emphasizes access to funding as a crucial factor, strategic management perspectives highlight the importance of dynamic capabilities such as business resilience (Hokmabadi *et al.*, 2024; Jim-Saiki & Onamusi, 2023). Business resilience, including behavioral, operational, and strategic resilience can help agro-allied enterprises navigate economic disruptions, climate risks, and market uncertainties (Abolade, 2022). Moreover, investing in sustainable agricultural practices, renewable energy, and adaptive supply chain strategies can help mitigate environmental risks and ensure long-term profitability. Hence, this study seeks to address these gaps by examining the influence of business resilience dimensions on the economic sustainability of agro-allied SMEs in Osun State.

LITERATURE REVIEW

Theoretical Underpinning

Contingency Theory, asserts that there is no universally applicable approach to organizational management; rather, the effectiveness of managerial strategies depends on fitting organizational characteristics to environmental contingencies (Mahmud *et al.*, 2021; Onamusi, 2021). This theoretical perspective has been widely applied in strategic management, emphasizing that organizational outcomes are contingent upon the fit between internal capabilities and external conditions (Parast, 2022; Onamusi *et al.*, 2020). Within the context of agro-allied SMEs in Osun State, Contingency Theory underscores the necessity for firms to adapt their resilience strategies to environmental uncertainties, such as climate variability, market fluctuations, and policy changes, to achieve economic sustainability.

Business resilience is the ability of a firm to anticipate, prepare for, respond to, and recover from disruptions plays a critical role in ensuring the long-term viability of agro-allied SMEs (Mafimisebi *et al.*, 2023). However, the degree to which resilience translates into economic sustainability is contingent upon how well firms align their resilience strategies with external factors. For instance, SMEs operating in the agro-allied sector must account for climatic conditions, access to financial resources, regulatory frameworks, and technological advancements in designing their resilience mechanisms (Dada *et al.*, 2021). The Contingency Theory framework suggests that the success of these strategies depends on their appropriateness in addressing specific external pressures, highlighting the need for SMEs to be flexible and adaptive in their approaches to business continuity.

Recent studies emphasize that aligning resilience strategies with external contingencies, such as climate change adaptation policies, access to microfinance, and market demand shifts can significantly enhance the sustainability of agro-allied enterprises (Parast, 2022; Nenavani, & Jain, 2023). By leveraging contingency-based frameworks, SMEs in Osun State can strengthen their adaptive capacities, ensuring long-term profitability and resilience in an increasingly volatile business environment. Thus, contingency theory provides a compelling foundation for understanding how agro-allied SMEs can optimize their resilience strategies to achieve economic sustainability. Hence, the study hypothesize that *business resilience mechanisms have positive and significant effect on the economic sustainability on Agro-allied SMEs in Osun State, Nigeria*.

Business Resilience and Economic Sustainability

Recent empirical studies emphasize that various aspects of business resilience, including resilient capacity, behavioral resilience, business agility, and strategic resilience, positively impact economic sustainability. For instance, research highlights that organizational resilience, characterized by the ability to survive, recover, and grow amid crises, contributes to long-term business sustainability, particularly by enhancing the organization's adaptability to disruptive changes (Nosike *et al.*, 2024). This adaptability is crucial for managing crises effectively, thereby safeguarding economic sustainability through improved operational continuity and reduced vulnerability to disruptions. The link between resilience and sustainability is further supported by a study on 4,436 A-share listed companies in China and found that environmental, social, and governance (ESG) performance is significantly correlated with corporate resilience (Wang *et al.*, 2023). Improved ESG performance helps reduce financing costs and increase operational efficiency, which in turn enhances the resilience of businesses, especially those in the non-state and manufacturing sectors. This illustrates how incorporating sustainable practices not only

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mitigates risk but also contributes to enhanced economic resilience and overall sustainability. However, dissenting views exist regarding the interrelationship between resilience and sustainability. A systematic review indicates that while resilience and sustainability are often viewed as interdependent, there is still ambiguity around their operational definitions and metrics (Negri *et al.*, 2021). This lack of consensus may lead to differences in how resilience and sustainability contribute to business outcomes, depending on the specific context and type of challenges faced. Some researchers argue that without clear metrics, the integration of resilience into sustainability efforts may become inconsistent and less effective, potentially limiting the expected positive impact on economic sustainability (Leal *et al.*, 2024). Overall, while most studies support the notion that resilience capabilities positively impact economic sustainability, dissenting submissions highlight the need for a more unified framework and operational metrics. This indicates an ongoing discussion in the literature about how to maximize the synergistic potential of resilience and sustainability for economic sustainability.

METHODOLOGY

This study adopted a positivist research philosophy to examine how business resilience influences the economic sustainability of agro-allied SMEs in Osun State, Nigeria. Positivism is based on the premise that objective realities can be understood through scientific inquiry, relying on empirical evidence to establish relationships between variables (Duru *et al.*, 2024; Onamusi & Olukolu, 2023). Given this orientation, the study employed a quantitative research methodology, which enables the collection of numerical data for statistical analysis (Creswell & Creswell, 2017). A cross-sectional survey research design was used, allowing for the assessment of contextual factors influencing SME performance at a specific point in time (Bryman, 2016). This approach is advantageous due to its cost-effectiveness and its suitability for examining the external factors that affect business sustainability (Asikhia *et al.*, 2022; Ibironke *et al.*, 2025; Umukoro, *et al.*, 23).

The target population of this study comprised 120 registered agro-allied SMEs in Osun State, with the owner-managers serving as the unit of analysis. These individuals were selected because they play a critical role in strategic decision-making regarding business resilience, digital marketing, and sustainability (Atuahene-Gima & Ko, 2001). Engaging all employees was deemed inappropriate, as they might not provide accurate feedback on such strategic matters (Asikhia *et al.*, 2020). Furthermore, Osun State was chosen due to the sustainability challenges facing its agro-allied sector, a topic that has been relatively underexplored in existing research, which tends to focus on Lagos and the broader Southwest region (Akinroluyo *et al.*, 2024).

A total enumeration sampling method was employed, meaning all 120 owner-managers were included in the study. Since the entire population was accessible, there was no need for additional sampling techniques (Etikan & Bala, 2017). Data collection was carried out using a structured, closed-ended questionnaire, which ensured consistency and facilitated the efficient gathering of responses (Dillman *et al.*, 2014). The questionnaire was adapted from validated instruments used in previous studies and consisted of four sections: demographic variables, contextual factors, organizational performance, and moderating variables. Responses were measured using a six-point Likert scale ranging from Strongly Agree (6) to Strongly Disagree (1) (Onamusi 2020, Oyedokun *et al.*, 2023).

To ensure validity and reliability, a pilot study was conducted with employees from selected agro-allied SMEs in Ibadan, a location with similar business characteristics to Osun State. A sample size of 24 respondents (20% of the target population) was used, and 18 valid responses were obtained, yielding a 75% response rate. Construct validity was tested using Average Variance Explained (AVE), with all constructs exceeding the 0.5 threshold, confirming their validity (Fornell & Larcker, 1981; Hair *et al.*, 2019; Onamusi, 2021). Reliability was assessed through Cronbach's Alpha, with all variables scoring above 0.7, demonstrating strong internal consistency (Nunnally & Bernstein, 1994; Onamusi, 2019).

For data analysis, both descriptive and inferential statistics were employed. Descriptive statistics, including mean, standard deviation, and frequency distributions, were used to summarize the data (Field, 2018). Inferential statistics were conducted using SPSS version 25 Hypothesis testing was conducted at a 5% significance level ($p \leq 0.05$) to determine statistical significance (Cohen, 2013). The study categorized variables into two groups: independent variable: business resilience (measured by behavioral resilience, business agility, operational resilience, and strategic resilience) and dependent variable: economic sustainability.

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RESULTS AND DISCUSSION OF FINDINGS

Table 1: Demographic Characteristics of Respondents

Variables	Category	Frequency	Percentage
Gender	Male	62	53.9%
	Female	52	45.2%
Age	31-40	17	14.8%
	41-50	71	61.7%
	51-60	23	20.0%
	61-65	3	2.6%
Academic Qualification	ND/NCE	12	10.4%
	BSc/BA/HND	63	54.8%
	PGD/MBA/MSc/MA	39	33.9%
Job Level	Top Management	54	47.0%
	Middle Management	28	24.3%
	Operational Management	32	27.8%
Length of Service	6-10years	11	9.6%
	11-15years	85	73.9%
	16years+	18	15.7%

Source: Field Survey Results, 2025

This section consists of background and respondents' information that describes basic characteristics such as gender of the respondents, age, academic qualification, job level, and length of service. The results are presented in Table 1.

Table 1 presents the demographic and personal profile of respondents used for this study. Demographic and personal profile of respondents as shown in table 1. Profile of gender indicated that 62 respondents representing 53.9% were male, while, 52 respondents representing 45.2% were female, indicating that most of the respondents were male. Also, 17 respondents representing 14.8% were between 31-40 years, 71 respondents representing 61.7% were between 41-50years, 23 respondents representing 20.0% were between 51-60 years, and 3 respondents representing 2.6% were between 61-65 years, indicating that most of the respondents were between 41-50 years. Furthermore, 12 respondents representing 10.4% had ND/NCE, 63 respondents representing 54.8% had BSc/BA/HND, and 39 respondents representing 33.9% had PGD/MBA/MSc/MA. However, 54 respondents representing 47.0% were top management, 28 respondents representing 24.3% were middle management, and 32 respondents representing 27.8% were operational management. In addition, 11 respondents representing 9.6% had 6-10years, 85 respondents representing 73.9% had 11-15years, and 18 respondents representing 15.7% had 16years+.

$H_0$1: Business resilience dimensions have no significant influence on the economic sustainability of Agro-allied SMEs firm in Osun State.

Table 2: Regression Analysis on the Influence of Business Resilience Dimensions on Economic Sustainability of Agro-allied SMEs Firm in Osun State.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.697a	.486	.467	.32720
a. Predictors: (Constant), Strategic Resilience, Operational Resilience, Behavioural Resilience, Business Agility				

Source: Field Survey Results, 2025

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.039	4	2.760	25.778	.000b
	Residual	11.670	109	.107		
	Total	22.709	113			
a. Dependent Variable: ECOSus						
b. Predictors: (Constant), Strategicl Resilience, Operational Resilience, Behavioural Resilience, Business Agility						

Source: Field Survey Results, 2025

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Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.226	.499		.453	.651
	Behavioural Resilience	.270	.098	.250	2.749	.007
	Businss Agility	.163	.105	.143	1.554	.123
	Operational Resilience	.484	.100	.382	4.845	.000
	Strategicl Resilience	.045	.022	.153	2.078	.040
a. Dependent Variable: Economic Sustainability						

Source: Field Result, 2025

The multiple linear regression analysis was conducted to evaluate the impact of business resilience dimensions, specifically; behavioral resilience, business agility, operational resilience, and strategic resilience on the economic sustainability of agro-allied SMEs in Osun State. The null hypothesis ($H_0$1) posited that these business resilience dimensions would not significantly affect economic sustainability. The regression results, summarized in Tables 2, provide insights into the statistical relationship between these variables.

The Model Summary reveals an R-value of 0.697, indicating a moderately strong correlation between business resilience dimensions and economic sustainability. The R Square value of 0.486 suggests that approximately 48.6% of the variance in economic sustainability among agro-allied SMEs can be explained by the combined effects of the four resilience dimensions. With an adjusted R Square of 0.467, the model appears robust, though some variability remains unaccounted for, likely due to other factors not included in this analysis.

In the ANOVA table, the F-value of 25.778 and a significance level (Sig.) of 0.000 indicate that the overall regression model is statistically significant. This result implies that at least one of the resilience dimensions significantly contributes to predicting economic sustainability, leading to the rejection of the null hypothesis. The significance level of 0.000 ($p < 0.05$) further strengthens the confidence in this conclusion, highlighting a meaningful relationship between business resilience dimensions and economic sustainability.

Examining the Coefficients table provides specific insights into the contribution of each resilience dimension. Behavioral resilience has a positive effect ($B = 0.270$, $p = 0.007$), indicating a statistically significant relationship with economic sustainability. Operational resilience shows the strongest positive impact ($B = 0.484$, $p = 0.000$), suggesting it is the most influential factor in this model. Strategic resilience also contributes significantly ($B = 0.045$, $p = 0.040$), though its effect size is smaller compared to operational resilience. However, business agility ($B = 0.163$, $p = 0.123$) does not show a statistically significant effect on economic sustainability within this sample.

The findings indicate that behavioral resilience, operational resilience, and strategic resilience significantly influence the economic sustainability of agro-allied SMEs in Osun State, with operational resilience showing the highest impact. Business agility, however, did not demonstrate a statistically significant effect in this context. The results suggest that efforts to enhance economic sustainability in agro-allied SMEs could benefit from focusing on building operational and behavioral resilience, as well as strategic resilience.

Implication for Management

Based on the results of the analysis, the following implications for the management of agro-allied SMEs in Osun State, Nigeria, are highlighted. The study's findings underscore the critical role of business resilience in promoting economic sustainability within agro-allied SMEs in Osun State. Specifically, operational resilience, behavioral resilience, and strategic resilience emerge as influential factors. The significant positive impact of operational resilience implies that SMEs that invest in maintaining continuous operations, even during disruptive events, are better positioned to sustain their economic viability. This finding highlights the importance of robust operational practices, such as supply chain continuity and effective resource management, in bolstering resilience and fostering sustainable growth.

The behavioral resilience dimension's significant effect suggests that the adaptability and proactive behavior of SME employees contribute substantially to economic sustainability. Employees who demonstrate flexibility and adaptability during challenges likely foster a culture that supports quick recovery and continuity, positively influencing economic outcomes. Additionally, strategic resilience, although exhibiting a smaller effect size also plays a role in economic sustainability, suggesting that SMEs with forward-looking strategies and adaptive planning capabilities are better equipped to weather market fluctuations and competitive pressures.

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Contrarily, business agility did not show a significant effect in this context, which may imply that agility alone, without strong operational and strategic foundations, may not substantially contribute to economic sustainability. This insight suggests that agility must be combined with other resilience dimensions to create meaningful impact. The findings suggest that agro-allied SMEs in Osun State can enhance economic sustainability by focusing on operational and behavioral resilience and developing adaptive strategic plans. While agility alone may not drive sustainability, combining it with these core resilience practices can lead to stronger and more sustainable economic performance. Implementing these recommendations will help agro-allied SMEs in Osun State build resilient business models capable of withstanding environmental uncertainties and fostering long-term economic stability.

DISCUSSION, CONCLUSION AND RECOMMENDATION

Several recent empirical studies support the assertion that business resilience has a positive and significant effect on economic sustainability, as well as some with dissenting views. A study found that small and medium-sized enterprises (SMEs) with high levels of resilience, achieved through dynamic capabilities like adaptive learning, resource reconfiguration, and agility demonstrated significantly enhanced economic sustainability (Negri *et al.*, 2021). These firms could quickly adapt to environmental shocks, thus preserving their operational continuity and financial performance. The alignment with dynamic capability theory here is evident, as the firms' adaptability allowed them to maintain competitiveness and mitigate disruptions effectively (Quansah *et al.*, 2022; Onamusi & Adekunle, 2025). In the context of the COVID-19 pandemic, a study showed that business resilience, specifically in the form of strategic agility and proactive risk management, had a statistically significant impact on sustaining economic performance. Firms with strong resilience mechanisms managed to avoid severe financial setbacks, showcasing that resilient firms could leverage opportunities and respond to threats dynamically. This aligns with both dynamic capability and contingency theory, as the firms' adaptability to unforeseen events validated resilience as a critical factor in achieving economic sustainability (Onamusi, 2019; Settembre-Blundo *et al.*, 2021)

Another study explored resilience in digitalized business environments and found that firms capable of reallocating resources and adjusting digital strategies during crises reported better economic outcomes. Their findings support dynamic capability theory, as digitalization facilitated real-time adjustments, allowing these firms to mitigate economic losses (Khurana *et al.*, 2022).

Contrarily, a study argued that resilience alone does not consistently predict economic sustainability, especially in highly volatile markets. They found that firms in sectors like hospitality and retail struggled to achieve economic sustainability despite resilience strategies, highlighting contingency theory, where specific external conditions may limit resilience's effectiveness. Their findings suggested that resilience might need to be complemented by other factors, such as governmental support or sector-specific strategies, to impact economic sustainability meaningfully (Elshaer, & Saad, 2022).

Another dissenting view was presented by a scholar, who analyzed resilience in manufacturing versus service sectors. They observed that while resilience positively affected economic sustainability in the manufacturing sector, this was not as evident in-service sectors, where rapid market shifts required constant adaptation. The findings imply that contingency theory is relevant, as the effects of resilience on economic sustainability can vary depending on industry conditions and market characteristics (Furlan Matos Alves *et al.*, 2017).

Empirical support emphasizes on business resilience as a strategic factor enhancing economic sustainability, notably when resilience is framed within dynamic capabilities. These capabilities allow firms to reconfigure resources and adapt to change swiftly, validating the dynamic capability theory's emphasis on adaptability. However, dissenting studies remind us of contingency theory's relevance, highlighting that resilience's impact on economic sustainability is often context-dependent, particularly in sectors with high external volatility or complex market conditions.

Based on the empirical findings, this study concludes that business resilience, measured through behavioral resilience, business agility, operational resilience, and strategic resilience has a statistically significant effect on the economic sustainability of agro-allied SMEs in Osun State, Nigeria. The findings of this study are theoretically grounded in contingency theory, which emphasizes that the effectiveness of organizational strategies is dependent on external conditions. In the context of agro-allied SMEs, contingency theory emphasises on the need for businesses to adapt their resilience strategies in response to environmental uncertainties, regulatory changes, and market dynamics. The study confirms that no single resilience approach is universally optimal; rather, successful sustainability outcomes depend on how well SMEs align their resilience strategies with external contingencies such as economic conditions, technological advancements, and consumer behavior shifts.

Agro-allied SME managers should prioritize investments in systems and processes that enhance operational resilience. This could involve diversifying supply sources, developing robust risk management

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protocols, and implementing practices that ensure resource availability during disruptions. By focusing on operational stability, SMEs can create a reliable foundation for long-term sustainability. Given the significance of behavioral resilience, management should promote a culture that encourages adaptability, teamwork, and proactive problem-solving. This could be achieved through training programs, employee empowerment initiatives, and incentives for demonstrating resilience. Cultivating such a workforce will better position SMEs to respond dynamically to challenges and maintain continuity. Moreover, Agro-allied SMEs should focus on building strategic resilience by creating adaptable business strategies that account for potential future challenges. Strategic planning should involve scenario analysis, flexible budgeting, and periodic reviews to adjust to emerging market conditions. Management could also consider forming alliances with other businesses to share resources and knowledge, which could collectively enhance resilience. Although business agility did not independently affect economic sustainability, it remains a valuable asset when integrated with other resilience dimensions. SMEs should strive to be agile but ensure that agility complements a resilient operational and strategic foundation. This balanced approach could provide SMEs the ability to pivot quickly while maintaining stability and direction.

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