Business Resilience, Digital Marketing Capability and Sustainability of Agro-allied SMEs in Osun State

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Certification

This is to certify that this thesis **"Business Resilience, Digital Marketing Capability and Sustainability of Agro-allied SMEs in Osun State"** was carried out by **Patrick Olanrewaju OLATUNJI** with Matriculation number **LCU/PG/002490,** in the Department of Management & Accounting under my thorough supervision in the Faculty of Management and Social Sciences, Lead City University, Ibadan, Nigeria and that this work had not been previously submitted.

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Dedication

This thesis is dedicated to late Chief Olatunji Aderoju, Chairman/MD Best Option Petroleum.

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Abstract

The Agro-allied industry in Nigeria is a cornerstone of the country's agricultural value chain, linking raw agricultural products with industrial processing and supporting economic diversification efforts. Nonetheless, the Agro-allied industry in Osun State faces significant sustainability challenges that threaten its ability to contribute meaningfully to economic growth and rural development. This development is suggestive of challenges attributable to deploying Business Resilience (BR) and Digital Marketing Capability (DMC). Hence, this study examined the interaction of BR and DMC on performance of Agro-allied SMEs in Osun State, Nigeria. The cross-sectional survey research design was adopted. The population was 120 owner-manager of registered Agro-allied SMEs in Osun State. Total enumeration method was adopted given the small study population. A validated questionnaire was used to collect data. The Cronbach's alpha reliability coefficients for the constructs ranged from 0.733 to 0.917. The response rate of 95% was achieved. Data were analysed using descriptive and inferential statistics. Findings revealed that BR had positive and significant effect on sustainability (R^2= 0.397, F(1,277)=182.247, p=0.000). BR had positive and significant effect on environmental sustainability (Adj. R^2= 0.4401, F(4,109)= 23.189, p= 0.000). BR had positive and significant effect on economic sustainability (Adj. R2= 0.4401, F(4,109)= 23.189, p= 0.000). BR had positive and significant effect on social sustainability (Adj. R2= 0.4401, F(4,109)= 23.189, p= 0.000). DMC had positive and significant moderating effect on the interactions between BR and sustainability of Agro-allied SMEs firm in Osun State (ΔR2= 0.010, ΔF = 7.230, P= 0.008). This study concluded that was a statistically significant effect of BR on sustainability. Further analysis revealed that DMC is significant moderator given the linkage between BR and sustainability of Agro-allied SMEs in Osun State, Nigeria. Owner-managers of Agro-allied SMEs in Osun State should renew their commitment to these BR dimensions and advantage of revenue generation potential of DMC.

Keywords: Agro-allied industry, Business resilience, Digital marketing capability, Sustainability

Word Count: 300

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Chapter One

Introduction

1.1 Background to the Study

The agro-allied industry in Nigeria serves as a cornerstone of the country's agricultural value chain, linking raw agricultural products with industrial processing and supporting economic diversification efforts. The sector includes enterprises involved in processing agricultural outputs, manufacturing inputs like fertilizers and agrochemicals, and providing essential services such as transportation and storage. An analysis of this industry reveals its strategic relevance and that despite this robust role of the agro-allied industry in Nigeria, their performance overtime suggest that the industry is far from its full sustainable potential in significantly enhancing the nations' economic recovery. This discovery raises the question of what internal and industry-specific competencies can be harnessed to boost the sustainability of the agro-allied industry in Nigeria.

Globally the agro-allied industry encompasses a wide range of agricultural products and associated industries, has maintained significant relevance due to its crucial role in food security, economic development, and employment generation. As per the Food and Agriculture Organization (FAO), the agro-allied sector provides employment for nearly 27% of the global population, serving as a key driver for economic growth, especially in developing countries[1]. The industry also contributes significantly to the global Gross Domestic Product (GDP), particularly through the value addition of raw agricultural products and the stimulation of rural development[1]. In developing economies, agro-allied industries offer value-chain opportunities that help mitigate poverty and contribute to economic stability. As such, these industries have become

integral to international trade and supply chain networks, playing a pivotal role in stabilizing food systems amid various global challenges[2,3].

In North America, the agro-allied industry has demonstrated steady growth, primarily due to advanced technologies and large-scale farming practices. The United States and Canada have heavily invested in agricultural technologies, resulting in increased efficiency and production capacity. However, issues like climate change and labor shortages continue to challenge this industry, with extreme weather events leading to disruptions in agricultural supply chains[3,4,5]. Moreover, the debate over sustainable practices has led to increased scrutiny regarding greenhouse gas emissions from agricultural activities. In Europe, the agro-allied sector is underpinned by sophisticated regulations and the European Union's Common Agricultural Policy (CAP), which provides significant subsidies to farmers. This support ensures a stable output level and promotes sustainability. However, issues such as aging farmers, decreasing arable land, and concerns over pesticide use have affected the industry's growth[4,5,6]. There is a growing push for organic farming and eco-friendly practices, aligning with consumer demand for sustainable products, though these shifts come with the challenge of higher production costs.

In Asia, the agro-allied industry is highly diverse, ranging from subsistence farming in South Asia to technologically advanced agricultural systems in countries like Japan and China. In China and India, government initiatives and a focus on mechanization have boosted production, making these countries leading producers of key commodities such as rice and wheat[5,7]. However, the industry still faces significant challenges like water scarcity, land degradation, and fragmented landholding, which

hinder efficiency and scalability. The rapid urbanization and industrial expansion also lead to reduced agricultural land, posing further challenges to the industry.

In South America, particularly in countries like Brazil and Argentina, the agro-allied industry is a major economic driver, largely due to favorable climatic conditions and the availability of large tracts of arable land[8]. These countries are leading exporters of soybeans, sugar, and coffee, benefiting from global demand[4]. Nevertheless, issues like deforestation, loss of biodiversity, and land conflicts, especially in the Amazon basin, present critical challenges. Environmental concerns have led to increased international pressure to adopt more sustainable farming practices, which might affect production levels and export revenues. The African agro-allied industry is largely characterized by smallholder farming, and its performance is closely tied to climate variability and government support. The sector has a huge potential due to abundant land resources; however, productivity remains low due to limited access to financing, infrastructure deficits, and a lack of modern farming techniques[8,9,10]. In recent years, the focus on agro-processing and value addition has grown as part of efforts to diversify economies away from primary agricultural exports, yet challenges related to logistics and power supply persist.

The agro-allied industry in Nigeria plays a crucial role in the country's economy, providing essential inputs for agriculture and contributing to the overall agricultural value chain[4,5]. This sector includes companies involved in the processing of agricultural products, manufacturing of inputs like fertilizers, pesticides, and machinery, as well as the provision of services such as logistics and storage. The industry has gained significant relevance, particularly as the Nigerian government has been emphasizing the need to diversify the economy away from its heavy reliance on

oil. According to the National Bureau of Statistics (NBS), agriculture, alongside the agro-allied sector, accounted for over 25% of Nigeria's Gross Domestic Product (GDP) in 2023, highlighting its importance to the national economy[7,8,9].

One of the main drivers of the agro-allied industry's relevance in Nigeria is the increasing demand for processed food and agricultural products, both locally and for export. Rising population and urbanization have led to a growing market for food products, and this provides opportunities for the industry to add value to raw agricultural outputs. For instance, the development of rice mills, palm oil refineries, and cassava processing plants has played a pivotal role in ensuring food security and reducing the dependence on imported food products[8]. The industry also plays a significant role in job creation, particularly in rural areas, helping to reduce unemployment and improve the livelihoods of farmers and processors along the value chain.

Despite its potential, the agro-allied industry in Nigeria faces several challenges that hinder its growth and corporate existence. Inadequate infrastructure, such as poor road networks and irregular power supply, remains a significant bottleneck. The lack of reliable electricity affects the efficiency of processing plants, leading to higher operational costs, which ultimately impacts the profitability of businesses in the industry[11,12]. Furthermore, limited access to finance remains a critical issue, as small and medium enterprises (SMEs) in the agro-allied sector struggle to obtain the necessary funding to expand operations. The high cost of credit and stringent collateral requirements from financial institutions are major barriers for these businesses. Another significant issue affecting the agro-allied industry is the inconsistent policy environment. Although the government has implemented various

agricultural policies and incentives aimed at encouraging local production and processing, inconsistent implementation and abrupt policy changes have created uncertainty for investors. The closure of land borders in 2019, for instance, impacted agro-allied businesses by limiting the export of processed goods, leading to losses for many companies[13]. The lack of adequate policy support for research and development (R&D) in agricultural technologies has also limited the industry's ability to adopt modern practices, which are essential for improving productivity and competitiveness.

Furthermore, the challenges of climate change and insecurity are affecting the availability and stability of raw materials for the agro-allied industry. Increasing incidents of flooding, desertification, and erratic rainfall patterns have disrupted agricultural activities, which in turn affects the supply of raw materials to processing companies[14]. Additionally, the rising insecurity in various parts of the country, particularly in the North where agriculture is predominant, poses a significant threat to the sourcing of raw materials. Farmers are often unable to access their farmlands due to security concerns, which disrupts the entire value chain[10]. The sustainability challenges in Nigeria's agro-allied industry are multifaceted, encompassing economic, social, and environmental dimensions. Economically, the industry struggles with fluctuating productivity due to inconsistent policies, inadequate infrastructure, and limited access to financial resources[15]. The lack of efficient financing systems hinders the adoption of advanced agricultural technologies, affecting the long-term profitability and competitiveness of the sector. Additionally, price volatility for both inputs and outputs exposes farmers and agro-processors to financial instability, discouraging investment in sustainable practices. Socially, issues such as rural poverty, lack of access to education, and inadequate healthcare contribute to labor instability within the agro-allied industry[14,15]. Many rural communities depend on agriculture as

their primary livelihood, but poor working conditions and low wages make it difficult for workers to achieve a reasonable quality of life[12]. This lack of social infrastructure creates a barrier to the growth of a skilled and resilient workforce, which is essential for sustainable development. Moreover, the failure to integrate local communities into decision-making processes results in conflicts over land use and resource allocation, further impeding sustainable progress.

Environmental sustainability is another pressing challenge for Nigeria's agro-allied sector. Unsustainable farming practices, such as slash-and-burn agriculture and the overuse of chemical fertilizers, have led to soil degradation, deforestation, and loss of biodiversity[16]. The excessive reliance on synthetic inputs contributes to water pollution and reduces the long-term fertility of the soil, making it difficult to maintain productive agricultural land. Additionally, climate change poses a significant threat, with increasingly erratic weather patterns leading to unpredictable growing seasons, flooding, and drought[17]. These environmental issues make it harder for farmers to adopt practices that would ensure the longevity and health of their land, ultimately threatening the entire agro-allied value chain.

Addressing these sustainability challenges requires a multi-dimensional strategic options that can restore the industry into prosperity. Several perspective from the accounting and finance literature have argued that funding (access and management)bis key to enhancing the sustainability of this industry however, from the strategic management perspective, this study posit that given the level of challenges, dynamism, and disruptions to the activities of the agro-allied industry in Nigeria, possessing dynamic capabilities such an business resilience and leveraging on digital marketing capability hold the potential to enhancing the sustainability of the agro

allied industry in Nigeria[14,18]. For instance, behavioral resilience is crucial for ensuring economic, social, and environmental sustainability in Nigeria's agro-allied industry. It refers to the ability of individuals, communities, and organizations to adapt positively in the face of challenges and changes. In the agro-allied context, this resilience is reflected in farmers, workers, and stakeholders being able to adapt to disruptions such as price volatility, climate variability, and market shifts. By cultivating behavioral resilience, agro-allied workers can embrace new techniques and technologies that increase productivity while minimizing negative environmental impacts. Training and capacity-building initiatives that enhance problem-solving skills and adaptability among farmers and workers are fundamental to achieving economic stability and reducing rural poverty, thus supporting social and environmental sustainability[18].

Moreover, business agility is another important factor for addressing sustainability challenges in Nigeria's agro-allied industry. It refers to the ability of an organization to respond swiftly and effectively to changes and opportunities in the market. Agro-allied businesses must be able to adjust to fluctuating market demands, regulatory changes, and disruptions in supply chains to maintain economic viability. Business agility also ensures the adoption of sustainable practices that enhance competitiveness. For example, investing in renewable energy sources or shifting to organic farming methods can help agro-allied companies reduce their environmental impact while remaining economically viable[19]. Furthermore, agile businesses are better positioned to respond to the diverse needs of rural communities, thereby improving social welfare by creating job opportunities and supporting local economies.

Furthermore, Operational resilience plays a critical role in ensuring the continuity and stability of agro-allied operations in Nigeria, even in the face of unexpected disruptions. This resilience is essential for addressing economic, social, and environmental challenges as it allows agro-allied enterprises to withstand shocks, such as extreme weather events, supply chain disruptions, or disease outbreaks. To achieve operational resilience, the agro-allied industry must adopt practices such as diversification of supply sources, building infrastructure to mitigate climate risks, and developing contingency plans for emergencies[20]. This ensures a steady production and supply of agricultural products, which is crucial for economic stability. Additionally, operational resilience helps safeguard the livelihoods of those dependent on agriculture, thereby addressing social concerns and promoting sustainable development. Environmentally, resilient operations can integrate adaptive practices, such as water conservation and soil restoration, to ensure sustainable resource management.

In addition, Strategic resilience is fundamental to the long-term sustainability of the agro-allied industry in Nigeria. It involves the ability to anticipate future challenges, align with emerging trends, and develop proactive strategies that ensure the industry's sustainability in the long run. Strategic resilience requires agro-allied businesses to consider the impacts of climate change, market changes, and technological advancements while making decisions that support sustainable growth[18]. By incorporating sustainability into their core strategies, agro-allied firms can adopt renewable energy, efficient irrigation methods, and sustainable land-use practices, which ultimately reduce their environmental footprint. Furthermore, strategic resilience emphasizes collaboration with stakeholders, including local communities, government agencies, and research institutions, to create a supportive ecosystem for

economic and social development. By prioritizing long-term goals over short-term profits, the agro-allied industry can enhance food security, create sustainable livelihoods, and preserve natural resources for future generations[19]. In addition, digital marketing capability can plays a crucial role in enhancing business resilience and driving sustainability within the agro-allied industry in Nigeria. As the agro-allied industry faces challenges like market volatility, fluctuating consumer demand, and climate unpredictability, leveraging digital marketing tools offers an opportunity to create a more resilient and adaptive business environment. Digital marketing can helps agro-allied businesses connect directly with consumers, develop diversified revenue streams, and enhance efficiency, all of which contribute to achieving higher sustainability levels.

Also, digital marketing can expands the reach of agro-allied businesses by connecting them directly to a wider audience. In Nigeria, where rural farmers often face difficulty accessing lucrative urban markets, digital platforms such as social media, e-commerce websites, and mobile applications allow them to engage directly with consumers, eliminating multiple layers of intermediaries. This connection not only increases profitability for producers by offering better prices but also strengthens relationships with end consumers. By utilizing digital platforms, agro-allied businesses can gain a better understanding of consumer preferences, allowing them to adjust their production practices to meet demand more effectively. The enhanced ability to predict and respond to market trends, facilitated by digital analytics, leads to greater operational efficiency, reduced waste, and a more sustainable production cycle. Additionally, digital marketing capability can supports diversification of revenue streams, which is an essential component of business resilience. The agro-allied industry in Nigeria is often affected by seasonal production cycles and climatic risks,

which can lead to income instability for farmers and processors. Through digital marketing, agro-allied businesses can create and promote new value-added products, such as organic fertilizers, preserved agricultural goods, and herbal products. By using targeted online advertising, businesses can reach niche markets and diversify their offerings, thereby minimizing the risks associated with dependence on a single product line.

Furthermore, digital marketing fosters community engagement and collaboration among stakeholders in the agro-allied industry. Platforms like WhatsApp, Facebook, and agricultural forums enable farmers, agro-processors, and other stakeholders to share insights, discuss common challenges, and collaborate on solutions. These platforms facilitate knowledge sharing on best practices, new farming techniques, and sustainable technologies, thereby building a stronger and more resilient community that can collectively address common challenges. In addition, digital marketing campaigns can contribute to raising awareness about the environmental, social, and economic benefits of adopting sustainable practices. Promoting initiatives like responsible waste management, renewable energy use, and community development projects can enhance the public perception of agro-allied businesses. By establishing themselves as sustainable brands, agro-allied companies can attract investment, build consumer loyalty, and gain access to certification programs that offer additional market advantages. Ultimately, a positive brand reputation anchored on sustainability helps businesses maintain a competitive edge in the market, which is crucial for long-term resilience. Thus, the potential for digital marketing capability in enhancing business resilience and achieving higher levels of sustainability for the agro-allied industry in Nigeria needs to be examined. Addressing the sustainability challenges of the agro-allied industry in Nigeria requires a comprehensive strategy that incorporates

business resilience and digital marketing capability. Hence, this study intends to evaluate how the interaction between business resilience and digital marketing capability can address the sustainability of agro-allied industry in Nigeria.

1.2 Statement of Problem

The agro-allied industry in Osun State faces significant sustainability challenges that threaten its ability to contribute meaningfully to economic growth and rural development. Despite the critical role of the industry in providing value-added products, supporting agricultural productivity, and generating employment, several issues continue to impede its sustainability. These challenges include inadequate infrastructure, inconsistent power supply, lack of access to finance, limited knowledge of sustainable practices, and vulnerability to climate change. These factors negatively impact operational efficiency, increase production costs, and limit the ability of agro-allied companies to achieve long-term viability. Without addressing these sustainability issues, the agro-allied industry in Osun State may struggle to maintain its relevance and contribute effectively to the state's economic development and food security.

To address the sustainability challenges facing the agro-allied industry in Osun State, it is crucial to focus on enhancing business resilience and leveraging digital marketing capabilities as strategic tools. Business resilience is essential in helping agro-allied companies withstand disruptions such as supply chain interruptions, climate variability, and market fluctuations. By adopting resilience strategies such as diversifying supply sources, employing adaptive production techniques, and enhancing risk management practices companies can reduce vulnerability to external shocks and ensure consistent production[17]. This will help improve the industry's

ability to maintain its operations in the face of uncertainties and contribute to long-term sustainability. In addition to business resilience, digital marketing capabilities can play a significant role in enhancing the sustainability of the agro-allied industry in Osun State. The adoption of digital marketing tools and platforms can provide agro-allied companies with broader market reach, improved customer engagement, and access to real-time market information. By leveraging social media, e-commerce platforms, and digital advertising, companies can expand their customer base beyond local boundaries, attract new markets, and increase revenue streams[18]. Furthermore, digital marketing allows companies to gain insights into consumer preferences, enabling them to offer customized products and value-added services that align with market demands. This, in turn, can enhance customer satisfaction, foster brand loyalty, and strengthen the industry's competitive advantage. Moreover, digital marketing tools can facilitate efficient and cost-effective marketing, which is particularly crucial for small and medium-sized enterprises (SMEs) that often face budget constraints. By reducing marketing costs and enabling targeted advertising, digital marketing can improve the profitability of agro-allied companies, contributing to their financial sustainability[19]. The use of digital platforms also promotes transparency and facilitates traceability in the supply chain, which is increasingly important for consumers who demand information about the source and quality of their food products.

While business resilience is increasingly recognized as a key factor in the sustainability of enterprises, empirical evidence specifically addressing the effect of resilience on the sustainability of agro-allied companies in Osun State, Nigeria, remains limited. Studies conducted in other regions have established that resilient companies are more capable of withstanding operational disruptions, adapting to changing market conditions, and sustaining long-term profitability[20]. However, there

is insufficient research focused on agro-allied companies in Osun State, particularly in understanding how resilience-building measures such as behavioral resilience, business agility, operational resilience, and strategic resilience influence the sustainability of these enterprises. Existing literature on the agro-allied sector in Nigeria primarily highlights challenges such as inadequate infrastructure, limited access to finance, and policy inconsistency as barriers to sustainability[21]. Nevertheless, the link between business resilience and sustainability outcomes in this specific context has not been sufficiently examined. There is a need for empirical studies that explore how resilience practices can contribute to the continuity and sustainability of agro-allied companies in Osun State, thereby addressing a critical gap in the literature. In addition to the need for research on business resilience, another significant gap exists concerning the role of digital marketing capabilities as a moderator in the relationship between business resilience and sustainability in agro-allied companies. Although digital marketing has been found to enhance market access, customer engagement, and overall business growth, there is limited empirical evidence on its moderating effect on the interaction between resilience and sustainability in the agro-allied sector[22]. Specifically, in Osun State, where the agro-allied industry faces both infrastructural and market-related challenges, understanding how digital marketing capabilities influence the resilience-sustainability relationship could provide insights into effective strategies for sustaining these businesses.

Few studies have examined the moderating role of digital marketing in resilience-building[23,24,25,26]. Available literature suggests that digital tools can enhance business agility by providing more flexible communication channels and improving responsiveness to market changes[23,26,27,28]. However, research focusing on the agro-allied companies in Osun State is yet to investigate how the adoption of digital

marketing practices can strengthen the impact of resilience on sustainability outcomes. This gap points to the need for comprehensive studies that consider the interplay between resilience and digital marketing capabilities in shaping the sustainability of agro-allied companies. Given the multiple gaps in strategic management literature, this study intends to assess the interaction between business resilience, digital marketing capability, and sustainability of agro-allied companies in Osun State, Nigeria.

1.3 Aim and Objectives of the Study

The aim of this study is to assess the effect of business resilience (behavioural resilience, business agility, operational resilience, & strategic resilience) on sustainability of agro-allied Small and Medium Enterprise in Osun state Nigeria. To achieve this are the following specific objectives which are to;

i. examine the influence of business resilience dimensions on environmental sustainability of Agro-allied SMEs firm in Osun State

ii. assess the effect of business resilience dimensions on social sustainability of Agro-allied SMEs firm in Osun State

iii. evaluate the influence of business resilience dimensions on economic sustainability of Agro-allied SMEs firm in Osun State

iv. analyse the effect of business resilience on sustainability of Agro-allied SMEs firm in Osun State

v. determine the moderating effect of digital marketing capability on the association between business resilience and sustainability of Agro-allied SMEs firm in Osun State

1.4 Research Questions

The following research questions were addressed in this study

i. What is the influence of business resilience dimensions on environmental sustainability of Agro-allied SMEs firm in Osun State

ii. How does business resilience dimensions influence social sustainability of Agro-allied SMEs firm in Osun State

iii. What is the effect of business resilience dimensions on economic sustainability of Agro-allied SMEs firm in Osun State

iv. In what way does business resilience affect the sustainability of Agro-allied SMEs firm in Osun State

v. What is the moderating effect of digital marketing capability on the association between business resilience and sustainability of Agro-allied SMEs firm in Osun State

1.5 Hypotheses of the Study

The following null hypotheses were tested in this study

$H_0$1: Business resilience dimensions have no significant effect on environmental sustainability of Agro-allied SMEs firm in Osun State

$H_0$2: Business resilience dimensions have no significant effect on social sustainability of Agro-allied SMEs firm in Osun State

$H_0$3: There is no significant influence on business resilience dimensions on economic sustainability of Agro-allied SMEs firm in Osun State

$H_0$4: Business resilience has no significant effect on sustainability of Agro-allied SMEs firm in Osun State

$H_0$5: Digital marketing capability has no significant moderating effect on the association between business resilience and sustainability of Agro-allied SMEs firm in Osun State

1.6 Significance of the Study

This research holds considerable importance for various stakeholders, including management of agro-allied business operators, government entities, academic institutions, and society, in the following manners:

This study offers empirical insights to agro-allied business operators in Osun State regarding the significance of business resilience and digital marketing capabilities essential for implementing various sustainability measures, including environmental, social, and economic sustainability. This study aims to furnish the government with empirical data to validate the impact of business resilience and digital marketing capabilities on the sustainability of agro-allied industry operators in Osun State, thereby facilitating the formulation and implementation of favourable policies. This study also addressed certain gaps in the current literature regarding business resilience and digital marketing capability. This study will examine the conceptual model assessing the sustainability impact of business resilience and digital marketing

capability within the agro-allied industry in Nigeria, thereby contributing to recent research and addressing the limited empirical literature on the sustainability effects of these factors among agro-allied management scholars in Nigeria. It serves as a reference for students' learning and establishes a foundation for advanced studies in agro-allied SMEs management, thereby advancing the frontiers of knowledge. This study is advantageous to society as a whole, as superior performance by agro-allied business operators can lead to expansion and opportunities for job and income generation.

1.7 Scope of the Study

This study is focused on evaluating the impact of business resilience on the sustainability of agro-allied small and medium enterprises in Osun State, Nigeria. The study specifically examined the impact of business resilience dimensions behavioral resilience, business agility, operational resilience, and strategic resilience on the environmental, social, and economic sustainability of agro-allied small and medium enterprises in Osun State, Nigeria. This study examined how digital marketing capability moderates the relationship between business resilience and the sustainability of agro-allied SMEs in Osun State, Nigeria. The research encompassed one hundred twenty (120) registered owner-manager agro-allied SMEs in Osun State, Nigeria. This study is situated in Osun State, as previous research has predominantly concentrated on Lagos State and the Southwest region. However, the distinctive characteristics of agro-allied enterprises in Osun State remain unexamined, thus justifying the selection of Osun State as the research context for this investigation. This study was conducted from 2023 to 2024.

1.8 Limitation of the Study

This study has limitations that must be acknowledged to facilitate future research opportunities. This research specifically focuses on Agro-allied SMEs in Osun State, Nigeria. The cross-sectional research design of the study precludes any conclusions regarding the long-term effects of business resilience and digital marketing capability on the sustainability of Agro-allied SMEs in Osun State, Nigeria. Despite this limitation, the study remains valid as its objective was to examine the interaction between business resilience and digital marketing capability on the sustainability of Agro-allied SMEs necessitates a one-time cross-sectional data collection, thereby leveraging the strengths of the research design. The utilized questionnaire possesses certain limitations as a data collection instrument. The researcher ensures that the questionnaire items are written in clear, unambiguous English to mitigate these issues and enhance response rates. The researcher guarantees the anonymity and confidentiality of respondents and secures approval from the relevant human resource managers of the selected DMBs to conduct the study, thereby enhancing the researcher's access to the respondents. The statistical assumptions, sample size requirements, and other issues pertaining to inferential statistics were significant concerns for testing study hypotheses. Nonetheless, these challenges were surmounted by modifying the data treatments and augmenting the study's sample size. Notwithstanding these constraints, this research offers significant conceptual, empirical, theoretical, and practical implications for the management of Agro-allied SMEs in Nigeria.

1.9 Operationalisation of Research Variables

The variables in this study are classified into three – dependent, independent, and moderating variables. The independent variable business resilience (X) is measured by;

behavioural resilience, business agility, operational resilience, & strategic resilience. The dependent variable sustainability (Y) is measured by environment, social, and economic sustainability. The moderating variables (Z) is digital marketing capability measured as . The variables are operationalized below:

$Y = f(X)$

Y = Dependent variable: Sustainability (SBT)

X = Independent variables: Business Resileince (BUR)

Z = Moderating variables: Digital Marketing Capability (DMC)

The independent variable- Business Resilience (BUR) is measured as:

x_1 = Behavioural Resilience (BER)

x_2 = Business Agility (BUA),

x_3 = Operational Resilience (OPM)

x_4= Strategic Resilience (STR)

The dependent variable- Sustainability (SBT) Y is measured as:

y_1= Environmental Sustainability (ENS)

y_2= Social Sustainability (SOS)

y_3= Economic Sustainability (ECS)

This study incorporates on moderating variables (Z) – Digital Marketing Capability (DMC) is considered

Z = Digital Marketing Capability (DMC)

1.10 Operational Definition of Terms

Agro-allied Enterprise: An agro-allied enterprise is a business involved in both agriculture and related industries, such as food processing, input supply, and distribution, adding value to agricultural products and contributing to the supply chain.

Behavioral Resilience: For agro-allied enterprises, behavioral resilience refers to the adaptability of individuals and teams within the organization to cope with changes, such as shifts in demand or supply challenges, while maintaining productivity and a positive attitude.

Business Agility: Business agility in agro-allied enterprises is the ability to rapidly adjust to changes in the market, production processes, or supply chain to seize new opportunities and minimize risks.

Business Resilience: In agro-allied enterprises, business resilience refers to the ability of a business to adapt and recover quickly from disruptions, such as market fluctuations or adverse weather conditions, while continuing operations and ensuring stable growth.

Digital Marketing Capability: In the context of agro-allied enterprises, digital marketing capability is the ability to effectively use digital tools, such as social media and online platforms, to reach customers, promote products, and enhance market presence.

Economic Sustainability: Economic sustainability in agro-allied enterprises is about maintaining profitability and financial stability over time by optimizing production efficiency, reducing costs, and developing resilient market strategies.

Environmental Sustainability: For agro-allied enterprises, environmental sustainability is the practice of minimizing harmful environmental impacts, such as soil degradation or water pollution, by adopting eco-friendly production methods and conserving natural resources.

Operational Resilience: In the context of agro-allied enterprises, operational resilience is the capacity to maintain essential functions and deliver products effectively, despite disruptions like equipment failures, labor shortages, or transportation challenges.

Social Sustainability: Social sustainability in agro-allied enterprises refers to creating fair working conditions, supporting local communities, and ensuring social welfare, which contributes to a stable and motivated workforce.

Strategic Resilience: Strategic resilience for agro-allied enterprises is the ability to modify long-term plans and strategies in response to changing industry trends, regulations, or competitive dynamics, ensuring sustained growth and market presence.

Sustainability: Sustainability in agro-allied enterprises refers to practices that ensure long-term economic viability, environmental conservation, and social well-being while producing agricultural and allied products.

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Chapter Two

Literature Review

This chapter comprises the reviews of relevant literature in line with the research topic. The review was done on the variable connecting the independent variable and the dependent variables as reflected in the model presented in this study. In other words, all the variables in the conceptual framework which include conceptual, theoretical and empirical were reviewed to illuminate understanding of the interactions among the variables. The theoretical framework and model for the study are clearly stated including the identification and measurement of variables. The researcher discussed identified gaps in literature as well as a summary of the reviewed literature.

2.1 Conceptual Review

This section explains in details major variables that are related to the subject matter of the relationship between business resilience, business sustainability. The conceptual review emphasis shall be on the concepts of business resilience (resilient capacity, behavioral resilience, business agility, and strategic resilience), and business sustainability (environment, social, & economic) as well as digital marketing capability as moderating variable.

2.1.1 Sustainability

It is possible to describe business sustainability as all of the actions that are carried out by a company in order to generate long-term shareholder value. This is accomplished by embracing the possibilities and managing the risks that are a direct result of an organization's economic, environmental, and social responsibilities1. Embracing the

possibilities and effectively managing the risks that arise as a consequence of an organization's economic, environmental, and social obligations are the activities that constitute business sustainability. These actions are undertaken with the goal of looking for ways to create long-term shareholder value. In a similar vein, the word "business sustainability" refers to the comprehensive efforts that a company does, which encompasses both its demand and supply chain network, in order to improve the performance of their business and, as a result, ensure the firm's continued existence over the long term3. The concept of business sustainability is an essential component of the business planning and management cycles that are implemented across all organizations, and it is also an essential component of any risk management process4. In addition to conserving, maintaining, and improving the environmental, social, and economic resources that are required for the future5, the goal of business sustainability is to consistently meet the demands of the company and its stakeholders, as well as to ensure that the interests of the organization are protected. As a result, the goal of business sustainability is to assist the company in developing a strategy that is both balanced and integrated in order to fulfill its economic, environmental, and social duties to its stakeholders and stakeholders. By doing so, it enables the emergence of an organization that is more resilient and the development of knowledge capabilities that are distinctive, both of which will make a company sustainable over the long run.

Business sustainability requires organisations to put into consideration long-term economic, environmental, and social effects when formulating the production and other policies to ensure the achievement of its predetermined goals and objectives[3,4]. In the same vein, organisations should implement effective sustainability practices and policies as these can drive competitive advantage for an organisation and power it towards a more innovative, sustainable and green future[7].

According to some scholars, business sustainability is important as it expands an organization's image and status, reduce costs, and augments the local economy, all of which lead to advanced business, stronger and improved local communities for operations[8]. For any economy to survive for short term and long term purpose, then it must be able to meet the 'three bottom line' which has to do with the ability of the firms to achieve sustainability in the environment, human and economic objectives of the firms[4,5,6]. Furthermore, business sustainability ensures the survival of both businesses and a nation's economy[9].

Several studies have identified the social, environmental, and economic dimensions as the components of business sustainability[4,5]. Business sustainability is an act that is consists of three components namely; social, environmental, and economic effects which allies with organizations current and future operations and the ability of the business to meet present needs while ensuring its objectives and long-term survival can be achieved effectively and efficiently[10]. Business sustainability requires quixotic leaders who look at more than just the 'bottom line' of a firm's financial position but review all resources at their disposal and how to align the resources to achieve their predetermined goals and objectives[11]. They adopt managerial strategies that integrate financial, environmental, and social concerns. Past studies opined that among the three components of business sustainability namely: social, environmental, and economic; the economic dimensions of business sustainability is more vivacious for the firm has it guarantees its survival and growth amidst the blustery and unpredictable competitive environment[8,9].

The benefit of business sustainability has been identified through development of more sustainable business practices, efficiency in operations will increase[12]. With

better use and conservation of resources, operations will be streamlined and costs will decrease. Business sustainability can be supportable with the continuous implementation of the following principles including; leadership, stakeholders value, system thinking, develop people capability, continuous improvement, information and knowledge management, business responsibility, and sustainable results[13]. The advantages of business sustainability includes; improved brand image, cost reduction, compliance with regulations, attract the right investors, attract the right employees, and please your shareholders[14]. Based on the opinion of past studies, this current research defines business sustainability as the management and coordination of all activities and resource effectively and efficiently in order to achieve sustainable competitive advantage, enhanced profits, incremental market share, improve general growth and performance of the firm.

Sustainability has been defined by different scholars with varying perspectives, influenced by the historical evolution of the concept and recent developments in literature. The term "sustainability" first gained prominence in the 1987 Brundtland Report, which defined it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This foundational definition is broad, emphasizing intergenerational equity and has influenced subsequent scholarly definitions[15].

Many scholars have built upon the Brundtland definition by emphasizing different aspects. For instance, a researcher introduced the concept of the "triple bottom line," highlighting that sustainability involves three interconnected pillars: economic viability, social equity, and environmental protection[15]. This approach suggests that sustainability is not solely an environmental issue but requires an integrated balance

among different domains, which has become a cornerstone of modern sustainability discourse. Similarly, sustainability involves a system's ability to maintain its viability by using natural resources responsibly, considering both ecological and social constraints[16].

On the other hand, some scholars have provided more specialized views of sustainability, particularly in terms of industry-specific applications. For example, focus on "environmental sustainability," defining it as the maintenance of natural capital, indicating that the environment should be protected against degradation[17]. This narrower definition focuses explicitly on the ecological aspect, distancing itself from the socio-economic elements highlighted by Elkington.

A dissenting opinion comes from scholars, who argues that the concept of sustainability is often ambiguous and context-dependent, leading to different interpretations based on socio-political agendas[18]. Redclift questions the practicality of achieving a balanced approach between economic growth and environmental preservation, suggesting that sustainability might be more of an ideal than an achievable goal in its current conceptualization. Recent literature has evolved to address the need for operationalizing sustainability in specific industries, including the agro-allied sector. In the agro-allied industry, sustainability is often linked to practices that ensure the long-term viability of soil fertility, biodiversity, and water resources. Scholars focus on sustainable agricultural intensification, which aims to increase food production from existing farmland while minimizing environmental impacts[19]. This approach is critical for the agro-allied industry, which must balance productivity with ecological preservation to meet global food demands.

Furthermore, the concept of "regenerative agriculture" has emerged as a recent development in sustainability literature. Regenerative agriculture goes beyond sustainable practices by actively seeking to restore ecosystems, enhance biodiversity, and improve soil health[20]. This approach is particularly relevant for the agro-allied industry as it addresses the challenges of soil degradation and loss of biodiversity while maintaining agricultural productivity. In conclusion, sustainability is a multifaceted concept, with different scholars emphasizing various dimensions, such as environmental, economic, or social aspects. While some definitions align closely with the Brundtland Report's broad focus, others offer more specific or critical perspectives. The relevance of sustainability to the agro-allied industry is evident through its focus on maintaining productivity while preserving natural resources. Recent developments, like regenerative agriculture, highlight the industry's move towards not just sustaining but actively enhancing ecological health, indicating a dynamic shift in how sustainability is approached and implemented. In this study, environmental, social, and economic sustainability are discussed as dimensions or measurement of sustainability.

2.1.1.1 Environmental Sustainability

Environmental sustainability has been a topic of extensive research and discussion for decades. Conceptually, it refers to the responsible interaction with the environment to avoid depletion or degradation of natural resources, ensuring long-term environmental quality and health. Historically, the concept of environmental sustainability emerged in the 1960s and 1970s as societies began grappling with the ecological consequences of rapid industrialization. The seminal work "The Limits to Growth emphasized the finite nature of the planet's resources, marking a significant turn towards sustainability

as a critical discourse[21]. Since then, numerous scholars have contributed varying definitions of environmental sustainability.

Recent literature shows consensus among several scholars who define environmental sustainability as the capacity to maintain ecological processes, biodiversity, and productivity over time. For instance, environmental sustainability as meeting human needs without depleting or degrading natural resources, allowing future generations the same ability[22]. Similar views are echoed by scholars, who define environmental sustainability as creating conditions under which human and natural systems can thrive symbiotically[15,16]. These scholars emphasize the importance of maintaining a balance between consumption and the replenishment of natural systems, thereby underlining the central feature of environmental sustainability intergenerational equity. In contrast, other scholars provide dissenting perspectives that emphasize different aspects of environmental sustainability. Environmental sustainability should not only focus on maintaining the status quo of ecological systems but should also actively seek social change to transform exploitative relationships with nature[23]. Similarly, the idea of sustainability has been overly simplified in mainstream discourse and that it needs to encompass the dynamic interaction between social, economic, and ecological factors[24]. These dissenting opinions emphasize that addressing socio-economic inequalities and political dimensions is just as crucial for achieving sustainability as managing ecological resources.

A variety of features characterize environmental sustainability. According to recent studies, key features include resource renewability, ecological integrity, and resilience[25]. Renewability, as highlighted by scholars, focuses on using resources at a rate at which they can be replenished[26]. Ecological integrity ensures that ecosystems

can maintain their structure and function under various stressors[27]. Finally, resilience the ability of a system to absorb disturbances and still retain its basic function is an important component of sustainability, stressed by authors[28]. The relevance of environmental sustainability to the agro-allied industry is substantial. The agro-allied industry depends heavily on natural resources, such as soil and water, which necessitate careful and sustainable management to ensure long-term productivity. For example, adopting environmentally sustainable practices such as crop rotation, organic fertilizers, and water conservation techniques can significantly improve soil health and crop yields, thereby aligning production with sustainability goals. A study suggests that sustainable agricultural practices not only improve yields but also enhance biodiversity, which in turn contributes to the stability and resilience of agro-ecosystems[29].

Recent developments in literature emphasize the role of technology and innovation in achieving environmental sustainability. Recent conceptual work highlights the synergy between circular economy principles and sustainability, promoting the reuse, recycling, and reduction of waste in industries, including agriculture[30]. Additionally, studies advocate for digital technologies such as precision agriculture, which leverages data analytics to optimize resource use, thereby reducing the environmental impact of agricultural practices[31]. Environmental sustainability encompasses a wide range of perspectives, ranging from resource management to socio-political dimensions of ecological interaction. The features of environmental sustainability renewability, integrity, and resilience are critical for the agro-allied industry, especially in ensuring long-term productivity. Recent literature further suggests that integrating technology can significantly enhance sustainability outcomes, making it a crucial avenue for future research and policy-making in this area.

2.1.1.2 Social Sustainability

Social sustainability emerged as an essential component of the broader concept of sustainable development, which gained prominence after the 1987 Brundtland Commission report titled "Our Common Future." The report highlighted that sustainability consists of three interconnected pillars: economic, environmental, and social sustainability. Historically, the focus on environmental sustainability overshadowed the social aspect, leading scholars to start exploring a more holistic understanding of sustainability that also emphasized human and societal well-being. Many scholars define social sustainability by emphasizing well-being, equity, and community development. Social sustainability as the capacity of a society to support equitable opportunities, ensure justice, and fulfill individuals' basic human needs[32]. The core idea is that communities must thrive socially and economically while ensuring quality of life is maintained for current and future generations. Similarly regard social sustainability as comprising social equity, community cohesion, and a good quality of life[33]. These definitions converge on social sustainability as primarily concerned with maintaining social equity, supporting communities, and fostering an inclusive society.

Similarly, social sustainability to involve four essential dimensions: equity, participation, social inclusion, and security[34]. The emphasis is placed on creating environments that encourage citizen involvement and access to basic resources and opportunities. This perspective aligns with previous scholars' definitions, suggesting that social sustainability is about creating a just and inclusive society. In recent literature, authors such further build on these ideas by arguing that policies for social

sustainability should target reducing social inequalities, improving accessibility, and building strong community networks to create resilient societies[35].

On the other hand, some scholars offer alternative perspectives on social sustainability. Social sustainability should not only be concerned with fulfilling basic needs and social equity but should also include cultural sustainability and maintaining desirable ways of life[36]. They propose a broader interpretation encompassing 'maintenance sustainability' (meeting basic needs), 'bridge sustainability' (changing behaviors to be more sustainable), and 'development sustainability' (preserving traditions and cultures). Their view provides a more culturally nuanced understanding that goes beyond the traditional notions of equity and well-being. A offer a further divergence by focusing on resilience as a critical feature of social sustainability[37]. They argue that building resilience at the community level is crucial for social sustainability, particularly in response to increasing environmental and social challenges such as climate change, inequality, and economic instability. This perspective is particularly relevant to contexts that face persistent challenges, highlighting that adaptability and resilience must be core elements of socially sustainable communities.

Key features of social sustainability include equity, inclusiveness, resilience, participation, and community cohesion. These features are highly relevant to the agro-allied industry, especially in fostering sustainable rural livelihoods and enhancing the well-being of farming communities. For instance, equity in access to resources and markets is critical to ensuring that all farmers, particularly smallholders, have opportunities to improve their livelihoods. Inclusiveness is also crucial, as it encourages the participation of marginalized groups, such as women and indigenous communities, in agro-allied activities, thereby boosting productivity and community

welfare. Moreover, building resilience is particularly relevant for the agro-allied sector, which is vulnerable to environmental risks such as climate change. Social sustainability, through building resilient farming systems and promoting community networks, can help mitigate the adverse effects of these risks. Therefore, the adoption of socially sustainable practices in the agro-allied industry could lead to enhanced social capital, improved quality of life, and a more equitable distribution of the benefits of agricultural production. Recent conceptual studies have emphasized the integration of technology and innovation within the framework of social sustainability. Digital transformation, particularly in agriculture, can be leveraged to improve social sustainability outcomes by enhancing access to information, reducing inequalities, and fostering participatory decision-making processes[38]. This development aligns with the growing role of social media and technology in empowering communities and promoting more equitable access to resources and opportunities.

Another notable development is the recognition of social sustainability's role in addressing mental health and well-being in rural areas. According to a researcher, promoting mental health should be considered an essential aspect of social sustainability, especially in industries like agriculture where economic pressures and environmental uncertainties significantly impact farmers' psychological well-being[39]. This expands the understanding of social sustainability to include aspects of mental and emotional health, which is crucial for building a resilient and thriving agro-allied community. The concept of social sustainability has evolved from a relatively narrow focus on equity and community well-being to encompass resilience, cultural sustainability, and mental health. While many scholars share a common definition focused on equity and social cohesion, some offer broader interpretations, emphasizing cultural aspects and resilience. In the agro-allied industry, social

sustainability is essential for promoting equitable resource access, fostering inclusive participation, and enhancing resilience against environmental challenges. Recent developments in literature have highlighted the importance of digital technology and mental health, thus broadening the scope and practical relevance of social sustainability in various sectors, including agriculture.

2.1.1.2 Economic Sustainability

Economic sustainability, as a concept, has evolved significantly over time, rooted in the broader discussion of sustainable development. The origins of economic sustainability can be traced back to the 1987 Brundtland Report, which outlined sustainability as a process that "meets the needs of the present without compromising the ability of future generations to meet their own needs"[40]. This holistic approach to sustainability incorporates economic, social, and environmental dimensions, and the economic aspect particularly emphasizes efficient and responsible resource management to ensure long-term economic growth. Many recent conceptual studies converge on a similar definition of economic sustainability. Economic sustainability involves maintaining the integrity of natural and human-made capital to ensure economic resilience over time[41]. The "triple bottom line," highlighting economic sustainability as a key pillar alongside social and environmental sustainability, thereby suggesting that businesses should focus on economic viability while also supporting social equity and environmental health[42]. This definition remains popular among scholars who believe that economic sustainability is centered around balancing profitability with responsible resource utilization, reducing waste, and promoting long-term growth[43].

On the other hand, dissenting views on the concept have emerged in recent literature, notably in works[44]. Economic sustainability should not be exclusively about profits but rather about ensuring the survival of the economic system through interdependence with the ecological and social systems[45]. Critiques conventional definitions of economic sustainability as being too growth-centric, proposing a "prosperity without growth" framework. This perspective emphasizes the need for a new economic model that prioritizes well-being and ecological balance over continuous economic expansion, particularly in light of growing concerns about climate change and resource depletion[46].

The features of economic sustainability include efficient resource use, risk management, and resilience. These characteristics are critical in ensuring a sustainable flow of resources and income generation for industries. From the perspective of the agro-allied industry, economic sustainability is crucial for managing natural resources, such as soil and water, to maintain consistent crop yields and support livelihoods. A feature like resource efficiency is particularly relevant, as it supports practices such as precision agriculture and organic farming, which help minimize environmental impact while maintaining productivity[47]. Moreover, resilience as a feature ensures that agricultural systems can adapt to climate variability, an increasingly pertinent issue for the agro-allied sector[48]. Recent literature highlights the importance of integrating technological innovations into achieving economic sustainability. For instance, the role of digital technologies, such as blockchain and Internet of Things (IoT), in enhancing economic sustainability within the agricultural sector by promoting transparency, reducing waste, and ensuring efficient use of resources[49]. Moreover, the concept of a "circular economy" as an approach that enhances economic sustainability by creating closed-loop systems to reduce waste and maximize the use of resources,

particularly in agro-allied value chains[50]. This development signifies a shift from traditional, linear models of production to more sustainable practices aimed at prolonging the life of resources. Economic sustainability encompasses a wide range of definitions and approaches, with the general consensus focusing on the responsible use of resources to support long-term economic growth[51]. The historical foundation laid by the Brundtland Report and later refined by scholars like Daly and Elkington emphasizes a balance between economic and environmental considerations[52]. Dissenting voices like Jackson's call for a paradigm shift that prioritizes well-being over growth. In the agro-allied industry, economic sustainability is vital for ensuring resource efficiency, resilience, and long-term viability, with recent advancements emphasizing technological integration and circular economy principles.

2.1.2 Business Resilience

Since the financial crisis that organization experienced, the phrase "resilience" has become increasingly prevalent in the discourse and documents that are associated with regulatory policy and supervision. The dynamic capacity of a complex, adaptive, nonlinear system to self-repair in response to stress or transition to a new stable equilibrium is the emphasis of this idea, which has its roots in a variety of disciplines and has attracted attention from a wide range of researchers[53]. The power of a system to avoid disturbance and rearrange itself while going through change in such a way that it still maintains essentially the same function, structure, identity, and feedbacks is a broad definition of resilience[54]. It is often accepted in the business sector that resilience refers to crisis management and business continuity, as well as the ability to respond to any and all forms of risks that an organization may be exposed to, which can include anything from internet threats to natural disasters and a great number of other types of risks[55]. As a result,

organizations all over the world have adopted a strategic approach to adapting to their surroundings, reorganizing and restructuring their activities, and working toward the achievement of set goals and objectives through the use of business resilience[56]. The ability of an organization to quickly react to disturbances while simultaneously maintaining continuous business operations and protecting people, assets, and total brand equity is what we mean when we talk about business resilience. The ability of an organization to deal with disruptions and unexpected events by maintaining strategic awareness and a related operational management of both internal and external shocks is what we mean when we talk about businesses being resilient.

A scholar had previously described business resilience as the capacity of an organization to effectively absorb, create situation-specific answers to, and ultimately engage in transformative activities in order to capitalize on disruptive surprises that have the potential to jeopardize the survival of the organization[57]. Therefore, business resilience extends beyond disaster recovery by providing post-disaster measures to avoid costly downtime, shore up vulnerabilities, and preserve business operations in the face of subsequent, unanticipated breaches. This is an example of how business resilience goes beyond disaster recovery. Understanding that workflows need to be kept in order for businesses to survive unforeseen occurrences is the first step toward achieving business resilience. This recognition is necessary in order to keep business operations running smoothly[58]. When it comes to corporate resilience planning, one of the challenges that is sometimes disregarded is the human factor. This is because individuals who are situated in a chaotic environment need to be prepared and taught on how to respond appropriately[59]. The ability to anticipate a disturbance, to resist it by adapting, and to recover by restoring the pre-perturbation state as much as possible in order to maintain the continuous and improve the performance of the firm is what another researcher meant

when they defined business resilience. According to the same point of view, business resilience is a constantly shifting target that contributes to performance during both business-as-usual and crisis scenarios. This type of performance demands businesses to be extremely reliable and adaptable, and it also enables them to manage problems that are disruptive for the organization[60].

There are a number of ideas that emerge from definitions of organizational resilience that are related to business resilience. These notions include awareness of the environment, level of preparation, anticipating of disturbances, adaptability, and the capacity to recover[61]. The degree to which an organization is able to generate resistance or absorb shock in response to disturbances in its environment is a reflection of the organization's potential level of readiness. Managers of resilient companies should have an understanding of the environment in which their firms operate at the board level, and they should be aware of any changes that may pose a threat to their people, facilities, activities, services, and supply chains[62]. Managers are required to have an understanding of the increasingly complex cultural, political, legal, regulatory, economic, technological, natural, and competitive context in which they operate. Additionally, they are required to monitor key issues and trends that may have an impact on the objectives of the organization as well as the perceptions and values of external stakeholders[63]. Business resilience will enable organizations to improve their competencies and their capacity to adapt to the environment, which will allow them to overcome the impacts of big disasters.

The following are three aspects that contribute to the resilience of a business: the organization's resilience must be appropriate for its intended purpose. The leaders of an organization need to discover a balance between preventative management, mindful action, performance optimization, and adaptive innovation that is suitable for their

organizational mission and the industry in which they operate. There is no single formula. When it comes to managing tensions, leaders are required to manage the tensions that arise from the need to be both progressive and defensive, as well as consistent and adaptable. The ability to think paradoxically enables leaders to move beyond the "either/or" paradigm and toward the "both/and" outcomes[64].

To maintain organizational resilience, consistent work is required. It is possible for businesses to sleepwalk into disaster if preventative control, attentive action, performance optimization, and adaptive innovation are neglected. These practices will deteriorate over time and leave organizations vulnerable to failure. The management of an organization's information, including its physical, digital, and intellectual property, must be maintained for the entirety of its lifecycle, from the point of origin to the point of destruction[64]. Control (many independent and redundant levels of security for all important assets like as people, product, property, and information, among other things) and compliance (standard operating procedures, protocols, and training) are both necessary components of organizational resilience. As a prerequisite for organizational resilience, proactive management and a culture that places a strong emphasis on recognizing and responding to both opportunities and dangers are required. The enhancement, refinement, extension, and utilization of pre-existing assets and capabilities, technologies, and paradigms are all components of organizational resilience. The process of changing before the cost of not changing becomes too great is an essential component of organizational resilience. As a result, it is necessary to acquire the ability to perform new tasks by altering fundamental beliefs and assumptions, as well as to engage in creative problem solving, innovation, and learning[36].

The focus could be on developing coping mechanisms that allow the organization to get back on track to what it used to be in terms of performance if organizational resilience is viewed as a capability to bounce back from adversity. This approach on organizational resilience that is focused toward rebounding places an emphasis on the significance of adaptation as a means of responding to variations that are unforeseen. When seen from a different angle, organizational resilience can be understood as the capacity to adapt consistently to changing circumstances. From this perspective, resilience can be understood as thriving[65]. The organization is able to build new competencies and capitalize on changes that were not anticipated within the organization. The ability of an organization to profit from its resources and capabilities, capitalize on opportunities, and construct a successful future is what we mean when we talk about resilience. Resilience is not the same thing as returning to performance that has already been established. According to this point of view, resilience is a dynamic characteristic that can be designed and developed on purpose. The latter perspective on the resilience of organizations is referred to as the transformational view[66].

In addition to being static in nature, business resilience can also be dynamic in nature. Other characteristics of business resilience include constant monitoring, the ability to anticipate, redundancy, simulation, initial vulnerability, a focus on minor issues, and the ability to learn from mistakes[67]. In addition, there are various types of company resilience, such as staff resilience—it is essential to ensure the health and happiness of your workers in order to construct a resilient firm—environmental and social resilience, operational resilience, commercial resilience, financial resilience, and future resilience[68]. Similarly, the six aspects of resilience, which include institutional, financial, operational, technical, organizational, and reputational resilience, describe the characteristics of resilience. There are a number of benefits associated with company resilience, including the following:

increased adaptability; increased firm reliability; increased effectiveness; enhanced firm agility; and increased firm market share[69]. Systems that are resilient significantly reduce the likelihood of failure, as well as the repercussions of failure, which include deaths and injuries, physical damage, and adverse effects on the economy and society, as well as the amount of time required for recovery[70]. The functionality of an infrastructure system after a disaster can be used to quantify resilience, as can the amount of time it takes for a system to return to the levels of performance it had before the disaster[71]. Nevertheless, the drawbacks of business resilience include the fact that it is time-consuming, that it results in financial loss, and that it is a competitive disadvantage[72].

According to the findings of this study, business resilience is defined as the organizational dynamic measures that are implemented to mitigate the effects of unanticipated external turbulence in order to attain competitiveness and ensure the survival of the business.

The capacity for resilience is a multifaceted organizational trait that enables a company to effectively absorb, respond to, and potentially capitalize on unexpected and disruptive events. From a conceptual standpoint, resilient capacity can be seen as the traits and processes that are associated with the capability of individuals or organizations to survive, recover, or bounce back in the midst of adversity or after experiencing adversity[73]. When we talk about resilient capacity, we are referring to the ability of an organization to identify, prevent, and deal with disruptive events in a way that is sustainable.

The capacity for resilience refers to the ability and confidence of an organization to respond in a decisive and efficient manner to circumstances that are unpredictable, unexpected, and sufficiently disruptive that they have the potential to put the organization's long-term survival in jeopardy[74]. On the basis of this, it appears that the capacity for resilience is connected with the ability to solve present difficulties while

maintaining flexibility. The capacity for resilience provides the opportunity to improve the capability set of the organization as a direct result of the activities that are being carried out in response to the crisis. A company can recover from disruptions and resume normal operations if it has a moderate degree of resilience capacity. On the other hand, a company with a high level of resilience capacity can undergo a robust transformation and, as a result, thrive in part as a result of the unfavorable occurrences. A spectrum of responses, spanning from survival to recovery to beneficial transformation, is represented by the resilience capability of a firm. The higher the amount of resilience capacity, the more realistic it is to anticipate that an organization will eventually arrive at a position that is closer to the end of the continuum that represents robust change. Cognitive resilience, behavioral resilience, and contextual resilience are the three characteristics that interact with one another to generate an organization's resilience capacity. These three dimensions each play a separate but complimentary role in the generation of organizational responses to disturbance. It is possible to notice and react to disruptive change by utilizing these three aspects of resilience capacity, which work alone as well as in conjunction with one another[4].

In the context of dealing with shocks or stresses, resilience capacities refer to the capability for proactive steps to be taken in order to deal with that situation. Absorptive capacity, transformative capacity, and adaptive capacity are the three dimensions that have been utilized in the process of measuring resilience capacity[52,54]. The capacity for resilience requires all three of these capabilities. They exist at numerous levels, such as the individual, the household, the community, the district, the national level, and within social-ecological systems. They are intrinsically linked to one another and mutually reinforce one another.

In addition to providing businesses with the opportunity to grow strategic agility in a

manner that is compatible with the existing environmental conditions and competitive realities, resilience capacity also provides businesses with the opportunity to establish a foundation for the development of different types of strategic agility throughout the course of time.

Similar to the function that resilience capacity plays in enabling businesses to select between adaptive fit and robust transformation when confronted with significant environmental shifts, this allows businesses to adjust to changing conditions. The reasoning behind it is not overly complicated. The capacity for resilience encourages a company to cultivate a wide variety of routines and resources, as stated in the previous sentence. Because of this variety, a company is able to develop a wide variety of various combinations of activities and assets in order to attain strategic agility.

The capacity for resilience is the foundation upon which a company's ability to effectively reconfigure and augment its resources and routines on the basis of its ability to take actions. Additionally, resilience capacity captures an essential conceptual diagnostic and interpretation component that enables a company to accurately choose the most appropriate type of strategic agility to apply in the ongoing situation[54]. This is made possible by the fact that resilience capacity catches this component. Companies that have the capacity for resilience are better able to traverse the many types of strategic agility and successfully adjust to changing conditions[43,44,45]. In addition to providing the foundation for repair following a severe jolt, resilience capability can also give an opportunity for an organization to undertake a positive transformation as a result of overcoming an unusually tough event. In a similar vein, resilience capacity helps a company to originate and implement competitive maneuvers that are flexible, nimble, and dynamic in order to positively adapt to changes imposed by others and to initiate shifts in strategy in order to create new realities in the marketplace[33,34,35,36].

Both the potential for resilience and its management are attainable. The implication of this is that managers should develop the ability to effectively attend to, analyze, and comprehend environmental conditions by establishing a robust organizational purpose and communicating this purpose throughout the entire organization in order to encourage decision making and action that is in line with the core values of the organization. The ability for resilience serves as the foundation for incorporating an adequate amount of diversity into a company's strategic agility, which in turn enables a portfolio of options and outcomes. It has been determined that resilience capacity is a beneficial asset that may be utilized to respond to unforeseen disruptions in a variety of environmental and operational conditions[62,64]. Disruptive change and surprise are the environmental factors that contribute to resilience ability. The core components of resilience are cognitive resilience, behavioral resilience, and contextual resilience[55]. There are two types of resilience ability, which have been recognized as contextual resilience and behavioral resilience[55]. The survival, repair, and transformation of resilience capacity are all included in the strategic relevance and usefulness of resilience capacity.

Reviews and conceptual analyses of the concept of resilient capacity have identified three core elements as fundamental to understanding resilient capacity. The first two of these core elements are precursors or antecedents of resilience. These elements are as follows: (a) the experience of hardship, risk, or adversity that threatens to produce a negative outcome, and (b) the availability of conditions, assets, or resources to respond to the adversity[78]. The third component is a discussion of the outcomes that result from resilience: The third type of adaptation is a positive adaptation, which occurs when the adverse outcome is avoided and functioning is improved beyond what was anticipated in the context of the adversary. On the other hand, the characteristics of resilient capacity include functions and tasks that are preventative, protective, adaptive, and recovery; ii.

traits that promote sensitive capability and threat detection, prevention, and adaptation; and[78]. There are a number of advantages and disadvantages associated with resilient capacity. When it comes to business resilience, the advantages include increased adaptability, increased firm reliability, increased effectiveness, enhanced firm agility, and increased firm market share. On the other hand, the disadvantages include time consumption, financial loss, and a disadvantage in the competitive arena. According to the findings of the study, resilient capability is defined as the capacity of an organization to react and adjust to unforeseen changes and disturbances that are observed in the business environment in which the organization operates.

2.1.1.2 Behavioural Resilience

For the purpose of this definition, behavioral resilience is defined as a developmental and psychosocial process that occurs when individuals who are subjected to prolonged adversity or potentially traumatic events undergo either positive or negative behavioral adaptation over the course of time. In a similar vein, behavioral resilience refers to the capacity to mentally or emotionally deal with a catastrophe or to quickly return to a state that existed prior to the crisis. According to the definition, resilience is present when an individual makes use of mental processes and behaviors in order to promote personal assets and protect themselves from the potential adverse impacts of stressors80. When we talk about behavioral resilience, we are referring to the possession of a set of adaptive features that enable an individual to deal with and recover from stress or trauma, and even thrive after experiencing it[81]. The established behaviors and routines that enable a company's workforce to learn more about a situation, implement new routines, and fully utilize its resources in the face of conditions that are disruptive, uncertain, and surprising,

and that have the potential to put the organization's long-term survival in jeopardy are what make up behavioral resilience. These actions and activities make it possible for members of the company to respond to environmental problems and risks in a manner that is collaborative, so facilitating the development of a firm that is stronger and more competent[55]. The routines and activities that make up behavioral resilience are established by a combination of experienced resourcefulness and counterintuitive action juxtaposed with useful habits and behavioral readiness. This combination is what makes behavioral resilience possible.

A dynamic conflict between behaviors that stimulate creativity and unorthodox activities and familiar and well-rehearsed routines that keep a company anchored and provide the foundation for inventiveness is what gives rise to behavioral resilience. In this way, behavioral resilience is the outcome of a dynamic tension. Centrifugal forces, which are influences that make ideas, knowledge, and information available for creative action, and centripetal forces, which are influences that direct inputs and processes toward actionable solutions, are created when these behaviors are combined. These forces allow a company to learn more about a situation and to fully utilize its own resources under conditions that are unexpected and uncertain.

The elements that make up behavioral resilience have a significant impact on the routines that belong to both the persistent and fluid capability categories. In the first place, it is essential to develop helpful habits in order to practice and perfect the analytical procedures that make effective use of your existing knowledge. Additionally, useful habits make it easier to carry out established job procedures in a linear fashion, which results in the production of predictable outcomes that are connected with enduring dynamic skills. Second, the development of a complex action repertoire requires the implementation of an intentional strategy that consists of a variety of competitive moves

that are time-triggered and performed frequently. This kind of meticulously planned and meticulously orchestrated routine serves as a prototype for complementing augmentation and for innovative types of agility that are transformed into breakthroughs. Third, an action inventory that is both complex and varied offers a wide range of possibilities that can be used to respond to the evolving, iterative requirements for the fluid dynamic capabilities that are necessary for innovative elaboration and radical improvisation[55]. Because of interdependence, it is much simpler for companies to acknowledge the significance of ideas that originate from other sources and to see the advantages of combining and combining resources in ways that have never been done before. Organizations that are successful in emergency response and disaster recovery, for example, frequently rely on the beneficial habit of modular work teams, incident command, and project-based assignments in order to strengthen and practice their capacities of rapid deployment. These companies are able to acquire the skills necessary for doing tasks that are unprecedented and unorthodox by utilizing the lessons they have learnt throughout previous projects. The models of behavioral resilience, on the other hand, are made up of an individual's cognitions, environment, and behaviors[82].

Behavioral resilience is essential because it guarantees the safety of industrial settings that are sensitive to safety concerns and reduces the prevalence of stress-related and trauma-related clinical disorders[83]. Resilient individuals are aware of the circumstances they are in, their own emotional responses, and the activities of those in their immediate environment. They are able to keep control of a situation and come up with innovative solutions to difficulties if they remain aware of the circumstance. People that are resilient tend to emerge stronger after experiencing adversity in many situations. A sense of control, the ability to solve problems, strong social ties, the ability to identify as a survivor rather than a victim, and the ability to seek for assistance are the characteristics

that define behavioral resilience. The following are some of the advantages and disadvantages of behavioural resilience: behavioural resilience increases the confidence of business managers, increases the likelihood of a firm's survival, increases the proactiveness of the firm, increases the number of business opportunities, and increases the speed with which behaviour can adapt to different situations. On the other hand, the disadvantages of behavioural resilience include an increase in individual and business trauma, the possibility of financial and business loss, and a disadvantage in the competitive arena. Behavioral resilience was characterized as a developmental process that unfolds across time and conditions that shape individual behavior in the context of comprehending the linkages between individuals, political economy, and ecosystems. This study was conducted by the British Psychological Association.

2.1.1.3 Business Agility

One definition of business agility is the capacity for companies to quickly identify and aggressively pursue potentially transformative possibilities in the global marketplace. Business agility was defined as the capacity to respond quickly and effectively to changes in the environment by modifying the strategic direction of the core business as needed. The capacity of a company to swiftly and efficiently adapt to changes in customer expectations is known as business agility, and researchers agreed with this definition[64,65,66,72].

The ability to swiftly adjust to internal and external changes in the market is a key component of business agility. Prioritizing practical solutions over detailed documentation. Be quick to respond and adaptable when customers require you. Maintain high standards of quality while adapting to and leading change in an efficient and

economical manner. The term "business agility" describes a company's ability to quickly, consistently, and systematically adapt to changing market conditions through entrepreneurial innovation and evolutionary change. Maintaining and altering goods and services to match client wants, reacting to changes in the marketplace, and taking advantage of available human resources are all ways to sustain corporate agility[87]. To be agile in business means to have the skills, attitudes, and practices that allow your company to adapt to changing circumstances and continue serving its mission regardless of what the future holds. A company's agility, in its most basic definition, is its ability and desire to respond to, generate, and capitalize on change for the advantage of its customers. A radical mentality change is required for agile businesses, and this one statement lays it all out. You can more accurately anticipate the market's reaction to your actions and where you will take them than the market's reaction to you.

Instead of viewing business agility as a one-time event in one or two domains, it is more accurate to think of it as a systematic and ongoing evolution of people, culture, and skills. Companies should not see customers as an independent entity but as an essential cog in the wheel. When businesses engage heavily in improving their processes (Process Agility) or organizational structure (Structural Agility) but neglect or underinvest in other areas of their business, the transformation is likely to fail. For this same reason, many companies are witnessing dwindling benefits from their present agile adoption. In an ever-evolving environment, a nimble business may be able to swiftly respond to new possibilities as they arise. It is possible to see the agile enterprise as a part of a bigger system, the actions of which cause changes in both the enterprise and the system as a whole. The ability to quickly and nimbly respond to changes in both external factors, such as the market, and internal factors, such as company strategy, is crucial for the success of any company. As a result of changes and developments in the market, business agility also evolves and

develops.

Faster time to market and more adaptation to change are two of the many commercial benefits of agility. An important side effect of corporate agility is the simplification of organizational processes, which aids in reducing costs without sacrificing quality. Relationships (with the customer at the center of the model), leadership, operations, and persons make up business agility's four primary areas. There are four defining features of an agile company: operational, R&D, transformation, and strategic agility[45]. There are pros and cons to business agility. Pros include being able to respond quickly to opportunities, reducing the impact of environmental threats, being more proactive as a firm, increasing competitive advantage, and increasing adaptability. Cons include things like learning curve productivity loss, innovation being lacking, and sometimes sacrificing long-term competitiveness for short-term solutions.

The researcher used the work of previous scholars as a foundation to define business agility as the ability to quickly respond and make decisions in response to changing market demands, allowing one to outpace competitors. Businesses that can't change with the times risk becoming immobile in the face of unpredictable marketplaces and other external factors. As a countermeasure, businesses can cultivate business agility by integrating change into their daily operations.

2.1.1.5 Operational Resilience

Organizational operational resilience is defined as the capacity to maintain and secure essential client-facing core business services in the face of both normal business operations and disruptions caused by operational stress. In a similar vein, operational resilience is defined as an organization's capacity to anticipate, prevent, recover from, and adapt to adverse operational events, thereby maintaining the provision of business

services. The degree to which a company can maintain the quality of its essential business services for its customers in the face of both normal and unexpected operational challenges or disruptions[92,93].

The ability of a company's operations to endure and bounce back from disturbances is what other scholars mean when they talk about operational resilience[74,82]. Similarly, some academics have argued that a system can have "resilience" (the capacity to continue functioning even when faced with disturbances) but not "stability" (the capacity to recover from disturbances and return to an equilibrium state)[89,91]. Therefore, features of operational resilience that aim to retain the existing realm of operations in the face of disturbances include disruption absorption and recoverability. This "static" perspective on operational resilience makes sense, since it could be too expensive and time-consuming for firms to rethink their area of operations every time a disruption occurs[93]. When problems arise with an organization's operations systems, first-order response actions to keep things running smoothly and get production rates back to normal are the ones that are most often taken. The goals of these measures are twofold: first, to keep the system structure and output rates within critical limits during disturbances; and second, to get the production rates back to normal once a disruption has occurred. One may make the case that companies need dynamic skills to carry out this function as they undergo continuous adaptation and transformation of their activities[64].

Nevertheless, such shifts in the scope of operations aren't always caused by interruption or outside forces of change; sometimes, it's only the outcome of upper management's new strategic goals. So, according to previous research, operational resilience is not the pinnacle of resilience as seen through the lens of dynamic/adaptive capabilities[14,16,17]. Recognizing that increased resilience capabilities may necessitate more investment in

inefficient projects like redundancies is crucial, notwithstanding the probable efficiency performance benefits of operational resilience capabilities. Particularly, it is arguable that investments in resilience-building methods may result in sunk expenses that cannot be readily recouped and redirected to other projects that improve efficiency[63].

A company is considered operationally resilient if it can quickly adjust to new circumstances. The ability of a firm to: - Retain business services in the face of a disruption - Respond to and recover from a crisis - Protect itself from unfavorable events - Prevent crisis events from happening is a key attribute or characteristic of operational resilience. One common definition of operational resilience is an organization's capacity to quickly adjust to new circumstances. System and process resilience, as well as the organization's overall capacity to keep running in the face of disruptions, fall under this category. Effective business going concern, operational variety, predicting business events, and recovering business activities loss are all aspects of operational resilience. Due to regulatory regimes that are becoming increasingly intolerant of operational failures and the fact that clients want 24/7 "always on" product/service, operational resilience is more important than ever for organizations. It is a must-have component for reaching company objectives and keeping the trust and confidence of customers and regulators. The areas most affected by operational resilience failures could be transformed into areas for positive differentiation if organizations achieve market-leading operational resilience. There are competing demands for resources and attention from other company initiatives that are comparable to resilience. It will be difficult for enterprises to allocate the resources needed to achieve operational resilience objectives in the face of disruption and digitally-driven new entrants. To better withstand disruptions, several companies are implementing or planning to implement transformative programs.

All aspects of operational resilience—data, third parties, buildings, operations, and people—are anticipated to undergo the aforementioned strengthening. A company's proposal should incorporate the commercial benefits, which should extend beyond risk and compliance alone. A company's overall performance and reputation can benefit from operational resilience in a number of ways, including:(1) minimizing losses caused by unforeseen negative events (2) the capacity to provide uninterrupted, high-quality service to its clients, leading to a rise in income 3) a rise in revenues (profits) leading to a boost in confidence among stakeholders and investors, and the subsequent benefits (4) the capacity to evade possibly costly regulatory fines and penalties.

Essential landmarks on the path to resilience include the critical elements of operational resilience, which include identifying and comprehending critical company services and impact tolerance, end-to-end mapping, scenario testing, and frequent self-assessments. Integrated business continuity planning, dependability and recovery, and quick reaction and recovery are other indicators of operational resilience[94]. While operational resilience has many benefits, such as improving business continuity and survival, increasing adaptability, increasing efficiency and effectiveness in resource allocation, and generating synergy across strategies, it also has some drawbacks, such as the fact that it increases firm operational risk and causes businesses to lose track of their own activities and plans. In order to better understand the effects, associated risks, and levels of tolerance for interruptions in the delivery of products or services to both internal and external stakeholders like employees, customers, citizens, and partners, the researcher established operational resilience as an initiative that broadens the scope of business continuity management programs[99].

2.1.1.6 Strategic Resilience

Resilience in strategy is not just about dealing with crises or getting back up after a loss; it also means being able to foresee and respond to secular trends that could damage the main business's earnings potential in the long run. Another way that researchers conceptualize strategic resilience is as the capacity for an organization to swiftly turn potentially harmful surprises into opportunities, as well as to recognize and seize novel chances before their competitors do[100]. Leadership that practices strategic resilience is better able to revitalize team spirit, concentrate efforts, and achieve strategic goals. Strategic resilience entails maintaining a focus on the horizon while adapting to challenging operational circumstances and guiding through present volatility. When it comes to strategic resilience, the operational environment is all about dynamic fluidity[101]. The ability to quickly and efficiently seize opportunities without causing a crisis is a key component of strategic resilience, as is the ability to transform threats into opportunities. To be resilient, one must constantly monitor market developments that could significantly reduce the core business's earnings power and implement necessary changes before the need for change becomes dangerously obvious, which is often too late in the digital economy[102].

Staff members can strengthen their strategic resilience by exercising regularly, carving out time for alone, talking positively to themselves, expanding their horizons, learning from mistakes, maintaining an open mind, having reasonable expectations for themselves and their clients, and so on. Consequently, resilient companies are those that are well-equipped to handle unexpected challenges and use their organizational capabilities as a source of resilience. Therefore, in order to maintain their competitive advantage, small businesses need to keep an eye on their environment, anticipate potential dangers, and react appropriately to disruptive challenges. This requires them to analyze the macro-environmental factors, which include political, economic, sociocultural, technical,

environmental, and legal aspects. Overall, resilience affects how a small business interacts with its environment. An organization's agility, flexibility, adaptability, robustness, and competitiveness are all enhanced by its level of resilience. Resilience, according to many academics who have studied the topic, does not happen at a specific "moment" but is ever-present[92,93,96].

According to their definition, resilience is the ability of an organization to adapt to its environment and continue working effectively in the face of adversity. Two main schools of thought on resilience—the characteristic and developmental approaches—were established[99]. The developmental approach sees resilience as a continuous process, whereas the characteristics perspective highlights organizations' inherent crisis recovery abilities. Having a positive outlook, great emotional intelligence, having a set of basic values that cannot be shaken, being able to learn from every situation, and being able to move on are all characteristics of strategic resilience. Strategic resilience has both positive and negative aspects. On one hand, it improves operational and tactical planning, which leads to more successful outcomes. On the other hand, it reduces disruption expenses and increases firm operational risk, which can lead to the loss of business activities and plans. On the other hand, it strengthens leadership capacity, generates synergy across strategies, increases the robust pursuit of opportunities in competitive environments, and improves exploration. Overall, strategic resilience helps organizations adapt to change without requiring or resulting in financial or other crises.105. Strategic resilience was defined by the researcher as the ability of a business to adjust to change without necessitating or experiencing a financial or other catastrophe. It is characterized by a progressive and robust pursuit of opportunities in a competitive environment.

2.1.3 Digital Marketing Capability

Digital marketing capability (DMC) has evolved as a crucial concept in the last two decades, gaining importance due to the shift from traditional marketing to online-based, data-driven strategies. Initially rooted in resource-based theory (RBT), digital marketing capability was seen as a competitive advantage grounded in technology and marketing resources[106]. As the digital landscape has continued to develop, capabilities like data analytics, social media engagement, and online customer relationship management have become central features of modern marketing. Scholars have provided various definitions of digital marketing capability, some of which align, while others present different perspectives. For example, DMC as the ability of an organization to use digital tools to collect, analyze, and act on customer data to improve marketing performance and create value[107]. This view emphasizes the analytics aspect of digital marketing, showcasing the role of technology in understanding customer preferences. Similarly, DMC as the integration of technology into marketing strategies to ensure seamless interactions with customers across digital channels[107]. This definition also stresses technological adoption and smooth integration, aiming at building effective customer relationships.

On the other hand, a somewhat dissenting view, arguing that DMC is not limited to technology integration but also includes agility and the capability to innovate marketing processes continually[107]. They focus more on adaptability, emphasizing how DMC involves ongoing innovation rather than mere deployment of tools. This definition adds an organizational dynamic component, suggesting that the capability to continuously evolve the digital marketing mix in response to changing digital environments is a crucial aspect.

Several features are central to digital marketing capability, as highlighted by various scholars: The ability to use data analytics to understand consumer behavior is emphasized by[108]. This feature is crucial for effective customer targeting and personalization. Seamless customer interactions across channels, which points to the necessity of integrating various digital platforms to provide a consistent experience[102]. According to a scholar, DMC involves adapting marketing processes to meet the evolving needs of the market, highlighting innovation and responsiveness as core features[109]. Engagement through social media and digital content is also a vital aspect. This capability allows for fostering relationships and creating value through digital interactions[102].

For agro-allied SMEs, DMC could provide several competitive advantages. The ability to collect and analyze consumer data allows these enterprises to understand customer preferences better, which is essential for tailoring products and services to meet specific needs. The omni-channel integration enables them to reach a wider market and connect with customers at various touchpoints, thus building brand loyalty. Furthermore, agility and innovation in digital marketing processes would enable agro-allied SMEs to adapt quickly to changes, such as fluctuating market demands or the introduction of new digital tools that could streamline their marketing efforts. This responsiveness can ensure that agro-allied enterprises remain competitive despite limited resources compared to larger agricultural firms.

Recent studies emphasize the role of artificial intelligence (AI) and machine learning in enhancing digital marketing capability. For instance, the integration of AI-powered analytics allows for more precise customer segmentation and targeted marketing campaigns[110]. Another emerging area is the use of social media influencers to promote

agricultural products, as noted by Chatterjee and Bose[111]. These authors argue that influencer marketing in the agro-allied sector helps build trust and drives consumer engagement more effectively than traditional marketing techniques. Furthermore, the sustainability aspect of digital marketing is becoming increasingly relevant. Leveraging digital marketing tools for promoting organic farming practices and transparent supply chains can attract environmentally conscious consumers, which aligns well with the global shift towards sustainable agricultural practices[112].

Digital marketing capability, as defined by different scholars, revolves around technology integration, data-driven strategies, agility, and innovation. While some scholars focus on the technological aspects of DMC, others expand the definition to include organizational adaptability and ongoing innovation[99,100,106]. These capabilities are highly relevant for agro-allied SMEs, particularly in helping them navigate the dynamic and competitive market environment. Recent literature emphasizes AI and sustainability, pointing to an evolving landscape where digital marketing is not just about reaching customers but also about creating value responsibly.

2.2 Theoretical Framework

This study theoretically reviewed Dynamic Capability Theory; Survival Base Theory; and Contingency theory.

2.2.1 Dynamic Capability Theory

Dynamic Capability Theory, provides a theoretical lens through which the relationship between business resilience and business sustainability can be understood[113]. Dynamic capabilities refer to an organization's ability to integrate, build, and reconfigure internal and external competencies to adapt to rapidly changing environments. In the

context of business resilience and sustainability, these capabilities enable organizations to respond effectively to disruptions, maintain stability, and evolve in ways that ensure long-term success.

The core assumptions of Dynamic Capability Theory include the notion that organizations must possess the ability to sense opportunities and threats, seize opportunities, and reconfigure resources to sustain competitive advantage[114]. In terms of business resilience, this means being agile and adaptable in the face of unforeseen challenges, such as economic disruptions, technological changes, or global crises like the COVID-19 pandemic. By fostering these capabilities, businesses can not only survive but thrive, thereby enhancing their sustainability. Business resilience, in this framework, becomes a dynamic capability that helps organizations withstand shocks, maintain operational continuity, and innovate in response to evolving environmental pressures. Critics of the Dynamic Capability Theory argue that its concepts are often vague, making it challenging to operationalize in practice[115]. Additionally, the theory's emphasis on dynamic capabilities may overlook the importance of stable routines in achieving efficiency and long-term profitability[115]. Despite these criticisms, the theory has gained considerable support for its relevance in understanding business adaptability and long-term survival. Scholars have extended the theory by emphasizing the role of managerial cognition in shaping an organization's dynamic capabilities, suggesting that leadership plays a critical role in fostering resilience and sustainability[116].

Recent studies have reinforced the link between dynamic capabilities, resilience, and sustainability. For instance, dynamic capabilities significantly enhance an organization's resilience by enabling quick adaptation to disruptions, which, in turn,

supports sustainable business practices[117]. Similarly, dynamic capabilities are crucial for firms aiming to balance short-term operational efficiency with long-term sustainability goals in an uncertain business environment[100]. These studies align with the view that building resilience through dynamic capabilities is integral to achieving sustainable growth. Dynamic Capability Theory provides a robust framework for understanding how business resilience can enhance sustainability. By enabling organizations to sense, seize, and reconfigure resources in response to changes, dynamic capabilities help maintain long-term viability. While there are criticisms regarding the operational clarity of the theory, recent empirical research supports its relevance in enhancing business resilience and sustainability, thus reaffirming its significance in the field of strategic management.

2.2.2 Survival-Based Theory

Survival-based theory, rooted in organizational and evolutionary economics, emphasizes that businesses must continuously adapt and evolve to survive in a changing environment. Proponents of this theory, who developed the resource-based view, and stressed innovation as a driver of firm survival, argue that organizations must possess adaptive capabilities to ensure resilience[118]. The theory posits that firms that effectively respond to changes whether they stem from the market, regulations, or environmental shocks are more likely to sustain operations over the long term. One of the fundamental assumptions of survival-based theory is that organizations face constant threats from the competitive environment and must therefore prioritize adaptability and resilience. Business resilience defined as the ability to respond and adapt to unforeseen challenges plays a crucial role in enhancing business sustainability, allowing companies to maintain continuity during disruptions. This

alignment supports the notion that organizations equipped with strategic foresight and robust operational adaptability are more likely to survive and thrive in the face of volatility. Scholars have also supported the significance of dynamic capabilities, which are closely tied to business resilience, as a means for businesses to achieve long-term sustainability through constant adaptation[118].

Critics of survival-based theory, however, argue that it overemphasizes adaptation without fully considering the complex interplay of factors such as organizational culture, leadership, and stakeholder engagement that contribute to resilience and sustainability. For instance, a researcher argue that resilience is not just about adaptive capabilities but also about the systemic relationships and collaborative efforts within and outside the organization[119]. They suggest that survival-based theory might be limited if applied as a standalone framework for sustainability, as it may neglect broader social and systemic factors influencing organizational survival.

Recent literature highlights the critical role of business resilience in achieving sustainability, emphasizing that firms must go beyond basic adaptability and focus on proactive risk management and sustainability initiatives. For example, resilience must be embedded within the organization's culture and strategy to ensure long-term sustainability[120]. Similarly, research asserts that resilience, when integrated into corporate sustainability strategies, allows businesses to not only withstand shocks but also contribute positively to sustainable development goals, enhancing their reputation and creating a competitive advantage[121]. Survival-based theory provides a theoretical framework for understanding how resilience can enhance business sustainability by emphasizing adaptation and continuous evolution. Despite criticisms regarding its limited scope, the integration of resilience as a core business strategy is increasingly

recognized as essential for sustaining operations in today's dynamic environment. Recent scholarly works substantiate the theory's relevance, suggesting that proactive resilience practices are instrumental in fostering business sustainability[109].

2.2.3 Contingency Theory

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[122]. This theory has been applied to various fields, including strategic management, where it suggests that organizational outcomes depend on the fit between internal capabilities and external conditions. Digital marketing capability, in this context, can moderate the relationship between business resilience and sustainability by enhancing an organization's ability to adapt its strategies to shifting market conditions and consumer demands. A flexible digital marketing strategy that aligns with evolving digital trends can significantly bolster a business's resilience and improve its long-term sustainability[122].

The assumptions of Contingency Theory include the idea that organizations must adapt to external variables to achieve optimal performance. This theory also implies that the alignment between organizational practices and the external environment leads to successful outcomes. Digital marketing capability acts as a dynamic moderator by enabling firms to respond effectively to market changes, enhancing their resilience in times of uncertainty while simultaneously fostering sustainable practices. For instance, a company's ability to utilize digital marketing to engage with customers, understand shifting preferences, and respond proactively can serve as a mechanism

that not only sustains its market presence but also fortifies its resilience against shocks like economic downturns or supply chain disruptions[123].

However, Contingency Theory has its critics. Some argue that it lacks specificity in determining which contingencies are the most important in various contexts, making it difficult to apply in practice[124]. Furthermore, the theory's heavy reliance on situational analysis is sometimes seen as overly simplistic, neglecting the complexities of modern business environments that require nuanced and integrated approaches. Critics also point out that contingency approaches can be reactive rather than proactive, focusing on fitting existing structures to situations instead of innovating ahead of potential changes[96].

Despite its criticisms, Contingency Theory has been embraced by scholars who align with the importance of adaptability in achieving business sustainability. Researchers have underscored that aligning organizational strategies with environmental contingencies is crucial for long-term sustainability[125]. Recent studies have extended this notion by suggesting that digital marketing capabilities provide a form of dynamic alignment, helping businesses leverage real-time data and customer insights to foster resilient operations that are also sustainable in the face of changing external pressures[78]. This approach emphasizes the idea that a well-developed digital marketing capability can not only improve a company's immediate adaptability but also contribute to a more sustainable business model by encouraging continuous learning and adaptation.

Contingency Theory provides a robust framework for understanding how digital marketing capabilities can moderate the interaction between business resilience and sustainability. While the theory has its critics, its emphasis on adaptability to

situational variables aligns well with the dynamic nature of modern digital environments. The integration of digital marketing as a moderating factor enhances an organization's ability to remain resilient while striving for sustainable growth, as highlighted by both foundational proponents of the theory and recent scholarship[123, 124,125].

Theoretical Underpinnings

Dynamic capability, resource dependency theory, and contingency theory offer complementary perspectives that, when combined, provide a comprehensive framework for understanding the interplay between business resilience, digital marketing capability, and sustainability. Dynamic capability theory focuses on a firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. In the context of digital marketing capability, this theory emphasizes the organization's need to adapt to new technologies, shifting consumer behaviors, and changing market dynamics to ensure sustained competitive advantage. The development and deployment of digital marketing tools require businesses to continually evolve, innovate, and align their strategies with market demands, which is crucial for building resilience and achieving sustainability.

Resource dependency theory complements this by emphasizing the importance of external resources, including information, technologies, and partnerships, which are critical for developing digital marketing capabilities and ensuring business resilience. According to resource dependency theory, firms are dependent on their external environment for resources and must effectively manage these dependencies to reduce uncertainty and enhance resilience. In the digital marketing landscape, where a firm must rely on technological tools, data, and alliances with platforms or service

providers, resource dependency theory helps explain how organizations can strategically manage their relationships with external actors to achieve sustainability goals. The effective management of these external resources ensures a stable flow of critical inputs, thereby enhancing both resilience and long-term sustainability.

Contingency theory, meanwhile, provides the contextual underpinning for understanding how dynamic capability and resource dependency are affected by specific environmental conditions. This theory asserts that there is no one-size-fits-all approach; rather, the effectiveness of an organization's strategy is contingent on the fit between its internal capabilities and the external environment. When it comes to digital marketing capability, contingency theory suggests that the degree to which an organization can achieve business resilience and sustainability depends on its ability to align digital strategies with external market conditions and internal resources. For example, in volatile markets, organizations that adopt a flexible approach to their digital marketing practices by leveraging dynamic capabilities and managing dependencies effectively are more likely to remain resilient and sustainable.

Together, these three theories provide a holistic view of how firms can build resilience, leverage digital marketing capabilities, and pursue sustainability. Dynamic capability provides insight into how organizations can adapt and reconfigure their resources, while resource dependency theory highlights the significance of managing external influences and contingencies that shape resource needs. Contingency theory ties these elements together by emphasizing that the strategies employed must be suitable for the specific circumstances of the firm. This multi-theoretical approach allows for a deeper understanding of the intricate relationships between resilience,

digital marketing, and sustainability, offering a more robust framework than any of these theories could individually provide.

2.3 Review of Empirical Studies

This sub-section address a review of extant related literature pertaining to the interaction between business resilience, digital marketing capability and sustainability.

2.3.1 Business Resilience and Environmental Sustainability

Recent empirical studies suggest that different dimensions of business resilience such as resilient capacity, behavioral resilience, business agility, and strategic resilience positively impact environmental sustainability by enabling businesses to adapt and thrive in uncertain environments, which in turn promotes sustainable practices. Resilient capacity, the ability of organizations to anticipate, prepare for, and respond to disruptive changes, is essential for promoting sustainability. According to a researcher, resilient organizations can manage crises by following a sequence of resilience awareness, adaptation, and action[54]. This helps these organizations adapt effectively, which is crucial for both survival and fostering a sustainable approach to environmental challenges. Developing a resilient capacity helps to embed sustainability practices that are adaptable to changing environments, ensuring organizations can achieve long-term success[54]. Behavioral resilience, which involves the attitudes and adaptability of individuals within an organization, is also a critical component. Studies have shown that fostering a resilient workforce, equipped with psychological capital, promotes sustainable business practices during and after crises. Fostering positive emotions, self-efficacy, and hope supports resilience among employees, which is crucial for navigating crises without compromising on sustainability goals[79].

Business agility the ability to rapidly adjust to changing market conditions is found to be linked with environmental sustainability. Resilient and agile businesses have demonstrated a capacity to adapt their operations and supply chains to support environmental sustainability, even under stress. According to research, resilient supply chains are more capable of adapting to fluctuations in the external environment, reducing the risk of disruption and promoting sustainability[126]. Strategic resilience involves the ability of a business to adopt a long-term perspective and integrate sustainability into strategic decision-making. Businesses need to move beyond reactive measures and focus on building resilience into their strategic planning[67]. This long-term approach includes enhancing financial, operational, and technological resilience, which supports sustainable outcomes. The proactive integration of resilience into strategic initiatives ensures that organizations remain competitive while also adhering to environmental sustainability objectives[79].

However, some studies present dissenting perspectives regarding the relationship between resilience and sustainability. Focusing solely on resilience as a crisis response can limit organizations' ability to fully integrate sustainability into their operations, as crisis management often involves resource allocation that prioritizes immediate survival over long-term sustainability[127]. Moreover, in some cases, the emphasis on resilience can lead businesses to prioritize financial stability and operational continuity at the expense of investing in sustainable practices[128]. The evidence suggests that business resilience when viewed as a multi-faceted concept involving strategic planning, capacity building, agility, and behavioral aspects contributes positively to environmental sustainability. Nevertheless, businesses must ensure that their resilience strategies also emphasize sustainability, rather than focusing solely on short-term crisis responses. Integrating resilience with a long-term

view on sustainability can help ensure that organizations are prepared for future disruptions while still contributing to environmental stewardship.

2.3.2 Business Resilience and Social Sustainability

Recent empirical studies have highlighted the positive effects of different aspects of business resilience resilient capacity, behavioral resilience, business agility, and strategic resilience on social sustainability. Business resilience, in this context, encompasses the ability of firms to adapt, recover, and even grow in the face of adverse events, ultimately leading to improved social sustainability outcomes. Strategic resilience, for instance, enables organizations to dynamically reinvent business models and strategies as circumstances change, thereby contributing to the sustainable operation of businesses even in times of crisis[129]. Resilient capacity refers to an organization's ability to effectively absorb shocks, adapt, and capitalize on new opportunities that arise during disruptions. This adaptability is crucial for achieving sustainability, as it allows businesses to thrive under challenging conditions. Studies emphasize the role of strategic resilience in promoting business agility and flexibility, which are essential for sustaining both economic and social well-being in turbulent times. For instance, McKinsey has found that firms that invest in resilience capabilities, such as strengthened financial positions, foresight skills, and robust crisis response preparedness, are better equipped to maintain operational stability, thus supporting their social commitments[129].

Behavioral resilience, on the other hand, involves the proactive actions of organizations to anticipate and address potential threats before they escalate into significant crises. This proactive approach ensures that firms not only survive disruptions but also contribute to social stability by maintaining jobs, ensuring

employee well-being, and minimizing the broader societal impact of business failures. Deloitte Insights suggests that organizations integrating resilience into their strategies are more likely to balance reactive protection with proactive growth, supporting their social responsibilities through resilience-driven growth initiative[130].

However, some studies have also presented dissenting perspectives on the interplay between resilience and social sustainability. For instance, while the concept of resilience is often seen as inherently positive, some scholars argue that too much emphasis on resilience may lead to an excessive focus on short-term survival tactics at the expense of long-term social sustainability goals. Organizations may prioritize financial resilience to safeguard their bottom line, thereby sidelining broader social commitments. This perspective suggests that resilience should be balanced with proactive investments in social and environmental initiatives to achieve a truly sustainable outcome. While there is a consensus that business resilience positively impacts social sustainability, it is also important for firms to strike a balance between reactive resilience measures and proactive sustainability efforts. This ensures that the resilience-driven growth aligns with broader social objectives, thus creating a sustainable impact that benefits both businesses and society.

2.3.3 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[131]. This adaptability is

crucial for managing crises effectively, thereby safeguarding economic sustainability through improved operational continuity and reduced vulnerability to disruptions[132]. 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[132]. 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[133]. This illustrates how incorporating sustainable practices not only 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[130]. 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[133]. 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. 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.

2.3.4 Business Resilience and Sustainability

Business resilience is a critical concept in the contemporary business environment, especially when considering the sustainability of organizations. Resilience refers to an organization's ability to adapt, recover, and continue operations in the face of disruptions, crises, or environmental changes. Sustainability, on the other hand, is the organization's capacity to maintain its operations, social responsibilities, and environmental stewardship over the long term. The connection between resilience and sustainability is grounded in the idea that resilient organizations are better positioned to manage unexpected challenges, thereby enhancing their ability to sustain their competitive advantage and operations. In this context, business resilience is considered vital for organizations striving for sustainability, as it enables them to withstand and thrive despite adverse conditions.

Empirical evidence supports the argument that business resilience significantly influences the sustainability of organizations. Studies have shown that resilient firms can effectively navigate disruptions, leading to improved financial, environmental, and social outcomes[78,84,85]. The Resource-Based View (RBV) provides a theoretical foundation for understanding the relationship between resilience and sustainability, emphasizing that unique resources, such as adaptive capabilities and strong organizational culture, contribute to resilience. These resources enable firms to mitigate risks and adapt to changing environments, thereby fostering sustainable growth. Dynamic Capability Theory further enhances this perspective by highlighting the role of adaptive and transformative capabilities in building resilience, which ultimately contributes to the long-term sustainability of the organization. For instance, organizations with dynamic capabilities such as flexibility, learning, and innovation are more likely to achieve sustainable success by responding effectively to environmental changes[134].

However, some empirical studies present contrary submissions regarding the impact of business resilience on sustainability. For example, a research indicates that an overemphasis on resilience can sometimes result in excessive resource allocation to risk management and crisis preparedness at the expense of other sustainability goals[135]. In such cases, focusing too heavily on resilience may lead to inefficiencies and reduced attention to long-term growth strategies, undermining the overall sustainability of the organization. From a dynamic capability perspective, firms may invest excessively in developing resilience-related capabilities, leading to rigidity and limiting their ability to adapt to opportunities that contribute to sustainability. This misallocation of resources may create tensions between resilience and sustainability, suggesting that the relationship is not always straightforward and may depend on how resilience is operationalized and integrated into the organization. Although there are substantial empirical evidence supporting the positive impact of business resilience on the sustainability of organizations, there are also studies that suggest potential negative consequences. Using the RBV and dynamic capability theory, it is clear that resilience when built upon unique resources and adaptive capabilities can enhance an organization's ability to sustain its competitive advantage. However, an overemphasis on resilience may lead to inefficiencies that detract from sustainability goals. Thus, organizations must carefully balance resilience-building initiatives with broader sustainability objectives to ensure long-term success.

2.3.5 Moderating Effect of Digital Marketing Capability

Digital marketing capability has become a critical competence for organizations seeking to enhance their resilience and long-term sustainability. With digital transformation increasingly shaping the global business landscape, firms must develop

digital marketing capabilities to better adapt to changing market dynamics, reach a broader customer base, and respond flexibly to disruptions. Digital marketing tools such as social media, search engine marketing, and customer analytics enable firms to establish more effective engagement with customers, develop predictive insights, and adapt their products or services to emerging demands. In the context of the resource-based view (RBV), digital marketing capabilities are valuable, rare, inimitable, and non-substitutable resources that allow organizations to develop competitive advantages that enhance their resilience to adverse conditions and their ability to achieve sustainability. Further, the dynamic capability theory highlights the importance of a firm's ability to continuously modify and reconfigure its resources to remain competitive in the face of changing environments, underscoring the relevance of digital marketing capabilities in driving strategic transformation and adapting to disruptions.

Empirical evidence suggests that digital marketing capability significantly moderates the relationship between business resilience and sustainability. Business resilience refers to the firm's ability to absorb, adapt to, and recover from disruptions. Sustainability, on the other hand, involves ensuring that the firm can meet the needs of its stakeholders while preserving resources for future generations. Digital marketing capability enhances these interrelated elements by enabling organizations to engage with diverse stakeholders, collect and analyze market data, and deliver tailored content that resonates with customer values such as sustainability and corporate social responsibility. Studies indicate that firms with strong digital marketing capabilities were better able to communicate and align their sustainability initiatives with consumer values during the COVID-19 pandemic, thereby enhancing both their resilience and long-term sustainability[136].

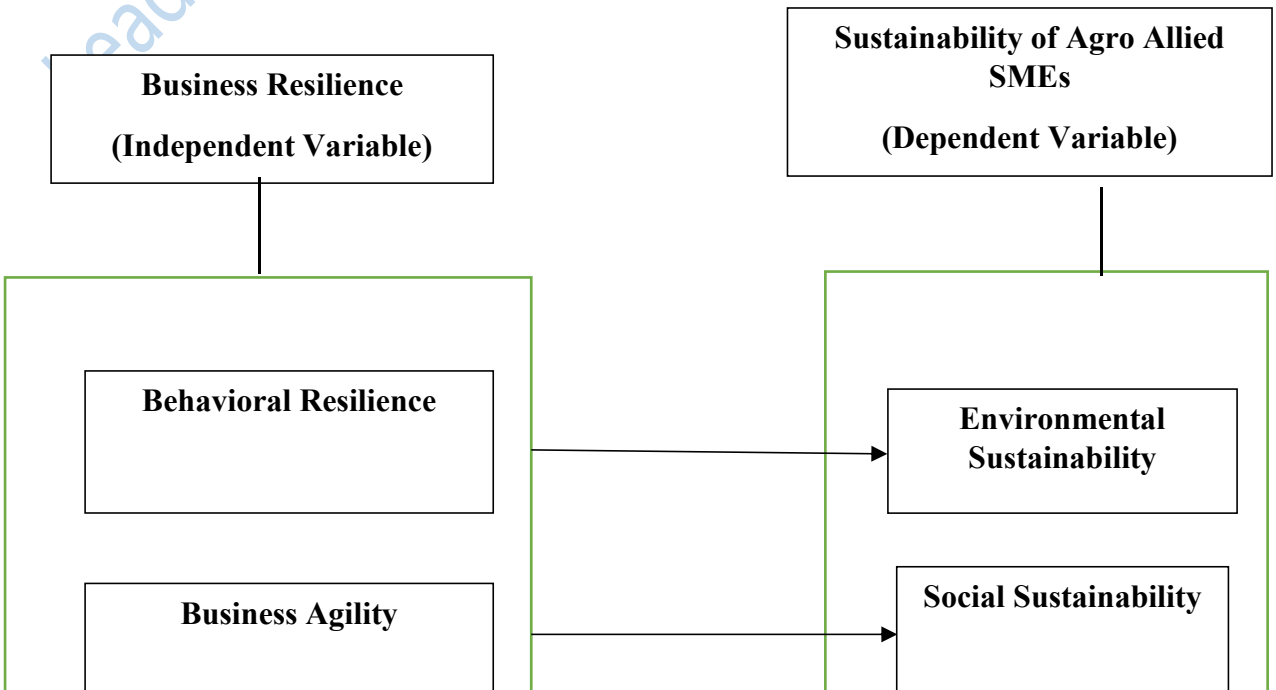
A study supports this positive moderating role by demonstrating how digital marketing initiatives can serve as a bridge between the firm's adaptive strategies and market conditions, ultimately influencing sustainable outcomes. The study highlights how organizations with well-developed digital marketing capabilities can respond to crises in ways that enhance customer trust, secure brand loyalty, and communicate a clear sustainability agenda, thereby strengthening the link between resilience and sustainability. These capabilities allow organizations to deploy adaptive strategies in real time, enabling them to address sudden disruptions and pivot toward new opportunities effectively. From the dynamic capability perspective, digital marketing capability acts as an enabler for firms to reconfigure their operations and value propositions to foster sustainable business practices.

However, there are contrasting views regarding the moderating impact of digital marketing capability on the relationship between business resilience and sustainability. Some studies argue that digital marketing capability may not always strengthen this relationship, particularly for firms in resource-constrained environments. For instance, a research reveals that smaller firms often face challenges in leveraging digital marketing capabilities due to limited financial and technological resources[137]. In such cases, investments in digital marketing do not always translate into enhanced resilience or sustainability outcomes. The authors argue that a lack of adequate infrastructure and human capital may prevent firms from effectively utilizing digital marketing tools to support both resilience and sustainability.

Furthermore, excessive reliance on digital marketing might lead to reduced authenticity in sustainability communications, thereby weakening stakeholder trust and undermining long-term sustainability goals[138]. The study found that firms

focusing heavily on digital marketing without aligning their actions with genuine sustainability practices risked consumer skepticism and reputational damage. This finding aligns with the contingency theory, which suggests that the effectiveness of specific capabilities depends on the context and environmental fit. In this context, digital marketing may not always serve as a beneficial moderator if the firm fails to achieve congruence between marketing messaging and actual sustainability practices. While digital marketing capability has the potential to significantly moderate the relationship between business resilience and sustainability, empirical evidence points to both supporting and opposing arguments. From an RBV and dynamic capability perspective, digital marketing is a powerful tool that enables firms to effectively respond to disruptions and foster sustainable growth. However, its impact is contingent on the firm's ability to align digital strategies with authentic sustainability practices and to adequately address the challenges posed by limited resources. This nuanced understanding is vital for organizations seeking to harness the benefits of digital marketing while navigating the complex interplay between resilience and sustainability.

2.4 Conceptual Model



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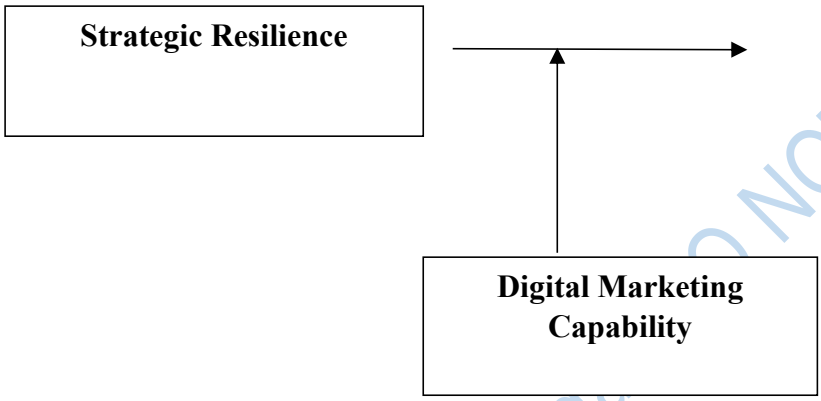

Figure 2.1: Conceptual Model

Source: Researcher Conceptual Model, (2024)

Dynamic capability, resource dependency theory, and contingency theory offer complementary perspectives that, when combined, provide a comprehensive framework for understanding the interplay between business resilience, digital marketing capability, and sustainability. Dynamic capability theory focuses on a firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. In the context of digital marketing capability, this theory emphasizes the organization's need to adapt to new technologies, shifting consumer behaviors, and changing market dynamics to ensure sustained competitive advantage. The development and deployment of digital marketing tools require

businesses to continually evolve, innovate, and align their strategies with market demands, which is crucial for building resilience and achieving sustainability.

The study measured sustainability of agro allied measures include environmental sustainability, social sustainability, and economic sustainability of agro allied SMEs firms. The model presented four dimensions of business resilience structure. These include behavioral resilience, business agility, operational resilience and strategic resilience. These were collectively measured to establish how they influence sustainability of agro allied SMEs firms. The model contains five gaps: Gap 1 focused on the link between business resilience and environmental sustainability. Gap 2 investigated the link between business resilience and social sustainability. Gap 3 examined the link between business resilience and economic sustainability. Gap 4 assessed the effect of business resilience on sustainability of agro allied SMEs firm. Gap 5 stands as the moderating interaction which shows the moderating effect of digital marketing capability on sustainability of agro allied SMEs firm.

2.5 Summary of Gaps in Literature Reviewed

Business resilience has increasingly been recognized as a critical factor in ensuring the sustainability of small and medium-sized enterprises (SMEs), especially in challenging sectors such as agro-allied industries. Recent studies have highlighted that resilience enables businesses to adapt to disruptions and maintain productivity, thereby contributing to long-term sustainability[139]. In the context of agro-allied SMEs, resilience becomes essential given the sector's susceptibility to various risks, such as fluctuating market conditions, environmental changes, and socio-economic challenges[140]. Research has specifically examined factors such as access to finance, managerial competencies, and market diversification as crucial components

influencing the resilience of agro-allied SMEs[141]. However, the specific effect of business resilience on the sustainability of agro-allied SMEs in Osun State, Nigeria, remains underexplored.

Despite increasing attention to the significance of resilience in the sustainability discourse, there is a distinct research gap regarding how different dimensions of business resilience such as adaptive capacity, robustness, and learning orientation specifically impact the sustainability outcomes of agro-allied SMEs in Osun State. Existing studies on SMEs in Nigeria have primarily focused on general challenges such as financial constraints, inadequate infrastructure, and access to markets[142]. There is limited empirical evidence that systematically examines the relationship between resilience-building practices and the sustainability of SMEs, particularly within the agro-allied sector in Osun State. This gap in understanding limits our ability to determine how resilience strategies can help these businesses endure disruptions such as climate variability, economic downturns, or supply chain interruptions.

Addressing this gap is crucial because without a nuanced understanding of how resilience influences sustainability, policy interventions and business support strategies may lack specificity and effectiveness, potentially undermining the growth and stability of agro-allied SMEs in the region. The agro-allied sector plays a vital role in food security, rural employment, and economic diversification in Nigeria, making its sustainability a matter of high socio-economic importance[143]. Without targeted resilience strategies, SMEs in Osun State may remain vulnerable to shocks that could impair productivity and disrupt livelihoods. Furthermore, empirical insights into resilience mechanisms could provide valuable lessons for developing context-

specific policies and fostering public-private partnerships aimed at enhancing the sector's long-term sustainabilit[143]. Thus, it is imperative to conduct empirical research that investigates the specific mechanisms through which business resilience contributes to the sustainability of agro-allied SMEs in Osun State, ensuring that stakeholders have actionable insights to support these critical enterprises.

Research has extensively examined the impact of business resilience on the sustainability of small and medium enterprises (SMEs), particularly in challenging environments such as the agro-allied sector in developing countries. Existing studies indicate that business resilience significantly influences SME sustainability by enhancing the ability to adapt to uncertainties and external shocks, such as economic instability, supply chain disruptions, and climate variability[143,144]. Similarly, digital marketing capability has been identified as a crucial factor in promoting business sustainability, allowing firms to better engage customers, access wider markets, and enhance competitive advantage[145,146,147]. However, while both business resilience and digital marketing capability have been individually linked to sustainability, there is limited research exploring the moderating effect of digital marketing capability on the relationship between business resilience and sustainability, particularly among agro-allied SMEs in Osun State, Nigeria. The gap in literature pertains specifically to how digital marketing capability can potentially enhance the influence of business resilience on SME sustainability in the agro-allied sector. Previous research has largely treated digital marketing as a direct driver of business performance or a standalone capability that contributes to marketing outcomes[146,148,149,150]. There is a need for empirical evidence that integrates digital marketing capability as a moderating variable that may strengthen or weaken the relationship between business resilience and sustainability outcomes for agro-allied SMEs. This gap becomes

particularly relevant considering the unique challenges faced by SMEs in the agro-allied sector in Osun State, including limited access to infrastructure, market volatility, and fluctuating input costs[147]. These challenges suggest that an integrated approach, which considers both resilience and digital marketing capabilities, may yield a more comprehensive understanding of sustainability strategies in this context.

The consequence of this gap is that policymakers and agro-allied SME owners may lack insights into effective strategies for leveraging digital marketing tools to enhance resilience-based sustainability. If the moderating role of digital marketing capability remains unexplored, there is a risk that agro-allied SMEs may not fully harness the potential benefits of these technologies in navigating periods of uncertainty. Furthermore, without understanding this moderating effect, SME owners might underutilize digital marketing as a strategic tool that complements resilience-building practices, thereby missing opportunities for improved adaptability and long-term viability[151,152]. Addressing this gap is essential, as understanding how digital marketing capability moderates the resilience-sustainability relationship can offer targeted recommendations to support SMEs in making data-driven decisions, optimizing resources, and enhancing their sustainability in the face of economic challenges. There is substantial evidence regarding the individual roles of business resilience and digital marketing capability in promoting the sustainability of SMEs[153,154]. the potential moderating effect of digital marketing capability on this relationship remains underexplored in the agro-allied sector of Osun State. Bridging this gap is crucial for developing practical strategies that allow SMEs to integrate resilience with digital innovation, thus enhancing their adaptability and sustainability. Future research should investigate this moderating effect through empirical studies to

generate actionable insights that can guide SME owners and policymakers in fostering a more resilient and sustainable

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Chapter Three

Methodology

This chapter describes the research methods to be used to test the hypotheses, objectives, and questions provided in the introduction. A synthesised framework was used to determine the study's research design, demographic, sample size, sampling strategy, data collection methods, research instrument, validity, and reliability. The pilot study, research instrument administration and retrieval, data analysis procedure, and mathematical models for each hypothesis to be investigated.

3.1 Research Design

Using a positivist research viewpoint, this study looked at how agro-allied SMEs in Osun State fared when it came to business resilience and sustainability. As a research philosophy, positivism holds that scientific methods can reveal the existence of objective facts that make up reality. One of positivism's main arguments is that we can learn more about a phenomenon with more confidence if we rely on empirical evidence. In addition, the researcher was able to see numerical relationships between variables because the study used a quantitative research methodology to examine its objective. The reasoning behind using a quantitative approach is that it can produce measurable evidence, which guarantees accurate and reliable results[2]. In order to determine the effect of contextual factors on performance at a given time, this study used a cross-sectional survey research design to look at a subset of the population. There is a cost benefit to using this approach rather than the more labour-intensive longitudinal survey design. The positivist tenets and quantitative methodology of the study led to the selection of a cross-sectional design. In addition, studies have shown that cross-sectional survey designs work well for some

purposes; for example, when looking at how certain factors in the environment affect the sustainability of Agro-allied businesses at a given point in time[3,4,5].

3.2 Population of the Study

The target population of this study comprised of one hundred and twenty (120) registered agro-allied SMEs in Osun State, Nigeria. The target population are owner-managers of the one hundred and twenty agro-allied SMEs in Osun State. The choice of owner-managers as the unit of analysis is because the issues regarding business resilience, digital marketing and sustainability of their business is one that involves heads of strategic units in the organisations. However, the nature of SMEs suggest that such head of operations is the owner-manager. Moreover, engaging all the staff may create bias given that they may provide inaccurate feedback on issues regarding business resilience, digital marketing and sustainability of agro-allied SMEs in Osun State, Nigeria. Also, the choice of Osun State as the geographical setting of this research is because of the sustainability challenges identified with the agro-allied industry. More so, studies have place too much emphasis on Lagos State and the Southwest, Nigeria as a whole not minding the unique contextual differences and the insight that can help address a context-specific challenges in Osun State, Nigeria.

3.3 Sample Size and Sampling Technique

The unit of analysis for this study are one hundred and twenty owner-managers of registered agro-allied SMEs in Osun State, Nigeria. It is important to stress that the unit of analysis are only a few within each agro-allied SMEs; thus, this explains the small target population. Consequently, a total enumeration method will be appropriate. The adoption of total enumeration meant the discussion of sampling technique

becomes irrelevant because the researcher have access to the entire population of the study. This use of total enumeration align with extant literature.

3.4 Description of Research Instrument

The researcher used a structured closed-ended questionnaires to collect data from the owner-manager of the agro-allied SMEs in Osun State, Nigeria. The researcher intention to use questionnaires is because large amounts of information can be collected from a large number of people in a short period and in a relatively cost-effective way. Also, the use of questionnaire is relevant because it helps in collecting feedback based on the perception of the respondents' concerning issues under investigation. The items in the questionnaire were adapted from prior studies (See table 3.1). The adapted questionnaire is a standardised scale that has been used by authors on the subject matter of this research in other countries, sectors, and in different industries. Below are the sources of the questionnaire items.

Table 3.1: Measurement of Research Instruments

Variable	Predictive measurement	Sources of instrument
Business resilience	Behavioral resilience, Business agility, Operational resilience and Strategic resilience	1,2,3,4
Sustainability	Environment, Social, & Economic	5,6
Moderating variable	Digital marketing capability	7,8,9

Source: Researcher's Computation, 2024

In line with extant literature, the response options provided in this study's questionnaire follow the 6-point Likert-type scale, consistent with[6]. This scale been an

ordinal interval scale numbered from 6 to 1. The response options in the questionnaire covered, 6 = Strongly Agree; 5 = Agree; 4 = Partially Agree; 3 = Partially Disagree; 2= Disagree; 1 = Strongly Disagree. The questionnaire has 4 sections: Section A covered the demographic variables with four (4) items, section B covered Contextual factors with forty (40) items, section C covered organisational performance with twenty-four (24) items, section D covered moderating variables (regulatory support) with seven (7) items.

3.5 Validity of the Research Instrument

A pilot study was conducted using the regular staff of agro-allied SMEs in Ibadan, as they possess similar attributes to the unit of analysis being studied in Osun State. The study utilized a sample size of 24, which represents 20% of the total sample size, as advised by scholars. The staff of Solocad and Tocnock agro-allied SMEs in Ibadan were selected using convenient sampling. After the process of retrieving and organizing the questionnaire, it was found that only 18 copies were completed correctly and deemed suitable for use. The response rate was 75%. The pilot study has verified the instrument's validity and reliability for the intended research. The instrument's validity and reliability are substantiated by the outcomes of the Average Variable Explained (AVE) and Cronbach's Alpha (CA) coefficient. The research instrument was validated through the use of face and construct validity. The face validity of the instruments was established through validation by senior faculty members in the department of management and accounting at Lead City University Ibadan, as well as the input of practitioners who participated in the pilot study and the researcher's supervisor. The contributions were utilized to adapt the questionnaire as required for the primary study, while considering the measurement of each variable in

the existing literature. The pilot study conducted allowed for the pre-testing of the instruments to determine their construct validity. Table 3.2 and 3.3 below presented a summary of the construct validity for these questionnaire items of this study.

Table 3.2: Summary of Pilot Test Incorporating Construct Validity Test.

Variable	Items before Pilot	AVE	Remark
Behavioral resilience,	8	0.591	Reliable
Business agility,	8	0.549	Reliable
Digital marketing Capability	6	0.709	Reliable
Economic sustainability	6	0.635	Reliable
Environment sustainability	8	0.638	Reliable
Resilient capacity,	8	0.657	Reliable
Social sustainability	6	0.670	Reliable
Strategic resilience	8	0.639	Reliable

Source: Computed from Pilot Study, 2024

Table 3.7 above shows that the AVE values for all the constructs are above the threshold of 0.5 to suggest that the convergent validity has been established for all the reflective constructs in this study.

3.6 Reliability of the Instrument

Reliability testing was conducted on the questionnaire by the researcher. Composite reliability and the internal consistency approach of reliability were applied to the variables. One way to determine if a measurement is reliable is to look at its internal consistency, which compares how consistently people answered each item on the scale. In order to evaluate the internal consistency of multiple-item assessment instruments, such as the one used in this study, Cronbach's alpha coefficient is commonly used. A

questionnaire is considered credible if its Cronbach's alpha coefficient is more than 0.7 but less than 1. Revalidating the instrument's dependability is done using the composite reliability. The reliability statistic for each variable in this study is shown in Table 3.10 below.

Table 3.3: Reliability Statistic

S/N	Variables	Cronbach's alpha Coefficient
1.	Behavioral resilience,	0.778
2.	Business agility,	0.753
3.	Digital marketing Capability	0.868
4.	Economic sustainability	0.735
5.	Environment sustainability	0.728
6.	Resilient capacity,	0.716
7.	Social sustainability	0.893
8.	Strategic resilience	0963

Source: Computed from pilot study (2024)

3.7 Administration of Research Instrument and Method of Data Collection

To achieve it aim, this study gathered primary data. This is due to the fact that it offers a chance to learn more about the respondents being studied while also lowering the likelihood of getting inaccurate data. Consistent with previous research, a structured questionnaire was used to gather the main data. This instrument also lends itself well to a cross-sectional design, which is useful for gathering data on respondents' opinions and perceptions of current events at a certain moment in time. One hundred and twenty owner-managers of small and medium-sized agro-allied enterprises in Osun State were given the survey.

3.8 Methods of Data Analysis

Descriptive and inferential statistics were used to examine the data that was gathered in this research. In order to answer the research questions, descriptive statistics were used to characterize and summarize the data on the study's variables. This was done by looking at things like frequency distribution, mean, standard deviation, and percentage of response. Moreover, inferential statistics will be easier to perform thanks to descriptive statistics. This study's hypotheses were tested with the help of inferential statistics.

In order to put the study's hypotheses to the test, the researchers used Partial Least Square-Structural Equation modeling, also known as PLS-SEM. This is due to the fact that, in contrast to the outcome of one-off regression analyses conducted using the SPSS statistical platform, path analysis using the PLS-SEM provides a stringent and robust conclusion12. Any hypothesis tested in this study was considered significant if the corresponding probability value is less than or equal to 0.05. Since SPSS is a statistical platform that permits the use of primary data (questionnaire) to run multiple data analyses, it is an excellent tool to utilize. This study's variables are categorized into three groups: dependent, independent, and moderating. Resilient capacity, behavioral resilience, business agility, and strategic resilience are the metrics used to assess the independent variable of interest, business resilience (X). Environmental, social, and economic sustainability are the metrics used to quantify the dependent variable, sustainability (Y). Digital marketing competence is the moderating variable (Z). The mathematical model with address the hypotheses formulated is show below:

$$Y = f(X)$$

Y = Dependent variable: Sustainability (SBT)

X = Independent variables: Business Resileince (BUR)

Z = Moderating variables: Digital Marketing Capability (DMC)

The independent variable- Business Resilience (BUR) is measured as:

x_1 = Behavioural Resilience (BER)

x_2 = Business Agility (BUA),

x_3 = Operational Resilience (OPM)

x_4= Strategic Resilience (STR)

The dependent variable- Sustainability (SBT) Y is measured as:

y_1= Environmental Sustainability (ENS)

y_2= Social Sustainability (SOS)

y_3= Economic Sustainability (ECS)

This study incorporates on moderating variables (Z) – Digital Marketing Capability (DMC) is considered

Z = Digital Marketing Capability (DMC)

By substituting the acronyms of each variable in the regression model, the researcher presents the following:

Hypothesis One

$y_1 = f(x_1, x_2, x_3, x_4)$

$y_1 = \beta o + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \mu_i$ ------ (i)

Hypothesis Two

$y_2 = f(x_1, x_2, x_3, x_4)$

$y_2 = \beta o + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \mu_i$ ------ (ii)

Hypothesis Three

$y_3 = f(x_1, x_2, x_3, x_4)$

$y_3 = \beta o + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \mu_i$ ------ (iii)

Hypothesis Four

$Y = f(XZ)$

$Y = \beta o + \beta_1 X_i + \mu_i$ ------ (i)

Hypothesis Five

$Y = f(XZ)$

$Y = \beta o + \beta_1 X_i + \beta_2 Z_1 + \beta_3 X_i * Z_1 + \mu_i$ ---------- (v)

For the purpose of this study, the above models will be used.

Where:

βo = the intercept expected value of y when x is equal to zero.

β = the Coefficient of the independent variable (it is the rate of change in y with respect to x).

e = the error term to accommodate the effect of other variables that can influence Sustainability of SMEs Agro-allied businesses, but which were not included in the model.

Endnotes

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Chapter Four

Results and Discussion of Findings

This chapter dealt with data presentation, analysis and interpretation of the results. The analysis was guided by the specific objectives and the hypotheses that were formulated in the study. The first section shows the presentation of the descriptive analysis using tables showing percentages and interpretation below the tables. Section two presented inferential statistics and a discussion of findings comes at the later end of the chapter. The results presented were based on the research questions and hypotheses, which the study set out to answer and examine. Data were analyzed using SPSS version 25.

4.1 Data Presentation

A total of one hundred and twenty (120) copies of the questionnaire were administered, and one hundred and sixteen (116) copies were returned. After sorting the questionnaires only one hundred and fourteen (114) copies were certified as duly filled and considered usable. The useable questionnaire represented a 95% response rate. The high response rate was recorded as the researcher administered the instruments with the help of research assistants who put concerted efforts into reaching out to the secretaries to request them to participate in the study. The response results are presented in Table 4.1

Table 4.1: Response Rate

Response Rate	Frequency	Percent (%)
Returned and used	114	95%
Not Returned/Returned but not used	06	5%
No of distributed Questionnaire	120	100%

Source: Field Survey Data (2024)

Table 4.2: 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 (2024)

This section consist 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 4.2.

Table 4.2 presents the demographic and personal profile of respondents used for this study. Demographic and personal profile of respondents as shown in table 4.2. 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+.

Table 4.3 Descriptive analysis on Business Resilience

Behavioural Resilience	VHE	HE	PHE	PLE	LE	VLE	Mean
Our employees demonstrate adaptability in response to unexpected changes in market conditions	33 (28.7%)	44 (38.3%)	35 (30.4%)	2 (1.7%)	-	-	4.95
Our team maintains a positive attitude even during challenging times	29 (25.2%)	60 (52.2%)	19 (16.5%)	6 (5.2%)	-	-	4.98
Employees in our business are quick to learn and adopt new technologies or practices	23 (20.0%)	62 (53.9%)	29 (25.2%)	-	-	-	4.95
Our staff proactively seeks out solutions to overcome obstacles in daily operations	8 (7.0%)	85 (73.9%)	15 (13.0%)	6 (5.2%)	-	-	4.83
We are capable of maintaining high levels of productivity despite operational disruptions	14 (12.2%)	63 (54.8%)	34 (29.6%)	3 (2.6%)	-	-	4.77
Our workforce remains committed and motivated during periods of uncertainty	26 (22.6%)	58 (50.4%)	24 (20.9%)	6 (5.2%)	-	-	4.91
There is a strong culture of support and encouragement among employees during stressful periods	24 (20.9%)	67 (58.3%)	23 (20.0%)	-	-	-	5.01
Weighted Mean							4.91

Business Agility							
Our business quickly adapts its strategies to respond to changes in the agro-allied market	26 (22.6%)	53 (46.1%)	26 (22.6%)	9 (7.8%)	-	-	4.84
We efficiently reallocate resources to capitalize on new opportunities	29 (25.2%)	57 (49.6%)	23 (20.0%)	5 (4.3%)	-	-	4.96
Our decision-making processes are flexible and responsive to market trends	24 (20.9%)	60 (52.2%)	24 (20.9%)	6 (5.2%)	-	-	4.89
We can rapidly introduce new products or services to meet customer needs	36 (31.3%)	52 (45.2%)	26 (22.6%)	-	-	-	5.09
Our business structure allows for quick adjustments to business plans	30 (26.1%)	59 (51.3%)	25 (21.7%)	-	-	-	5.04
We regularly update our processes to improve efficiency and effectiveness	28 (24.3%)	65 (56.5%)	16 (13.9%)	5 (4.3%)	-	-	5.02
Our company is proficient at managing and implementing changes swiftly	31 (27.0%)	62 (53.9%)	21 (18.3%)	-	-	-	5.09
Weighted Mean							4.99
Operational Resilience							
We have contingency plans in place for potential disruptions in our supply chain	22 (19.1%)	61 (53.0%)	31 (27.0%)	-	-	-	4.92
Our business can sustain operations even during	26 (22.6%)	64 (55.7%)	21 (18.3%)	3 (2.6%)	-	-	4.99

adverse weather conditions							
We have backup systems to ensure continuity of operations in case of equipment failure	14 (12.2%)	69 (60.0%)	31 (27.0%)	-	-	-	4.85
Our company has a robust risk management framework for addressing operational challenges	21 (18.3%)	62 (53.9%)	25 (21.7%)	6 (5.2%)	-	-	4.86
We maintain sufficient inventory to avoid disruptions in supply	21 (18.3%)	75 (65.2%)	9 (7.8%)	9 (7.8%)	-	-	4.95
Our business has established relationships with multiple suppliers to mitigate risks	18 (15.7%)	77 (67.0%)	19 (16.5%)	-	-	-	4.99
We conduct regular training to prepare employees for emergency situations	16 (13.9%)	65 (56.5%)	30 (26.1%)	3 (2.6%)	-	-	4.82
Weighted mean							4.91
Strategic Resilience							
Our long-term strategies are designed to be flexible and adaptable	32 (27.8%)	56 (48.7%)	26 (22.6%)	-	-	-	5.05
We continually assess the external environment to identify potential threats and opportunities	27 (23.5%)	49 (42.6%)	35 (30.4%)	3 (2.6%)	-	-	4.88
Our business invests in innovation to stay competitive in the agro-allied sector	40 (34.8%)	42 (36.5%)	29 (25.2%)	3 (2.6%)	-	-	5.04

We engage in strategic planning that considers future industry trends and uncertainties	3 (2.6%)	21 (18.3%)	73 (63.5%)	17 (14.8%)	-	-	6.64
Our business has a clear vision that guides our actions during periods of change	19 (16.5%)	68 (59.1%)	24 (20.9%)	3 (2.6%)	-	-	4.90
We regularly review and update our business strategies to align with market developments	20 (17.4%)	81 (70.4%)	10 (8.7%)	3 (2.6%)	-	-	5.04
Our company prioritizes strategic partnerships that enhance our resilience	32 (27.8%)	52 (45.2%)	30 (26.1%)	-	-	-	5.02
Weighted mean							5.22
Weighted mean for business resilience							5.01

Source: Field Work, 2024

According to results in Table 4.3. 28.7% of respondents rated to a very high extent that their employees demonstrate adaptability in response to unexpected changes in market conditions, 38.3% high extent, 30.4% partially high extent, and 1.7% partially low extent. On average, the respondents indicated that their employees demonstrate adaptability in response to unexpected changes in market conditions has a mean of 4.95. Results also indicated that 25.2% of respondents rated to a very high extent that their team maintains a positive attitude even during challenging times, 52.2% high extent, 16.5% partially high extent, and 5.2% partially low extent. On average, the respondents indicated that their team maintains a positive attitude even during challenging times has a mean of 4.98. Results also indicated that 20.0% of the respondents rated to a very high extent that employees in their business are quick to learn and adopt new technologies or practices, 53.9% high extent, and 25.2% partially high extent. On average, the respondents

indicated that employees in their business are quick to learn and adopt new technologies or practices has a mean of 4.95. Results also indicated that 7.0% of the respondents rated to a very high extent that their staff proactively seeks out solutions to overcome obstacles in daily operations, 73.9% high extent, 13.0% partially high extent, and 5.2% partially low extent. On average, the respondents indicated that their staff proactively seeks out solutions to overcome obstacles in daily operations has a mean of 4.83. Results also indicated that 12.2% of the respondents rated to a very high extent that they are capable of maintaining high levels of productivity despite operational disruptions, 54.8% high extent, 29.6% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they are capable of maintaining high levels of productivity despite operational disruptions has a mean of 4.77. Results also indicated that 22.6% of the respondents rated to a very high extent that their workforce remains committed and motivated during periods of uncertainty, 50.4% agree, 20.9% partially agree, and 5.2% partially disagree. On average, the respondents indicated that their workforce remains committed and motivated during periods of uncertainty has a mean of 4.91. Results also indicated that 20.9% of the respondents rated to a very high extent that there is a strong culture of support and encouragement among employees during stressful periods, 58.3% agree, and 20.0% partially agree. On average, the respondents indicated that there is a strong culture of support and encouragement among employees during stressful periods has a mean of 5.01.

According to results in Table 4.3. 22.6% of respondents strongly agree that their business quickly adapts its strategies to respond to changes in the agro-allied market, 46.1% agree, 22.6% partially agree, and 7.8% partially disagree. On average, the respondents indicated that their business quickly adapts its strategies to respond to changes in the agro-allied market has a mean of 4.84. Results also indicated that 25.2% of respondents strongly

agree that they efficiently reallocate resources to capitalize on new opportunities, 49.6% agree, 20.0% partially agree, and 4.3% partially disagree. On average, the respondents indicated that they efficiently reallocate resources to capitalize on new opportunities has a mean of 4.96. Results also indicated that 20.9% of the respondents strongly agree that their decision-making processes are flexible and responsive to market trends, 52.2% agree, 20.9% partially agree, and 5.2% partially disagree. On average, the respondents indicated that their decision-making processes are flexible and responsive to market trends has a mean of 4.89. Results also indicated that 31.3% of the respondents strongly agree that they can rapidly introduce new products or services to meet customer needs, 45.2% agree, and 22.6% partially agree. On average, the respondents indicated that they can rapidly introduce new products or services to meet customer needs has a mean of 5.09. Results also indicated that 26.1% of the respondents strongly agree that their business structure allows for quick adjustments to business plans, 51.3% agree, and 21.7% partially agree. On average, the respondents indicated that their business structure allows for quick adjustments to business plans has a mean of 5.04. Results also indicated that 24.3% of the respondents strongly agree that they regularly update their processes to improve efficiency and effectiveness, 56.5% agree, 13.9% partially agree, and 4.3% partially disagree. On average, the respondents indicated that they regularly update their processes to improve efficiency and effectiveness has a mean of 5.02. Results also indicated that 27.0% of the respondents strongly agree that their company is proficient at managing and implementing changes swiftly, 53.9% agree, and 18.3% partially agree. On average, the respondents indicated that their company is proficient at managing and implementing changes swiftly has a mean of 5.09

According to results in Table 4.3. 19.1% of respondents rated to a very high extent that they have contingency plans in place for potential disruptions in our supply chain, 53.0%

high extent, and 27.0% partially high extent. On average, the respondents indicated that they have contingency plans in place for potential disruptions in our supply chain has a mean of 4.92. Results also indicated that 22.6% of respondents rated to a very high extent that their business can sustain operations even during adverse weather conditions, 55.7% high extent, 18.3% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that their business can sustain operations even during adverse weather conditions has a mean of 4.99. Results also indicated that 12.2% of the respondents rated to a very high extent that they have backup systems to ensure continuity of operations in case of equipment failure, 60.0% high extent, and 27.0% partially high extent. On average, the respondents indicated that they have backup systems to ensure continuity of operations in case of equipment failure has a mean of 4.85. Results also indicated that 18.3% of the respondents rated to a very high extent that their company has a robust risk management framework for addressing operational challenges, 53.9% high extent, 21.7% partially high extent, and 5.2% partially low extent. On average, the respondents indicated that their company has a robust risk management framework for addressing operational challenges has a mean of 4.86. Results also indicated that 18.3% of the respondents rated to a very high extent that they maintain sufficient inventory to avoid disruptions in supply, 65.2% high extent, 7.8% partially high extent, and 7.8% partially low extent. On average, the respondents indicated that they maintain sufficient inventory to avoid disruptions in supply has a mean of 4.95. Results also indicated that 15.7% of the respondents rated to a very high extent that their business has established relationships with multiple suppliers to mitigate risks, 67.0% high extent, and 16.5% partially high extent. On average, the respondents indicated that their business has established relationships with multiple suppliers to mitigate risks has a mean of 4.99. Results also indicated that 13.9% of the respondents rated to a very high extent that they

conduct regular training to prepare employees for emergency situations, 56.5% high extent, 26.1% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they conduct regular training to prepare employees for emergency situations has a mean of 4.82.

According to results in Table 4.3. 27.8% of respondents rated to a very high extent that their long-term strategies are designed to be flexible and adaptable, 48.7% high extent, and 22.6% partially high extent. On average, the respondents indicated that their long-term strategies are designed to be flexible and adaptable has a mean of 5.05. Results also indicated that 23.5% of respondents rated to a very high extent that they continually assess the external environment to identify potential threats and opportunities, 42.6% high extent, 30.4% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they continually assess the external environment to identify potential threats and opportunities has a mean of 4.88. Results also indicated that 34.8% of the respondents rated to a very high extent that their business invests in innovation to stay competitive in the agro-allied sector, 36.5% high extent, 25.2% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that their business invests in innovation to stay competitive in the agro-allied sector has a mean of 5.04. Results also indicated that 2.6% of the respondents rated to a very high extent that they engage in strategic planning that considers future industry trends and uncertainties, 18.3% high extent, 63.5% partially high extent, and 14.8% partially low extent. On average, the respondents indicated that they engage in strategic planning that considers future industry trends and uncertainties has a mean of 6.64. Results also indicated that 16.5% of the respondents rated to a very high extent that their business has a clear vision that guides their actions during periods of change, 59.1% high extent, 20.9% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that their business

has a clear vision that guides their actions during periods of change has a mean of 4.90. Results also indicated that 17.4% of the respondents rated to a very high extent that they regularly review and update their business strategies to align with market developments, 70.4% high extent, 8.7% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they regularly review and update their business strategies to align with market developments has a mean of 5.04. Results also indicated that 27.8% of the respondents rated to a very high extent that their company prioritizes strategic partnerships that enhance their resilience, 45.2% high extent, and 26.1% partially high extent. On average, the respondents indicated that their company prioritizes strategic partnerships that enhance their resilience has a mean of 5.02.

A weighted mean of 5.01 for business resilience reflects a high degree of resilience among agro-allied SMEs in Osun State, indicating that these businesses possess robust adaptive capacities, proactive operational strategies, and strong strategic planning. This score suggests that, on average, respondents feel confident in their businesses' ability to withstand disruptions, adapt to changes, and leverage opportunities. Each resilience dimension contributes to this overall score by enhancing the organization's ability to operate effectively despite market fluctuations or unforeseen events.

Implications for the Management of Agro-Allied SMEs in Osun State

The high weighted mean of 5.01 for business resilience has several important implications for the management of agro-allied SMEs in Osun State: The positive scores in behavioural resilience highlight the importance of investing in employee adaptability and motivation. Managers should prioritize continuous skill development programs to ensure employees can quickly adjust to technological advancements and market demands. The strong performance in business agility implies that SMEs are efficiently re-allocating

resources and adapting business strategies. Management should continue to emphasize agile decision-making processes to capture market opportunities and maintain competitive positioning.

High scores in operational resilience suggest robust supply chain and risk management frameworks are in place. Managers should regularly review contingency plans, maintain a diverse supplier base, and conduct training to uphold operational continuity. The leading score in strategic resilience suggests that these SMEs are forward-thinking and adaptable. Managers should continue to develop flexible long-term strategies, foster innovation, and prioritize partnerships that align with future trends. This strategic emphasis can sustain growth and enhance resilience against potential market shifts or external shocks. In all, these descriptive findings reveal that agro-allied SMEs in Osun State exhibit strong resilience across behavioural, operational, and strategic aspects. Management should leverage this resilience by reinforcing training, agility, risk management, and strategic foresight, thus positioning these enterprises for sustainable success in a dynamic agro-allied sector.

Table 4.4 Descriptive Analysis on Sustainability

Environmental Sustainability	**VHE**	**HE**	**PHE**	**PLE**	**LE**	**VLE**	**Mean**
Our business regularly evaluates and reduces its environmental impact	31 (27.0%)	60 (52.2%)	20 (17.4%)	3 (2.6%)	-	-	5.04
We have	41	47	23	3	-	-	5.11

implemented energy-efficient practices and technologies	(35.7%)	(40.9%)	(20.0%)	(2.6%)			
Our company actively works to reduce waste and promote recycling	43 (37.4%)	54 (47.0%)	17 (14.8%)	-	-	-	5.23
We prioritize sourcing materials and products that are environmentally friendly	27 (23.5%)	67 (58.3%)	17 (14.8%)	3 (2.6%)	-	-	5.04
Our business complies with all relevant environmental regulations and standards	23 (20.0%)	63 (54.8%)	28 (24.3%)	-	-	-	4.96
We adapt our business practices based on sustainability trends and insights	31 (27.0%)	61 (53.0%)	19 (16.5%)	3 (2.6%)	-	-	5.05
Weighted Mean							5.07

Economic Sustainability							
Our business maintains a stable and healthy financial position	29 (25.2%)	68 (59.1%)	14 (12.2%)	-	-	-	5.14
We invest in long-term growth and development	43 (37.4%)	39 (33.9%)	29 (25.2%)	3 (2.6%)	-	-	5.07
Our company effectively manages risks and uncertainties	36 (31.3%)	50 (43.5%)	20 (17.4%)	8 (7.0%)	-	-	5.00
We continuously seek to improve our operational efficiency	17 (14.8%)	66 (57.4%)	31 (27.0%)	-	-	-	4.88
Our business strategy includes sustainable economic practices	15 (13.0%)	71 (61.7%)	25 (21.7%)	3 (2.6%)	-	-	4.86
We regularly measure and report on our sustainability performance	20 (17.4%)	71 (61.7%)	20 (17.4%)	3 (2.6%)	-	-	4.95

Weighted Mean							4.98
Social							
Sustainability							
Our company supports and engages with the local community	31 (27.0%)	58 (50.4%)	25 (21.7%)	-	-	-	5.05
We ensure fair and equitable treatment of all employees	29 (25.2%)	66 (57.4%)	19 (16.5%)	-	-	-	5.09
Our business promotes diversity and inclusion in the workplace	38 (33.0%)	41 (35.7%)	32 (27.8%)	3 (2.6%)	-	-	5.00
We provide opportunities for employee development and growth	32 (27.8%)	61 (53.0%)	21 (18.3%)	-	-	-	5.10
Our company upholds high standards of health and safety for our employees	27 (23.5%)	72 (62.6%)	12 (10.4%)	3 (2.6%)	-	-	5.08
Our stakeholders	23	61	27	3	-	-	4.91

recognize and appreciate our sustainability efforts	(20.0%)	(53.0%)	(23.5%)	(2.6%)
Weighted mean				5.04
Weighted mean for Sustainability				5.03

Source: Field Work, 2024

According to results in Table 4.4. 27.0% of respondents rated to a very high extent that their business regularly evaluates and reduces its environmental impact, 52.2% high extent, 17.4% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that their business regularly evaluates and reduces its environmental impact has a mean of 5.04. Results also indicated that 35.7% of respondents rated to a very high extent that they have implemented energy-efficient practices and technologies, 40.9% high extent, 20.0% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they have implemented energy-efficient practices and technologies has a mean of 5.11. Results also indicated that 37.4% of the respondents rated to a very high extent that their company actively works to reduce waste and promote recycling, 47.0% high extent, and 14.8% partially high extent. On average, the respondents indicated that their company actively works to reduce waste and promote recycling has a mean of 5.23. Results also indicated that 23.5% of the respondents rated to a very high extent that they prioritize sourcing materials and products that are environmentally friendly, 58.3% high extent, 14.8% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they prioritize sourcing materials and products that are environmentally friendly has a mean of 5.04. Results also indicated that 20.0% of the respondents rated to a very high extent that their

business complies with all relevant environmental regulations and standards, 54.8% high extent, and 24.3% partially high extent. On average, the respondents indicated that their business complies with all relevant environmental regulations and standards has a mean of 4.96. Results also indicated that 27.0% of the respondents rated to a very high extent that they adapt their business practices based on sustainability trends and insights, 53.0% agree, 16.5% partially agree, and 2.6% partially disagree. On average, the respondents indicated that they adapt their business practices based on sustainability trends and insights has a mean of 5.05.

According to results in Table 4.4. 25.2% of respondents rated to a very high extent that their business maintains a stable and healthy financial position, 59.1% high extent, and 12.2% partially high extent. On average, the respondents indicated that their business maintains a stable and healthy financial position has a mean of 5.14. Results also indicated that 37.4% of respondents rated to a very high extent that they invest in long-term growth and development, 33.9% high extent, 25.2% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they invest in long-term growth and development has a mean of 5.07. Results also indicated that 31.3% of the respondents rated to a very high extent that their company effectively manages risks and uncertainties, 43.5% high extent, 17.4% partially high extent, and 7.0% partially low extent. On average, the respondents indicated that their company effectively manages risks and uncertainties has a mean of 5.00. Results also indicated that 14.8% of the respondents rated to a very high extent that they continuously seek to improve their operational efficiency, 57.4% high extent, and 27.0% partially high extent. On average, the respondents indicated that they continuously seek to improve their operational efficiency has a mean of 4.88. Results also indicated that 13.0% of the respondents rated to a very high extent that their business strategy includes sustainable economic practices,

61.7% high extent, 21.7% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that their business strategy includes sustainable economic practices has a mean of 4.86. Results also indicated that 17.4% of the respondents rated to a very high extent that they regularly measure and report on their sustainability performance, 61.7% high extent, 17.4% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they regularly measure and report on their sustainability performance has a mean of 4.95.

According to results in Table 4.4. 27.0% of respondents rated to a very high extent that their company supports and engages with the local community, 50.4% high extent, and 21.7% partially high extent. On average, the respondents indicated that their company supports and engages with the local community has a mean of 5.05. Results also indicated that 25.2% of respondents rated to a very high extent that they ensure fair and equitable treatment of all employees, 57.4% high extent, and 16.5% partially high extent. On average, the respondents indicated that they ensure fair and equitable treatment of all employees has a mean of 5.09. Results also indicated that 33.0% of the respondents rated to a very high extent that their business promotes diversity and inclusion in the workplace, 35.7% high extent, 27.8% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that their business promotes diversity and inclusion in the workplace has a mean of 5.00. Results also indicated that 27.8% of the respondents rated to a very high extent that they provide opportunities for employee development and growth, 53.0% high extent, and 18.3% partially high extent. On average, the respondents indicated that they provide opportunities for employee development and growth has a mean of 5.10. Results also indicated that 23.5% of the respondents rated to a very high extent that their company upholds high standards of health and safety for their employees, 62.6% high extent, 10.4% partially high extent, and 2.6% partially low extent. On average,

the respondents indicated that their company upholds high standards of health and safety for their employees has a mean of 5.08. Results also indicated that 20.0% of the respondents rated to a very high extent that their stakeholders recognize and appreciate our sustainability efforts, 53.0% high extent, 23.5% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that their stakeholders recognize and appreciate our sustainability efforts has a mean of 4.91.

This overall weighted mean of 5.03 indicates that sustainability efforts across environmental, economic, and social domains are generally well-integrated into the operations of agro-allied SMEs in Osun State, with responses indicating moderate to high levels of sustainable practices.

An overall weighted mean of 5.03 suggests that agro-allied SMEs in Osun State are implementing sustainability practices at a fairly consistent level across the three pillars of sustainability. This level of engagement demonstrates an awareness and commitment to sustainability principles in areas such as environmental impact reduction, economic stability, and social responsibility. However, the scores also suggest there is room for improvement, particularly in economic sustainability, which has a slightly lower weighted mean.

Implications for Agro-Allied SME Management

The findings imply that management should prioritize maintaining and enhancing sustainable practices, with particular attention to balancing all three sustainability areas. Key recommendations include: Although economic sustainability scored slightly lower, enhancing long-term financial resilience through targeted investments and strategic growth can bolster SME sustainability. This may involve fostering partnerships to access funding, improving risk management strategies, and optimizing operational efficiencies.

Social sustainability scored fairly high, indicating a strong commitment to employee welfare and community engagement. Management should continue these efforts, particularly in health, safety, and employee development initiatives. Such initiatives can help maintain high employee morale and community support, fostering a stable operating environment. With environmental sustainability receiving positive feedback, there is a need to maintain momentum. Management can encourage ongoing improvements in waste reduction, recycling, and adopting energy-efficient practices. Additionally, increasing the use of environmentally friendly materials can further enhance environmental sustainability, aligning the SMEs with global sustainability standards and potentially attracting environmentally conscious consumers and investors.

Given that SMEs in Osun State demonstrate solid foundational sustainability efforts, periodic evaluation is recommended to adapt to evolving sustainability standards and market demands. Tracking and reporting these efforts can strengthen their reputation and improve compliance with national and international environmental regulations. By addressing these areas, agro-allied SMEs in Osun State can achieve a more robust, balanced approach to sustainability, aligning with both immediate business goals and long-term sustainability objectives.

Table 4.5: Descriptive analysis on Digital Marketing Capability

Digital Marketing Capability	VHE	HE	PHE	PLE	LE	VLE	Mean
We regularly update our digital marketing strategy to reflect market changes	25 (21.7%)	71 (61.7%)	18 (15.7%)	-	-	-	5.06
We use various digital platforms (website, social media, etc.) to share our content	26 (22.6%)	60 (52.2%)	25 (21.7%)	3 (2.6%)	-	-	4.96
Our content effectively communicates the benefits of our products	24 (20.9%)	73 (63.5%)	11 (9.6%)	6 (5.2%)	-	-	5.01
We respond promptly to customer inquiries and feedback on social media	20 (17.4%)	61 (53.0%)	427 (23.5%)	4 (3.5%)	2 (1.7%)	-	4.82
We use social media analytics to understand customer preferences	35 (30.4%)	65 (56.5%)	14 (12.2%)	-	-	-	5.18
Our website is optimized for search engines to increase visibility	29 (25.2%)	50 (43.5%)	32 (27.8%)	3 (2.6%)	-	-	4.92
We use customer data to personalize our marketing efforts	27 (23.5%)	48 (41.7%)	36 (31.3%)	3 (2.6%)	-	-	4.87
Our business has an easy-to-use online store for purchasing our	23 (20.0%)	63 (54.8%)	28 (24.3%)	-	-	-	4.96

products							
We offer secure payment options on our e-commerce platform	28 (24.3%)	62 (53.9%)	21 (18.3%)	3 (2.6%)	-	-	5.01
Our business offers excellent customer support for online purchases	31 (27.0%)	56 (48.7%)	23 (20.0%)	4 (3.5%)	-	-	5.00
Weighted mean							4.98

Source: Field Result, 2024

According to results in Table 4.5. 21.7% of respondents rated to a very high extent that they regularly update their digital marketing strategy to reflect market changes, 61.7% high extent, and 15.7% partially high extent. On average, the respondents indicated that they regularly update their digital marketing strategy to reflect market changes has a mean of 5.06. Results also indicated that 22.6% of respondents rated to a very high extent that they use various digital platforms (website, social media, etc.) to share their content, 52.2% high extent, 21.7% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they use various digital platforms (website, social media, etc.) to share their content has a mean of 4.96. Results also indicated that 20.9% of the respondents rated to a very high extent that their content effectively communicates the benefits of their products, 63.5% high extent, 9.6% partially high extent, and 5.2% partially low extent. On average, the respondents indicated that their content effectively communicates the benefits of their products has a mean of 5.01. Results also indicated that 17.4% of the respondents rated to a very high extent that they respond promptly to customer inquiries and feedback on social media, 53.0% high extent, 23.5% partially high extent, 3.5% partially low extent, and 1.7% low extent. On average, the respondents indicated that they respond promptly to customer inquiries and feedback on social media

has a mean of 4.82. Results also indicated that 30.4% of the respondents rated to a very high extent that they use social media analytics to understand customer preferences, 56.5% high extent, and 12.2% partially high extent. On average, the respondents indicated that they use social media analytics to understand customer preferences has a mean of 5.18. Results also indicated that 25.2% of the respondents rated to a very high extent that their website is optimized for search engines to increase visibility, 43.5% agree, 27.8% partially agree, and 2.6% partially disagree. On average, the respondents indicated that their website is optimized for search engines to increase visibility has a mean of 4.92. Results also indicated that 23.5% of respondents rated to a very high extent that they use customer data to personalize their marketing efforts, 41.7% high extent, 31.3% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they use customer data to personalize their marketing efforts has a mean of 4.87. Results also indicated that 20.0% of the respondents rated to a very high extent that their business has an easy-to-use online store for purchasing their products, 54.8% high extent, and 24.3% partially high extent. On average, the respondents indicated that their business has an easy-to-use online store for purchasing their products has a mean of 4.96. Results also indicated that 24.3% of the respondents rated to a very high extent that they offer secure payment options on their e-commerce platform, 53.9% high extent, 18.3% partially high extent, and 2.6% partially low extent. On average, the respondents indicated that they offer secure payment options on their e-commerce platform has a mean of 5.01. Results also indicated that 27.0% of the respondents rated to a very high extent that their business offers excellent customer support for online purchases, 48.7% high extent, 20.0% partially high extent, and 3.5% partially low extent. On average, the respondents indicated that their business offers excellent customer support for online purchases has a mean of 5.00.

The descriptive analysis of digital marketing capability among agro-allied SMEs in Osun State reveals a generally high level of competence across several key digital marketing activities. With a weighted mean of 4.98, the analysis indicates that SMEs are leveraging digital marketing strategies to varying extents, with a notable focus on staying current with market trends, utilizing diverse digital platforms, and delivering effective online customer support. Below is a summary of each component and its implications for SME management in the region.

Implications for Management

The high level of regular strategy updates suggests that SMEs are already attuned to market changes, positioning them to respond effectively to customer needs. Management should continue prioritizing strategic agility by investing in training on emerging digital trends, ensuring marketing teams can adapt to shifts in consumer behavior. The use of multiple digital platforms opens numerous customer engagement channels, yet management should ensure these platforms are fully utilized to maximize reach. By diversifying content types (e.g., videos, blogs, interactive posts), SMEs can deepen customer engagement and differentiate themselves in the competitive market.

Although SMEs generally provide prompt customer responses, a slight improvement in responsiveness could further enhance customer satisfaction. Management might consider implementing tools like automated responses for frequently asked questions or hiring dedicated customer service personnel to ensure inquiries are promptly addressed. With

high engagement in social media analytics, management has a foundation for data-driven decision-making. By further utilizing customer data for personalized marketing, SMEs could better cater to individual customer needs, improving customer satisfaction and driving repeat purchases.

Given the emphasis on SEO, SMEs should continue to improve website performance by regularly updating SEO strategies to maintain or increase visibility. Management should consider monitoring SEO metrics and making necessary adjustments to enhance website discoverability. High ratings for secure payment options and usability indicate that SMEs understand the importance of secure and convenient online shopping experiences. Management should maintain security protocols and evaluate the user experience of online stores periodically to ensure that purchasing processes remain smooth and secure.

Customer support plays a critical role in online customer retention. Management can enhance customer support by gathering and analyzing feedback, which can inform improvements in both product offerings and support services. In conclusion, the descriptive analysis indicates that while agro-allied SMEs in Osun State exhibit substantial digital marketing capabilities, specific areas such as timely customer response, SEO, and personalized marketing could be further enhanced. By building on these capabilities, Agro-allied SMEs can more effectively engage with their audience, create lasting customer relationships, and improve overall sustainability in a digital economy.

4.2 Test of Hypotheses

$H_0$1: Business resilience dimensions have no significant effect on environmental sustainability of Agro-allied SMEs firm in Osun State

The null hypothesis (H01) proposed that Business resilience dimensions have no significant effect on environmental sustainability of Agro-allied SMEs firm in Osun State. To test this hypothesis, multiple linear regression analysis was conducted, where environmental sustainability (dependent variable) was regressed on Business resilience dimensions (independent variable), which was represented by summing responses across several components: behavioural resilience, business agility, operational resilience, and strategic resilience. The regression test results are presented in Tables 4.6a-c

Table 4.6: Summary of Multiple Regression Analysis for the Effect of Organisational Resilience on Environmental Sustainability of Agro-allied SMEs in Osun State

a. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.678[a]	0.460	0.440	.36086

a. Predictors: (Constant), behavioural resilience, business agility, operational resilience, & strategic resilience

b. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.078	4	3.020	23.189	.000[b]
	Residual	14.194	109	.130		
	Total	26.272	113			

a. Dependent Variable: Environmental Sustainability

b. Predictors: (Constant), Strategic Resilience, Operational Resilience, Behavioural Resilience, Business Agility

c.

d. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.114	.550		.207	.836
	Behavioural Resilience	.396	.108	.341	3.657	.000
	Business Agility	.420	.116	.342	3.623	.000
	Operational Resilience	.224	.110	.165	2.035	.044
	Strategic Resilience	-.036	.024	-.115	-1.517	.132

a. Dependent Variable: Environmental Sustainability

Source: Field Result, 2024

The null hypothesis (H01) proposed that business resilience dimensions—behavioural resilience, business agility, operational resilience, and strategic resilience—have no significant effect on the environmental sustainability of agro-allied SMEs in Osun State. Multiple linear regression analysis was conducted to test this hypothesis, where environmental sustainability served as the dependent variable and the four dimensions of business resilience were the independent variables.

The model summary shows an (R) value of 0.678, which indicates a moderate positive correlation between the business resilience dimensions and environmental sustainability. The (R^2) value of 0.460 suggests that 46% of the variance in environmental sustainability can be explained by the combined effects of the four resilience dimensions. An adjusted (R^2) of 0.440 further accounts for the number of predictors in the model, showing consistency with the variance explanation.

The ANOVA table provides evidence of the overall significance of the regression model, with an F-value of 23.189 and a p-value of 0.000. This result is highly significant, meaning that at least one of the resilience dimensions has a significant effect on environmental sustainability. Therefore, we reject the null hypothesis, indicating that business resilience dimensions, collectively, have a significant effect on environmental sustainability.

Looking at the coefficients table, behavioural resilience and business agility show significant positive effects on environmental sustainability with p-values of 0.000 for each. Their standardized beta values, 0.341 and 0.342 respectively, suggest they are strong contributors to the model. Operational resilience also demonstrates a positive effect with a p-value of 0.044, though its beta coefficient of 0.165 indicates a moderate contribution. However, strategic resilience is not statistically significant, with a p-value of 0.132, suggesting it does not independently contribute to environmental sustainability in this model.

In conclusion, the regression analysis results indicate that behavioural resilience, business agility, and operational resilience significantly affect the environmental sustainability of agro-allied SMEs in Osun State, while strategic resilience does not demonstrate a significant independent effect.

Implications for Agro-allied SMEs Management

The findings from this study reveal that business resilience dimensions significantly influence the environmental sustainability of agro-allied SMEs in Osun State, with behavioural resilience, business agility, and operational resilience emerging as strong contributors. This highlights that these dimensions are critical to fostering environmental sustainability in agro-allied businesses, a sector where resilience to environmental, operational, and economic pressures is paramount. The moderate correlation and substantial percentage of variance explained (46%) indicate that resilience strategies can be impactful in addressing sustainability challenges, helping agro-allied SMEs minimize ecological impact while maintaining stability and adaptability.

From a management perspective, these results underscore the importance of investing in behavioural resilience by cultivating a culture of adaptability among employees and promoting proactive responses to environmental risks. Business agility also plays a crucial role, as agile practices allow SMEs to swiftly adapt to environmental demands and integrate sustainable practices into daily operations. Furthermore, operational resilience—by enhancing the robustness of processes and supply chains—enables these firms to withstand external shocks, which is essential for maintaining both business continuity and environmental goals. However, the lack of significance for strategic resilience suggests that, in this context, longer-term strategic resilience planning alone may not directly enhance environmental sustainability without corresponding practical and adaptive measures.

Table 4.7: Summary of Multiple Regression Analysis for the Effect of Organisational Resilience on Economic Sustainability of Agro-allied SMEs in Osun State

a. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.697[a]	.486	.467	.32720

a. Predictors: (Constant), Strategic Resilience, Operational Resilience, Behavioural Resilience, Business Agility

b. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.039	4	2.760	25.778	.000[b]
	Residual	11.670	109	.107		
	Total	22.709	113			

a. Dependent Variable: ECOSus

b. Predictors: (Constant), Strategicl Resilience, Operational Resilience, Behavioural Resilience, Business Agility

c. Coefficients[a]

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, 2024

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 ($H_0 2$) posited that these business resilience dimensions would not significantly affect economic sustainability. The regression results,

summarized in Tables 4.7, 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.

In summary, 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.

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.

Table 4.8: Summary of Multiple Regression Analysis for the Effect of Organisational Resilience on Social Sustainability of Agro-allied SMEs in Osun State

a. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.632[a]	.399	.377	.36256

a. Predictors: (Constant), Strategicl Resilience, Operational Resilience, Behavioural

Resilience, Business Agility

b. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.507	4	2.377	18.081	.000[b]
	Residual	14.328	109	.131		
	Total	23.835	113			

a. Dependent Variable: SOCSus

b. Predictors: (Constant), Strategic Resilience, Operational Resilience, Behavioural Resilience, Business Agility

c. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.497	.553		.899	.371
	BehResilience	.007	.109	.006	.062	.951
	BusAgility	.255	.117	.217	2.185	.031
	OperationalResilience	.673	.111	.518	6.072	.000
	Strategic Resilience	-.013	.024	-.043	-.535	.594

a. Dependent Variable: Social Sustainability

Source: Field Result, 2024

The regression analysis aimed to assess whether the dimensions of business resilience significantly influence the social sustainability of agro-allied SMEs in Osun State. The null hypothesis (H03) stated that business resilience dimensions, comprising behavioral resilience, business agility, operational resilience, and strategic resilience, have no significant effect on social sustainability. Multiple linear regression was conducted, and the results are summarized below.

The model summary reveals that the multiple correlation coefficient (R) is 0.632, which indicates a moderate positive relationship between business resilience dimensions and social sustainability. The R Square value of 0.399 implies that approximately 39.9% of the variance in social sustainability can be explained by the four dimensions of business resilience in this model. The Adjusted R Square of 0.377 slightly adjusts this value to account for the model's complexity, providing a similar interpretation.

In the ANOVA table, the F-test result ($F = 18.081$, $p = .000$) demonstrates that the overall model is statistically significant at the 0.05 level. This significant result indicates that at least one of the business resilience dimensions significantly predicts social sustainability, leading to a rejection of the null hypothesis, H03.

The coefficients table provides more detailed insights into the individual effects of each business resilience dimension. The unstandardized coefficient for Business Agility is 0.255 ($p = 0.031$), indicating a positive and statistically significant effect on social sustainability. Operational Resilience has an even more substantial effect, with a coefficient of 0.673 ($p = 0.000$), showing a highly significant positive relationship. On the other hand, Behavioral Resilience ($p = 0.951$) and Strategic Resilience ($p = 0.594$) do not have significant effects on social sustainability, as indicated by their high p-values.

Overall, these findings suggest that while Business Agility and Operational Resilience significantly contribute to social sustainability, Behavioral and Strategic Resilience do not. Consequently, the null hypothesis is rejected, as specific dimensions of business resilience positively and significantly affect social sustainability in agro-allied SMEs within Osun State.

Implications for Management

The results of this study provide valuable insights into how specific dimensions of business resilience influence social sustainability within agro-allied SMEs in Osun State, Nigeria. The moderate correlation coefficient (R = 0.632) and the R-squared value of 0.399 indicate that 39.9% of the variance in social sustainability is explained by the four dimensions of resilience—behavioral resilience, business agility, operational resilience, and strategic resilience—underscoring the relevance of resilience strategies in fostering socially sustainable outcomes for these SMEs.

The findings reveal that Business Agility and Operational Resilience significantly affect social sustainability. Business Agility's significant positive relationship with social sustainability ($p = 0.031$) highlights the importance of flexibility and the capacity to adapt swiftly to market changes. For agro-allied SMEs, which often operate in volatile environments, this agility allows for adjustments to social initiatives that support the community and respond to socio-economic shifts. Additionally, Operational Resilience exhibits a highly significant positive effect ($p = 0.000$), emphasizing that internal operational strength and continuity planning are essential to maintain community trust and social contributions, particularly in times of disruption. These two dimensions imply that adaptive and robust operations can significantly enhance social sustainability.

On the contrary, Behavioral Resilience and Strategic Resilience did not demonstrate significant impacts on social sustainability, suggesting that certain internal and strategic behavioral adaptations may not directly contribute to the social goals of agro-allied SMEs. Behavioral resilience, which often relates to the psychological adaptability of employees, may need more direct alignment with socially sustainable practices to show a measurable impact. Similarly, strategic resilience, though valuable for long-term planning, may require enhanced linkage with social objectives to realize its potential impact on social sustainability.

a. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.528[a]	.279	.272	.32988

a. Predictors: (Constant), Business Resilience

b. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.708	1	4.708	43.262	.000[b]
	Residual	12.188	112	.109		
	Total	16.896	113			

a. Dependent Variable: Sustainability

b. Predictors: (Constant), Business Resilience

c. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.031	.305		9.921	.000
	Business Resilience	.399	.061	.528	6.577	.000

a. Dependent Variable: Sustainability

Source: Field Result, 2024

The regression analysis conducted aimed to determine whether business resilience significantly influences the sustainability of agro-allied SMEs in Osun State. The null hypothesis (H04), stating that business resilience has no significant effect on sustainability, was tested by examining the relationship between business resilience (independent variable) and sustainability (dependent variable) using multiple linear regression. Business resilience was represented by aggregating several critical components, namely behavioral resilience, business agility, operational resilience, and strategic resilience, to form a comprehensive resilience measure. The results are detailed in the model summary, ANOVA, and coefficients tables.

The **Model Summary** table shows an R-value of .528, indicating a moderate positive correlation between business resilience and sustainability. The R Square value of .279 implies that approximately 27.9% of the variance in sustainability among agro-allied SMEs in Osun State can be explained by business resilience. The adjusted R Square, at .272, confirms this finding with a slight adjustment for the number of predictors, demonstrating the robustness of the model.

The **ANOVA** table provides further support for the model's significance, with an F-statistic of 43.262 and a p-value of .000. This indicates that the overall regression model is statistically significant ($p < 0.05$), meaning that there is a significant relationship between business resilience and sustainability. Therefore, the null hypothesis (H04) can be rejected, supporting the assertion that business resilience significantly influences the sustainability of these SMEs.

Finally, the **Coefficients** table reveals the details of this relationship. The unstandardized coefficient (B) for business resilience is .399, with a standard error of .061, and a t-value of 6.577, which is statistically significant at the .000 level. This means that for every one-unit increase in business resilience, the sustainability score of agro-allied SMEs in Osun State is expected to increase by .399 units, assuming other factors remain constant. The standardized beta coefficient of .528 further emphasizes the positive effect of business resilience on sustainability.

In conclusion, the regression analysis provides strong evidence that business resilience has a significant positive effect on the sustainability of agro-allied SMEs in Osun State, accounting for a substantial portion of the variability in sustainability outcomes. This suggests that enhancing business resilience components, such as behavioral resilience, agility, operational strength, and strategic resilience, could be critical for improving sustainability in this sector.

The results indicate that business resilience has a significant and positive impact on the sustainability of agro-allied SMEs in Osun State, which has substantial implications for management within this sector. The findings, as evidenced by a moderate correlation ($R = .528$) and significant F-statistic ($p < .05$), highlight that a significant portion (27.9%) of sustainability outcomes can be attributed to the degree of business resilience. This

demonstrates that agro-allied SMEs that prioritize resilience-building strategies—such as operational resilience, agility, and strategic and behavioral resilience—are more likely to sustain operations and achieve greater stability, especially amid disruptions.

Implications for Management

The findings underscore the importance of resilience for sustainability, suggesting that SMEs should allocate resources to strengthen various dimensions of resilience. Managers can enhance operational resilience by implementing robust risk management strategies, investing in backup resources, and ensuring supply chain reliability. Also, to improve sustainability, management should also focus on building agility within their businesses. Agility allows SMEs to respond quickly to changes in the market or industry environment, which is crucial in the agro-allied sector given its susceptibility to environmental and market fluctuations. Managers can foster agility by training staff to respond swiftly to unforeseen circumstances and by implementing flexible operational practices.

Developing a resilience-oriented culture within the organization can further reinforce sustainability efforts. This includes promoting proactive behaviors, fostering a supportive work environment, and encouraging innovation among employees. By embedding resilience into the organizational culture, SMEs can better withstand shocks and continuously adapt to changes in their external environment. Given the findings, industry associations and policymakers should work closely with agro-allied SMEs to support resilience-building initiatives. Offering resilience-focused training programs and incentives for resilient practices could empower these SMEs to enhance their sustainability profiles.

Table 4.9: Summary of Hierarchical Regression Analysis for the Moderating Effect of Digital Marketing Capability on the association between organisation resilience and Sustainability of Agro-allied SMEs in Osun State

a. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.528[a]	.279	.272	.32988	.279	43.262	1	112	.000
2	.748[b]	.559	.551	.25915	.280	70.484	1	111	.000
3	.781[c]	.610	.600	.24460	.052	14.598	1	110	.000

a. Predictors: (Constant), Business Resilience

b. Predictors: (Constant), Business Resilience, Digital Marketing Capability

c. Predictors: (Constant), Business Resilience, Digital Marketing Capability, interaction Term

b. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.708	1	4.708	43.262	.000[b]
	Residual	12.188	112	.109		
	Total	16.896	113			
2	Regression	9.442	2	4.721	70.293	.000[c]
	Residual	7.455	111	.067		
	Total	16.896	113			
3	Regression	10.315	3	3.438	57.469	.000[d]

Residual	6.581	110	.060
Total	16.896	113	

a. Dependent Variable: Sustainability

b. Predictors: (Constant), BusinessResilience

c. Predictors: (Constant), BusinessResilience, DigitalMarketingCapability

d. Predictors: (Constant), BusinessResilience, DigitalMarketingCapability, interactionTerm

C. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.031	.305		9.921	.000
	BusinessResilience	.399	.061	.528	6.577	.000
2	(Constant)	1.509	.301		5.018	.000
	BusinessResilience	.113	.059	.150	1.938	.055
	DigitalMarketingCapability	.593	.071	.650	8.395	.000
3	(Constant)	-15.085	4.352		-3.466	.001
	BusinessResilience	3.647	.926	4.825	3.936	.000

DigitalMarketingCapability	3.676	.810	4.030	4.540	.000
interactionTerm	-.656	.172	-7.190	-3.821	.000

a. Dependent Variable: Sustainability

Source: Field Result, 2024

The regression analysis reveals significant insights into the moderating role of digital marketing capability on the relationship between business resilience and the sustainability of agro-allied SMEs in Osun State. Here is an interpretation of the findings, organized by each model in the analysis.

The first model includes only business resilience as a predictor of sustainability, showing an R-squared value of .279, indicating that business resilience alone explains about 27.9% of the variation in sustainability. The significant F-statistic (43.262, $p < .001$) indicates that business resilience has a significant effect on sustainability, with a standardized beta coefficient of .528 ($p < .001$), suggesting a moderately strong positive relationship.

In the second model, digital marketing capability is added as an additional predictor alongside business resilience. This model shows a substantial improvement in the explanatory power, with an R-squared of .559, indicating that both predictors together explain 55.9% of the variance in sustainability. The change in R-squared (.280, $p < .001$) reflects a statistically significant improvement in the model fit with the inclusion of digital marketing capability. Digital marketing capability has a highly significant positive effect ($\beta = .650$, $p < .001$), suggesting that it is a strong predictor of sustainability when combined with business resilience. However, business resilience's beta coefficient drops from .528 to .150 ($p = .055$), indicating a potential interaction effect.

The third model introduces the interaction term between business resilience and digital marketing capability, further enhancing the model's explanatory power with an R-squared of .610. This suggests that the full model, including the interaction term, explains 61% of the variance in sustainability. The interaction term itself is statistically significant ($\beta = -7.190$, $p < .001$), indicating that digital marketing capability significantly moderates the relationship between business resilience and sustainability, but the negative coefficient implies that the effect of business resilience on sustainability weakens as digital marketing capability increases.

In summary, the regression analysis supports rejecting the null hypothesis (H05), as digital marketing capability has a significant moderating effect on the relationship between business resilience and sustainability. This suggests that while digital marketing capability can enhance sustainability, it simultaneously alters the influence of business resilience on sustainability, potentially requiring a balanced approach to maximize the positive outcomes for agro-allied SMEs.

The findings of this study reveal several key implications for the management of agro-allied SMEs in Osun State, Nigeria. The results suggest that both business resilience and digital marketing capability are significant predictors of sustainability, and the interaction between these factors further influences sustainability outcomes. Here's a discussion of these implications, followed by practical recommendations.

Implications for Management

The first model shows that business resilience alone significantly impacts sustainability, explaining around 27.9% of its variance. This indicates that fostering resilience, such as

through risk management strategies, operational adaptability, and continuity planning, is fundamental for agro-allied SMEs to achieve a sustainable baseline. Resilient businesses can better withstand market disruptions, supply chain uncertainties, and environmental challenges, which are common in the agro-allied sector.

In the second model, the inclusion of digital marketing capability increases the explained variance to 55.9%, suggesting that digital marketing is a powerful enhancer of sustainability for agro-allied SMEs. Effective digital marketing expands market reach, improves customer engagement, and enables more efficient resource allocation, all of which contribute to a sustainable growth trajectory. The significant positive relationship between digital marketing capability and sustainability also highlights that digital tools can help these SMEs access broader markets and enhance visibility, which is essential for building resilience in a competitive environment.

The third model introduces an interaction term between business resilience and digital marketing capability, which is significant but negatively moderates the relationship. This indicates that while digital marketing capability is beneficial, its presence may reduce the direct impact of business resilience on sustainability. This finding suggests that a balanced approach is crucial, as an over-reliance on digital marketing could potentially overshadow resilience efforts. SMEs may need to carefully integrate both digital and resilience strategies to maintain an optimal impact on sustainability.

4.3 Discussion of Findings

Research on the connection between business resilience and environmental sustainability is growing, with some studies affirming a positive impact while others highlight complexities that question this relationship. Several studies substantiate the view that business resilience positively influences environmental sustainability. For instance, some

scholars demonstrate that businesses capable of withstanding market disruptions, adapting quickly, and implementing sustainable resource management practices are better equipped to maintain environmental commitments even under adverse conditions. This finding aligns with dynamic capability theory, which posits that adaptive capabilities allow firms to respond proactively to environmental shifts, integrating sustainability as a core element of resilience[1].

Some scholars also found that firms with strong resilience capabilities exhibit increased environmental sustainability, as resilience facilitates the adoption of sustainable practices that reduce environmental impact, especially during crises. Their study emphasizes that resilient firms can allocate resources to long-term sustainability goals even when facing short-term challenges, an approach consistent with contingency theory, which suggests that the context of external pressures shapes organizational outcomes[2]. In this case, resilient firms adapt to environmental regulations and stakeholder demands, enhancing sustainability as a strategic response to external pressures.

Conversely, other studies offer dissenting perspectives on the resilience-sustainability link, suggesting that the relationship is not universally positive. Some scholars argue that while resilience can help firms maintain operational stability, it does not automatically translate to environmental sustainability. Their research shows that some firms prioritize immediate economic stability over long-term environmental goals, particularly when resources are constrained. This perspective highlights a contingency-based argument where environmental sustainability is not prioritized unless there are explicit incentives or regulatory pressures[3].

Similarly, some scholars observe that resilience-focused firms may sometimes adopt practices that are environmentally unsustainable if they perceive these practices as

necessary for survival in highly competitive markets. In alignment with dynamic capability theory, their study suggests that while resilience is valuable, firms need to develop specific sustainability-oriented capabilities to ensure that resilience efforts also advance environmental sustainability. Without these capabilities, resilience alone may lack the specificity needed to drive sustainable outcomes[4].

Aligning these findings with dynamic capability theory, it becomes evident that business resilience alone may not ensure environmental sustainability unless coupled with adaptive, sustainability-focused competencies. The theory underscores that while resilience enhances a firm's adaptability, it requires sustainability-driven processes and strategies to influence environmental outcomes positively. The contingency theory further clarifies that the context—such as regulatory frameworks, market pressures, and stakeholder expectations—plays a critical role in whether resilience translates into sustainability. For instance, firms in regions with stringent environmental regulations are more likely to align resilience efforts with sustainability, as seen in supportive studies. Conversely, in markets lacking these external pressures, resilience may prioritize economic rather than environmental goals, as dissenting studies reveal. In conclusion, while business resilience often supports environmental sustainability, this relationship is nuanced by organizational capabilities and contextual factors, supporting both dynamic capability and contingency theoretical perspectives.

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. 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[5]. 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[6,7].

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[8].

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[9].

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[10].

Empirical support underscores 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.

Recent empirical research provides growing support for the view that business resilience has a positive and significant effect on social sustainability. Studies supporting this claim argue that resilient businesses are better equipped to foster positive social outcomes, such as community engagement, employee well-being, and fair labor practices. For instance, a scholar found that resilient organizations demonstrate higher adaptability in meeting social demands, thus reinforcing social cohesion and trust, particularly during crises. Their findings align with dynamic capability theory, which posits that organizations with strong adaptive capabilities are more likely to thrive and sustain positive social outcomes amid changing environments[11]. Additionally, some scholars examined businesses in developing economies and reported that resilience strengthens corporate social

responsibility initiatives by enabling firms to reallocate resources to support social needs, especially under challenging economic conditions. These findings underscore how resilience aids in maintaining organizational focus on social sustainability, even in times of uncertainty[12].

On the other hand, some studies express dissent, suggesting that the emphasis on business resilience does not always translate into significant improvements in social sustainability. For example, some scholars argue that resilience-building efforts often prioritize economic survival and operational continuity over social objectives, particularly when resources are limited. They found that organizations facing resource constraints may deprioritize social initiatives in favor of measures that ensure business continuity. This perspective is echoed in contingency theory, which asserts that organizational strategies and their effectiveness are highly context-dependent. According to contingency theory, businesses might choose resilience strategies that align more closely with immediate operational needs rather than broader social outcomes, especially when external pressures (e.g., economic downturns) limit their capacity to address social priorities[13].

Both perspectives illustrate the nuanced relationship between business resilience and social sustainability, suggesting that while resilience can foster social benefits, its influence is often shaped by contextual factors and organizational priorities. These studies highlight the importance of considering both internal capabilities, as emphasized by dynamic capability theory, and external contingencies, as proposed by contingency theory, to fully understand how resilience affects social sustainability.

Recent empirical studies consistently highlight the positive influence of business resilience on sustainability, emphasizing how resilient firms adapt to environmental and economic challenges to secure long-term viability. For example, a study revealed that

firms with robust resilience frameworks effectively mitigated environmental disruptions and promoted sustainable operations. The study found that resilient firms tend to have a heightened capacity to adapt to unexpected events, supporting both environmental and economic sustainability by maintaining operational stability[14]. Similarly, some scholars argued that resilient businesses can better allocate resources during crises, which fosters sustainable growth by reducing waste and optimizing resource use. The findings align with dynamic capability theory, which suggests that firms' ability to adapt and reconfigure internal competencies in response to environmental changes enhances their sustainable performance. Resilience, in this context, is viewed as a dynamic capability that enables firms to integrate sustainable practices into their strategic framework[15].

Conversely, some studies present a dissenting perspective on the relationship between business resilience and sustainability, arguing that resilience alone may not guarantee sustainable outcomes. For instance, some scholars highlighted cases where resilient organizations, focused solely on short-term recovery, neglected long-term sustainability goals. In these cases, resources were primarily allocated to ensure operational continuity rather than advancing environmental or economic sustainability objectives. This finding aligns with contingency theory, which posits that organizational effectiveness depends on situational factors, suggesting that resilience may only enhance sustainability when aligned with broader strategic goals[16]. Moreover, some scholars observed that while resilience facilitates adaptive responses to immediate challenges, it does not necessarily instill a proactive orientation toward sustainability. These studies imply that business resilience, when not strategically directed toward sustainable goals, may yield limited or even contradictory outcomes in sustainability contexts[17].

In synthesizing these perspectives, it becomes evident that while resilience is generally beneficial to sustainability, its impact varies based on strategic alignment and contextual factors. Dynamic capability theory underscores resilience as a critical capability that can foster sustainability through adaptive innovation, while contingency theory reveals that resilience's effectiveness depends on aligning resilience practices with specific sustainability objectives. These insights emphasize the need for a strategic approach that integrates resilience with sustainable objectives, accounting for the dynamic and contingent nature of organizational environments.

Recent empirical studies have increasingly recognized the pivotal role of digital marketing capability in enhancing the interaction between business resilience and sustainability. One line of research suggests that digital marketing capability positively and significantly influences this relationship by enabling organizations to adapt to rapidly changing market dynamics, especially in response to disruptive events such as economic downturns and environmental crises. For instance, a study found that firms with robust digital marketing capabilities were better able to pivot their strategies during crises, leveraging data analytics and social media engagement to maintain brand presence, which in turn strengthened resilience and contributed to long-term environmental and economic sustainability. This finding aligns with the principles of dynamic capability theory, which emphasizes that capabilities like digital marketing allow firms to sense and seize opportunities and reconfigure their resources effectively in the face of external challenges, promoting resilience and sustainability[18].

Conversely, some studies argue that digital marketing capability does not always enhance the relationship between business resilience and sustainability, and may even detract from it if not strategically aligned with broader organizational goals. For instance, scholars

found that over-reliance on digital marketing strategies without adequate integration with core resilience-building activities can lead to resource over-extension, diminishing the firm's capacity for sustainable growth. This perspective resonates with contingency theory, which posits that the effectiveness of organizational capabilities is contingent upon specific environmental and structural factors. Findings indicate that digital marketing capability might only foster resilience and sustainability when properly tailored to the firm's unique circumstances and resources.

In summary, while a majority of empirical studies uphold the view that digital marketing capability can enhance the relationship between business resilience and sustainability, some studies offer dissenting views, underscoring the need for a nuanced approach. Dynamic capability theory supports the positive impact of digital marketing, advocating for flexible adaptation in crisis periods, while contingency theory provides insight into the contextual limitations of digital marketing, suggesting that its efficacy depends on the firm's specific conditions and alignment with broader resilience strategies.

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Chapter Five

Conclusion

This chapter discusses the summary of the findings, conclusions and recommendations of the study. The findings of this study concisely summarize the contributions of the study to knowledge whilst also emphasizing respective limitations to study as well as suggestions to further studies.

5.1 Summary of Findings

The study examined the effect of Business resilience vis-à-vis behavioural resilience, business agility, operational resilience, and strategic resilience on the sustainability of Agro-allied SMEs firm in Osun State, Nigeria. It precisely assessed the relative effect of business resilience dimensions on sustainability of Agro-allied SMEs firm in Osun State. Further analysis was done to determine the moderating effect of digital marketing capability on the interaction between business resilience and sustainability of Agro-allied SMEs firm in Osun State, Nigeria. From the analyses and interpretation of hypotheses, the following can be summed up as the major empirical findings of this study:

1. Business resilience has positive and significant effect on environmental sustainability of Agro-allied SMEs firm in Osun State (Adj. R^2= 0.4401, F(4,109)= 23.189, p= 0.000).
2. Business resilience has positive and significant effect on economic sustainability of Agro-allied SMEs firm in Osun State (Adj. R^2= 0.4401, F(4,109)= 23.189, p= 0.000).
3. Business resilience has positive and significant effect on social sustainability of Agro-allied SMEs firm in Osun State (Adj. R^2= 0.4401, F(4,109)= 23.189, p= 0.000).

4. Business resilience has positive and significant effect on sustainability of Agro-allied SMEs firm in Osun State (R^2= 0.397, F(1,277)= 182.247, p= 0.000)
5. Digital marketing capability has positive and significant moderating effect on the interactions between Business resilience and sustainability of Agro-allied SMEs firm in Osun State (ΔR^2= 0.010, ΔF = 7.230, P= 0.008)

5.2 Conclusion

Based on the empirical findings, this study concluded that there was a statistically significant effect of business resilience (behavioural resilience, business agility, operational resilience, and strategic resilience) on the sustainability of Agro-allied SMEs firm in Osun State, Nigeria which include environmental, economic and social sustainability. Further analysis showed that digital marketing capability has significant moderating effect on the interaction between business resilience and the sustainability of Agro-allied SMEs firm in Osun State, Nigeria.

Theoretically, the outcome of this study is in line with the dynamic capability theory, survival-based theory, and the contingency theory which provided the theoretical underpinnings for this study. The theories were selected to guide this study because their perspectives relate to the variables under investigation.

Dynamic capability, resource dependence theory, and contingency theory complement each other to explain business resilience, digital marketing capability, and sustainability. Dynamic capability theory emphasizes a firm's ability to integrate, build, and reconfigure internal and external skills for fast-changing settings. To maintain competitive advantage in digital marketing competence, the company must adapt to new technology, consumer habits, and market dynamics. For resilience and sustainability, firms must evolve, innovate, and align their goals with market expectations while developing and using

digital marketing solutions. Resource dependency theory emphasises the need of external resources including information, technologies, and relationships for digital marketing capabilities and business resilience. Resource dependence theory states that enterprises must manage their external resource dependencies to reduce uncertainty and increase resilience. In digital marketing, firms must rely on technology tools, data, and alliances with platforms or service providers. Resource dependence theory helps explain how companies should strategically manage their interactions with external actors to meet sustainability goals. Effective management of these external resources guarantees a stable supply of key inputs, improving resilience and sustainability.

Contingency theory contextualizes how environmental factors affect dynamic capability and resource dependency. The efficiency of an organization's strategy depends on its internal capabilities and external environment, according to this notion. Contingency theory implies that aligning digital plans with external market conditions and internal resources is key to corporate resilience and sustainability in digital marketing. In unpredictable marketplaces, firms that use dynamic capabilities and manage dependencies in their digital marketing activities are more likely to survive. These three theories show how organizations might establish resilience, use digital marketing, and achieve sustainability. Dynamic capability shows how organizations can adapt and reconfigure their resources, while resource dependency theory emphasizes controlling external influences and contingencies that affect resource needs. Contingency theory links these factors by highlighting that firm-specific methods must be used. A multi-theoretical approach provides a more solid framework for understanding resilience, digital marketing, and sustainability's complex relationships than any one theory.

5.3 Recommendations

Based on the findings of this study, the following recommendations are made;

1. SME owner-managers in Osun State should cultivate an organizational culture that values environmental consciousness and trains employees to anticipate and react effectively to environmental risks. This can involve regular training on sustainable practices and involving employees in decision-making on sustainability issues, which can increase commitment and resilience at the individual and team levels. Also, develop agile management systems that allow for quick adaptation to changes in environmental policies, resource availability, and customer preferences. Implementing flexible supply chains, diversifying input sources, and adopting digital tools for real-time monitoring can help in adapting to environmental challenges while minimizing negative impacts on the business. Focus on building resilient and sustainable operational frameworks by incorporating environmentally friendly technologies and practices, such as efficient resource management and waste reduction. Managers should assess and improve areas such as energy usage, raw material sourcing, and waste disposal to ensure that operations are not only resilient to disruptions but are also aligned with sustainability goals. While strategic resilience did not show a significant effect in this study, SMEs should still maintain a forward-thinking perspective on environmental trends, policies, and potential threats. Rather than relying solely on strategic planning, managers might integrate strategic initiatives with actionable, short-term resilience measures to enhance overall sustainability outcomes.

2. 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 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.

3. Management should prioritize initiatives that enhance organizational agility. This includes training programs that encourage adaptive thinking and fast response capabilities, as well as investing in flexible resources that allow SMEs to pivot in response to community needs and market changes. Agile practices can support the quick adaptation to societal expectations, thereby enhancing social sustainability. Developing strong operational resilience should be a central part of the SMEs' sustainability strategy. Management could consider investing in technology that

supports continuity and minimizes disruptions. Additionally, building resilient supply chains and efficient resource management practices will foster more consistent social contributions, such as local employment opportunities and community support during periods of economic hardship.

Although behavioral and strategic resilience were not found to have significant direct impacts on social sustainability, aligning these aspects with social objectives could increase their influence. Management could encourage social responsibility as a core part of employee values, which would better integrate behavioral resilience with social sustainability. Furthermore, embedding social objectives in strategic resilience planning, such as long-term goals that support community development, could strengthen the link between strategic efforts and social outcomes. Collaborating with local community groups, NGOs, and governmental bodies may also enhance the social sustainability efforts of agro-allied SMEs. Partnerships can amplify the positive effects of operational and business agility by creating programs that directly address community needs, such as educational outreach and environmental conservation efforts, thus boosting the enterprise's social credibility and impact. By focusing on these recommendations, agro-allied SMEs in Osun State can effectively enhance their social sustainability. These strategies will not only improve community relations but also contribute to a more resilient and socially responsible agro-allied sector in the region.

4. SME managers should create formal resilience plans that outline specific goals and actions across operational, strategic, and behavioral aspects. Regular resilience audits can be conducted to assess and improve these plans over time. Training programs

focused on building resilience, particularly in areas such as crisis management and adaptability, will enable employees to actively contribute to the firm's sustainability. By monitoring resilience metrics regularly, SMEs can track their progress and make data-informed adjustments to sustain operations effectively. This continuous assessment can guide proactive adjustments to their strategies in response to emerging challenges. Forming alliances or cooperatives with other agro-allied SMEs can help share resources and best practices for resilience, which is especially helpful in sectors where resource constraints are common. Such collaboration can enhance collective resilience and promote sustainable practices across the industry.

5. Agro-allied SMEs should prioritize resilience-building strategies, such as enhancing operational flexibility, establishing robust supply chains, and creating contingency plans for disruptions. Training programs focused on risk management and continuity planning can equip management teams with the skills to adapt in times of crisis, which is essential for sustainable operations. Given the significant positive influence of digital marketing on sustainability, management should invest in digital marketing tools, including social media platforms, e-commerce solutions, and digital advertising. These capabilities can help SMEs reach wider markets and establish a stronger brand presence, which is vital for long-term growth. Management might consider employing dedicated digital marketing personnel or training existing staff to manage these platforms effectively.

Recognizing the moderating effect of digital marketing on resilience, SMEs should aim to integrate digital marketing without compromising resilience measures. For instance, digital platforms could be used not only for marketing but also for enhancing

operational efficiencies, such as demand forecasting and supply chain management, which support resilience goals. A balanced approach that leverages both resilience and digital strengths will help these SMEs build a sustainable business model that can adapt to both market opportunities and uncertainties. Policymakers and industry associations could create support programs that provide digital infrastructure and resilience training for agro-allied SMEs. This support might include subsidized access to digital tools, workshops on digital strategy and resilience, and grants to help SMEs implement sustainable practices that integrate resilience with digital capabilities. By implementing these recommendations, agro-allied SMEs in Osun State can achieve greater financial sustainability while remaining resilient and adaptable in the face of challenges. This approach will not only enhance their competitive advantage but also contribute to the long-term viability of Nigeria's agro-allied sector.

5.4 Contributions to Knowledge

The finding of this study made important contributions to academia and practitioners in the following ways:

1. This study identified and filled conceptual gaps in literature concerning the business resilience linkage with the sustainability of Agro-allied SMEs firm in Osun State, Nigeria.

2. Likewise gap regarding the moderating role of digital marketing capability on the linkage between business resilience and sustainability of Agro-allied SMEs firm in Osun State, Nigeria was equally addressed.

3. The conceptual model developed for the study suggests another area in which this study has contributed to the body of knowledge conceptually because no known

similar studies, both theoretical and empirical, have utilized the model in their studies. Hence, adding to models that can explain the link between business resilience, digital marketing capability and sustainability of Agro-allied SMEs firm in Osun State, Nigeria.

4. The outcome of this study offered additional support for the tenets of the dynamic capability theory, resource dependency and the contingency theory, which provided the theoretical underpinnings for this study. Specifically, these theories offered a complementary explanation to substantiate the interaction of business resilience, digital marketing capability and sustainability of Agro-allied SMEs firm in Osun State, Nigeria.

   Therefore, on the strength of the outcomes of theory testing (see 4.2 Test of hypotheses), this study confirms that via the complementary role played by the dynamic capability theory resource dependency theory, and the contingency theory, this study has made a significant contribution to theory application and offers future studies the ability to infuse three theories to provide theoretical basis and explanation for the achievement of the objective of a study.

6. This study evaluated the interactions of business resilience, digital marketing capability, and sustainability of Agro-allied SMEs firm in Osun State, Nigeria. The empirical outcome of this study contributes to the existing literature and empirical findings in the area of business resilience, digital marketing capability, and sustainability in Nigeria. and equally served as a reference material for future researchers. Specifically, the empirical findings from the test of hypotheses suggested that behavioural resilience, business agility, operational resilience, and strategic resilience are critical to business resilience with the potential to enhance

sustainability of Agro-allied SMEs firm in Osun State, Nigeria, given that individually and collectively, they exert positive and significant effects on sustainability of Agro-allied SMEs firm in Osun State, Nigeria. Moreover, this study positioned the value relevance of having and deploying digital marketing capability given that it can help Agro-allied SMEs firm in Osun State maximize their market potential and ensuring securing competitive advantage.

These empirical submissions are a product of hypotheses testing, and they offer future researchers the opportunity of having a robust finding to aid their empirical reviews in their studies and the basis to corroborate and present a contrary outcome as with this study's submission, hence pushing forward the frontier of knowledge in the field of strategic management. Overall, these above-mentioned points lay emphasis on the fact that this study offers significant contribution to knowledge and has practical implication for the Agro-allied SMEs that were investigated in Osun State, Nigeria.

5.5 Suggestion for Further Studies

The limitations of this study offer opportunity and suggestions for future study.

i. With the rise in Agro-allied SMEs shutting down operation in Nigeria, future studies could explore business resilience from a qualitative methodology perspective to enhance deeper insight to the development and with the hope that Agro-allied SMEs firm in Osun State can understand what competencies are critical to develop business resilience.
ii. Future studies may consider a multi-industry study that will incorporate other organisation in apart from Agro-allied SMEs in the country to enhance the generalization of this study's findings.

iii. In order to provide explanations of causality between the variables studied over time, future studies may consider a longitudinal study.

iv. Future studies may consider incorporating other intervening variables for example business angel and financial intelligence to evaluate the performance-effect on Agro-allied SMEs performance over time.

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Appendix I

Questionnaire

Lead City University, Ibadan

Department of Management & Accounting

Dear Respondent,

As part of the requirement for a Doctor of Philosophy degree in Business Administration, I am carrying out a study on **"Business resilience, digital marketing capability, and sustainability of agro-allied enterprises in Osun State, Nigeria".** This study is mainly an academic exercise, as all information provided would be treated as confidential. In any case, you feel uncomfortable to proceed; you may withdraw your consent at no cost. Below is the questionnaire that addressed the objective of this study. Please feel free to tick the option that best express your personal views.

Thank you.

Olatunji

Section A: Business Resilience

The statement in this section concerns business resilience dimensions as applicable to your agro-allied enterprises. Using the six-point Likert-type-scale provided, please indicate the extent to which each statement applies to your enterprise by selecting one of the options provided (6, 5, 4, 3, 2, 1).

6 = Very High extent; 5 = High extent; 4 = Partially High extent; 3 = Partially Low extent; 2= Low extent; 1 = Very Low extent

I	**Behavioural Resilience**	**VHE**	**HE**	**PHE**	**PLE**	**LE**	**VLE**

1	Our employees demonstrate adaptability in response to unexpected changes in market conditions	6	5	4	3	2	1
2	Our team maintains a positive attitude even during challenging times	6	5	4	3	2	1
3	Employees in our business are quick to learn and adopt new technologies or practices	6	5	4	3	2	1
4	Our staff proactively seeks out solutions to overcome obstacles in daily operations	6	5	4	3	2	1
5	We are capable of maintaining high levels of productivity despite operational disruptions	6	5	4	3	2	1
6	Our workforce remains committed and motivated during periods of uncertainty	6	5	4	3	2	1
7	There is a strong culture of support and encouragement among employees during stressful periods	6	5	4	3	2	1
II	**Business Agility**	**SA**	**A**	**PA**	**PD**	**D**	**SD**
1	Our business quickly adapts its strategies to respond to changes in the agro-allied market	6	5	4	3	2	1
2	We efficiently reallocate resources to capitalize on new opportunities	6	5	4	3	2	1
3	Our decision-making processes are flexible and responsive to market trends	6	5	4	3	2	1
4	We can rapidly introduce new products or	6	5	4	3	2	1

	services to meet customer needs						
5	Our business structure allows for quick adjustments to business plans	6	5	4	3	2	1
6	We regularly update our processes to improve efficiency and effectiveness	6	5	4	3	2	1
7	Our company is proficient at managing and implementing changes swiftly	6	5	4	3	2	1
III	**Operational Resilience**	**VHE**	**HE**	**PHE**	**PLE**	**LE**	**VLE**
1	We have contingency plans in place for potential disruptions in our supply chain	6	5	4	3	2	1
2	Our business can sustain operations even during adverse weather conditions	6	5	4	3	2	1
3	We have backup systems to ensure continuity of operations in case of equipment failure	6	5	4	3	2	1
4	Our company has a robust risk management framework for addressing operational challenges	6	5	4	3	2	1
5	We maintain sufficient inventory to avoid disruptions in supply	6	5	4	3	2	1
6	Our business has established relationships with multiple suppliers to mitigate risks	6	5	4	3	2	1
7	We conduct regular training to prepare employees for emergency situations	6	5	4	3	2	1
IV	**Strategic Resilience**	**VHE**	**HE**	**PHE**	**PLE**	**LE**	**VLE**

1	Our long-term strategies are designed to be flexible and adaptable	6	5	4	3	2	1
2	We continually assess the external environment to identify potential threats and opportunities	6	5	4	3	2	1
3	Our business invests in innovation to stay competitive in the agro-allied sector	6	5	4	3	2	1
4	We engage in strategic planning that considers future industry trends and uncertainties	6	5	4	3	2	1
5	Our business has a clear vision that guides our actions during periods of change	6	5	4	3	2	1
6	We regularly review and update our business strategies to align with market developments	6	5	4	3	2	1
7	Our company prioritizes strategic partnerships that enhance our resilience	6	5	4	3	2	1

Section B: Sustainability of Agro-Allied Enterprises

The statement in this section concerns sustainability indicators as applicable to your Agro-Allied enterprises. Using the six-point Likert-type-scale provided, please indicate the extent to which each statement applies to your enterprise by selecting one of the options provided (6, 5, 4, 3, 2, 1).

6 = Very High extent; 5 = High extent; 4 = Partially High extent; 3 = Partially Low extent; 2= Low extent; 1 = Very Low extent

V	**Environmental Sustainability**	**VHE**	**HE**	**PHE**	**PLE**	**LE**	**VLE**
1	Our business regularly evaluates and reduces its environmental impact	6	5	4	3	2	1
2	We have implemented energy-efficient practices and technologies	6	5	4	3	2	1
3	Our company actively works to reduce waste and promote recycling	6	5	4	3	2	1
4	We prioritize sourcing materials and products that are environmentally friendly	6	5	4	3	2	1
5	Our business complies with all relevant environmental regulations and standards	6	5	4	3	2	1
6	We adapt our business practices based on sustainability trends and insights	6	5	4	3	2	1
VI	**Economic Sustainability**	**VHE**	**HE**	**PHE**	**PLE**	**LE**	**VLE**
1	Our business maintains a stable and healthy financial position	6	5	4	3	2	1
2	We invest in long-term growth and development	6	5	4	3	2	1
3	Our company effectively manages risks and uncertainties	6	5	4	3	2	1
4	We continuously seek to improve our operational efficiency	6	5	4	3	2	1
5	Our business strategy includes sustainable economic practices	6	5	4	3	2	1

6	We regularly measure and report on our sustainability performance	6	5	4	3	2	1
VII	**Social Sustainability**	**VHE**	**HE**	**PHE**	**PLE**	**LE**	**VLE**
1	Our company supports and engages with the local community	6	5	4	3	2	1
2	We ensure fair and equitable treatment of all employees	6	5	4	3	2	1
3	Our business promotes diversity and inclusion in the workplace	6	5	4	3	2	1
4	We provide opportunities for employee development and growth	6	5	4	3	2	1
5	Our company upholds high standards of health and safety for our employees	6	5	4	3	2	1
6	Our stakeholders recognize and appreciate our sustainability efforts	6	5	4	3	2	1

Section C: Moderator: Digital Marketing capability

The statement in this section concerns moderating variable which your enterprise is exposed to. Using the six-point Likert-type-scale provided, please indicate the extent to which each statement applies to your enterprise by selecting one of the options provided (6, 5, 4, 3, 2, 1).

6 = Very High extent; 5 = High extent; 4 = Partially High extent; 3 = Partially Low extent;

2 = Low extent; 1 = Very Low extent

VIII	**Digital Marketing capability** To what extent, does your enterprise achieve the following relative to industry average?	**VHE**	**HE**	**PHE**	**PLE**	**LE**	**VLE**
1	We regularly update our digital marketing strategy to reflect market changes	6	5	4	3	2	1
2	We use various digital platforms (website, social media, etc.) to share our content	6	5	4	3	2	1
3	Our content effectively communicates the benefits of our products	6	5	4	3	2	1
4	We respond promptly to customer inquiries and feedback on social media	6	5	4	3	2	1
5	We use social media analytics to understand customer preferences	6	5	4	3	2	1
6	Our website is optimized for search engines to increase visibility	6	5	4	3	2	1
7	We use customer data to personalize our	6	5	4	3	2	1

	marketing efforts						
8	Our business has an easy-to-use online store for purchasing our products	6	5	4	3	2	1
9	We offer secure payment options on our e-commerce platform	6	5	4	3	2	1
10	Our business offers excellent customer support for online purchases	6	5	4	3	2	1

Section D: Demographic Information

Please carefully go through each item and tick (√) as appropriate.

1. Gender: Male ( ) Female( )
2. What is your age bracket: 21- 30( ) 31- 40( ) 41-50 ( ) 51 – 60( ) 61 - 65 ( )
3. What is your highest academic qualification: ND/NCE ( ) B.Sc/BA/HND ( ) PGD/MBA/MSc/MA ( ) MPhil ( ) PhD ( ) Others, (please specify)…….
4. Years of Operations: Below 5yrs ( ), 6-10yrs ( ), 11-15yrs ( ) 16yrs + ( )

Appendix II

SPSS Output

Statistics

KNOWLEDGE

N	Valid	115
	Missing	0

KNOWLEDGE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.9	.9	.9
	7	58	50.4	50.4	51.3
	8	53	46.1	46.1	97.4
	9	3	2.6	2.6	100.0
	Total	115	100.0	100.0	

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Frequencies

Statistics

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	Missing	1	1	1	1	1	1	1
Mean		4.95	4.98	4.95	4.83	4.77	4.91	5.01
Std. Deviation		.818	.798	.676	.623	.692	.804	.645

Frequency Table

BR1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	2	1.7	1.8	1.8
	PARTIALLY HIGH EXTENT	35	30.4	30.7	32.5
	HIGH EXTENT	44	38.3	38.6	71.1
	VERY HIGH EXTENT	33	28.7	28.9	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BR2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	6	5.2	5.3	5.3
	PARTIALLY HIGH EXTENT	19	16.5	16.7	21.9
	HIGH EXTENT	60	52.2	52.6	74.6
	VERY HIGH EXTENT	29	25.2	25.4	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BR3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	29	25.2	25.4	25.4
	HIGH EXTENT	62	53.9	54.4	79.8
	VERY HIGH EXTENT	23	20.0	20.2	100.0
	Total	114	99.1	100.0	

Missing	System	1	.9		
Total		115	100.0		

BR4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	6	5.2	5.3	5.3
	PARTIALLY HIGH EXTENT	15	13.0	13.2	18.4
	HIGH EXTENT	85	73.9	74.6	93.0
	VERY HIGH EXTENT	8	7.0	7.0	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BR5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	34	29.6	29.8	32.5
	HIGH EXTENT	63	54.8	55.3	87.7
	VERY HIGH EXTENT	14	12.2	12.3	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BR6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	6	5.2	5.3	5.3
	PARTIALLY HIGH EXTENT	24	20.9	21.1	26.3
	HIGH EXTENT	58	50.4	50.9	77.2
	VERY HIGH EXTENT	26	22.6	22.8	100.0

	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BR7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	23	20.0	20.2	20.2
	HIGH EXTENT	67	58.3	58.8	78.9
	VERY HIGH EXTENT	24	20.9	21.1	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

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  /ORDER=ANALYSIS.
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Frequencies

Statistics

		BA1	BA2	BA3	BA4	BA5	BA6	BA7
N	Valid	114	114	114	114	114	114	114
	Missing	1	1	1	1	1	1	1
Mean		4.84	4.96	4.89	5.09	5.04	5.02	5.09
Std. Deviation		.868	.797	.791	.735	.696	.752	.673

Frequency Table

BA1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	9	7.8	7.9	7.9
	PARTIALLY HIGH EXTENT	26	22.6	22.8	30.7
	HIGH EXTENT	53	46.1	46.5	77.2
	VERY HIGH EXTENT	26	22.6	22.8	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BA2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	5	4.3	4.4	4.4
	PARTIALLY HIGH EXTENT	23	20.0	20.2	24.6
	HIGH EXTENT	57	49.6	50.0	74.6
	VERY HIGH EXTENT	29	25.2	25.4	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BA3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	6	5.2	5.3	5.3

	PARTIALLY HIGH EXTENT	24	20.9	21.1	26.3
	HIGH EXTENT	60	52.2	52.6	78.9
	VERY HIGH EXTENT	24	20.9	21.1	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BA4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	26	22.6	22.8	22.8
	HIGH EXTENT	52	45.2	45.6	68.4
	VERY HIGH EXTENT	36	31.3	31.6	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BA5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	25	21.7	21.9	21.9
	HIGH EXTENT	59	51.3	51.8	73.7
	VERY HIGH EXTENT	30	26.1	26.3	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BA6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	5	4.3	4.4	4.4

	PARTIALLY HIGH EXTENT	16	13.9	14.0	18.4
	HIGH EXTENT	65	56.5	57.0	75.4
	VERY HIGH EXTENT	28	24.3	24.6	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

BA7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	21	18.3	18.4	18.4
	HIGH EXTENT	62	53.9	54.4	72.8
	VERY HIGH EXTENT	31	27.0	27.2	100.0
	Total	114	99.1	100.0	
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Total		115	100.0		

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  /ORDER=ANALYSIS.
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Frequencies

Statistics

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	Missing	1	1	1	1	1	1	1
Mean		4.92	4.99	4.85	4.86	4.95	4.99	4.82
Std. Deviation		.680	.723	.613	.774	.762	.572	.694

Frequency Table

OR1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	31	27.0	27.2	27.2
	HIGH EXTENT	61	53.0	53.5	80.7
	VERY HIGH EXTENT	22	19.1	19.3	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

OR2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	21	18.3	18.4	21.1
	HIGH EXTENT	64	55.7	56.1	77.2
	VERY HIGH EXTENT	26	22.6	22.8	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

OR3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	31	27.0	27.2	27.2
	HIGH EXTENT	69	60.0	60.5	87.7
	VERY HIGH EXTENT	14	12.2	12.3	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

OR4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	6	5.2	5.3	5.3
	PARTIALLY HIGH EXTENT	25	21.7	21.9	27.2
	HIGH EXTENT	62	53.9	54.4	81.6
	VERY HIGH EXTENT	21	18.3	18.4	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

OR5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	9	7.8	7.9	7.9
	PARTIALLY HIGH EXTENT	9	7.8	7.9	15.8
	HIGH EXTENT	75	65.2	65.8	81.6
	VERY HIGH EXTENT	21	18.3	18.4	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

OR6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	19	16.5	16.7	16.7
	HIGH EXTENT	77	67.0	67.5	84.2
	VERY HIGH EXTENT	18	15.7	15.8	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		

Total	115	100.0		

OR7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	30	26.1	26.3	28.9
	HIGH EXTENT	65	56.5	57.0	86.0
	VERY HIGH EXTENT	16	13.9	14.0	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

```
FREQUENCIES VARIABLES=SR1 SR2 SR3 SR4 SR5 SR6 SR7
  /STATISTICS=STDDEV MEAN
  /ORDER=ANALYSIS.
```


Frequencies

Statistics

		SR1	SR2	SR3	SR4	SR5	SR6	SR7
N	Valid	114	114	114	114	114	114	114
	Missing	1	1	1	1	1	1	1
Mean		5.05	4.88	5.04	6.64	4.90	5.04	5.02
Std. Deviation		.714	.800	.846	9.819	.691	.609	.741

Frequency Table

SR1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	26	22.6	22.8	22.8
	HIGH EXTENT	56	48.7	49.1	71.9
	VERY HIGH EXTENT	32	27.8	28.1	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SR2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	35	30.4	30.7	33.3
	HIGH EXTENT	49	42.6	43.0	76.3
	VERY HIGH EXTENT	27	23.5	23.7	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SR3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	29	25.2	25.4	28.1
	HIGH EXTENT	42	36.5	36.8	64.9
	VERY HIGH EXTENT	40	34.8	35.1	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SR4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	17	14.8	14.9	14.9
	HIGH EXTENT	73	63.5	64.0	78.9
	VERY HIGH EXTENT	21	18.3	18.4	97.4
	66	3	2.6	2.6	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SR5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	24	20.9	21.1	23.7
	HIGH EXTENT	68	59.1	59.6	83.3
	VERY HIGH EXTENT	19	16.5	16.7	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SR6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	10	8.7	8.8	11.4
	HIGH EXTENT	81	70.4	71.1	82.5
	VERY HIGH EXTENT	20	17.4	17.5	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SR7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	30	26.1	26.3	26.3
	HIGH EXTENT	52	45.2	45.6	71.9
	VERY HIGH EXTENT	32	27.8	28.1	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

Frequencies

Statistics

		ES1	ES2	ES3	ES4	ES5	ES6
N	Valid	114	114	114	114	114	114
	Missing	1	1	1	1	1	1
Mean		5.04	5.11	5.23	5.04	4.96	5.05
Std. Deviation		.745	.813	.692	.703	.670	.739

Frequency Table

ES1

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	20	17.4	17.5	20.2
	HIGH EXTENT	60	52.2	52.6	72.8
	VERY HIGH EXTENT	31	27.0	27.2	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

ES2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	23	20.0	20.2	22.8
	HIGH EXTENT	47	40.9	41.2	64.0
	VERY HIGH EXTENT	41	35.7	36.0	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

ES3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	17	14.8	14.9	14.9
	HIGH EXTENT	54	47.0	47.4	62.3
	VERY HIGH EXTENT	43	37.4	37.7	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

ES4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	17	14.8	14.9	17.5
	HIGH EXTENT	67	58.3	58.8	76.3
	VERY HIGH EXTENT	27	23.5	23.7	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

ES5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	28	24.3	24.6	24.6
	HIGH EXTENT	63	54.8	55.3	79.8
	VERY HIGH EXTENT	23	20.0	20.2	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

ES6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	19	16.5	16.7	19.3
	HIGH EXTENT	61	53.0	53.5	72.8
	VERY HIGH EXTENT	31	27.0	27.2	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

```
FREQUENCIES VARIABLES=ECS1 ECS2 ECS3 ECS4 ECS5 ECS6
  /STATISTICS=STDDEV MEAN
  /ORDER=ANALYSIS.
```

Frequencies

Statistics

		ECS1	ECS2	ECS3	ECS4	ECS5	ECS6
N	Valid	111	114	114	114	114	114
	Missing	4	1	1	1	1	1
Mean		5.14	5.07	5.00	4.88	4.86	4.95
Std. Deviation		.610	.859	.882	.640	.664	.676

Frequency Table

ECS1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	14	12.2	12.6	12.6
	HIGH EXTENT	68	59.1	61.3	73.9
	VERY HIGH EXTENT	29	25.2	26.1	100.0
	Total	111	96.5	100.0	
Missing	System	4	3.5		
Total		115	100.0		

ECS2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6

	PARTIALLY HIGH EXTENT	29	25.2	25.4	28.1
	HIGH EXTENT	39	33.9	34.2	62.3
	VERY HIGH EXTENT	43	37.4	37.7	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

ECS3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	8	7.0	7.0	7.0
	PARTIALLY HIGH EXTENT	20	17.4	17.5	24.6
	HIGH EXTENT	50	43.5	43.9	68.4
	VERY HIGH EXTENT	36	31.3	31.6	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

ECS4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	31	27.0	27.2	27.2
	HIGH EXTENT	66	57.4	57.9	85.1
	VERY HIGH EXTENT	17	14.8	14.9	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

ECS5

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	PARTIALLY LOW EXTENT		3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT		25	21.7	21.9	24.6
	HIGH EXTENT		71	61.7	62.3	86.8
	VERY HIGH EXTENT		15	13.0	13.2	100.0
	Total		114	99.1	100.0	
Missing	System		1	.9		
Total			115	100.0		

ECS6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	20	17.4	17.5	20.2
	HIGH EXTENT	71	61.7	62.3	82.5
	VERY HIGH EXTENT	20	17.4	17.5	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

```
FREQUENCIES VARIABLES=SS1 SS2 SS3 SS4 SS5 SS6
  /STATISTICS=STDDEV MEAN
  /ORDER=ANALYSIS.
```

Frequencies

Statistics

		SS1	SS2	SS3	SS4	SS5	SS6
N	Valid	114	114	114	114	114	114
	Missing	1	1	1	1	1	1
Mean		5.05	5.09	5.00	5.10	5.08	4.91

Std. Deviation	.702	.646	.852	.678	.667	.735

Frequency Table

SS1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	25	21.7	21.9	21.9
	HIGH EXTENT	58	50.4	50.9	72.8
	VERY HIGH EXTENT	31	27.0	27.2	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SS2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	19	16.5	16.7	16.7
	HIGH EXTENT	66	57.4	57.9	74.6
	VERY HIGH EXTENT	29	25.2	25.4	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SS3

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	32	27.8	28.1	30.7
	HIGH EXTENT	41	35.7	36.0	66.7
	VERY HIGH EXTENT	38	33.0	33.3	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SS4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	21	18.3	18.4	18.4
	HIGH EXTENT	61	53.0	53.5	71.9
	VERY HIGH EXTENT	32	27.8	28.1	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SS5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	12	10.4	10.5	13.2
	HIGH EXTENT	72	62.6	63.2	76.3
	VERY HIGH EXTENT	27	23.5	23.7	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

SS6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	27	23.5	23.7	26.3
	HIGH EXTENT	61	53.0	53.5	79.8
	VERY HIGH EXTENT	23	20.0	20.2	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

Frequencies

Statistics

		DMC1	DMC2	DMC3	DMC4	DMC5	DMC6	DMC7	DMC8	DMC9	DMC10
N	Valid	114	114	114	114	114	114	114	114	114	114
	Missing	1	1	1	1	1	1	1	1	1	1
Mean		5.06	4.96	5.01	4.82	5.18	4.92	4.87	4.96	5.01	5.00
Std. Deviation		.614	.745	.723	.826	.632	.800	.804	.670	.735	.787

Frequency Table

DMC1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	18	15.7	15.8	15.8
	HIGH EXTENT	71	61.7	62.3	78.1
	VERY HIGH EXTENT	25	21.7	21.9	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

DMC2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	25	21.7	21.9	24.6
	HIGH EXTENT	60	52.2	52.6	77.2
	VERY HIGH EXTENT	26	22.6	22.8	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

DMC3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	6	5.2	5.3	5.3
	PARTIALLY HIGH EXTENT	11	9.6	9.6	14.9
	HIGH EXTENT	73	63.5	64.0	78.9
	VERY HIGH EXTENT	24	20.9	21.1	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

DMC4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LOW EXTENT	2	1.7	1.8	1.8
	PARTIALLY LOW EXTENT	4	3.5	3.5	5.3
	PARTIALLY HIGH EXTENT	27	23.5	23.7	28.9
	HIGH EXTENT	61	53.0	53.5	82.5
	VERY HIGH EXTENT	20	17.4	17.5	100.0
	Total	114	99.1	100.0	

Missing	System	1	.9		
Total		115	100.0		

DMC5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	14	12.2	12.3	12.3
	HIGH EXTENT	65	56.5	57.0	69.3
	VERY HIGH EXTENT	35	30.4	30.7	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

DMC6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	32	27.8	28.1	30.7
	HIGH EXTENT	50	43.5	43.9	74.6
	VERY HIGH EXTENT	29	25.2	25.4	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

DMC7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	36	31.3	31.6	34.2
	HIGH EXTENT	48	41.7	42.1	76.3
	VERY HIGH EXTENT	27	23.5	23.7	100.0
	Total	114	99.1	100.0	

Missing	System	1	.9		
Total		115	100.0		

DMC8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY HIGH EXTENT	28	24.3	24.6	24.6
	HIGH EXTENT	63	54.8	55.3	79.8
	VERY HIGH EXTENT	23	20.0	20.2	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

DMC9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	3	2.6	2.6	2.6
	PARTIALLY HIGH EXTENT	21	18.3	18.4	21.1
	HIGH EXTENT	62	53.9	54.4	75.4
	VERY HIGH EXTENT	28	24.3	24.6	100.0
	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

DMC10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PARTIALLY LOW EXTENT	4	3.5	3.5	3.5
	PARTIALLY HIGH EXTENT	23	20.0	20.2	23.7
	HIGH EXTENT	56	48.7	49.1	72.8
	VERY HIGH EXTENT	31	27.0	27.2	100.0

	Total	114	99.1	100.0	
Missing	System	1	.9		
Total		115	100.0		

Bio-data

A. Personal Data.

1. Full names: OLATUNJI, Olanrewaju Patrick.

2. Email: patrickolanrewaju62@gmail.com.

3. Phone No: 08035721025.

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5. Date and place of Birth: 30th March, 1962.

6. Nationality: Nigeria.

7. Name and address of next of kin: OLATUNJI, Oluwaseun Paul. No. 13, Olanrewaju villà, Oleyo, Ibadan.

B. Educational Background with dates:

1. Educational Institutions with dates& qualifications:

*Lead City University, Ibadan. 2021 till date. PhD. in view.

*University ECole De Techniciens Suprieurs Du Benin. 2016. Msc. Business Administration.

*Achiever University, Owo, Ondo state. 2014. BSC. Business Administration.

* University of Ado Ekiti. 2003. MBA.

*Osun State College of Technology, Esa Oke. 1996. HND.

*St Theresa Minor Seminary, Oke are, Ibadan. 1979. School Certificate.

*Christ the King Primary School, Odo Ona, Moor Plantation, Ibadan. 1974.

C. Working experience with dates:

*Osun state Polytechnic,Iree. 2021-to date.

*Osun state college of Technology , Esa Oke . 2004 - 2021.

*The Polytechnic , Ibadan . 2002- 2004.

*Mahogany Building Society. (Mortgage Bankers). 1992-1996.

*Cooperative Bank PLC.(now Polaris Bank). 1980-1992.

D. Award and Fellowship:

* Commendation for apprehending Fraudulent staff and customer. Cooperative Bank. 1982.

*Commendation letter - Osun state College of Technology , Esa Oke . 2009.

E. Member of Academic Professional Bodies:

*Nigeria Institute of Management. 2005.

* National Institute of Marketing of Nigeria. 2005.

F. Publication:

* Olatunji ,O.P.(2005). The Economic significance of Interest rate in Bolstering an Underdeveloped Economy . Esa Oke journal of arts and science (JAS).1(2), 83-100.

*Olatunji O.P and Asabi O.M (2010). Effect of Entrepreneurial competencies on the performance of small scale Enterprises in Osun state, Nigeria. Esa Oke journal of arts & science 3(2), 35-38.

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Growth . A Publication of the Faculty of arts and Social Sciences. Adeyemi Federal University of Education Ondo. Review in Social Sciences . 13(01), 72-91.

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G. Conference:

*1st National Conference, OSCOTECH Esa Oke.2022.

* Academic Industry Edge Seminar. Lead City University. 2022.

*4th International Conference Takoridi Technical University, Ghana. 2023.

* Academic Industry Edge Seminar. Lead City University. 2023.

Academic Industry Edge Seminar . Lead City University .2024.

* School of Business Studies , The Federal Polytechnic ,Ado Ekiti . August 2024.

* Conference at University of Port Harcourt, Nigeria. September 2024.

H. References:

- Most Rev Dr. Peter Odetoyinbo.
  Catholic Bishop House,
  Abeokuta.

- Dr. Onamusi Abiodun.
  Lead City University.
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The University Compliance Certification

This is to certify that this thesis titled "**Business Resilience, Digital Marketing Capability and Sustainability of Agro-allied SMEs in Osun State"** was written by **Patrick Olanrewaju OLATUNJI** with Matric Number **LCU/PG/002490,** in the Department of Management & Accounting, Faculty of Management & Social Sciences, Lead City University, Ibadan and is in full compliance with the approved University format and style.

_____ _____

Signature **Date**