

The Federal University of Technology (FUTA),  
Akure - Ondo State



12th African Regional  
Conference on Sustainable  
Development Strategies

# CONFERENCE PROCEEDINGS

Theme: Addressing Africa's Development  
Challenges in the 21st Century

26th -27th November, 2025

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# **12TH AFRICAN REGIONAL CONFERENCE ON SUSTAINABLE DEVELOPMENT STRATEGIES**

VENUE: FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE (FUTA)

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## **CONFERENCE THEME:**

Addressing Africa's Development Challenges in the 21st Century

## **CONFERENCE OBJECTIVE:**

The conference is organized by the African Research Council for Sustainable Development with the Federal University of Technology, Akure (FUTA), Ondo State, Nigeria offering opportunity for onsite and virtual presentation designed to examine emerging challenges affecting Africa.

## **CONFERENCE DATE:**

Wednesday 26th - Thursday 27th November, 2025

## **CONFERENCE VENUE:**

The Federal University of Technology, Akure (FUTA) - Ondo State

**TIME:** 10:00am

## **CONFERENCE CONTACT**

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# 12TH AFRICAN REGIONAL CONFERENCE ON SUSTAINABLE DEVELOPMENT STRATEGIES

VENUE - FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE (FUTA)

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## CONFERENCE PROGRAMME

### DAY ONE – Tuesday 25th November 2025

Arrival of Guest/Conferees/Delegates

### DAY TWO – Wednesday 26th November 2025

#### OPENING SESSION/PLENARY

Conference Registration	- 9:00am – 10:00am
Opening Prayer/Welcome Remark	- 10:00am – 10:15am
Institutional Brief/Chairman's Opening Remark	- 10:15am – 10:30am
Plenary Session	- 10:30am – 12:00pm
Launch Break/Group Photograph	- 12:00pm – 1:00pm
Plenary Session 2	- 1:00pm – 4:00pm
Policy Review Session	- 4:00pm – 5:00pm

### DAY THREE – Thursday 27th November 2025

#### PLENARY SESSION (continuation)

Plenary Session	- 10:00am – 2:00pm
Launch Break/Group Photograph	- 2:00pm – 3:00pm
Policy Review Session/Certification	- 3:00pm – 4:00pm

### DAY THREE – Friday 28th November 2025

Departure of Guest/Conferee/Delegates

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# **BOOK OF PROCEEDINGS**

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ON SUSTAINABLE DEVELOPMENT STRATEGIES**  
FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE (FUTA) - WED. 26TH - THU. 27TH NOV., 2025

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# **IMPACT OF 25% CONTRIBUTORY PENSION SCHEME WITHDRAWAL POLICY ON RETIREMENT BENEFITS OF STAFF OF FEDERAL POLYTECHNIC, KADUNA**

**<sup>1</sup>Samson Ehada & <sup>2</sup>Linus Kevin**

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## ***Abstract***

*The contributory pension scheme was expected to alleviate the challenges of the old pension scheme rather it become controversial. This study examined the effect of the 25% withdrawal policy from the contributory pension scheme on retirement benefits of staff of Federal Polytechnic, Kaduna. Using a descriptive survey design, data were collected from 600 staff (academic and non-academic) via a structured questionnaire. Data was collected using a structured questionnaire designed to gather information on staff perceptions of the 25% withdrawal policy's impact on their retirement benefits and was analyzed using descriptive statistics (frequencies, percentages, means) to summarize staff perceptions and experiences regarding the policy's impact on retirement benefits. The results showed that most staff are aware of the policy and believe it affects retirement benefits and financial security. Staff perceptions were mostly neutral or negative, and most respondents want the policy reviewed. The study concludes that the policy has implications for retirement planning. Recommendations include reviewing the policy considering staff concerns and informing staff about policy implications for better retirement planning.*

**Keywords:** PenCom, RSA, PFA, 25% Withdrawal, Retirement Benefits, Federal Polytechnic.

## Introduction

Contributory pension schemes is where employees and employers contribute to retirement savings, are common. Management and regulations vary across countries, impacting retirement benefits. Globally, pension schemes ensure financial security in retirement, and contributory schemes are common, with varying management and regulations (Organisation for Economic Co-operation and Development [OECD, (2020)]. In Africa, pension reforms aim to enhance retirement security, however, some countries are adopting contributory schemes for sustainability. Nigeria's Contributory Pension Scheme (CPS), established under the Pension Reform Act 2014, mandates contributions for public and private sector employees. The National Pension Commission (PenCom) regulates the scheme. Contributors can access 25% of their Retirement Savings Account (RSA) under specific conditions. For staff of Federal Polytechnic, Kaduna, the 25% withdrawal policy's effect on retirement benefits is significant. The policy's implications on financial security in retirement are of interest.

Stakeholders are worrying on how the effect of 25% withdrawal could be in the long run. The contributory pension scheme was expected to alleviate the challenges of the old pension scheme rather it become controversial. The research problem focuses on understanding the effect of the 25% withdrawal policy on retirement benefits of staff of Federal Polytechnic, Kaduna. Empirical studies: Adegbite & Ojo (2022) observed that early withdrawals reduce retirement benefits. In the same vein, in the word of Nwankwo and Udeh (2021), partial withdrawals impact retirement savings.

Some gaps that this study intends to fill are that no past researches was carried out with focus on the impact of the 25% withdrawal policy in a polytechnic setting like Federal Polytechnic, Kaduna. In addition, limited research captures staff perceptions of the policy's impact on retirement benefits. Finally, little research provides insights into whether the policy needs review based on staff experiences. This study among others provides insights for policymakers on potential adjustments; and helps staff understand policy implications for financial planning; and it adds to the body of knowledge on pension policies in Nigeria.

Based on the foregoing, the study will answer the following questions:

- i. What is the effect of the 25% withdrawal policy on retirement benefits of staff of Federal Polytechnic, Kaduna?
- ii. How does the 25% withdrawal policy impact financial security in retirement for staff?
- iii. What are staff perceptions of the 25% withdrawal policy from the contributory pension scheme?
- iv. Does the 25% withdrawal policy influence retirement planning of staff?
- v. Should the 25% withdrawal policy be reviewed based on staff experiences and perceptions?

The main objective of this study is to find out the impact of 25% withdrawal from contributory pension scheme policy on retirement benefits of staff of federal polytechnic, kaduna. The specific objectives are to:

- i. determine the effect of the 25% withdrawal policy on retirement benefits.
- ii. examine the impact on financial security in retirement.
- iii. assess staff perceptions of the policy.

- iv. investigate the influence on retirement planning.
- v. provide insights on whether the policy should be reviewed.

However, null hypotheses were formulated and tested as follows:

Ho<sub>1</sub>: 25% withdrawal policy does not significantly affect retirement benefits of staff.

Ho<sub>2</sub>: The policy has no significant impact on financial security in retirement.

Ho<sub>3</sub>: Staff perceptions of the policy are generally not negative.

Ho<sub>4</sub>: The policy do not influences retirement planning of staff.

Ho<sub>5</sub>: Staff does not believe the policy should be reviewed for better outcomes.

### **Literature Review**

Contributory Pension Scheme (CPS) is regulated by the National Pension Commission (PenCom) and involves Pension Funds Administrators (PFAs) managing Retirement Savings Accounts (RSAs). The 25% Withdrawal Policy allows RSA holders to withdraw up to 25% of their balance under specific conditions like job loss or for residential mortgage contributions. Research indicates concerns about the impact of the 25% withdrawal on long-term retirement benefits and financial security of retirees. The PenCom has guidelines for administering retirement and terminal benefits under the CPS, as outlined in the Pension Reform Act 2014.

The theory of Life Cycle Hypothesis (LCH) propounded in 1954 by Franco Modigliani and Richard Brumberg (Modigliani & Brumberg, 1954). The Life Cycle Hypothesis suggests that individuals plan consumption and savings over their lifetime for stable consumption. People save during working years for retirement. The LCH explains how the 25% withdrawal policy from the contributory pension scheme might affect retirement benefits of staff of Federal Polytechnic, Kaduna. Early withdrawal could impact retirement savings, influencing financial security based on lifetime savings and consumption planning.

### **Risks of early pension withdrawal**

The most obvious risk of early access to pension savings is the risk of inadequate retirement income. This risk may occur even in systems without a direct access link to pension savings through contribution holidays or reduced earning capacities. Members with more education and higher income usually save for retirement while members who withdrawal their pension early are usually from a lower education and income background and are likely to spend these funds on debt repayments (Butrica, Zedlewski, & Issa, 2010). This is supported by (The World Bank Group, 2019) whose study showed that vulnerable people especially those with less education, have no other financial assets and have the least retirement savings have highest rates of withdrawals.

More than half of workers will spend some of their retirement savings if given the opportunity. (Butrica, Zedlewski, & Issa, 2010). Furthermore, the study showed that early pension withdrawals are usually necessitated due to job loses, loss of income, divorce, and home purchases with each of these events increasing the likelihood of a withdrawal by 3 to 10%. The younger workers with low balances are most likely to spend their retirement savings resulting in significant loss to their retirement income. Vulnerable individuals facing various shocks which include the loss of income are likely to withdraw their pension early (Bekbossinova et al, 2022).

Pension savings for this group also constituted a major source of wealth for the lower income workers in the UK who were excluded from financial services such as loans or mortgages hence access to savings was considered necessary. The argument in the study was by consumer interest groups who stated that access to pensions would open low-income workers to pressure from creditors to meet their debt arrears using pension savings. This view caused countries around the world to put in place strict rules around early pension access for example due to limited and inconclusive evidence on the benefits to under saving groups, the UK government did not approve a proposal for early access to pension saving in 2011.

The study by (The World Bank Group, 2019) also supported this argument for extreme cases; it stated that in the face of extreme shocks, limited pensions access can help improve the welfare of individuals. Early access to pensions in some countries in the Pacific Islands which were affected by a natural disaster improved people's welfare. This could be comparable to the COVID 19 period in 2019 – 2021 when a lot of people lost their jobs or businesses and had no other source of funds.

### **Early pension withdrawals in sub-Saharan region**

Early access to pension saving not only has an impact on the members as can be seen in Uganda where early access to pensions had a 2.5% decrease in the interest rate in the 2021/2022 savings year when compared to the previous year (Busuulwa, 2022). Early access to pension can also have an impact on the pension fund. High volumes of withdrawals would lead to an increase in portfolio liquidity. This would restrict investment opportunities in long term instruments reducing the ability of the scheme to generate higher returns through illiquidity premiums (The World Bank Group, 2019). When early withdrawals are a major driver of outflows, early pension withdrawals would have a major impact on pension funds (Morales, Fuentes, Searle, & Stewart, 2017).

A correlation analysis study on the impact of accessing pension benefits before attaining retirement age in Kenya conducted by (WERE, 2011) as quoted by (Murithi, 2015) revealed that an inverse relationship exists between early access to pension benefit and fund financial performance. The study highlighted that Ksh. 2 billion was accessed by members within a period of six months. The researcher indicated that this would affect the pension funds liquidity in the short term, and it was recommended that the Kenyan Government takes appropriate measures to mitigate this in the long term.

### **Methodology**

This study employs a descriptive survey research design to investigate the effect of the 25% withdrawal policy from the contributory pension scheme on retirement benefits of staff of Federal Polytechnic, Kaduna. The study is conducted at Federal Polytechnic, Kaduna, Nigeria with the population of 1,000 staff of Federal Polytechnic, Kaduna, who are part of the Contributory Pension Scheme. The sample size of 600 staff was obtained through stratified random sampling technique from different categories of staff (academic, non-academic) to ensure representation. Data was collected using a structured questionnaire designed to gather information on staff perceptions of the 25% withdrawal policy's impact on their retirement benefits and was analyzed using descriptive statistics (frequencies, percentages, means) to summarize staff perceptions and experiences regarding the policy's impact on retirement benefits.

Based on the objectives of the study, the following question was designed in the Questionnaire

- i. Are you aware of the 25% withdrawal policy from the contributory pension scheme? (Yes/No)
- ii. Do you think the 25% withdrawal policy affects your retirement benefits? (Yes/No)
- iii. How does the 25% withdrawal policy impact your financial security in retirement? (High, Moderate, Low, None)
- iv. What is your perception of the 25% withdrawal policy? (Positive, Neutral, Negative)
- v. Does the policy influence your retirement planning? (Yes/No)
- vi. Are you concerned about the impact of the 25% withdrawal on your long-term retirement benefits? (Yes/No)
- vii. Do you think the policy should be reviewed? (Yes/No)
- viii. How satisfied are you with the 25% withdrawal policy? (Satisfied, Neutral, Dissatisfied)
- ix. Do you think the policy affects your overall retirement savings strategy? (Yes/No)
- x. Would you consider using the 25% withdrawal option if needed? (Yes/No)

Summary of the results from the questionnaire

- i. Aware of policy: Yes 80%, No 20%
- ii. Affects retirement benefits: Yes 60%, No 40%
- iii. Impact on financial security: High 40%, Moderate 30%, Low 20%, None 10%
- iv. Perception: Positive 20%, Neutral 40%, Negative 40%
- v. Influences retirement planning: Yes 60%, No 40%
- vi. Concerned about long-term impact: Yes 70%, No 30%
- vii. Policy should be reviewed: Yes 80%, No 20%
- viii. Satisfaction: Satisfied 20%, Neutral 40%, Dissatisfied 40%
- ix. Affects overall strategy: Yes 60%, No 40%
- x. Consider using option: Yes 50%, No 50%

The reliability of the questionnaire refers to its ability to produce consistent results when administered under similar conditions. Without specific data on test-retest reliability, internal consistency (e.g., Cronbach's alpha), or other reliability measures for this particular questionnaire, it's challenging to definitively state its reliability. Typically, reliability can be enhanced through clear question wording, consistent administration, and pilot testing. The questionnaire appears to have face validity as questions align with study objectives (assessing impact on retirement benefits, financial security, and staff perceptions).

The validity of the questionnaire pertains to how accurately it measures what it intends to measure regarding the "Effect of 25% withdrawal policy from contributory pension scheme on retirement benefits of staff of federal polytechnic, Kaduna". The questionnaire appears to have face validity as questions align with study objectives (assessing impact on retirement benefits, financial security, and staff perceptions). Content validity seems adequate given the coverage of relevant aspects like awareness, impact, perception, and satisfaction regarding the policy. Construct validity would depend on how well the questions capture the constructs of interest. Content validity seems adequate given the coverage of relevant aspects like awareness, impact, perception, and satisfaction regarding the policy.

## Findings

The study found out that most staff believes the policy affects retirement benefits and impacts financial security. Perceptions are mostly neutral or negative.

## Conclusion

The study concluded that 25% withdrawal policy has implications for staff retirement benefits and financial security.

## Recommendations

Based on the conclusion, the following recommendations were proffered:

- i. Government through PENCOS should review the policy considering staff concerns;
- ii. Staff should be informed about policy implications for better retirement plan.

## Suggestion for further Studies

Based on the findings on the "Effect of 25% withdrawal policy from contributory pension scheme on retirement benefits of staff of federal polytechnic, Kaduna", further studies could:

- i. Investigate the long-term effects of the 25% withdrawal policy on retirement benefits and financial security.
- ii. Compare the effects of the policy in different institutions in Nigeria.
- iii. Examine alternative policies or modifications to the 25% withdrawal policy for better retirement outcomes.
- iv. Study how staff financial literacy influences decisions regarding the 25% withdrawal policy.
- v. Assess the effectiveness of PenCom guidelines on the 25% withdrawal policy in protecting retirement benefits.

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## **FINANCIAL TECHNOLOGY SERVICE ATTRIBUTES AND SUSTAINABLE RURAL BANKING**

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### **Abstract**

*This research investigates how features of financial technology services affect the long-term viability of banking in rural areas. The inquiry stemmed from gaps in earlier studies which revealed that only about a quarter of residents in south-western Nigeria actively use conventional banks, a trend that hampers the realisation of both cashless economy initiatives and financial inclusion policies. The study relied on the Unified Theory of Acceptance and Use of Technology (UTAUT) as its theoretical framework, as the model provides insights into the factors that drive individuals to embrace technology for various activities. A causal research design was adopted, and data were obtained through a multi-stage sampling approach. From a target population of 26,906,000, a sample of 384 respondents was selected. The findings indicate that performance expectancy, effort expectancy, and trust in fintech services play a significant role in making rural banking appealing to rural populations. Conversely, the facilitating conditions of fintech services were not found to exert a meaningful effect on rural banking. On the strength of these outcomes, the study suggests that both the Federal Government of Nigeria and fintech providers should prioritise enhancing the enabling conditions of financial technology services in order to increase their appeal among rural dwellers.*

**Keywords:** Performance expectancy, service effort, facilitating conditions, trust, sustainability, rural banking.

## Introduction

Since Nigeria attained independence, the expansion of banking facilities has remained heavily concentrated in urban locations, leaving rural communities underserved. This imbalance prompted the introduction of a rural banking initiative in 1977 as a government policy response to the limited financial presence outside cities (Okorie, 2022). The Rural Banking Scheme (RBS) was specifically designed to address the scarcity of banking institutions in remote areas. Its foundation was laid on the recommendations of the Financial Review Committee led by Okigbo (1976), which proposed that commercial banks should be mandated to establish branches in rural localities.

The scheme was premised on the belief that increasing the accessibility of banks to rural residents would stimulate the mobilisation of savings, channel financial resources into the rural economy, provide credit to small-scale enterprises, enhance financial inclusion, and promote the culture of banking among rural dwellers (Okorie, 2022; Central Bank of Nigeria, 2014). Consequently, legislation was enacted to oblige commercial banks to extend their operations into non-urban areas (Angahar, 2013). Despite the existence of the RBS for several decades, the original challenges that justified its creation remain largely unresolved. As of April 2020, fewer than 20 percent of commercial bank branches were located in rural areas, even though over 70 percent of Nigeria's estimated 220 million people lived there (Central Bank of Nigeria, 2020). Subsequent reviews of bank distribution in 2022 confirmed that urban areas still receive more attention in branch establishment, with issues such as insecurity cited as the major reason for avoiding rural expansion (Okorie, 2022; Angahar, 2013). These trends highlight the continuing under-representation of rural Nigeria in formal banking coverage.

Empirical evidence further reveals the preference of rural households for informal financial systems. A survey carried out in South-West Nigeria revealed that only one-quarter of rural residents made use of formal banking institutions. In contrast, fewer than one percent depended on microfinance banks. About 16 percent engaged with Rotating Savings and Credit Associations (commonly known as ROSCAs or ESUSU), while roughly 3 percent preferred other informal savings groups not classified as ROSCAs. Additionally, more than one-third relied on daily money collectors, and around one-fifth were active members of cooperative societies and credit unions (Oluwatusin & Olofinsao, 2016). This outcome reflects the perception that informal mechanisms are more convenient than conventional banking channels (Anyanwu, 2016).

For rural banking to succeed in mobilising deposits and extending credit, financial institutions must integrate features that resonate with rural populations, particularly those associated with financial technology innovations (Angahar, 2013). Increasingly, a large proportion of transactions in Nigeria are executed through digital channels such as Point of Sale (POS) terminals, Automated Teller Machines (ATMs), mobile banking, internet banking, and electronic fund transfers. These digital tools are widely recognised as essential in ensuring speed, efficiency, and reliability of financial services (Central Bank of Nigeria [CBN], 2014; Nigerian Inter-Bank Settlement Systems [NIBSS], 2015).

Nevertheless, there remains a theoretical and practical disconnect regarding how fintech attributes can be harnessed to guarantee the sustainability of rural banking. To address this gap,

this study adapts the Unified Theory of Acceptance and Use of Technology (UTAUT) model, tailoring it to rural Nigeria to examine how adoption, financial inclusion, and acceptance of cashless policies can be strengthened. The framework emphasises four fintech service attributes (performance expectancy, effort expectancy, facilitating conditions, and trust in fintech services) which are explored as potential drivers of sustainable rural banking in developing economies.

## **Literature review**

### **The Unified Theory of Acceptance and Use of Technology**

The present investigation is guided by the Unified Theory of Acceptance and Use of Technology (UTAUT), a framework developed by Venkatesh, Morris, Davis, and Davis in 2003. This theoretical model consolidates insights from earlier explanations of technology adoption into one comprehensive structure, addressing both individuals' intentions and their subsequent behaviours in relation to technology use. Within this framework, four central constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are identified as the main predictors of user acceptance. While performance expectancy, effort expectancy, and social influence are considered direct influences on the intention to embrace new technologies, actual usage is determined by the combined effect of facilitating conditions and behavioural intention.

The theory also recognises the moderating influence of demographic and contextual factors such as gender, age, prior experience, and the degree to which usage is voluntary. Unlike previous models, which accounted for roughly 40 percent of variance in adoption behaviour, UTAUT demonstrates stronger predictive capacity by explaining up to 70 percent of the variation in users' intention to adopt technological innovations (Venkatesh et al., 2003). In this study, the model is extended by incorporating trust in financial technology services as an additional construct, thereby refining its applicability. Trust is considered an essential element in financial transactions (McKnight et al., 2015). Trust is an internal features and direct relationship that encourage the acceptability of technology especially in the financial sector. While, relative advantage and social factors are with external features and possess an indirect relationship with rural banking. This study seeks to bridge the practical gap to sustainable rural banking (adoption, financial inclusion and cashless policy acceptability) in Nigeria through financial technology services attributes even without the physical presence of banks in rural areas.

## Conceptual Framework Fintech Service Attributes

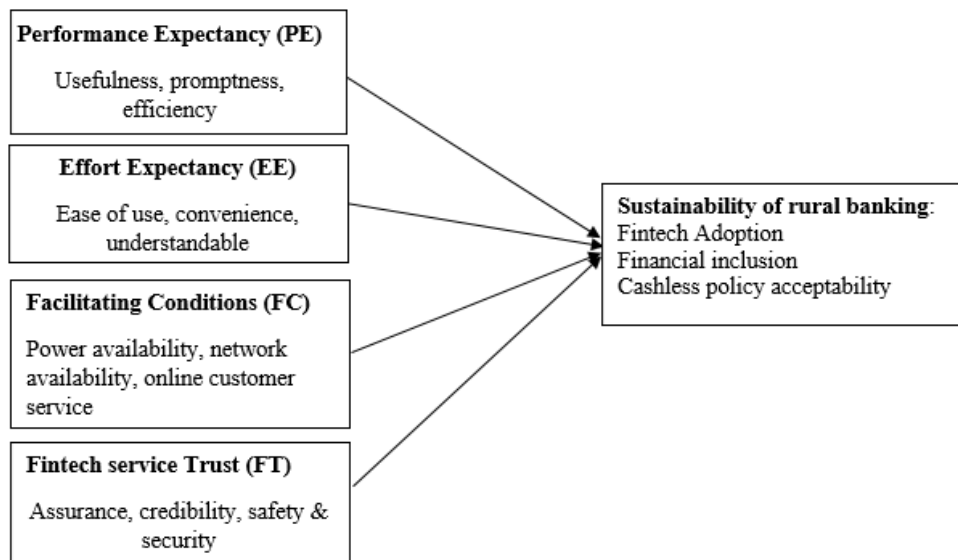


Fig. 1: Modified UTAUT model on financial technology service attributes and sustainability of rural banking

**Source:** Researcher's Conceptualization (2024) (Adapted from Vankatesh, 2003).

### Performance expectancy

Performance expectancy describes the belief that using a given technological system will improve an individual's task performance. It reflects the perception that embracing new tools can make tasks easier and more efficient to complete (Venkatesh et al., 2003). Within the context of financial snip technologies, performance expectancy relates to how well services such as point-of-sale devices, automated teller machines, and electronic money transfers operate for rural users. Thus, this study hypothesizes that:

$H_{01}$ : Fintech's services performance expectancy does not significantly affect sustainability of rural banking.

### Effort expectancy

Effort expectancy refers to how simple or difficult individuals perceive the use of a system to be. According to Venkatesh et al. (2003), it reflects the level of convenience or challenge experienced when interacting with a particular system. In the context of financial technology, effort expectancy describes how easily people in rural communities can utilise services such as point-of-sale terminals, automated teller machines, and electronic money transfers. The availability of these technologies, when they are easy to operate, is anticipated to promote the long-term growth and stability of rural banking. Thus, this study hypothesizes that:

$H_{02}$ : Fintech's services effort expectancy does not significantly affect sustainability of rural banking.

### Facilitating conditions

Facilitating conditions describe the degree to which an individual believes that the necessary organisational support and technological resources are available to ensure smooth and effective

system usage (Venkatesh et al., 2003; Bhatiasevi, 2015). In the context of financial technology, they describe the presence and reliability of resources that ensure seamless and efficient service delivery. Such resources include infrastructure and tools that support transactions through platforms like point-of-sale devices, automated teller machines, and electronic money transfers, alongside essentials such as reliable electricity supply, internet access, GSM coverage, and sufficient broadband capacity. Thus, this study conjectures that:

Ho<sub>3</sub>: Facilitating conditions of fintech's services does not significantly influence sustainability of rural banking.

### **Trust in fintech services**

Trust in technology service entails; assurance, credibility, safety and security in performing financial transactions through financial technology services platforms (POS, ATM, money transfer, etc.) by users in a manner that protects their data and guarantees that financial transactions can be made without problems. Therefore, even when all the elements of the UTAUT are satisfied, individuals may still refrain from adopting financial technology services if they lack confidence in the reliability of the technology. Trust in technology is intrinsic and have direct influence on the use of financial technology services by rural dwellers in the hinterland. Thus, this study hypothesizes that:

Ho<sub>4</sub>: Fintech's services trust does not significantly influence sustainability of rural banking.

#### **2.2.1 Rural banking sustainability**

Rural banking refers to the delivery of financial services to people residing in remote communities, often facilitated by financial technology firms. Ensuring the sustainability of such services involves maintaining and strengthening banking operations in ways that encourage rural populations to embrace them, thereby advancing financial inclusion and fostering acceptance of cashless transactions. Achieving sustainability in Nigeria's rural banking sector requires the introduction of well-designed, technology-driven solutions that suit the realities of the local population. This process should be implemented in alignment with the skills and experiences of the individuals directly involved, supported by essential infrastructure such as information and communication systems that enhance service delivery. At this point, the role of fintech becomes indispensable, as banks are expected to take greater responsibility in extending these services to rural communities. Alongside this extension, providing technical support, coupled with continuous monitoring and evaluation, can help to strengthen operations. Ultimately, such measures would contribute to establishing enduring and reliable micro-level banking systems within rural areas (Mogaji et al., 2021).

#### **2.2.2 Adoption of rural banking**

Nigeria continues to operate as a largely cash-driven economy, with heavy reliance on physical money shaped by low literacy levels, inadequate awareness of digital payment advantages, and limited security consciousness (Ovia, 2008; Ayo & Babajide, 2006). This reliance has discouraged many citizens, especially those with minimal education, from recognising the value of formal banking. Experts contend that addressing fundamental barriers through robust electronic fraud-prevention measures and the establishment of legislation that guarantees safety, credibility, and public trust in the banking system would significantly accelerate the adoption of digital financial services while also driving broader growth in the country's e-commerce landscape (Chiemeké et al., 2006).

### **2.2.3 Cashless policy in Nigeria**

The Central Bank of Nigeria (CBN) first introduced the cashless policy in 2011 and began testing the programme in Lagos State in April 2012. Prior to this reform, cash dominated banking activities, accounting for more than 99 percent of customer transactions. Records indicated that approximately 86% of withdrawals carried out at banking halls were below ₦100,000, while fewer than 10% exceeded this amount. In fact, only a small proportion, about 10 percent, involved sums greater than ₦150,000 (CBN, 2014). The policy was not designed to completely eradicate the use of cash but rather to minimise the volume of paper money in circulation and to promote reliance on electronic payment systems. Nevertheless, cash usage remains widespread in many rural communities, largely because of the absence of physical banking branches. The growing availability of financial technology services is expected to bridge this gap by motivating rural populations to adopt electronic platforms for their financial dealings, thereby advancing the penetration of banking services in underserved areas. (Adeoti & Osotimehin, 2012).

### **2.2.4 Financial inclusion**

Financial inclusion requires that banking opportunities extend to individuals in every part of a nation, without leaving anyone behind. It emphasises that all people, regardless of location or status, should have the ability to access formal banking services. At its core, financial inclusion means that those who are typically excluded from the financial system are able to open accounts, obtain credit, and carry out transactions within regulated financial institutions (Mukhopadhyay & Mukhopadhyay, 2021; CBN, 2020; David-West, Iheanachor, & Umukoro, 2020; Mende, Nendov, Salisbury, & Scott, 2019; Ozili, 2018; Baradaran, 2015). However, in Nigeria, the spread of inclusive financial practices remains limited. This is largely because many banks still hesitate to fully engage in the process by establishing and sustaining rural branches, extending coverage to remote areas, supporting agricultural lending, fostering fintech collaborations, and providing the necessary infrastructure (Soetan et al, 2023; Mogaji et al., 2021, David-West, Iheanachor & Umukoro, 2020; Newlyn, 2017).

### **2.2.5 Financial technology service firms in Nigeria**

Nigeria's financial sector is still in its growth stage, and sustaining this progress, while also meeting the demands of its expanding population, depends on effective marketing strategies. Financial technology firms have become central to this process by using digital innovations to extend services to both the unbanked and underbanked population. In addition, government initiatives aimed at encouraging entrepreneurship and the growth of small businesses have opened further opportunities for Fintech operators. These firms now provide a wide range of services, including credit facilities, savings and investment options, fundraising platforms, blockchain and cryptocurrency transactions, cross-border remittances, insurance packages, digital payment systems, and online lending solutions. Their offerings are tailored to serve not only individuals but also micro, small, and medium-scale enterprises, which constitute the foundation of Nigeria's economy. Some financial technology firms in Nigeria include; Paystack, Flutterwave, PiggyVest, Kuda, Chipper Cash, Interswitch, Binance, GoFundMe, Monipoint, Palmpay, Opay, Remita, etc.

## **Methodology**

The study adopted a causal research design, which is suitable for examining how independent factors, in this case, the features of financial technology services, affect dependent outcomes

such as sustainable rural banking. The investigation was conducted across rural settlements in six states within Nigeria's south-west geopolitical zone, namely Lagos, Ekiti, Ondo, Oyo, Osun, and Ogun. This region was deliberately chosen because it serves as the nation's financial stronghold and hosts its primary commercial centre. The research population consisted of rural residents in the south-west zone. Data from Statista (2021) indicate that Nigeria recorded 122.3 million bank customers, both active and inactive, in 2021, with the south-west alone representing 22 per cent of that figure. This translates to approximately 26.9 million individuals, and this group formed the study's target population. The justification for this is because even those living in the cities, also do travel to their rural communities from time to time, while others periodically send money to their parents or relations in the rural areas. Students in primary, secondary and tertiary institutions also send, receive money and pay their fees through electronic banking systems. Hence, they are also affected directly or indirectly with the rural banking technology challenges. A distribution of the state's populations is seen in table 1

**Table 1:** Population of the study by states in the south-west geopolitical zone

Geographical Zone	State	Population
South-West	Lagos	8,700,000
South-West	Ekiti	3,500,000
South-West	Ondo	3,000,000
South-West	Oyo	4,900,000
South-West	Osun	3,000,000
South-West	Ogun	3,806,000
<b>Total</b>	<b>6 States</b>	<b>26,906,000</b>

**Source:** National Bureau of Statistics (2020). National Survey Demographic Division.

From the total estimated population of 26,906,000 current and prospective bank clients in the South-West region, a sample of 400 participants was derived through the application of Taro Yamane's formula for finite populations. Data were obtained by means of a field survey, which involved the distribution of structured questionnaires to both active and inactive banking customers within rural communities of the region. The survey exercise took place between 2 November 2023 and 27 May 2024. A multi-stage approach was employed in drawing the sample. In the initial stage, each state's population was organised into clusters based on Local Government Areas, after which a comprehensive list of LGAs was produced for every state in the South-West geopolitical zone. Subsequently, one Local Government Area was chosen at random from each of the six states, with the selection carried out through a simple random sampling process using a ballot system. This makes the total number of six local governments selected. At the second stage of the sampling, a random sample of two villages were selected from each of the LGAs also using simple random sampling and this makes a total of 12 villages selected. The selection of the respondents from each of these rural areas was selected using stratified random sampling. The optimum allocation formula was used in distributing the 400 sample size as shown in below:

$$\text{Lagos} = \frac{8,700,000}{26,906,000} \times 400 = 129$$

$$\text{Ekiti} = \frac{3,500,000 \times 400}{26,906,000 \times 1} = 52$$

$$\text{Ondo} = \frac{3,000,000 \times 400}{26,906,000 \times 1} = 45$$

$$\text{Oyo} = \frac{4,900,000 \times 400}{26,906,000 \times 1} = 73$$

$$\text{Osun} = \frac{3,000,000 \times 400}{26,906,000 \times 1} = 45$$

$$\text{Ogun} = \frac{3,800,000 \times 400}{26,906,000 \times 1} = 56$$

$$\text{Total} = 400$$

Out of 400 questionnaires administered, 384 were correctly filled, returned and used for analyses. The research questionnaire was divided into two parts. Part A gathered respondents' demographic information, while Part B comprised items intended to obtain data on financial technology service characteristics and the sustainability of rural banking in south-west Nigeria. Financial technology (Fintech) attributes were assessed using four constructs (performance expectancy, effort expectancy, facilitating conditions and trust) with respondents indicating their views via the questionnaire items. Part A covered respondent biographical data (items 1-4). Responses in Part B were recorded on a five-point Likert scale: Very Great Extent (VGE) = 5; Great Extent (GE) = 4; Some Extent (SE) = 3; Little Extent (FP) = 2; Very Little Extent (VLE) = 1. Performance expectancy 5-8, effort expectancy 9-12, facilitating conditions 13-16, trust in fintech services 17-20. Sustainability of rural banking was measured by adoption, cashless policy acceptability and financial inclusion implementation using 5 points Likert scale from question 21-23. Data obtained from returned questionnaire, were analysed using multiple regression statistical tool.

#### 4. Result and discussion of findings

##### 4.1 Test of hypotheses

**Table 2:** Model summary showing the relationship between financial technology services attributes and sustainability of rural banking

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.654	.427	.421	2.89508

Source: Field survey (2024)

**Table 2:** ANOVA result summary showing the relationship between financial technology services attributes and sustainability of rural banking

Model		Sum of Squares	Df	Mean Square	F-calc.	F-crit.	Sig.
1	Regression	2368.745	4	592.186	70.654	2.40	.000
	Residual	3176.589	379	8.382			
	Total	5545.333	383				

Source: Author's computation (2024)

**Table 3:** Parameter estimates of the multiple linear regression for testing the hypotheses Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized T Coefficients	Sig.	Collinearity Statistics	
	B	Std. Error	Beta		Tolerance	VIF
(Constant)	-2.988	.964	-3.100	.002		
Performance expectancy	.319	.059	.260	5.442	.000	.663
Effort Expectancy	.407	.066	.310	6.168	.000	.597
Facilitating conditions	-.059	.052	-.047	-1.132	.258	.885
Fintech services trust	.333	.054	.273	6.161	.000	.771

Dependent Variable: Rural banking

Source: Author's computation (2024)

The results summarised in Table 3 show that performance expectancy regarding Fintech services ( $\beta = .319$ ,  $SE = .059$ ,  $t = 5.442$ ,  $p = .000$ ,  $p < 0.05$ ) is positively linked with the sustainability of rural banking in South-West Nigeria. The computed t-statistic of 5.442 is higher than the critical benchmark of 1.97 at the 5% significance level. This outcome leads to the rejection of the null hypothesis and affirms that performance expectancy significantly strengthens rural banking sustainability. In the same vein, Table 3 indicates that effort expectancy associated with Fintech services ( $\beta = .407$ ,  $SE = .052$ ,  $t = 6.168$ ,  $p = .000$ ,  $p < 0.05$ ) is also positively related to rural banking sustainability in the South-West region. Since the observed t-value of 6.168 surpasses the critical value of 1.97 at the 5% threshold, the null hypothesis is rejected, which establishes that effort expectancy makes a substantial contribution to sustaining rural banking practices.

Conversely, the results in Table 3 suggest that the facilitating conditions of Fintech services ( $\beta = -.059$ ,  $SE = .052$ ,  $t = -1.132$ ,  $p = .258$ ,  $p > 0.05$ ) do not bear a significant relationship with rural banking sustainability in South-West Nigeria. The t-value of -1.132 falls below the critical cutoff of 1.97 at the 5% significance level. Consequently, the null hypothesis is upheld, indicating that facilitating conditions have no meaningful effect on the sustainability of rural banking. Lastly, Table 3 reveals that trust in Fintech services ( $\beta = .333$ ,  $SE = .054$ ,  $t = 6.161$ ,  $p = .000$ ,  $p < 0.05$ ) exhibits a strong positive association with rural banking sustainability in South-West Nigeria. The t-value of 6.161 exceeds the critical threshold of 1.97 at the 5% level of significance. Hence,

the null hypothesis is rejected, confirming that trust in Fintech services plays an important role in maintaining sustainable rural banking.

## **4.2 Discussion of findings**

### **4.2.1 Performance expectancy and sustainability of rural banking**

Finding reveals that Fintech services' performance expectancy has significantly affected sustainability of rural banking in the South-West of Nigeria, and this had to do with the degree of usefulness, promptness and efficiency associated with using the banking technology services in the rural area. The findings of this study align with those reported by Al-Sharafi et al. (2023), who explored how Artificial Intelligence (AI) products can promote environmental sustainability. In their work, they developed a conceptual model that merged the Unified Theory of Acceptance and Use of Technology (UTAUT) with Protection Motivation Theory (PMT) to explain the drivers of Generation Z's acceptance of AI-based products and how this adoption contributes to sustainable behaviour. Their analysis showed that in Malaysia, key determinants such as performance expectancy, effort expectancy, social influence, perceived severity, response efficacy, and response costs significantly motivated environmentally sustainable actions. Conversely, in Turkey, the major factors linked to such behaviour were effort expectancy, facilitating conditions, perceived severity, response efficacy, and response costs. Similarly, Carlsson et al. (2006), in an earlier study, applied the UTAUT framework to investigate how individuals and society adopted advanced mobile technologies and services. Their evidence demonstrated that both performance expectancy and effort expectancy had a strong and direct impact on users' intention to adopt mobile innovations.

### **4.2.2 Effort expectancy and sustainability of rural banking**

The second finding revealed that the ease with which financial technology services could be used proved to have a considerable impact on sustaining banking activities in rural communities. This influence was largely linked to the simplicity and convenience offered by such technological banking solutions in those areas. In a related investigation, Dulle and Minishi-Majanja (2011) applied the Unified Theory of Acceptance and Use of Technology (UTAUT) to explore the adoption of open access within public universities in Tanzania. Their work went beyond the traditional UTAUT framework by introducing additional factors such as users' attitudes and confidence in internet use. Findings from the research showed that awareness, effort expectancy, performance expectancy, and attitude were decisive elements shaping scholars' intentions to engage with open access systems. Chiemeké and Ewiewkpae (2011), also buttressed this result in his study which found that how people perceived POS as being easy to use in terms of their interaction with the machine greatly affected their adoption of this technology in Lagos and Ibadan states, Nigeria.

### **4.2.3 Facilitating conditions and sustainability of rural banking**

The results of this research suggest that the enabling environment for fintech services does not exert a substantial impact on the sustainability of rural banking. In this context, facilitating conditions refer to the supporting infrastructure that makes financial technology usable, including steady electricity supply, reliable telecommunication networks, affordable data services, and other related provisions. Adeoti (2013), in an investigation of barriers to the effective utilisation of point-of-sale (POS) terminals in Nigeria, found that the key obstacles were unstable network connectivity, frequent power interruptions, and the inadequate

availability of POS devices per retail outlet. These findings stand in contrast to the work of Dulle and Minishi-Majanja (2011), who employed the Unified Theory of Acceptance and Use of Technology (UTAUT) framework in their study of open access implementation in Tanzanian public universities. Their research established that factors such as age, level of awareness, users' behavioural intentions, infrastructural support, and social influence all played a significant role in determining researchers' actual adoption of open access systems.

#### **4.2.4 Financial technology services trust and sustainability of rural banking**

The next of this study's result shows that fintech services trust significantly influence sustainability of rural banking and this had to do with the degree of assurance, credibility, safety and security. The present finding aligns with the work of Anyadighibe et al. (2022), which examined how automated service quality influences customer satisfaction in deposit money banks (DMBs) within Calabar, Cross River State, Nigeria. A total of 329 participants took part in that research, and the data collected were analysed using multiple regression techniques. The results indicated that aspects of automation such as security, privacy, trust, and confidence significantly enhanced customer satisfaction. Based on these outcomes, the study suggested that DMBs should ensure faster automated processes for fund transfers and withdrawals, while also preventing instances where customers' account balances are reduced without corresponding payments during electronic transactions, as this is essential for sustaining customer trust.

## **5. Conclusion and recommendations**

### **5.1 Conclusion**

Since Nigeria gained independence, the growth of its banking system has largely been concentrated in urban areas, leaving rural communities underserved. Over the years, several policy initiatives have been introduced to accelerate rural banking schemes with the aim of advancing the United Nations' goal of financial inclusion and supporting the transition towards a cashless economy. It is evident that the effectiveness of FinTech services, particularly in terms of performance expectation, ease of use, enabling conditions, and trust, is essential for ensuring the sustainability of rural banking in Nigeria.

The absence or limited number of conventional banks in rural regions does not necessarily hinder the success of rural banking operations. Findings from this study demonstrate that applying a refined version of the Unified Theory of Acceptance and Use of Technology (UTAUT) framework to financial technology services provides a viable pathway for implementing sustainable rural banking in the country. Through this system, rural residents are now able to save for development, maintain bank accounts, and access credit facilities even in the absence of physical commercial bank branches. Individuals and business owners in the rural area now perform cash and non-cash financial transactions with the advent of financial technology firms' services. Financial technology services attributes are key motivators to sustainability of rural banking adoption, financial inclusion and cashless policy acceptability by rural dwellers.

### **5.2 Recommendations**

- i. The Federal Government's financial regulator such as Central Bank of Nigeria (CBN) and fintech firms should ensure performance expectancy (usefulness, promptness and

- efficiency) of financial technology services in the country, in order to sustain rural banking and make it more attractive to rural dwellers.
- ii. Financial technology services firms must ensure that customers are guaranteed effort expectancy (understandable, ease of use and convenience) of financial technology services deliveries, in order to enhance rural banking culture.
  - iii. The Government and fintech firms should do everything in their powers to improve the facilitating conditions (power availability, network availability, online customer service) in order not to discourage the use of fintech services in rural areas.
  - iv. Finally, financial technology firms must ensure rural dwellers customers fintech trust (privacies and financial transactions are secure and safe), at all times, to boost their confidence towards rural banking.

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# INVESTIGATING ORDER AND CONVERGENCE OF A 2 POINT REFITTED SUPER CLASS OF BBDF FOR SOLVING STIFF INITIAL VALUE PROBLEMS

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## **Abstract**

*This scheme studied the 2 point refitted super class of block backward differentiation formula for integrating first order stiff Initial Value Problems (IVPs) and the necessary and sufficient condition for the convergence of the method is investigated. It also shown that the method is both zero and consistent and of order 3.*

**Keywords:** *Consistency, Order and Convergence, Stiff ODEs, Zero Stable.*

## 1.0 Introduction

Consider a system of first order stiff ordinary differential equations (ODEs) of the form:

$$y' = f(x, y) \quad y(x_0) = y_0, \quad [a, b] \quad (1)$$

Equation (1) is said to be stiff if it has a stable fixed point with eigenvalues of greatly different magnitudes or if all its eigenvalues have negative real part, and the stiffness ratio (the ratio of the magnitudes of the real parts of the largest and smallest eigenvalues) is large. Stiff ODEs do exist in most of fields of science, engineering and social science, most of the real-life problems are converted into models. Such models brought stiff ordinary differential equations. They are particularly found in electrical circuits, vibrations, chemical reactions, kinetics, automatic control etc. Block Backward differentiation formula is one of the reliable Block numerical methods for obtaining solutions of stiff ODEs. In (Ja'afar et al 2023) is a Refitted block super class of backward differentiation formula for integrating first order stiff ODE's is developed as follows:

$$\begin{aligned} y_{n+1} &= -\frac{1}{6} y_{n-1} + \frac{7}{8} y_n + \frac{7}{24} y_{n+2} + h \frac{1}{2} f_{n+1} - h \frac{1}{4} f_{n+2} \\ y_{n+2} &= \frac{1}{4} y_{n-1} - \frac{6}{5} y_n + \frac{39}{20} y_{n+1} - h \frac{3}{10} f_{n+1} + h \frac{3}{5} f_{n+2} \end{aligned} \quad (2)$$

The (R2SBBDF) method proves to be efficient and one of the competitive block methods for stiff problems. The derivation of the method can be found in (Ja'afar et al 2023) in details. Convergence of block methods for solving (1) has been studied in (Musa et al 2012), (Musa et al 2016) and (Suleiman et al 2014). In this paper, we studied the convergence property of the method (2).

## 2.0 Order of the Method

To define the order of the method (2), the formulae are defined in the general matrix form as follows:

$$\sum_{j=0}^1 C_j^* y_{m+j-1} = h \sum_{j=0}^k D_j^* y_{m+j-1} \quad (3)$$

Where  $D_0^*, D_1^*, C_1^*$  and  $C_2^*$  are square matrices define by

$$C_0^* = \begin{pmatrix} \frac{1}{6} & -\frac{7}{8} \\ -\frac{1}{4} & -\frac{6}{5} \end{pmatrix}, C_1^* = \begin{pmatrix} 1 & -\frac{7}{24} \\ -\frac{39}{20} & 1 \end{pmatrix}, D_0^* = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}, D_1^* = \begin{pmatrix} \frac{1}{2} & -\frac{1}{4} \\ -\frac{3}{10} & \frac{3}{5} \end{pmatrix} \text{ and}$$

$Y_{m-1}, Y_m, F_{m-1}$ , and  $F_m$ , are column vectors define by

$$Y_{m-1} = \begin{pmatrix} y_{n+1} \\ y_{n+2} \end{pmatrix}, Y_m = \begin{pmatrix} y_{n-1} \\ y_n \end{pmatrix}, F_{m-1} = \begin{pmatrix} f_{n-1} \\ y_n \end{pmatrix}, F_m = \begin{pmatrix} f_{n+1} \\ f_{n+2} \end{pmatrix}$$

Equation (3) can be written as

$$\begin{pmatrix} 1 & -\frac{7}{24} \\ -\frac{39}{20} & 1 \end{pmatrix} \begin{pmatrix} y_{n+1} \\ y_{n+2} \end{pmatrix} + \begin{pmatrix} \frac{1}{6} & -\frac{7}{8} \\ -\frac{1}{4} & -\frac{6}{5} \end{pmatrix} \begin{pmatrix} y_{n-1} \\ y_n \end{pmatrix} = h \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \begin{pmatrix} f_{n-1} \\ y_n \end{pmatrix} + h \begin{pmatrix} \frac{1}{2} & -\frac{1}{4} \\ -\frac{3}{10} & \frac{3}{5} \end{pmatrix} \begin{pmatrix} f_{n+1} \\ f_{n+2} \end{pmatrix}$$

Definition 1: the order of the block method (2) and it is associated linear operator given by  
 $L \{y(x), h\} = \sum_{j=0}^k [C_j y(x + jh) - hD_j y'(x + jh)].$  (5)

Is the unique integer  $p$  such that

$E_q = 0, q=0(1) p$  and  $E_{p+1} \neq 0$  where  $E_q$  are constant matrices defined by

$$E_0 = C_0 + C_1 + C_2 + \dots + C_k$$

$$E_1 = C_1 + 2C_2 + \dots + kC_k - (D_0 + D_1 + D_2 + \dots + D_k)$$

$$E_q = \frac{1}{q!} (C_1 + 2^q C_2 + \dots + k^q C_k) - \frac{1}{(q-1)!} (D_1 + 2^{q-1} D_2 + \dots + k^{q-1} D_k)$$

$$a = 2, 3, \dots$$

Let  $D^*_0, D^*_1, C^*_0$  and  $C^*_1$  be block matrices defined by

$$C^*_0 = (C_0, C_1), C^*_1 = (C_2, C_3), D^*_0 = (D_0, D_1), \text{ and } D^*_1 = (D_2, D_3)$$

Where

$$C_0 = \begin{pmatrix} \frac{1}{6} \\ \frac{1}{4} \end{pmatrix}, C_1 = \begin{pmatrix} -\frac{7}{8} \\ \frac{6}{5} \end{pmatrix}, C_2 = \begin{pmatrix} \frac{1}{39} \\ -\frac{1}{20} \end{pmatrix}, C_3 = \begin{pmatrix} -\frac{7}{24} \\ 1 \end{pmatrix}, D_0 = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, D_1 = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, D_2 = \begin{pmatrix} \frac{1}{2} \\ -\frac{3}{10} \end{pmatrix}, D_3 = \begin{pmatrix} -\frac{1}{4} \\ \frac{3}{5} \end{pmatrix}$$

For  $q = 0(1)3$ , we have

$$E_0 = C_0 + C_1 + C_2 + C_3 = \begin{pmatrix} \frac{1}{6} \\ -\frac{1}{4} \end{pmatrix} + \begin{pmatrix} -\frac{7}{8} \\ \frac{6}{5} \end{pmatrix} + \begin{pmatrix} \frac{1}{39} \\ -\frac{1}{20} \end{pmatrix} + \begin{pmatrix} -\frac{7}{24} \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$E_1 = C_1 + 2C_2 + 3C_3 - (D_0 + D_1 + D_2 + D_3)$$

$$= \begin{pmatrix} -\frac{7}{8} \\ \frac{6}{5} \end{pmatrix} + 2 \begin{pmatrix} \frac{1}{39} \\ -\frac{1}{20} \end{pmatrix} + 3 \begin{pmatrix} -\frac{7}{24} \\ 1 \end{pmatrix} - \left[ \begin{pmatrix} 0 \\ 0 \end{pmatrix} + \begin{pmatrix} 0 \\ 0 \end{pmatrix} + \begin{pmatrix} \frac{1}{2} \\ -\frac{3}{10} \end{pmatrix} + \begin{pmatrix} -\frac{1}{4} \\ \frac{3}{5} \end{pmatrix} \right] = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$E_2 = \frac{1}{2!} (C_1 + 2^2 C_2 + 3^2 C_3) - \frac{1}{1!} (D_1 + 2D_2 + 3D_3)$$

$$= \frac{1}{2!} \left[ \begin{pmatrix} -\frac{7}{8} \\ \frac{6}{5} \end{pmatrix} + 2^2 \begin{pmatrix} \frac{1}{39} \\ -\frac{1}{20} \end{pmatrix} + 3^2 \begin{pmatrix} -\frac{7}{24} \\ 1 \end{pmatrix} \right] - \frac{1}{1!} \left[ \begin{pmatrix} 0 \\ 0 \end{pmatrix} + 2 \begin{pmatrix} \frac{1}{2} \\ -\frac{3}{10} \end{pmatrix} + 3 \begin{pmatrix} -\frac{1}{4} \\ \frac{3}{5} \end{pmatrix} \right] = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$E_3 = \frac{1}{3!} (C_1 + 2^3 C_2 + 3^3 C_3) - \frac{1}{2!} (D_1 + 2^2 D_2 + 3^2 D_3)$$

$$= \frac{1}{3!} \left[ \begin{pmatrix} -\frac{7}{8} \\ \frac{6}{5} \end{pmatrix} + 2^3 \begin{pmatrix} \frac{1}{39} \\ -\frac{1}{20} \end{pmatrix} + 3^3 \begin{pmatrix} -\frac{7}{24} \\ 1 \end{pmatrix} \right] - \frac{1}{2!} \left[ \begin{pmatrix} 0 \\ 0 \end{pmatrix} + 2^2 \begin{pmatrix} \frac{1}{2} \\ -\frac{3}{10} \end{pmatrix} + 3^2 \begin{pmatrix} -\frac{1}{4} \\ \frac{3}{5} \end{pmatrix} \right] = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$E_4 = \frac{1}{4!} (C_1 + 2^4 C_2 + 3^4 C_3 + 4^4 C_4) - \frac{1}{3!} (D_1 + 2^3 D_2 + 3^3 D_3 + 4^3 C_4)$$

$$= \frac{1}{4!} \left[ \begin{pmatrix} -\frac{7}{8} \\ \frac{6}{5} \end{pmatrix} + 2^4 \begin{pmatrix} \frac{1}{39} \\ -\frac{1}{20} \end{pmatrix} + 3^4 \begin{pmatrix} -\frac{7}{24} \\ 1 \end{pmatrix} \right] - \frac{1}{3!} \left[ \begin{pmatrix} 0 \\ 0 \end{pmatrix} + 2^3 \begin{pmatrix} \frac{1}{2} \\ -\frac{3}{10} \end{pmatrix} + 3^3 \begin{pmatrix} -\frac{1}{4} \\ \frac{3}{5} \end{pmatrix} \right] = \begin{pmatrix} \frac{5}{48} \\ -\frac{7}{40} \end{pmatrix} \neq \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

Therefore, the method is of order 3 with error constant  $E_4 = \begin{pmatrix} \frac{5}{48} \\ -\frac{7}{40} \end{pmatrix}$

### 3.0 Convergence of the method

An essential property that every acceptable linear multistep method (LMM) must possess is convergence. This section shows the convergence of the method (2). According to a paper in (Henrici et al 1962) reported in (Musa et al 2016), consistency and zero stability are the necessary conditions for the convergence of any numerical method. It was explained in (Lambert et al 1993) that consistency controls the magnitude of the local transition error and while zero stability controls the manner in which the error is propagated at each step of the calculation. A method, which is not both consistent and zero stable is rejected outright and has no practical interest. We start by presenting the following definitions and theorems related to the convergence of LMM taken from (Musa et al 2016)

#### 3.1 Definition 1 (LMM):

A general k-step linear method is defined as

$$\sum_{j=0}^k \alpha_j y_{n+j} = h \sum_{j=0}^k \beta_j f_{n+j} \quad (6)$$

Where  $\alpha_j$  and  $\beta_j$  are constants and  $\alpha_k \neq 0$ .  $\alpha_0$  and  $\beta_0$  cannot both be zero at the same time, for any linear k-step method,  $\alpha_k$  is normalized to 1. The method (6) is said to be explicit if  $\beta_k = 0$  and  $\beta_k \neq 0$ .

#### 3.2 Definition 2:

The linear difference operator L associated with the linear multi-step method (6) is defined by

$$L\{y(x), h\} = \sum_{j=0}^k [\alpha_j y(x + jh) - h\beta_j y'(x + jh)]. \quad (7)$$

Where  $y(x)$  is an arbitrary test function and it is continuously differential on [a, b].

Expanding  $y(x + jh)$  and  $y'(x + jh)$  as a Taylor's series about  $x$ , and expanding the common terms yields:

$$L\{y(x), h\} = c_0 y(x_n) + c_1 h y'(x_n) + c_2 h^2 y''(x_n) + \dots + c_q h^q y^{(q)}(x_n) + \dots \quad (8)$$

Where  $c_q$  are common constants given by

$$\begin{aligned} c_0 &= \alpha_0 + \alpha_1 + \alpha_2 + \dots + \alpha_k \\ c_1 &= \alpha_1 + 2\alpha_2 + \dots + k\alpha_k - (\beta_0 + \beta_1 + \beta_2 + \dots + \beta_k) \\ &: \\ c_q &= \frac{1}{q!} (\alpha_1 + 2^q \alpha_2 + \dots + k^q \alpha_q) - \frac{1}{(q-1)!} (\beta_1 + 2^{q-1} \beta_2 + \dots + k^{q-1} \beta_k) \end{aligned} \quad (9)$$

$q = 2, 3, \dots$

#### 3.3 Definition 3:

The characteristic polynomial of the linear multi-step method (6) is defined by

$$\pi(r, \bar{h}) = \rho(\xi) - \bar{h}\sigma(\xi) = 0 \quad (10)$$

Where  $\bar{h} = \lambda h$  and  $\lambda = \frac{\delta f}{\delta y}$

The first and second characteristics polynomial of the linear multistep method (LMM) are defined by

$$\begin{aligned} \rho(\xi) &= \sum_{j=0}^k \alpha_j \xi^j \\ \text{and} \\ \sigma(\xi) &= \sum_{j=0}^k \beta_j \xi^j \end{aligned} \tag{11}$$

### 3.4 Definition 4:

A linear Multistep Method is said to be of order  $p$  if  $E_0 = E_1 = \dots = E_p = 0$  and  $E_{p+1} \neq 0$

### 3.5 Definition 5 (Consistency):

The LMM (6) is said to be consistent if it is  $p \geq 1$ .

It also follows from (9) that the LMM (6) is consistent if and only if

$$\sum_{j=0}^k j \alpha_j = \sum_{j=0}^k \beta_j \tag{12}$$

### 3.6 Definition 6 (zero stability):

A Linear Multistep Method is said to be zero stable if no root of the first characteristics polynomial has modulus greater than one and that any root with modulus one is simple.

### 3.7 Theorem 1 (Convergence of LMM):

Henrici (1962) gave the following theorems on convergence of LMM

1. A necessary condition for convergence of the LMM (6) is that the modulus of no root of the associated polynomial on  $p(e)$  (given in (11)) exceeds one, and that the roots of modulus 1 is simple.  
The condition thus imposed on  $p(e)$  is called the condition of zero stability.
2. A necessary condition for convergence of the LMM defined by (6) is that the order of the associated difference operator be at least one. The condition that order  $p \geq 1$  is called condition of consistency

## 4.0 Consistency of the method

We show the method (2) is consistent.

We have seen that the method (2) is of order 3. So, it satisfies the consistency conditions given in definition 5. Now we show that the method is consistent

The method (2) is consistent if and only if the following conditions are satisfied

- $\sum_{j=0}^3 C^*_j = 0$  (13)

- $\sum_{j=0}^3 j C^*_j = \sum_{j=0}^3 D^*_j$  (14)

Where the  $C^*_j$ 's and  $D^*_j$ 's are defined

Equation (13) becomes

$$\begin{aligned} \sum_{j=0}^3 C^*_j &= 0 \\ \sum_{j=0}^3 C^*_j &= C^*_0 + C^*_1 + C^*_2 + C^*_3 = 0 \\ &= \begin{pmatrix} \frac{1}{6} \\ \frac{1}{4} \end{pmatrix} + \begin{pmatrix} -\frac{7}{8} \\ \frac{6}{5} \end{pmatrix} + \begin{pmatrix} \frac{1}{39} \\ -\frac{20}{20} \end{pmatrix} + \begin{pmatrix} -\frac{7}{24} \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \end{aligned} \quad (15)$$

Hence condition (13) is satisfied.

Equation (14) becomes

$$\begin{aligned} \sum_{j=0}^3 (jC^*_j) &= (0)C^*_0 + (1)C^*_1 + (2)C^*_2 + (3)C^*_3 \\ &= (0) \begin{pmatrix} \frac{1}{6} \\ -\frac{1}{4} \end{pmatrix} + (1) \begin{pmatrix} -\frac{7}{8} \\ \frac{6}{5} \end{pmatrix} + (2) \begin{pmatrix} \frac{1}{39} \\ -\frac{20}{20} \end{pmatrix} + (3) \begin{pmatrix} -\frac{7}{24} \\ 1 \end{pmatrix} = \begin{pmatrix} \frac{1}{4} \\ \frac{3}{10} \end{pmatrix} \end{aligned} \quad (16)$$

$$\begin{aligned} \sum_{j=0}^3 D^*_j &= D^*_0 + D^*_1 + D^*_2 + D^*_3 \\ &= \begin{pmatrix} 0 \\ 0 \end{pmatrix} + \begin{pmatrix} 0 \\ 0 \end{pmatrix} + \begin{pmatrix} \frac{1}{2} \\ -\frac{3}{10} \end{pmatrix} + \begin{pmatrix} -\frac{1}{4} \\ \frac{3}{5} \end{pmatrix} = \begin{pmatrix} \frac{1}{4} \\ \frac{3}{10} \end{pmatrix} \end{aligned} \quad (17)$$

$$\sum_{j=0}^3 jC^*_j = \sum_{j=0}^3 D^*_j = \begin{pmatrix} \frac{1}{4} \\ \frac{3}{10} \end{pmatrix} \quad (18)$$

Thus, the second conditions in (16) and (17) also satisfied  
Therefore, the method (2) is consistent.

## 5.0 Zero stability

To show that the method is zero stable.

The stability polynomial of the method (2) is given by

$$R(t, \bar{h}) = \frac{69}{160}t^2 - \frac{21}{40}t^2\bar{h} - \frac{33}{80}t + \frac{9}{40}t^2(\bar{h})^2 - \frac{3}{8}t\bar{h} - \frac{3}{160} = 0 \quad (19)$$

By putting  $\bar{h} = h\lambda = 0$  in (19), we obtain the first characteristic polynomial as:

$$R(t, \bar{h}) = \frac{-3}{160} - \frac{33}{80}t + \frac{69}{160}t^2 = 0 \quad (20)$$

$$\text{Hence, } t = 0.0434782609 \text{ or } t = 1 \quad (21)$$

Since method (2) is both consistent and zero stable, thus, it converges according to Theorem 1

## 6.0 Conclusion

In this paper, we have discussed the necessary and sufficient conditions for the convergence associated with the R2SBBDF method proposed (Ja'afar et al, 2023). The method is zero stable and consistent. We conclude the method converges and thus, validating its significance in solving stiff ordinary differential equations.

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# FOREIGN POLICY AND DIPLOMACY: A COMPARATIVE ANALYSIS OF OBASANJO AND BUHARI ADMINISTRATION IN NIGERIAN FOURTH REPUBLIC

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## Abstract

*Since independence there is no significant changes in Nigeria foreign relations until Nigerian fourth republic, 1999 till date. Pertinent to her foreign policy is the projection of Africa as the centerpiece of Nigerian foreign policy, thus swift to playing the 'big brother' role in Africa. This paper juxtaposes foreign policy and diplomacy of Obasanjo and Buhari's administrations in their external relations. It evaluates diplomacy as instrument by each of the administration to achieve foreign policy goals and objectives. The study employs an eclectic approach, a qualitative/narrative approach to establish themes and events. The data pertaining to the subjects of inquiry formed the basis for analysis. Theory of National Interest was employed to underpin the influence of domestic issues in foreign relations. The findings revealed that Nigeria's foreign policy decisions and direction were the resultant influence of the personality traits and leadership idiosyncrasy. The paper concludes that, many challenges faced by Nigeria nation such as, Niger Delta crisis under Obasanjo and Boko-haram insurgency under Buhari was a stigma to Nigeria image projections beyond domestic environment. It recommends that, Nigeria government needs focusing on her statutory obligations such as; security of lives and properties; infrastructural development; economic diversification; a virile foreign policy among others.*

**Keywords:** Foreign Policy, Diplomacy, Administration, International relations.

## Introduction

A country's foreign policy consists of self-interest strategies chosen by the state to safeguard its national interests and to achieve its goals within the international relations milieu. It is the aggregate of a country's national interest which results from the interaction of internal and external forces as perceived by the foreign policy decision makers. The approaches used are strategically employed to interact with other countries. In recent times however, due to the deepening level of globalization and transnational activities, relations and interactions between and among nations have been known to exist between state and non- state actors in the international political arena. These relations in their own way have influenced several foreign policies between nation states.

Nigeria's foreign policy since independence has been viewed from different perspectives (Aluko, 1981) Macridis (1985), Anyaele, (2005) in recent times. One of the most prevailing perspectives of her foreign policy is that it is chameleon in nature, (Anyaele, 2005) a foreign policy constantly in a state of flux as a result of internal and external dynamics inherent in any given administration or regime. Some scholars however maintained that irrespective of the frequent changes, the substance of Nigeria's foreign policy has remained the same. However, the later parts of this study may argue otherwise. Buttressing the above point, (Anyaele, 2005) upholds the view that the protection of our national interest has remained the permanent focus of Nigeria's foreign policy, but the strategies for such protection have varied from one regime/administration to another. The formation and execution of Nigeria's foreign policy from independence have been carried out in no fewer than fourteen different administrations through the external affairs ministry. From Tafawa Balewa administration who pioneered Nigerian Foreign policy in 1960 to President Obasanjo administration in 2003, from the administration of President Musa Yar'Adua to the current administration of President Amed Bola Tinubu, 2025. These various administrations - including the different military regimes which took over administrative power in Nigeria for over a cumulative period of 35 years, of the entire 60 years of the existence of Nigeria foreign policy- claimed to pursue the same national interest with regards to the nation foreign policy's principles and objectives.

The consequence of the flux nature of Nigeria's foreign policy, has been a plethora of conceptual ideological transitions in Nigeria's foreign policy machinery, (Vision 2020 Report, 2009); (Pine, 2011); (Akinboye, 2013), this indicate that past administrations strove towards an epistemological construction and definition of the thrust of Nigeria's foreign policy. These conceptualizations are often regime/administration specific and born out of a psychological and selfish hunger of various administrations or regimes to carve an identity which will leave a lasting impression in the minds of Nigerians. To this end, (Pin, 2011) laments, these ideologies are not necessarily products of deep and profound philosophical reflections. This paper argues that these ideologies are rather collections of selfish efforts by these various administrations to make a name or an identity for themselves and their regime/administration as the case may be. Pin, (2011) strongly believes this factor was one of the major causative avenues agencies of project abandonment and Nigeria foreign policy summersault. Since Balewa assumed office in 1960, the basic principles of Nigerian foreign policy, the concepts and ideologies have been proposed to include; Africa as the centre piece of Nigeria's foreign policy, Dynamic foreign policy, National consensus in foreign policy, economic diplomacy, citizen diplomacy, multilateralism, non-alignment and the transformation agenda of Nigeria's foreign policy are a

few examples among many other ideologies which in many ways have fall short of expectations,(Pin, 2011).

The military incautions into Nigeria political atmospheres particular, the one led by a tyrant, General Sani Abacha, just to mention the recent one to Nigerian Fourth Republic who significantly ruled for 5 years and plunged Nigeria into a pariah and state isolation from the rest part of the World like; United Nations and most especially, international organisations as a result of Nigeria suspension from the Commonwealth and others organization on how Nigerian dictator, Sani Abacha who saw people's lives insignificant and as a sacrifice for the perpetuation and sustainability of his regime. Apart from his unexplainable regime hunting to Nigerian big-wigs, and gross violation of human rights, the unlawful arrest, summary trial and judgement coupled with the hanging of 8 Ogoni agitators led by late Ken Saro-wiwa, compelled the international community to declare Nigeria a Pariah nation in 1995. The tragic end of Abacha on the 8 of June, 1998 paved the way for Democracy as Gen. Abdulsalami Abubakar was quickly appointed as the Nigeria's new Head of State who within 6-7 months took pragmatic steps to address some of the salient and contending issues of the Nigerian nation including transition into democratic government.

### **Statement of Problems**

It is problematic that, Nigeria's foreign policy has been viewed from different mission and notion despite the laid down principles and objective that can guide the operator in the operation and the conduct of a nation's external affairs. One of the most demoralising issues in of Nigeria in her foreign policy is that of instability as regards the guiding principles and objectives of Nigeria foreign policy and these are induced by leadership characters and characterisation. The paper is therefore charged with the responsibility of evaluation the peculiarity in line with the laid down objectives. In nature, a foreign policy is constantly in a state of flux as a result of internal and external dynamics inherent in any given administration/ regime. Some scholars however maintained that irrespective of the frequent changes, the substance of Nigeria's foreign policy has remained the same. This paper is pigeon-holed in 4 sections; The first section prologues the paper with statement of problems, methodology and scope. Section two addresses the literature review and theoretical framework while section three deals with thematic and qualitative data analysis on the information gathered through desktop research.

### **Methodology and Scope**

This paper seeks to evaluate the juxtaposition of two different administrations' foreign policy and diplomatic relations in their external affairs namely, Obasanjo, 1999- 2007 and Buhari, 2015-2023 in Nigeria as the specific scope and major focus of the research and for the sake of peculiarity of the administrations. This aspect of the study provides a description of the sources of data used and the applicable methodology. Most of the data used for this study were curled from published scholarly works (textbooks, articles and journals) and descriptive qualitative analysis based on content analysis. Although the paper is centered on foreign policy and the use of diplomacy to achieve core national and secondary interest of the nations as goals and objectives. It is therefore limited to the scope aforementioned.

## Literature Review

### Foreign policy

The term “foreign policy” has been given different definitions by scholars, historians and diplomats. Foreign policy has been defined as “the actions of a state towards external environment and conditions usually domestic, under which these decisions are formulated”. The issue of foreign policy has been observed based on scholarly viewpoints that reflect the various vantage points from the perspectives of the scholars. Ofoegbu states in (Ola,1997) that foreign policy is as follows; a collection of related concepts and ideas that are frequently the result of mental reflection and development. It includes judgment, selection, assessment, methodical insight, understanding of the objective reality pertaining to the environment, and solution-seeking; state's program of decisions and activities about its external environment, intended to accomplish both long- and short-term goals, is essentially its foreign policy. By extension, a nation's foreign policy decisions are influenced by its internal climate. "The system of activities evolved by communities for changing the behavior of other states and for adjusting their own activities to the international environment", Bojang (2018). Foreign policy needs to shed insight on how governments try to alter the behavior of other states and are successful in doing so. To put it succinctly, in this sense, foreign policy is just the set of behaviors and inactions that are aimed at the outside world in order to achieve the goals of home development. According to this definition, the goal of any country's foreign policy, including Nigeria's, is to assist the country to accomplish its internal or domestic goals, the primary one being the transformation of its people. Such could be directed or based on economics, politics, culture or creating understanding or-cooperation (Adesola, 2004). Professor Bolaji Akinyemi defines foreign policy as the assemblage of propagated ideas and the actions taking by a state which has some Impacts on its territorial boundaries.

The notion of foreign policy embraces a deliberately constructed design to fit a country properly into the international system. It is a carefully planned course of action which informs the behavioural pattern of a country towards other countries in the international system, and which is designed to facilitate the attainment of the objectives of a state in its relationship with other members of the international community (Afinotan, 2007). Within this context, foreign policy is divisible into three broad sections: it involves the setting of goals, the development of strategies for their attainment, and the implementation of those strategies or conduct of the foreign policy (Afinotan, 2007). Basically, the main elements of foreign policy would include such things as the overall policy orientation of a country towards her external environment, manifesting her intentions towards that environment, the objectives which she seeks to achieve in her relations with other countries, and the means for achieving those objectives (Adeniran, 1983). According to Holsti (1983), foreign policy deals with the actions of a state towards its external environment. And Northedge (1968) describes it as “an interplay between the outside and the inside”.

Kolawole (2001), in his summaries views various definitions of foreign policy as thus: That first, foreign policy is usually an attempt at shaping the world towards a nation's direction of the ideal system. Second, that in its formulation and execution, it realizes the existence of, and aims at other actors in the international system. And finally, that there is an organic relationship between domestic politics and foreign policy. A nation's foreign policy is in part, a reflection of its domestic policy. Central to the concept of foreign policy however is the idea of national

interest which constitutes the fulcrum around which foreign policy revolves (Afinotan, 2007). In the specific case of Nigeria, the search for national unity has come to assume the dimensions of a national survival project, and an issue of strategic national interest. Since all state policy, domestic or foreign is directed in the first place towards the attainment and preservation of national security and survival, Nigeria's quest for unity, constitutes an important issue area towards which state policy is being directed.

### **Diplomacy**

The concept of diplomacy comes from the Greek word diploma meaning a folded document and is linked to the official handwriting and the idea of credentials confirming the claims of the bearer. Accordingly, a preoccupation with authenticity and authority appears to be at the etymological foundation of the term. There is no agreement among scholars on the exact meaning of diplomacy. However, we will examine the literature and submission by seasoned scholars working in this area.

The application of intelligence and tact in the conduct of official relations between the governments of independent states" (Ernst, 1922). Diplomacy is a discrete human practice constituted by the explicit construction, representation, negotiation and manipulation of necessarily ambiguous identities". (Paul Sharp, 1999). The Art of resolving international difficulties peacefully (John R. Wood and Jean Serres, 1970). Diplomacy is the way of managing relations between individuals, groups, principalities or states in order to advance and protect the interests of all those involved in such relationships. (Akinjide O, 2006).

### **Theoretical Framework**

#### **The National Interest Theory**

It has become a common practice for the state officials to explain their decisions and actions towards the external environment of the state in respect of National interest. The main objective of any nation's foreign policy however, is the promotion and furtherance of its National Interest. Rosenau (1980) explained National Interest from two perspectives. One hand, he views National Interest as an analytic concept used in explaining, describing or evaluating the sources or adequacy of a nation's foreign policy. On the other hand, he views it as an instrument of political action which politicians use to justify and legitimize their policies or to mobilize public support for intended objectives. National interest can therefore be viewed as a highly generalized concept of those elements that constitutes the states most vital need as well as being the fundamental objective and ultimate determinant that guides the decision makers of a state in making foreign policy.

#### **Nigerian Foreign Policy: An Overview**

One of the hallmarks of independent and sovereign statehood is the determinations and conduct of a nation's foreign policy. Nigeria assumed sovereign independent status in October 1, 1960 and the mantle of leadership fell on Sir Abubakar Tafawa Balewa, the first and the last prime minister of Nigeria. The task of taking and pursuing Nigeria's national interest became a task for the pioneering indigenous administration whose ability and capability in performing the roles were limited by experience, lack of precedence, institutional deficiencies, poor operational environment and shortage of foreign policy experts. Nigeria from January 1, 1914 when the amalgamation of the Northern and Southern protectorates was formally affected to

October 1, 1960 when Nigeria attained her independence but could not pursue an independent foreign policy which could be said to be separate and distinct from that of Britain. It was on this note that; there is a consensus among scholars and policy makers in Nigeria that the core national interests upon which country's foreign policy decisions had been directed as the main objectives since independence were:

- i. The defense of the country's sovereignty independence and territorial integrity.
- ii. The restoration of human dignity to black men and women all over the world, particularly the eradication of colonialism and white minority race from the face of Africa.
- iii. The creation of the relevant political and economic conditions in Africa and the rest of the world which will not only facilitate the preservation of the territorial integrity and security of all African countries but also foster national self-reliance in Africa countries.
- iv. The promotion and improvement of the economic well-being of the Nigerian citizens.
- v. The promotion of world peace with justice, (Olusanya and Akindele, 1984).

### **Peculiarity of Obasanjo and Buhari's Foreign Policy**

The only two Nigerian presidents to have held office twice are Olusegun Obasanjo and Muhammadu Buhari, both as military heads of state and as civilian presidents. Nigeria's foreign policy saw a rebirth and vigor under his two administrations, marking a golden age in the development and application of foreign policy. Nonetheless, compared to the preceding administrations, one might observe a mix of continuity and change in Nigeria's foreign policy during their second terms in office (Durutoye, 2014). During Olusegun Obasanjo's administration (1975–1979), the government adopted a radical foreign policy with the goal of releasing African governments from the shackles of colonialism and apartheid and lessening the power of Western capitalist nations. After the Sani Abacha government was isolated, Olusegun Obasanjo (1999–2007) made the decision to reopen Nigeria to the outside world. His foreign policy was centered on shuttle diplomacy, which was intended to promote economic development. Durutoye, A. (2014). Muhammadu Buhari decided to adopt the hardline Murtala/Obasanjo foreign policy from 1983 to 1985. Muhammadu Buhari's foreign policy from 2015 to 2023 also focused on fostering better ties with neighbors and preserving links with other nations, including China and the United States (Bello, Dutse & Othman, 2017).

### **Comparative Analysis: Obasanjo and Buhari Administrations**

#### **Nigeria Foreign Policy under Obasanjo, 1999-2007.**

Obasanjo's administration major task was bringing Nigeria out of her dead-end “by consolidating democracy at home, respecting fundamental human rights and encouraging liberal economic reforms, good governance and transparency with a view to boosting internationals to reassuring and realign Nigeria back to the international communities. His Administration continued image building and made a shift from concentration of Africa as the centre piece of Nigeria's foreign policy to global focused policy. He played a crucial role in international organization like, transforming OAU into a more effective African Union (AU). He was more focused in the creation of new partnership for Africa's Development (NEPAD). On conflict resolution and peace initiatives, Nigeria has been involving in series of peacekeeping missions in Africa in Liberia, Sierra Leone, Togo, Sao Tome and Principe and the African mission in Sudan (Adeniyi, 2005).

### **Shuttle Diplomacy**

Rarely to have major countries in the world that did not welcome the visit of the President Obasanjo. On assumption of office in May 1999, he embarked on frequent familiarization tours for bilateral foreign relations. He was pragmatic in taking Nigeria out of the recluse of Abacha years and was renowned for his shuttle diplomacy which was a vital instrument of foreign bilateral and multilateral collaborations for sustainable development and peaceful co-existence in the West Africa sub-region as well as with other countries of the world. The nation shuttle diplomacy is said to have emerged from Henry Kissinger's efforts in the Middle East in the early 1970s. He flew back and forth between Middle Eastern capitals for months in an effort to bring about peace after the 1973 Arab-Israeli war. The term shuttle diplomacy according to Cambridge dictionary refers to discussion between two or more countries in which someone travels between the different countries, talking to the governments involved, carrying messages and suggesting ways of dealing with problems (Cambridge university press, 2005).

The nation achieved significant gains through Obasanjo regime shuttle diplomacy. Apart from the psychological relief following its re-integration and accommodation into the world affairs, Nigeria also assumed the leadership of several international organisations such as: ECOWAS, AU, and G-77. It had hosted very important international summits thereby attracting foreign players to Nigeria. All these imply that the international system has restored its confidence in Nigeria under Obasanjo's administration. Nigerians would rather forget what happened during the Abacha administration, which caused them unnecessary suffering and led many of them to seek asylum overseas. Those who were unable to travel formed numerous coalition groups against the despicable Junta (Sanubi, & Oke, 2017).

### **Impact of Obasanjo Foreign Policy on Nigeria Development.**

#### **Nigeria Debt relief**

Nigeria external debt before 1999 was 27.008 billion dollars which presented Nigeria as the highest bankrupt State in Africa (CBN, 2002) and the country was spending 3 billion dollars every year to pay interest on debts. In order to tackle this financial problem, the Obasanjo led government went on the drive for foreign direct investment, the campaign for cancellation of the nation's debt and a cutting-edge economic diplomacy. President Obasanjo went on foreign trips to woo prospective investors to the country and established high diplomatic contacts with leaders of Nigeria's creditors, Ezeife (2003). Nigeria's foreign reserves rose from 2 billion dollars in 1999 to 43 billion dollars while leaving office in 2007. He was able to secure debt pardons from the Paris and London club amounting to some 18 billion dollars. (CBN, 2002).

#### **Restoring Nigeria into comity of nations**

The regime of General Sanni Abacha was characterized by tension, chaos, conflict and outright suspension from the commonwealth in his determination to regain Nigeria's lost glory and re-integrate it to the civilised world, president Obasanjo engaged in shuttle diplomacy across the major capital of the world. The president during his extensive foreign trips addressed the United Nations (UN), Economic Community of West African States (ECOWAS), the group of 8 (G-8), Group 77 (G-77), the Commonwealth African Union (AU) and European Union (EU) (Ajayi, 2006).

### **Promotion of Democracy and Good Governance in Africa**

As part of the plan to promote good administration throughout the continent, President Olusegun Obasanjo, who chaired the African Union in 2004 and served as president of Nigeria for eight years, suggested a code of governance for Africa. Dayo (2004) cited President Obasanjo as saying, "We have introduced a unique scheme called the African Peer Review Mechanism (APRM) which would enable us to peer review ourselves" in reference to the launch of the APRM in the quest of good governance. Stated differently, we have the ability to support, exert pressure on, and share best practices with one another. We would establish benchmarks that would control every country's performance. This was evident enough when resisted government change through coup d'états in Sao Tome and Principe where the country's president Fredrique de Menezes came to Nigeria to attend the Leon Sullivan summit. The Nigerian government ensured the return of de Menezes to power, Dayo (2004). Another instance was in Guinea-Bissau where the government of Kumba Yala was overthrown. Nigeria and other countries ensured immediate commencement of a transition program to civil rule in Guinea-Bissau

### **Nigeria's roles in ECOMOG under Obasanjo**

Under Obasanjo's leadership, Nigeria has proven a powerhouse in the region in economic and security affairs. Without Nigeria, ECOMOG (West African Peace Monitoring Force) of ECOWAS (Economic Community of West African States) would be toothless, and African-led peacekeeping missions in Guinea-Bissau, Liberia and Sierra Leone would not have been possible. Nigeria's foreign policy thrust under President Obasanjo recorded remarkable achievements in the area of maintenance of peace and security.

### **Regional Economic Integration under Obasanjo**

On regional economic integration front, Nigeria under President Obasanjo moved on the West African Gas Pipeline Project (WAPCO) that had been billed to facilitate the supply of natural gas to four countries in West Africa – i.e. Benin, Ghana, Togo, and subsequently Cote d'Ivoire. Although the country could not meet the 2006 deadline slated for the completion of the project due to unforeseen challenges, including the crisis in the Niger Delta.

### **NEPAD and Obasanjo's Foreign Policy**

Obasanjo has been instrumental in gathering African leaders to work towards establishing a code of conduct in economic and political reforms that would satisfy the conditions and expectations of Western donors. At the June 2001 Group of Eight summit in Genoa, Italy, Obasanjo was one of four leading African heads of state to unveil an African initiated plan called the New Partnership for Africa's Development (NEPAD). NEPAD is designed to garner aid from donors in return for African commitments to good governance. Obasanjo has led a number of meetings on NEPAD including the March 2002 summit of leaders from 19 countries. One of the cardinal principles of Nigeria's foreign policy since 1999 was that of Afro-centrism, which implies that Nigeria under the new attempt at democratic rule has not deviated from the main principles as outlined in 1960 and noted above, (Uche, 2003).

### **Challenges of Obasanjo's Foreign Policy**

There were several national issues that dragged Nigeria's foreign policy in the mud during Obasanjo's civilian administration. One major setback to Obasanjo's foreign policy was Niger

Delta crises. The crises discouraged the free inflow of oil foreign investors as they considered their life unsaved in the Niger Delta region. There were cases of kidnapping, hostage taking, bunkering, Sea Pirates among others.

Another shortcoming of Obasanjo's foreign policy is corruption that has eaten so deep into marrow and fabric of Nigeria's bone. The corrupt nature of Nigerian frustrated Nigeria's foreign policy under Obasanjo's administration. Also, Obasanjo's domestic policies on infrastructural development yielded little which in turn negatively affected the conduct of foreign relations especially in the area of wooing investors to the country. Nigeria did not witness a significant improvement in infrastructure in eight years of Obasanjo's civilian administration.

### **Nigeria Foreign Policy Under Buhari 2015-2019**

The election conducted on March 28, 2015, ushered in the former military Head of State, General Muhamadu Buhari for second time as Nigeria's former military Head of State, then elected as Nigeria President. One of the factors which contributed to President Buhari success at polls could be attributed to the failure of the President Jonathan to deal decisively with the issue of insecurity particularly, Boko Haram terrorism which affected Nigeria's image at the international communities. President Buhari hinged his campaign promises on three cardinal points which include, combating terrorism, fighting corruption and improving Nigeria economy. As stated earlier, foreign policy under a democratic government involves a lot stages for planning and execution, (Akinbi, O. J. 2015). The main foreign policy under president Buhari government includes improving relations with its neighbors in order to jointly fight Boko Haram which assumed a multinational or transnational dimension, partner with US and other world power to support the government in order to fight terrorism by providing needed manpower and intelligence, and more importantly improvement of economy and fighting corruption, improved relations with China in order to foster economic development through provision of needed infrastructure (Aning, K., Abdallah, M., & Kofi, F. 2017).

### **Benefits Buhari Foreign Policy 2015-2023**

- i. Buhari's administration has been able to improve its foreign relations with Nigeria particularly, with ECOWAS countries and LAKE CHAD Commission members. These also helped the government achieved some little success in the fight against Boko Haram insurgency which has taken an international dimension in Nigeria.
- ii. The administration was able to forge important diplomatic and economic relations with China, which is a growing economic power house in the global economy. This relation provided the country with needed funds to cushion the effect of the infrastructural deficit.
- iii. President Buhari championed negotiation for the peaceful return of democratically elected government in the Gambia.

### **Shortcomings of Buhari's Foreign Policy, 2015-2023**

Despite all these movements by President Buhari, he has not been able to solve Nigerian problem to a barest minimum. For example, Buhari visited Lake Chad after he was sworn in, this propel Lake Chad President to join military forces into Sambisa Forest where he was shot death. It is crystal clear that his journey to Lake Chad was not just effort in futility but a disaster. Not only that, invitation of Buhari to G7 meeting did not bring any meaningful development to Nigeria.

His leadership role at ECOWAS and AU did not bring any significant different in fighting Boko Haram insurgency in Nigeria. Therefore, the use of Diplomacy as an instrument of foreign policy did not yield any positive development in mostly all aspect of Nigeria government under Buhari's administration unlike Obasanjo Administration who made significant achievement in Nigerian foreign policy with the use of Diplomacy.

### **Challenges of Buhari's Foreign Policy**

President Buhari promised, during his campaign, to tackle three major challenges facing the country, which include insecurity (the Boko Haram insurgency), corruption, and dwindling economy. It is, however, noteworthy that Nigeria's domestic problems are not limited to the ones stated, some others as indicated by Akinterinwa, (2004), include “intermittent polarization and instability, high level of unemployment and poverty, mono-cultural economy and low industrial and agricultural productivity, the problems of institutional corruption, declining quality of education and ethical standards, as well as infrastructural deficit”, and the list could go on. All these challenges are obstacles to Nigeria's foreign policy; some of these challenges are discussed in the paragraphs that follow:

#### **Security Challenge**

The Boko Haram insurgency group gained prominence with the adoption of 276 Chibok school girls in 2014, and this prompted the world to join in the international activism to ensure the rescue of the girls. The fight against Boko Haram insurgency was one of the objectives of President Buhari's administration towards the 2015 election. Being a retired general, he was shocked at the way a terrorist group was able to attack Nigeria and its military installations at will. With all the effort of the Nigerian government and collaborations with its neighbouring countries, years down the line, 112 Chibok girls were still missing. According to Charles Onunaju, an International Affairs expert, in an interview with Mohammed, the relations with these countries consist of a diplomatic achievement for the country.

#### **Education**

Education is the bed rock of any nation of the world, and no nation can raise above her level of Education, and as such there is a great problem with the education sector under Buhari administration. In 2020, Academic Staff Union of University (ASUU) was on strike from March 2020 to November 2020. They are only asking Federal Government to fulfill the promise made to them in 2009. Moreover, many primary and secondary schools were deficient of teachers, academic facilities such as classroom, laboratories, library books among others, and where available, are in a bad condition. Incessant strike by university staff both academic and non-academic staff has really affected teaching learning process in Nigeria, and all these are more pronounced during Buhari administration.

#### **Economic Challenges**

President Buhari's administration is argued to have inherited a battered economy, due to mismanagement and corruption of past administrations. As such he is faced with the task of reviving the economy and bringing Nigeria back to its respectable status in Africa. This dire economic situation, among other economic challenges like inflation, unemployment and poverty, are responsible for the growing brain-drain syndrome ravaging almost every sector of the Nigerian economy. Consequently, many Nigerians continue to put their lives at risk by

taking illegal route through the Mediterranean Sea to get to Europe, only to end up losing lives on the journey; others who choose to cross over to Europe through Libya become victims of enslavement

### **Corruption**

The economy of Nigeria cannot be mentioned without the effects of multidimensional corruption and tackling of corruption is the third cardinal objective of president Buhari's government partly because it is an impediment and a major image deplete for the nation in foreign relations. According to Chukwuemeka, Bartholomew and Ugwu, corruption in Nigeria is pervasive and has an image tarnishing effect on the country. For this reason, foreign nationals have for long started exercising extreme caution in entering into business transactions with Nigerians. This condition has obviously weakened the economic sector of Nigeria. To support this assertion, Akinboye(2013), further clarified that Nigeria has struggled against its image crisis for about three decades, under the inhibiting influence of corruption, a condition that cannot be overcome until the government shows seriousness in fighting corruption. Accordingly, in order to improve the image of Nigeria and for Nigerians to enjoy better identity abroad, the fight against corruption in every sector of the Nigerian government becomes important. However, the government has been criticized for being selective in its handling of corruption allegations and cases, using the battle against corruption to victimize members of the opposition party. As such, the fight against corruption have not had much impact on the nation's foreign policy. Also, Transparency International has ranked Nigeria 144 out of 180 countries in its Corruption Perception Index of 2019 which does not show so much progress in the fight against corruption for almost half a decade, Akinboye (2013).

### **Conclusion**

The study examines foreign policy and diplomacy under the administration of Olusegun Obasanjo, 1999-2007 and Muhamadu Buhari, 2015-2023. President Obasanjo administration was able to transform Nigeria from isolated state of Sani Abacha's regime to a globalized nation. The development is that Nigeria is no longer perceived as a pariah state by the international community and her views on global issues are now respected. On the hand, personality trait of President Buhari arguably endeared a lot of Nigerians and subsequently won him more votes during the 2015 election and eventually brought him to power. His reputation of integrity and discipline, earned him some good will from outside the country as well. For instances, the invitation by the then U.S. President Barrack Obama in July 2015, shortly after he was elected into office, this was before he attended the G-7 summit in Germany, these are indicators that the group of world's most powerful states recognized and had confidence in him. However, the inadequate handlings of domestic issues viz-a-viz, insecurity, poor infrastructure, failing economy, unemployment among others, which he promised to tackle when elected, have collectively affected the foreign image of Nigeria in an adverse manner. However, the diplomatic relations with Chad, Cameroun and Niger had led to the 'technical defeat' of the Boko Haram terrorist group as at 2015, gory stories of their attacks are still being reported, coupled with rampageous activities of killer herdsmen in the country. Corruption and battered economy have resulted in many Nigerians leaving the country in search of greener pastures and a lot of them are treated with suspicions in foreign lands as a result of the poor foreign image of the country. Some migrants end up as victims of xenophobic killings like the ones experienced in South Africa. Due to corruption and insecurity many foreign companies have relocated their

businesses from Nigeria, thereby further shrinking the already dwindled economy, and those companies that manage to stay, doing business in the country has become very expensive, making products also expensive. There may not be any ready-made solution, however, it is instructive that the Nigerian government, particularly under this current administration, should begin to focus on national interest, including security, infrastructural development, economic diversification, improvement in the energy sector, particularly in the provision of steady supply of electricity, among others, as these would indirectly and significantly boost the foreign image of the Nigerian state. It is crystal clear that President Obasanjo administration uses shuttle diplomacy to have a formidable and a virile foreign policy with the external world and explored diplomatic mechanism to solve some external problems of the country such as debt cancelation, restoring Nigeria into comity of Nations among others.

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**GENDERED PATHWAYS TO POWER: WOMEN'S  
AGENCY AND ADVERSITY IN THE POLITICAL  
ARENA OF SOKOTO STATE**

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***Abstract***

*The persistent under-representation of women in political decision-making across Nigeria underscores the deep entrenchment of gendered hierarchies within the country's democratic institutions. Despite Nigeria's commitment to various international conventions such as the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), its adoption of the National Gender Policy (2006) and the Affirmative Policy Action of 35% representation, the country continues to record alarmingly low representation of women particularly in the north-west geo political zones where religion, traditions and norms have intersected. This paper examines the lived experiences of female elected officials and political appointees in Sokoto State, exploring how they navigate adversity and exercise agency within unique sociopolitical contexts. Qualitative method was used for the study feminist institutionalism was applied as the theoretical framework. Findings reveal that women often rely on networks of patronage, moral legitimacy and negotiation to access and sustain political power, yet remain structurally marginalized in formal decision-making. The paper concludes that women's agency in Sokoto manifests not as outright resistance but as strategic negotiation within patriarchal frameworks. It argues for institutional reforms, gender-sensitive political party structures, and civic education initiatives aimed at normalizing women's leadership in Northern Nigeria.*

**Keywords:** *Women, Political Participation, Gender, Leadership, Power*

## **Introduction**

Globally, the inclusion of women in decision-making processes is now recognized as a cornerstone of democratic governance and sustainable development. The United Nations and international feminist movements have repeatedly emphasized that governance structures devoid of women's perspectives risk reproducing inequality and undermining social justice (UN Women, 2022). In Africa, countries such as Rwanda, South Africa, and Uganda have demonstrated that increasing women's descriptive representation often translates into more inclusive governance practices (Burnet, 2011; Goetz & Hassim, 2003).

In Nigeria, however, the gap between normative commitments and political reality remains stark. Despite constitutional guarantees of equality and the adoption of progressive frameworks like the 35% Affirmative Action policy, women's representation in political offices has remained very low since 1999 (Akiyode-Afolabi & Arogundade, 2003; Oloyede, 2016). The situation is particularly pronounced in the predominantly North-West region of the country, where socio-religious norms, patriarchal political structures, and economic dependency intersect to limit women's access to political power (Ibrahim & Salihu, 2004; Yusuf, 2019).

According to a 2023 report by Agora Policy, Northwestern states such as Sokoto, Kebbi and Zamfara had no female representation in their State Houses of Assembly for both the 2019–2023 and 2023–2027 legislative tenures. In this, Sokoto state provides a distinctive yet revealing context for understanding these dynamics as a predominantly Muslim state where social institutions are deeply embedded in patriarchal and religious traditions that define gender roles and leadership legitimacy. Studies have shown that as at 2025, no woman holds an elected position in the state whereas for appointed positions, only 11% of women executive positions in the core agency and ministries while men hold 89% of the executive positions in the state. Thus, it could be argued that while there have been individual appointments of women to executive positions, such as commissioners, and permanent secretaries, these instances are exceptions rather than the norm and do not significantly alter the overall landscape of female political representation in the state. Even in career positions such as directors and heads of ministerial departments and agencies, women's career progression is highly limited and undermined by certain socio-cultural and political challenges unique in the region. Impliedly, women's public participation in the region particularly in formal politics has historically been constrained by misinterpretations of religious texts, gendered access to education, and the dominance of male patronage networks. Yet, within this restrictive context, a number of women have defied the odds to assume political leadership roles, navigating complex terrains that often demand a balance between exercising agency and negotiating patriarchal resistance.

In Nigeria, while some research focused on women's political marginalization at the national level, there is a significant knowledge gap regarding the day-to-day realities, coping strategies, as well as overt and subtle forms of resistance employed by women who have managed to navigate the system. Existing literature often overlooks the voices of women who are not just participating, but are actively engaged in routine duties and responsibilities for shaping power structures at the sub-national level. The absence of localized, experience-based knowledge contributes to the persistence of challenges and policy failures. There is therefore the need for a study that centers on the voices and experiences of women in power particularly in the

Northwest region, being one of the most conservative regions with very low women representation in the country.

This study therefore is set to not merely examine why women are underrepresented in politics, but how those who have gain access to power navigate, survive in a region where social institutions are deeply embedded in patriarchal and religious traditions that define gender roles and leadership legitimacy. In exploring this, the paper centers the lived experiences of women in appointed and elected positions in Sokoto State. By documenting their experiences as well as trends that underscore their assertion to power the paper contributes to broader debates on how women in deeply traditional societies negotiate political legitimacy without outrightly confronting entrenched patriarchy.

### **Conceptual Clarification and Theoretical Framework**

**Power:** Power refers broadly to the ability of individuals or groups to influence decisions, control resources, shape institutional practices, and set the parameters of acceptable political behavior. Max Weber (1947) famously defines power as the probability that one actor within a social relationship will be able to carry out their will despite resistance, highlighting the inherently contested nature of political interactions. He distinguishes power from authority, which is power recognized as legitimate and identifies three types of authority; traditional authority (based on custom), Charismatic authority (based on personality), Legal-rational authority (based on formal rules). This implies that political power is legitimate when backed by authority. Weber's typology has been foundational in political sociology and continues to influence how scholars analyze state authority and leadership legitimacy, especially in bureaucratic and electoral systems.

**Women Political Participation:** The concept of women's political participation has evolved significantly over the past few decades, encompassing both formal and informal dimensions of political engagement. At its core, it reflects the extent to which women are involved in decision-making processes and occupy positions of political leadership, representation, and influence. the conceptual issues surrounding women's political participation have evolved significantly over the past decades. While there is no consensus among scholars on the most effective means of achieving gender parity in politics, scholars have identified gender biases in traditional theories of political participation and moral reasoning (Steuernagel, 1987). This has led to a re-examination of how political participation is defined and measured, considering women's unique experiences and perspectives transforming the relationship between politics, and gender with research expanding to cover diverse areas and topics (Alexander et al., 2016). In addition, different theoretical paradigms have emerged, including mainstream political science, Marxist, and feminist. Despite progress, women's political empowerment remains unequal to men's globally, prompting calls for a more comprehensive definition and measurement of women's political empowerment as a transformative process (Alexander et al., 2016). Contemporarily, there are major debates and contradictions that have continued to exist in the literature; first, while some scholars argue that gender quotas are necessary to break structural barriers (Tripp et al., 2006), others warn they may reinforce tokenism (Dahlerup, 2006). Second, while descriptive representation is important, it does not guarantee that women will advocate for feminist or gender-sensitive policies (Celis et al., 2008). Third, western feminist models on women political participation do not with African contexts where

patriarchy is institutionalized and political participation is more often that not on informal levels. Thus, scholars like Obioma Nnaemeka (2004) call for African-centered models such as "nego-feminism", which emphasize negotiation and local values.

**Women Agency:** Feminist scholars, has argued on the notion of women agency to refers not simply to women's ability to act freely but to their capacity to navigate and make meaning of constraints imposed by patriarchal systems (Mahmood, 2005). The literature on women's agency highlights the importance of not only gaining access to power but also exercising power effectively once in office. Women agency here, has to do with capacity of women to strategically act on issues that concerns them or of interest to them. It also has to do with the capacity of women to independently exercise power and influence policy making decisions. Cornwall (2017) and Goetz and Hassim (2003) argue that real empowerment involves the capacity to influence decision-making, rather than merely occupying political positions.

### **Theoretical Framework**

This study adopts Feminist Institutionalism to provide a robust lens for understanding how women navigate power within male-dominated political systems. The feminist institutionalism emerged as a response to traditional institutionalism, which often overlooked or marginalized gender. Scholars in political science and sociology, such as Miriam A. Goldstein, S. Laurel Weldon, Nicola Smith, and Aili Mari Tripp, have been influential in developing and promoting this approach. They emphasize that institutions are not neutral but they are gendered, and this gendering impact policy-making, governance, and women's participation in politics. Chapell (2006) argued that traditional new institutionalism was blind to gender. Feminist institutionalism fills that gap by drawing attention to the role of power, identity, and agency within gendered structures.”

Feminist institutionalism provides a useful framework for understanding the institutional barriers and challenges that women in political power in northwestern Nigeria face. It explains how political institutions are structured in ways that may disadvantage women, especially in male-dominated spaces, how women, through their agency, can challenge or navigate these institutional structures and the role of gendered practices in shaping the political careers of female political leaders, and how these practices impact their decision-making power. By using feminist institutionalism, it will serve a guide to analyzing the systemic challenges women face within political institutions and how these challenges affect their ability to exercise power and influence. It also provides a framework to explore how women in power deploy strategies to overcome gendered barriers within political institutions. Thereby, enabling a deeper understanding of how power, resistance, and resilience intersect in women's political lives in northwestern Nigeria.

### **Methodology**

#### **Research Design**

This study adopted a qualitative research design, specifically a phenomenological approach, to explore the lived experiences of women in political power in Sokoto State. Phenomenology is particularly useful for understanding how individuals make meaning of their experiences within social and cultural contexts (Creswell, 2013). The purpose here was not to generalize but to interpret how women construct agency and confront adversity in a political environment defined by gendered hierarchies and religious conservatism.

**Study Area:** The study area for this research is Sokoto State, located in Nigeria's North-West geopolitical zone. The state's political culture is shaped by deep-rooted Islamic traditions, patriarchal authority structures, and high levels of female illiteracy (Yusuf, 2019). These characteristics make Sokoto an instructive case for examining women's political participation within contexts where religion, gender, and power are tightly interwoven. Politically, Sokoto exhibits a dominance of male elites in party structures, reflecting what Akinyemi (2021) describes as a “masculinized political economy of access.” Yet, women have emerged albeit in small numbers as commissioners, and special advisers, offering an opportunity to study their adaptive strategies of agency and negotiation of legitimacy within the system.

**Population and Sampling:** The study targeted female elected officials and political appointees who served between 1999 to 2023 in Sokoto State. These included members of the State House of Assembly, local government chairpersons, commissioners, and special advisers, permanent secretaries, councilors and state women leaders. A total of 54 respondents participated in the study consisting of female permanent secretaries, commissioners, special advisers, executive secretaries, female councilors, female political party contestants, and women leaders. Purposive and snowball sampling techniques were employed to identify respondents who met the study's criteria of holding substantive political roles. Purposive sampling was used to deliberately select respondent's technique proved valuable because women politicians in Sokoto operate within close networks shaped by trust and discretion. Access was thus facilitated through referrals and introductions by politically active women leaders and civil society advocates.

**Data Collection Methods:** Primary data were obtained through semi-structured interviews complemented by informal conversations and document analysis. The interview guide covered themes such as motivations for political participation, pathways to power, experiences of discrimination, strategies of negotiation, and perceptions of influence in governance. Each interview lasted between 45 and 60 minutes, conducted in English and Hausa depending on respondents' preferences.

Interviews were conducted in participants' offices, residences, or neutral locations to ensure privacy and comfort. With consent, discussions were recorded and later transcribed verbatim. Supplementary data were drawn from state policy documents, media reports, and election archives to contextualize the findings.

**Data Analysis:** Data analysis followed Braun and Clarke's (2006) thematic approach, which involves familiarization, coding, theme identification, and interpretation. Transcripts were read multiple times to capture patterns and contradictions. Initial codes were grouped into broader categories reflecting recurring themes such as pathways to power, negotiation of patriarchy, symbolic representation, and institutional resistance. NVivo 12 software was used to support data organization and retrieval, but coding decisions were guided by interpretive engagement rather than frequency counts. This approach allowed meanings to emerge inductively from participants' narratives, grounded in their lived realities and contextual specificities.

**Ethical Considerations:** Given the sensitivity surrounding gender and religion in Northern Nigeria, strict ethical measures were observed throughout the research process. Participants were fully informed about the study's purpose, and verbal and written consent were obtained prior to interviews. The researcher was reflexively conscious of her positionality as a female academic researching woman in power within a conservative context. While this sometimes-facilitated trust and openness, it also required careful navigation of social boundaries. The researcher ethically emphasized empathy, respect, and non-judgmental engagement throughout the fieldwork process.

**Findings and Discussion:** The findings of this study are organized around four major themes that emerged from the interviews: (1) pathways to power, (2) women agency (3) formal and informal barriers, and (4) strategies for sustaining power. Together, these themes illustrate the complex interplay between structure and agency that defines women's political experiences in Sokoto State.

### **Pathways to Power**

The entry of women into politics in Sokoto State followed multiple, though intersecting, routes shaped largely by networks of patronage and grassroots mobilization. Most respondents emphasized that access to political positions was not necessarily through party structures but rather through networks of patronage.

As one respondent observed, “You must have somebody to introduce you to the men who decide things, even if you are qualified, nobody will hear you without that connection.”

Another respondent added that;

*In this part of the country, it is very difficult for a woman to get into politics without starting from somewhere, you have to know a very influential person that can take you in unlike men who are very free to start from anywhere. Some women start at grassroots level and advance to greater areas of participation but there must be that network and connection to take you through.*

This reflects what Tripp (2015) describes as “the politics of linkage”, where women's entry into governance is mediated by their proximity to power holders rather than by institutional openness. In Sokoto, several women appointees such as women leader and councilors were selected not through competitive processes but through nomination by male governors or party leaders. This underscores the persistence of clientelist political culture and the centrality of patriarchal gatekeeping.

However, on the part of appointed positions, professional credentials and reputational capital also served as legitimate entry points. Some respondents who were commissioners, Accountant general of the state, permanent secretaries, directors and executive secretaries noted that their qualifications and competency have made them to be where they are. The findings thus reveal that pathways to power for women in Sokoto are negotiated spaces where social credibility intersects with male approval. This hybridity mirrors what Nnaemeka (2004) conceptualizes as nego-feminism; the art of balancing self-assertion with strategic accommodation within patriarchal boundaries.

## **Women Agency**

The literature on women's agency highlights the importance of not only gaining access to power but also exercising power effectively once in office. Women agency here, has to do with capacity of women to strategically act on issues that concerns them or of interest to them. It also has to do with the capacity of women to independently exercise power and influence policy making decisions. Cornwall (2017) and Goetz and Hassim (2003) argue that real empowerment involves the capacity to influence decision-making, rather than merely occupying political positions. While the public narrative often frames women in politics as passive beneficiaries of male patronage, the interviews reveal a more nuanced picture of women agency. Respondents demonstrated considerable resourcefulness in navigating exclusionary structures while maintaining social legitimacy.

For instance, several participants consciously adopted “respectful femininity” as a political strategy such as dressing modestly, invoking religious identity, and framing their leadership as service to community rather than competition with men. This echoes Mahmood's (2005) argument that agency in conservative societies is not necessarily oppositional but may be expressed through embodied practices that align with, rather than reject, social norms.

A respondent described her approach as “leading like a mother.” By framing her political role in maternal and moral terms, she gained acceptance among male colleagues who might otherwise perceive her as transgressive. Such symbolic maternalism provided moral legitimacy while subtly expanding the scope of women's participation.

Another respondent said;

The capacity to exercise agency for a woman in leadership role is determined by her personality. For me, I always make sure that I stay firm and present in every stage of decision making and to speak with substance. I make sure I present myself morally and culturally well also in other to be well respected. Whenever a woman have the capacity to exercise agency, she can actually build very good initiatives and make difference.

Another respondent added that;

Yes, women have the capacity to influence decisions but only if the woman realize the potentials in her. Here, when the male counterparts know that you are firm and decisive, some of them will feel you are trying to compete with them but they would still consult you in decision making, not necessarily making the woman as the final decision maker.

Thus, it could be argued that women agency in Sokoto state also has limits. Many respondents noted that their influence was often “consultative rather than decisive.” While they could contribute to discussions, ultimate decision-making remained in male hands. This asymmetry illustrates Lukes' (1974) third dimension of power which is control over agendas and definitions of legitimacy which remains a major obstacle for women's substantive representation in Sokoto politics.

### **Formal and Informal Barriers**

In Sub-Saharan Africa, formal and informal challenges intensify due to entrenched patriarchal norms, weak gender-sensitive legal frameworks, and political party structures that marginalize women. Bauer and Britton (2006) show that even in countries like Rwanda (with over 60% female parliamentarians), women often lack real power due to elite control and patriarchal political norms. Tamale (1999) in Uganda and Tripp et al. (2009) in various African states document how women appointees are sometimes tokenistic and isolated from policymaking decisions, reinforcing symbolic rather than substantive representation.

In Nigeria, while there has been some non-manifesting increase in the appointment of women to government positions, formal challenges include faced by women in power include lack of legal quotas at national and sub-national levels. Patriarchal party structures that rarely support women's leadership and limited control over budgets and policy direction, especially in male-dominated cabinets (Okeke-Ihejirika, 2013). Informally, women in positions of power encounter social and religious expectations that undermine authority (Oloyede, 2016). According to Oloyede&Omilusi (2020), informal challenges faced by women in power in Nigeria include exclusion from decision-making cliques, stereotyping and delegitimization by male colleagues and the media. A recent study by Akinboye (2021) found that female commissioners and legislators in Nigeria often face “double marginalization” having to constantly prove legitimacy to male peers while also fulfilling culturally expected feminine roles

A respondent said;

Although, the price for nomination form is subsidized for women but we do not want that sympathy. What we want is support of the party leaders, the male counterparts and our communities. Unfortunately, candidate selection is often determined by male political godfathers and you as a woman will even feel less of a qualified and competent candidate to come out and contest.

On informal barriers, it was gathered as even more pervasive. Respondents particularly involved directly in politics described bitter experiences of verbal hostility, subtle ridicule, and moral scrutiny. Some were told outright that “politics is not for decent women.” Social expectations about women's domestic roles, coupled with fear of reputational damage, discouraged many from continuation of active political engagement. In addition, religion was also frequently mobilized as a justification for exclusion, though interpretations varied.

A respondent said;

Any woman that venture into politics must have faced some kinds of harassment and moral scrutiny. In this part of the country, religion is usually misinterpreted to discourage us from participating. Because people use religion to claim that Islamically a woman is not supposed to come out and mingle with men. But that is not true as far as you have protected your chastity you can also aspire for a position. In most cases we face harassment from our family members even before rest of the

community. My uncle once said that he does not want to see my face because I am involved in politics. Another discouraging thing is we do not have support of our women counterparts because of pull her down syndrome.

A religious scholar buttressed the above point by supporting that;

“Islamically, women are allowed to also hold positions of power and demonstrate agency, however, the activities involved in politics which include too much intermingling with men is what is usually questioned because Islam frowns at that.

Notably, women in appointed position do face subtle of forms informal and formal challenges ranging from balancing work and family to male domination in the work place, women who are directly involved in politics in the state have reported overt forms of formal and informal challenges such as religious misinterpretation and harassment that affect their agency and participation. Furthermore, several women pointed out that resistance did not always come from men alone; female community members sometimes reinforced patriarchal values by questioning women's public visibility. This resonates with Cornwall and Goetz's (2005) argument that patriarchy is sustained not only through male dominance but also through the internalization of gender norms across society.

### **Strategies for Sustaining Leadership**

According to Chattopadhyay and Duflo (2004) argue that women's inclusion in leadership improves governance outcomes, suggesting that women's authority can be impactful if given room to operate. However, once elected, women face additional challenges that require both resilience and strategic acumen. As noted by Tamale (2020), sustaining leadership is often harder than attaining it. The concept of “political mimicry” (Oloyede, 2016) suggests that women sometimes adopt masculine leadership styles to be taken seriously. This aligns with Jamieson's (1995) “double bind” theory, which states that women in power are often criticized either for being too soft or too assertive. Other studies highlight alternative strategies. Kwesiga (2021) and Tamale (2020) argue that coalition-building and alliance-making are vital for survival in male-dominated parliaments. In contrast, Oloyede (2016) suggests that adopting community-focused governance what she terms “gendered governance” can help women maintain legitimacy and support. On the other hand, Goetz and Hassim (2003), argue that institutional support structures are essential for sustaining women's leadership.

Despite the constraints, women in Sokoto have developed innovative strategies to sustain their leadership and influence policy decisions. Four major patterns emerged: (a) Coalition-Building (b) moral framing, (c) informal diplomacy and mentorship

**(a) Coalition-building:** Many respondents emphasized the importance of forming alliances with other women and deeply expressed concern over the and lack of coalition building for women in the state. Majority of the respondents including party chairmen interviewed under key informant interviewed have expressed that women are found not supporting women in politics due to jealousy and lack of cooperation between them normally termed as pull her down syndrome.

A respondent said;

Women need women to support them but the womenfolk do not support us. There is no one single coalition or organization developed support women in Sokoto. While every woman is fighting alone the rest of the womenfolk do not support us because jealousy and the need to support men whom their husbands are supporting.

The above assertion deeply portrays the need to have coalition building for women to feel strong and supported in the political landscape of Sokoto State. Women often worked collectively to advocate for appointments or defend one another against political attacks. These informal solidarities, while fragile, served as a buffer against institutional isolation. This finding aligns with Tripp (2000), who highlights women's coalitional politics in patriarchal systems as critical to sustaining representation.

**(b) Moral framing:** Women often framed their political ambitions around communal service, education, or welfare to align with cultural ideals of nurturing femininity. This moral framing helped reduce hostility and position their leadership as culturally legitimate. Such “gendered moral capital” (Hassim, 2006) served as an alternative source of authority when formal power was limited. This aligns with Oloyede's (2016) argument that women often gain positions through non-threatening roles of service and moral representation that are culturally acceptable. In such cases, women's legitimacy in leadership was derived not from partisan activism but from their perceived virtue and social respectability.

A respondent said;

As Muslim woman, you have to behave like one anywhere you find yourself. Otherwise, the men will think you are there to challenge them and they will start making all moves to put you back to your place, by frustrating you. Personally, I take my political journey as service to my community, as I go out there as a mother, I do not see me representing my self but my whole community especially women and children.

Abdullahi (2022) documents how Northern Nigerian women leverage religious networks and philanthropic work to gain political capital, noting that these women often avoid confrontational activism. This resonates with Tripp (2001), who found similar patterns in Uganda and Tanzania, where women employed non-threatening ways to survive in politics.

### **(c) Informal diplomacy**

Respondents frequently mentioned the need to “manage relationships” with party elders and male politicians through tact, respect, and interpersonal diplomacy. Respondents have made emphasis on the strong belief that in the contextual landscape of the state politics, even a man must know how to manage relationships and networks not to talk of a woman who hardly get a godfather or majority of the men counterparts to support her. Most of the respondents claimed that the inability of party leaders to encourage and support them have actually led to their back off even at the verge of primary election.

A respondent said;

I have actually done my assignment very well, I did my campaigns and gathered the support of my people. Unfortunately, at the last hour I was called by a highly influential male politician whom I respect a lot and asked to step down for a man and which I did.

**(d) Mentorship and symbolic representation:** Several respondents described mentoring younger women and encouraging civic participation. Although their numbers remain small, these women serve as symbols of possibility in a conservative environment.

As one commissioner reflected, “Our presence itself is an achievement; it tells girls that leadership is not forbidden.” Such symbolic representation may not immediately transform institutions, but it gradually reshapes public perceptions of women’s capability and legitimacy.

Another respondent added that

“I am very passionate about mentoring our younger ones so that the chain should not break, we continue to train them, educate them and sensitize to be ready to make difference.”

### **Discussion of Findings**

The findings of this study explicitly underscore that women’s political engagement in Sokoto is shaped by a dual reality, pervasive adversity and resilient agency. While institutions remain structurally patriarchal, women’s adaptive strategies to get access to power and demonstrate agency is relational and contextually grounded. Contextually, pathway to power for women is determined by gender. That is, the pathways to power is different for men and women. Findings have revealed that women enter into politics through network of patronage and must work twice as hard as a man to gain legitimacy within the male dominated structures. Furthermore. The few women who have defied the odds to be in power positions have experienced adversities. This however, do not to some extent affect women in appointed position compared the women who are directly involved in politics either by contesting or a position or actively being involved in politics. This have further explained the fact that currently, there is no single woman in an elected position in the state but rather nominated position in politics. This could be attributed to the fact women who contest for elections are see as unchaste and highly exposed as against the traditions and culture of the society.

The study also found that women in power uses survival strategies to gain legitimacy and sustain power. Strategies used are moral framing, symbolic representation, and informal diplomacy. While coalition building is very important, majority of the respondents have complained bitterly that coalition building is non-existent in the state. This also plays a major role in promoting “the pull her down syndrome” and lack of support from womenfolk in the state. Thus, women’s participation in Sokoto politics could be argued to be constrained yet transformative. The fact that women although not in a satisfying percentage have started to occupy positions of power compared to previous times where extremely few numbers of women are in appointed positions. Their experiences illuminate how gendered power operates not only through exclusion but also through the everyday negotiations that sustain women limited but significant presence in political life.

## Conclusion and Recommendations

This study explored the gendered pathways through which women in Sokoto State access, negotiate, and sustain political power within deeply patriarchal institutions. The findings reveal that although women's formal inclusion in politics remains minimal, their presence however symbolic signifies complex forms of agency exercised within constraint. Rather than outright resistance, women's political agency in Sokoto manifests through negotiation, moral legitimacy, and strategic adaptability. Women navigate institutional and cultural barriers by leveraging personal networks, invoking religious and moral authority, and engaging in quiet diplomacy. These strategies enable them to survive in a political culture that remains resistant to gender equality while subtly challenging entrenched norms from within. The study therefore underscores that agency in patriarchal contexts should not be measured solely by overt contestation, but also by the capacity to rework existing structures in ways that expand women's participation over time.

The implications of these findings are both empirical and theoretical. Empirically, the study contributes to a more nuanced understanding of women's political participation in Northern Nigeria, moving beyond deficit narratives to highlight resilience, negotiation, and incremental change. Theoretically, it affirms the relevance of feminist institutionalism as framework for analyzing gendered power relations in conservative societies.

To advance the cause of women's substantive representation, recommendations as follows have emerged:

1. **Enforcement of Affirmative Action:** Federal and state governments must demonstrate political will in implementing the 35% Affirmative Action policy and the policy initiative for reserved seats for women should be passed into law. This will promote participation especially at the sub-national level.
2. **Capacity Building and Mentorship:** Sustained investment in leadership development programs for women is essential. Experienced female leaders should continue to mentor younger women, particularly at local government levels where representation remains weakest.
3. **Public Sensitization and Religious Dialogue:** Civil society and faith-based organizations should engage religious and traditional leaders to reinterpret gender roles in ways that are compatible with Islamic principles of justice and equality. Such dialogues can help normalize women's leadership and reduce social resistance.
4. **Education and Economic Empowerment:** Expanding girls' education and women's economic participation remains foundational to sustainable political empowerment. Economic autonomy enhances women's capacity to fund campaigns and assert independence within party systems.

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# **PARTIAL SUBSTITUTION OF INDIGENOUS WHEAT CULTIVARS WITH MILLET AND CASSAVA FLOURS: IMPACT ON BREAD VOLUME AND ACCEPTABILITY**

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## **Abstract**

*Bread was produced from local (Nigerian indigenous wheat flour) with even substitution level of 10% millet and cassava flour. The resulting flours were analyzed for their physicochemical properties and compared with control sample, the volume of the bread obtained was determined. All the results obtained were compared with that of control sample from Northern Nigerian flour Mills Plc. Kano. The result obtained shows no significant difference ( $p \geq 0.05$ ). Due to the ballooning of wheat importations bills, the result indicate that a good quality bread can be produced from the use of local (Nigerian indigenous wheat flour) with even substitution with locally available grain flours i.e. millet and cassava that could lead to the cost reduction and boast our Agricultural transformation.*

**Keywords:** *Bread, Substitution, Nigerian indigenous grains, Wheat Flour, Millet flour*

## Introduction

Bread has also been defined as a bakery product made from cereal and other starchy flour moistened and kneaded into dough and then baked. Is the major flour product consumed by majority of Nigerians as breakfast, lunch and sometimes dinner (), made of four essential ingredients; flour, water, yeast and salt (Ihekoronye, 1985). The consumption and price of bread is steady and increasing in Nigeria, being made from foreign wheat as the major ingredient().

A lot of research has been made and still being made to promote the use of composite flours in which a portion of imported wheat flour were replaced with a locally grown crops in bread production, thereby decreasing the quantity demanded for imported wheat and increasing the demand of locally grown crops (). Advances in food science and Technology has made it possible to produce baked product through partial substitution of wheat flour with other non-wheat flour from cereals, legumes and root or tubers (Arowolo, *et. al* 2011). Pearl millet is known as gero/maiwa/dauro in Hausa language, (). It is considered to be a staple food for millions of people in arid and semi-arid region of the world especially northern Nigeria (). Its drought-resistant crop, contributing positively to the national food security(). Millions of tons of pearl millet were used in northern Nigeria as staple food ().

Research shows that Pearl millet grain appears to be generally free of any major anti-nutritional factors which reduces the bioavailability of nutrients (). Processing technologies helps in promoting millet utilization as food for a large and growing population of the world(). Another research also confirmed that, processing improve the dietetic and sensory properties of the grains and equally assist in the reduction of anti-nutritional factors such as phenols, phytic acids and tannins().

The potential health benefits of millet grain is now receiving a great interest from food scientists, technologists, and nutritionists (). Millet grain were characterized with high carbohydrates concentration, dietary fibre, and essential amino acids, phytochemicals as well as presence of essential minerals. It can also help nutritionally in reducing the risk of diabetes mellitus, high blood pressure and gastro-intestinal tract disorder. Despite all its usefulness and nutritional properties, there is little research on millet flours().

Cassava (*Manihotesculentacrantz*) is an herbaceous perennial crop of the Euphorbiaceae family, it's consumed extensively as the major staple food in Nigeria. it has been seen nutritionally as major source of dietary energy for low and medium income families(). Cassava tuber were in used as raw materials in the bakery, pharmaceutical, food and garment industries and the nutritional value of cassava roots is important because is the main part of the plant utilized in developing countries. (Hasmadiet *al.*, 2020). Cassava is popularly known as 'akpu', 'ege' and 'rogo' among the Igbo, Yoruba and Hausa tribes respectively().

## MATERIALS AND METHODS

### MATERIALS

Three varieties of local (Nigerian indigenous wheat) i.e. Seri-M82, Cettia, and AtilaganAtila, and three varieties of local (Nigerian indigenous millet grains) was provided by Lake Chad Research Institute, Maiduguri and a variety of cassava flour and hard winter wheat flour

(control) was provided by Northern Nigeria Flour Mills, plc. Kano. Reagents and equipment for the production and analysis was obtained from the laboratories of these participating Institutions.

## **METHODS**

The research was conducted in three places as circumstance dictated, these are; Department of food science & technology, Kano University of Science and Technology Wudil, and Northern Nigeria Flour Mills, plc. Kano.

### **Sample preparation**

Local wheat and millet samples were manually cleaned using a tray. All light debris, metallic substances, stones, animal parts and any other undesirable substances were removed. Each variety was conditioned to a moisture content of about 14% to facilitate bran removal using a pestle and mortar. The cleaned, sorted, tempered and dehulled wheat and millet samples were milled using a hammer milling machines (HMO274, Japan Model) , then allowed to pass through a sieve DIN 4188 (0.12 mm) aperture. The Processed cassava flour was obtained from northern Nigeria flour Mills, Kano Nigeria.

### **Formulation of blends**

Eight sample of bread were produced, of which three were 100% of each of the three local Nigerian indigenous wheat flours. The sample with the highest percentage of gluten, crude protein and bread volume (AtillaGanAtilla) was chosen for further substitution with the best out of the three varieties of millet flour (Super sosat) in terms of percentage crude protein. Another three samples were produced by substituting 10%, 20%, and 30% of the selected millet flour with 90%, 80% and 70% of AtillaGanAtilla (the best selected local wheat flour) for the production. Additionally 10% of cassava flour was used to substitute a portion of the selected local wheat flour in one variation. Finally the last sample serve as a standard control, using imported hard winter wheat flour from Northern Nigeria Flour Mills Kano in production bread.

### **Bread making Process**

**The percentage ingredients used in bread making are: flour, yeast, fat, salt, sugar and water.**

(500 g) flour, (2.5% flour basis) compressed yeast, (1.6 % flour basis) sodium salt, (1.6% flour basis) sugar, (3.5% flour basis) fat and (500 Brabender Units) of distilled water up to optimum absorption. The ingredients were mixed for 4 min, rested for 10 min, divided (100 g), kneaded and then rested (15 min). The bread making process was carried out according to the method described by Iglesias-Puig and Haros (2013).

### **Sensory Assessment of Bread**

The various bread samples were properly labelled and served to the various panelists, who ate and assessed the samples based on the grading parameter on the questionnaire given to each of them, and they were also given bottled water to rinse their mouths after tasting each samples to avoid interference on the next sample. The sensory evaluation of the bread produced was done according to the method described by Iwe (2002), in which 20 panelists used the 9 point hedonic scale to grade the various samples for the following parameters; taste, texture, appearance, aroma and general acceptability.

## Statistical Analysis

All determinations were carried out in triplicates, subjected to analysis of variance ANOVA and the means were separated by New Duncan Multiple Range Test (NDMRT). Mean and standard deviation of all the samples were calculated and compared. SPSS for Windows program version 21.0 was used to analyze the results obtained.

## RESULTS AND DISCUSSION

Fig. 1. Shows the percentage bread volume of local (Nigerian indigenous wheat) flour sample, atillaganatilla had significantly ( $p < 0.05$ ) higher specific volume of the bread when compared with Cettia and Seri M82. The higher specific volume of the bread produced with atillaganatilla flour makes it to be the selected flour for the substitution with millet and cassava. Loaf Volume of bread is an important indicator of knowing the characteristics of bread, because it provided the quantitative measurement of baking performance (Krishnan *et al.*, 1987). A small decrease of loaf volume of bread was exhibited in bread sample with 10% millet and cassava substitution in this research. The decrease in the bread volume was attributed to the gluten dilution effect (Krishnan *et al.*, 1987), and it was associated with the low protein network of the dough (Rosellet *et al.*, 2001). Which resulted in weak gluten interactions with the starch. The occurrence of lower loaf volume of the bread was as the result of higher amount of amylopectin of the flour which increased the water retention and decreased the gas retention of loaf during baking and finally resulting in reduced loaf volume of the bread (Lee *et al.*, 2001).

The results of the sensory analysis of the bread was presented in table 1. Above, there is no significance in all the bread sample produce at 100% wheat flour, 10% and 20% *P-glabra* flour substitution in terms of the Mouthfeel and texture ( $p < 0.05$ ). This suggests that the level of substitution does not show much effect on the bread in terms dough rising due to the carbon dioxide produced by yeasts during fermentation leads to a characteristics porosity and texture of baked products. No significant difference among the bread produces at 100% wheat flour and 10% *P-glabra* flour substitution in terms of the aroma and overall acceptability ( $p < 0.05$ ). The bread produce with 20% *P-glabra* flour substitution was significantly different with other two samples in terms of aroma and overall acceptability ( $p < 0.05$ ), but bread produced with 100% wheat flour was significantly different with the other two samples in terms of colour ( $p < 0.05$ ).

All the bread samples produced were generally accepted by the consumers in relation to their organoleptic properties. The result showed that bread samples were accepted by the panelists.

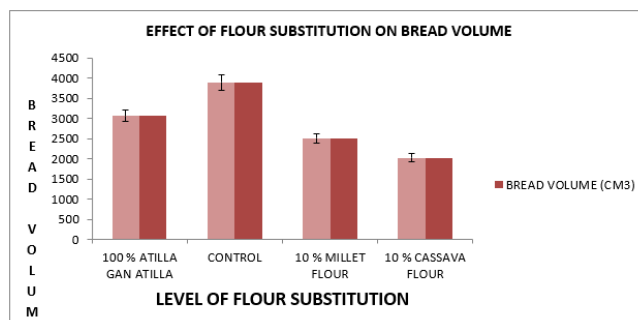


Fig. 1. Effect of flour substitution on bread volume

**Table 1.0:** Sensory Profile of the Bread Samples

SAMPLE	AROMA	COLOUR	MOUTHFEEL	TEXTURE	O/ ACCEPT.
AA	7.42 ± 1.31 <sup>b</sup>	7.43 ± 5.65 <sup>a</sup>	7.22 ± 1.31 <sup>a</sup>	7.05 ± 1.34 <sup>a</sup>	7.44 ± 1.28 <sup>a</sup>
AB	7.23 ± 1.12 <sup>b</sup>	6.27 ± 1.56 <sup>b</sup>	7.25 ± 1.8 <sup>a</sup>	6.88 ± 1.25 <sup>a</sup>	7.01 ± 1.42 <sup>ab</sup>
AC	6.90 ± 44 <sup>a</sup>	6.01 ± 1.21 <sup>b</sup>	6.14 ± 1.60 <sup>b</sup>	6.62 ± 1.13 <sup>a</sup>	6.30 ± 1.22 <sup>c</sup>
AC	7.00 ± 44 <sup>a</sup>	6.30 ± 1.21 <sup>b</sup>	6.52 ± 1.60 <sup>b</sup>	6.90 ± 1.13 <sup>a</sup>	6.50 ± 1.22 <sup>c</sup>

Keys: AA = 100 % wheat flour (control), AB = 100 atilla gan atilla, AC = 10 % millet flour and 90% atilla gan atilla, and AD = 10 % cassava flour and 90% atilla gan atilla . Means with the same letter along the column showed no significant difference (at  $p \leq 0.05$ ). Values are means  $\pm$  standard deviation.

### Conclusion Recommendation

- i. Locally available wheat grains and other non-gluten flours can be used to produce an acceptable bread of high stability, volume, nutritional status, comparatively good loaf and good sensory attributes by the use of local with even substitution with other locally available non gluten flours i.e millet and cassava flour that could lead to the cost reduction job and wealth creation, reduction on importation bills and enhancement on a food security.
- ii. It is recommended to use local (Nigerian indigenous wheat) flour with even substitution with other local (Nigerian indigenous gluten-free) flours from other grains.
- iii. Further research should also be conducted on the baking potential of other varieties of local (Nigerian indigenous wheat) flour, it's also recommend the analysis of the final product

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# DIGITAL MICROCREDIT IN NIGERIA: FINANCIAL INCLUSION OR ENTREPRENEURIAL DEBT TRAP?

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## **Abstract**

Digital microcredit services in Nigeria have become one of the most tangible symbols of Africa's financial-technology (fintech) revolution. Characterised by the ability to deliver short-term credit quickly to smartphones, these services have been touted as a key contributor to financial inclusion. By filling the structural gaps left by traditional banks and microfinance organisations, fintechs have provided entrepreneurs with quick, easy access to credit, enabling them to secure working capital. On the other hand, there are concerns over interest rates, repayment tenors, and debt collection methods have raised questions about whether efforts to promote financial inclusion through microcredit are a prelude to building risk and debt dependency. This study is determined to elaborate whether digital microcredit is an inclusive innovation, a means of financial inclusion for entrepreneurs, or a means of entrenching them in debt. The specific objectives of this study are to determine the contribution of digital loans to financial inclusion in Nigeria, to investigate the nexus between digital loans and entrepreneurial performance, to identify the linkage between digital loans and debt accumulation, and to develop policy recommendations for building a responsible and sustainable digital credit market. The research adopted a mixed-method approach to gather primary data through surveys of 300 digital credit users and key informant interviews with a sample of entrepreneurs and fintech operators in South-West Nigeria. The findings of this research are expected to contribute to establishing the dual nature of digital microcredit, both as an inclusive innovation and a potential risk to inclusive development. Through this, the provided both empirical and theoretical insights into the establishment of responsible and sustainable digital finance models for emerging markets, and developed policy frameworks that can help strike a balance between innovation and accountability.

**Keywords:** Debt, entrepreneurs, fintech, microcredit, Nigeria

## Introduction

Over the last few years, this growth in credit accessibility in Nigeria owes most of its success to the mobile phone proliferation trend, the increased internet penetration, and the high rate of digital financial service offerings powered by fintech. The developments have also lowered the cost of transactions and eased faster access to credit than the conventional means of banking (Echu, Ogundare, Abba, Misau, & Liman, 2024). Aided by smartphones and USSD (Unstructured Supplementary Service Data) menu interfaces, millions of Nigerians, especially those who are unbanked or financially excluded, can now access short-term, unsecured microloans in just a few minutes. The 2023 National Survey conducted by the Central Bank of Nigeria (CBN) and Enhancing Financial Innovation and Access (EFInA) reveals that over 15 million digital loans were issued in Nigeria in 2022 alone, while the value of transactions in digital loan accounts has grown by more than 35% annually in recent years (Central Bank of Nigeria & Enhancing Financial Innovation and Access [CBN & EFInA], 2023). Fintech companies, such as FairMoney, PalmCredit, Carbon, and Branch, have increasingly fulfilled the role of offsetting liquidity shortages faced by small business owners by providing them rapid, temporary, and unsecured online lendings out of traditional banking structures (Fintech and SME Financing in Nigeria, 2024). Because of inventory purchases or unexpected commercial expenses that can create temporal differences, empirical studies carried out within the country prove this digital credit instruments are used to meet working capital needs, smooth short-term cash-flow fluctuations, and to settle temporal differences, not to meet capital outlay (Björkegren, Blumenstock, Oyeniran, and Razaq, 2022; Ozili, 2022).

The potential as well as the limits of the development are confirmed in empirical work of Björkegren, Blumenstock, Oyeniran, and Razaq (2022) demonstrate that the approval of digital loans enhances the subjective well-being of credit recipients but does not result in a significant increase in income or long-term business expansion in Nigeria. In a related field experiment, Ekong (2022) confirms that the digital finance sector has expanded access to credit for small-firm owners in Nigeria, but reports that pricing opacity, consumer protection gaps, and limited access to credit reporting continue to impose severe constraints on its sustainable impact. Similar findings are reported in recent studies showing that the use of fintech credit products improves small-firm access to loans but also raises concerns about cost management and repayment discipline (Björkegren et. al., 2021).

Also, the rapid growth of fintech lending has created new vulnerabilities, as many fintech credit platforms have opaque pricing structures with hidden or exorbitant effective interest rates (annualised through daily service charges). Moreover, tenors tend to be short (between seven and 30 days), and digital repayment processes that make use of automated debits, pre-authorized charges, and algorithmic debt-collection partnerships have often led to privacy intrusions, harassment of borrowers, and loss of reputation (Federal Competition and Consumer Protection Commission [FCCPC], 2024). For micro-entrepreneurs, particularly those who depend on revolving loans to manage cash flows or keep their businesses afloat, these factors could easily push financial inclusion towards financial fragility. Overtapped revolving-credit models and short refinancing cycles can easily create a debt-stress spiral that bloats existing loan costs and depresses profitability, placing entrepreneurs' very survival at risk (Guérin, Roesch, Venkatasubramanian, & Kumar, 2021; Ghosh & Gupta, 2018; Schicks, 2014).

Expanded access to credit under digital microcredit in Nigeria reveals a fundamental contradiction in outcomes. While digital credit contributes to the achievement of Sustainable Development Goals related to inclusive economic growth, industrial and technological innovation, and the development of responsible and sustainable infrastructure (SDGs 8 and 9), persistent challenges relating to cost transparency, borrower capability, and weak debt-market governance threaten to undermine these same objectives. Consequently, the empirical literature on fintech credit and small-business performance remains fragmented. Much of the existing peer-reviewed and policy-oriented research focuses on technology adoption rates, financial inclusion metrics, and operational efficiency, with comparatively limited attention to how loan-product design features and borrower capabilities shape profitability and enterprise resilience. Moreover, studies examining the impact of fintech credit on Nigerian SMEs rarely account for geographic variability and regional market heterogeneity. This omission is particularly salient in South-West Nigeria, the country's most dynamic SME cluster, which contributes over 40% of national GDP according to the National Bureau of Statistics (NBS, 2024), yet remains under-represented in empirical small-business research that has traditionally concentrated on northern regions.

Borrower heterogeneity further conditions the effectiveness of digital credit utilisation among entrepreneurs. Differences in financial literacy, digital proficiency, entrepreneurial experience, and firm size significantly influence whether digital credit can be deployed productively to meet business needs. Recent empirical evidence indicates that while the adoption and use of digital financial services can positively affect entrepreneurial outcomes, these benefits materialise primarily among users possessing moderate to high levels of digital and financial capability (Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2018; Osei-Assibey & Sarpong-Kumankoma, 2023; Ozili, 2022). Yet in the Nigerian case, studies are rare that combine these variables into a more complex empirical model. As such, the empirical research base in Nigeria remains unable to properly clarify whether digital credit is empowering small business owners or keeping them in a permanent cycle of debt.

Access to credit may have improved for credit-seeking SMEs in Nigeria; however, even for those who successfully obtain fintech loans, short repayment terms, high interest charges, and automated debit collections tend to heighten default risk and raise the effective cost of credit (Björkegren, Blumenstock, Oyeniran, & Razaq, 2022; Guérin, Roesch, Venkatasubramanian, & Kumar, 2021; Ghosh & Gupta, 2018). Loan cost structures and collection features embedded in many digital microcredit products can heighten financial risk for SMEs by intensifying short-term cash-flow pressure. High effective interest rates, short repayment tenors, and daily or weekly automated repayment schedules reduce entrepreneurs' ability to absorb revenue volatility, particularly in businesses exposed to seasonal demand or inventory-financing cycles. These repayment rigidities can interact with broader macroeconomic stressors, such as inflationary pressures and foreign exchange volatility, further eroding profit margins and increasing default risk. In response to these concerns, fintech firms and regulators have introduced measures aimed at improving transparency and consumer protection, including the Central Bank of Nigeria's fintech regulatory frameworks and the Federal Competition and Consumer Protection Commission's (FCCPC) enhanced market oversight and borrower-education initiatives. Consequently, the primary challenge facing fintech lenders is increasingly less about expanding access to credit and more about maintaining compliance with evolving regulatory and consumer-protection standards.

At the macro-policy level, however, these trends raise unanswered questions for policy and empirical research. Although digital microcredit has evidently increased access to finance among Nigerian SMEs, the question remains whether this access is leading to sustainable entrepreneurial activity or triggering repayment pressure that jeopardises entrepreneurial sustainability. Specifically, the current studies have not sufficiently defined the circumstances in which fintech microcredit fosters financial inclusion and entrepreneurial growth, and in which digital microcredit contributes to debt stress that destroys profitability and business viability.

It is in this context that the following research questions will inform this study:

- i. To what extent does access to digital microcredit improve SMEs' access to short-term working capital in South-West Nigeria?
- ii. What is the relationship between digital microcredit adoption and SME profitability in South-West Nigeria?
- iii. How do digital microcredit design borrowing conditions affect SME profitability?
- iv. What conditions cause digital microcredit to shift from supporting SME profitability to generating entrepreneurial debt stress consistent with a debt-trap dynamic?

This study seeks to address the research questions by situating digital microcredit within the broader framework of sustainable financial inclusion and the United Nations Sustainable Development Goals, specifically SDG 8, which emphasises inclusive economic growth, productive entrepreneurship, and decent work, and SDG 9, which focuses on innovation, resilient infrastructure, and the role of technology-enabled financial systems in supporting industrial and enterprise development. This study is grounded in three complementary theoretical perspectives. Financial inclusion theory provides the foundational lens, positing that access to appropriately designed and affordable credit instruments can facilitate economic inclusion and entrepreneurial participation, particularly when product fit and accessibility are prioritised (CBN & EFINA, 2023; World Bank, 2015). Entrepreneurial finance theory further informs the analysis by explaining how debt structures, financing terms, and capital constraints shape firm performance trajectories and strategic decision-making over time (Block et al., 2018; Cumming & Zhang, 2019). In addition, insights from the debt-stress literature underpin the micro-level examination of high-cost, short-term, and misaligned debt obligations, enabling the identification of threshold conditions under which digital microcredit may transition from a mechanism of entrepreneurial empowerment to a source of financial fragility (Ghosh & Gupta, 2018; Guérin et al., 2021; Schicks, 2014). Collectively, these perspectives provide the analytical foundation for the study's empirical investigation.

## **Literature Review**

Digital microcredit is the new trend in the financial services sector of Nigeria and it is made possible by the fintech systems which exploit the mobile technologies and sophisticated data analytics. Digital microcredit In scholarly usage, digital microcredit is defined as small-value, short-term unsecured credit facilities, which are automatically priced and provided through mobile applications or USSD interfaces and repaid through linked digital wallets or bank accounts (Omokhoa, Odionu, Azubuiké, and Kwaghter, 2024). The design of these loan products is designed to reduce the impediments to regular lending, with fast approvals and payments, that may reach unbanked and underbanked folks. Studies show that machine

learning and other data information applications in credit scoring make it more inclusive and more efficient compared to the usual risk assessment systems, but it also presents ethical risks and a threat of algorithmic bias (Omokhoa et al., 2024).

In Nigeria, digital microcredit has grown as part of a broader fintech platform of platforms which include FairMoney, Branch, Carbon and PalmCredit. This growth is an indication of greater mobile connectivity and fintech adoption, which have ultimately increased the financial inclusion levels among informal and underserved layers of the population (Usman, Halidu, and Mohammad, 2025). However, regulators and other empirical investigations raise the issue of hidden pricing models, pressurising collection tactics, and information asymmetry that can work against the debtor especially when there is a lack of sound consumer protection laws (Parker, Mitchell, Hughes, and Alayode, 2025). These problems underscore the need to have governance systems that can balance innovations and safety of consumers, particularly since digital lenders amass and process large amounts of personal and transactional information.

Empirical evidence on financial inclusion and the outcome of small firms in Nigeria have started to increasingly focus on the importance of regional dynamics. To provide an example, Oke, Soetan, and Ayedun (2023) analysed the survey data based on micro, small, and medium enterprises (MSMEs) and operating in the South-West geography and established a statistically significant positive change between generalised indexes of financial inclusion and business-level performance outcomes, such as profitability and sales growth. Their results indicate the central nature of access to formal financial services in the economically most active part of Nigeria and can provide pertinent contextual information as to how financial exclusion imperfectly affects enterprise development. While these findings establish a strong association between financial inclusion and SME performance in South-West Nigeria, they do not explain how the specific design features of digital microcredit products shape profitability and financial resilience, particularly under conditions of repayment pressure and borrower heterogeneity.

However, the study conceptualises financial inclusion in broad terms but not distinguishing between traditional forms of financing through banks but rather the new forms of digital microcredit through fintech. Besides that, it lacks causal inferency and is also cross-sectional which did not consider any of the characteristics of the loan products like the pricing framework, repayment rate or tenor congruence, which has since gained relevance in the modern digital credit market. Therefore, despite the paper providing valuable regional data on the inclusion performance connection, it provides little insight into the non-linear and possibly negative impact of costly digital credit that is short-term on SME performance and financial stability. The given limitation highlights the need to take a more detailed look at the digital microcredit design and heterogeneity of borrowers in South-West Nigeria.

The effects of digital microcredit on the welfare and performance of enterprises are situational and complicated. A randomised trial in Nigeria realised that access to instant digital credit had a significant positive impact on subjective wellness of borrowers in the short run but failed to report any changes on the measurement of income, spending, resilience or empowerment during the study package time (Bjorkegren, Blumenstock, Folajimi-Senjobi, Mauro and Nair,

2022). The result is consistent with the rest of the literature that reveals that although digital credit may increase liquidity and financial satisfaction in the short term, it does not predeterminably lead to greater enterprise growth or better economic results without the support systems (Bjorkegren et al., 2022). Besides, as Plateau State research states, certain aspects of digital lending, including credit evaluation and relationship management, may have a positive impact on the financial development of SMEs in case of proper application, indicating that the design of the product and quality of the service are the key to successful outcomes (Longwul, Sallah, and Linus, 2025).

Altogether, the results of the literature evidence the that implications of digital microcredit on SMEs and individual well-being are not determined only by access, but also credit quality, credit repayment structures, and financial literacy and regulatory supervision of borrowers (Usman et al., 2025; Parker et al., 2025). Without proper planning and oversight, digital credit can enhance short-term liquidity and put borrowers at risk of high-cost, high-pressure, repayment, and data privacy risks, especially when it is used by financially vulnerable populations.

A debt trap is a concept in the microcredit and over-indebtedness literature, defined as situations in which borrowers are trapped in repetitive cycles of debt that undermine income and productive investment, and leave them financially vulnerable (Schicks, 2014; Ghosh and Gupta, 2018). A debt trap in an entrepreneurial situation does not involve unbroken default or going out of business, but rather continuous pressure to repay debts, loan rollovers, and decreased net returns as debt demands crowd out operating capital. The empirical analysis of developing economies indicates that high-cost products with short tenors are the most likely to generate this kind of dynamics when the repayment schedule does not coincide with the business cash flow cycles (Guérin, Roesch, Venkatasubramanian, and Kumar, 2021).

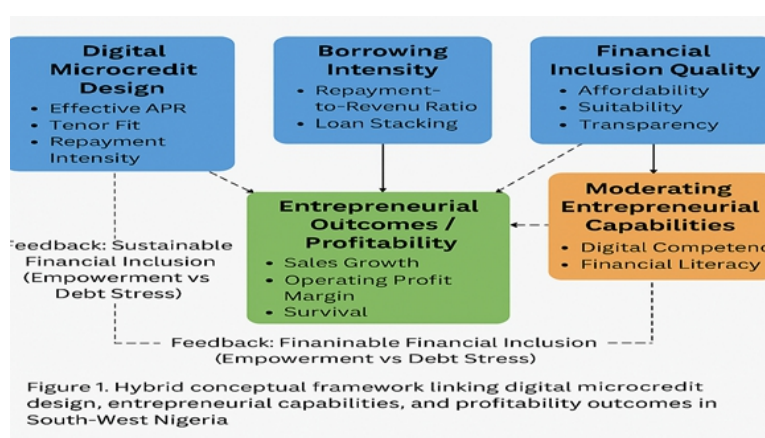
Recent research thus no longer views debt trap as a binary state of being, but as a procession of debt-stress, which is also manifested by excessive repayment rates, recurrent refinancing, and simultaneous multiple loan use (Schicks, 2014; Ghosh & Gupta, 2018). This view is particularly evident in the market for digital microcredit, where the automation of lending processes, the high frequency of disbursements, and the lack of ex-ante affordability screening can amplify borrowing frequency and pressure on repayment. This study has employed the concept of the entrepreneurial debt trap, grounded in this tradition of debt-stress, and operationalised in terms of observable characteristics of loan use and loan repayment rather than individual welfare assertions.

The general theoretical construct on financial inclusion is very relevant to the research of digital microcredit in Nigeria. The concept has since 2000 evolved past simple ownership of accounts to include access to high quality financial products that are affordable, relevant, transparent and are backed by effective grievance redress practices. The focus then shifts more towards the quality of inclusion as opposed to the actual number of inclusions, and extrinsic consideration is made to the nature of customer protection characteristics, such as fairness to the customers, privacy, and clear pricing.

Although to some extent, inclusion has been extended, the quality of the inclusion in Nigeria is still the work of heterogeneity especially in such areas as transparency, grievances

management, and protection of customer data (Ekong, 2022; Ozili, 2022). A significant percentage of online borrowers do not have thorough knowledge of pricing of credit or their rights in case of recourse to the grievance mechanism against mistreatment of their indulgence. To this end, this research paper assumes a multidimensional approach where it would argue that products must be affordable and fit effective instead of just being available to conclude that financial inclusion is meaningful.

A construct used to capture the opposite of "affordability" in this study is entrepreneurial debt stress, a form of financial strain that occurs when small firms are subjected to various pressures, including the combined impact of high pricing (expressed as effective annual percentage rate), tenor-cash-cycle mismatch, heavy repayment-to-revenue ratios, and the concurrent carrying of



**Source:** Anchored in Financial Inclusion–Capability Framework (Sen 1999; Kempson 2016; Ozili 2022), Debt-Stress Dynamics (Stiglitz & Weiss 1981; Ghosh & Gupta 2018), and Resource-Based View (RBV) (Barney 1991).

The term is intentionally less emotive than "debt trap", but is intended to capture a similar state of financial vulnerability or distress. The strain on repayment occurs when debt sets in the income of a firm take an amount that goes beyond the income and ability of a firm to pay. In this case, the owners are forced to spend income on debt servicing at the expense of adding money to the capital of reinvestment and decrease in profit. This may over time create a self-feeding loop of de-incentivizing productive capital, increasing the risk of default, and making further growth difficult. Early indications of Nigerian SMEs indicate that publicly unstates credit is likely to become more difficult to repay, more difficult to operate, especially if the cash flows of a firm are poorly aligned without transparent terms, fair treatment, and proper credit planning (Bjorkren et al., 2022; Eze et al., 2023; Ozili, 2022).

Profitability, the dependent variable of interest, is conceptualised in this study, in line with previous small-business research, as an overarching multidimensional outcome comprising operating profit margin, sales growth, owner withdrawals, employment change, and business survival (NBS, 2024). Given the practical difficulty of obtaining reliable income data across many micro and small enterprises in Nigeria, where many do not file audited accounts, this

approach allows for indirect measurement using triangulated proxy indicators, such as self-reported profit bands, revenue levels, and business continuity. This is both a pragmatic and defensible position that allows for a more holistic yet meaningful comparison across relevant businesses while accounting for the lack of financial statements.

Entrepreneurial competencies attenuate the impact of the digital credit on the performance of SMEs with the inclusion of digital competence, and financial literacy. Digital competence, defined as the ability of an entrepreneur to make use of digital financial tools and platforms the use of fintech apps, dashboards, channels to repay, or analytical utilities included, and financial literacy as a broader concept refers to the understanding of credit pricing, cash-flow planning, debt prioritisation, and overall financial management practises.

Investigative studies confirm that the competencies define the interactions of firms with digital financial services and the subsequent performance outcomes. As an example, digital competence and financial literacy are positively related to the acquisition and successful use of digital finance, which positively influences the financial inclusion and performance of firms (Gbadebo, 2025; Sajuyigbe et al., 2025). Moreover, a higher degree of financial literacy, especially when faced with intensive information asymmetry and technological complexity, increases the ability of SMEs to utilise loans, decode credit information and make informed decisions on whether to borrow or not, which leads to growth over time but not worsened financial distress (Financial Innovation Study, e.g., Charfeddine, Umlai, & El-Masri, 2024). What these results reveal is that the existence or lack of digital and financial capabilities is an essential factor in whether entrepreneurs use digital credit in a productive way that would fulfil strategic requirements of investment and cash-flow and would take a proactive stand or act instead in a reactive manner that may result in suboptimal performance.

Recent research demonstrates that the adoption and use of digital-finance tools and products support entrepreneurship only to the extent that users possess adequate baseline digital and financial capabilities to moderate their effectiveness (Osei-Assibey & Sarpong-Kumankoma, 2023; Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2018). In a similar vein, Ozili (2022) demonstrated that financial digital literacy, when present, reduces the risk of customer distrust and contributes to the informed and rational use of digital credit, in contrast to situations in which users are uninformed. For these reasons, digital competence and financial literacy are treated as moderators in the model.

Drawing on insights from financial inclusion theory, and the debt stress literature, the proposed conceptual model outlines the theorised routes, in which digital microcredit design characteristics, namely loan prices, tenor alignment, and repayment intensity, influence the profitability of the small and medium-sized enterprises (SME)s. Profitability is operationalised as a primary outcome variable, and the financial strain is a secondary outcome; the orientation of impact is the idea of either negative or positive depending on the interaction of the credit design and the ability of a borrower. Similarly, to the preceding theoretical and empirical studies, the model has a non-linear approach, acknowledging the fact that the impact of digital credit use and price cannot be constant, beneficial, or harmful (Guerin et al., 2021; Schicks, 2014).

The general hypothesis is that moderate and sustainable credit use will be able to enhance the growth of enterprises by alleviating liquidity strains in the short term, especially with cash-strapped micro- and small-firm enterprises. However, the opposite can also be true: when the intensity of borrowing exceeds the profitability of the business and the effective interest rate is high, or when the tenor of the loans does not match their business revenue cycles, profitability may be undermined, and the financial burden may increase (Ozili, 2022; Schicks, 2014). The model goes further to argue that those entrepreneurs that have superior digital and financial prowess are at a better position to weather such risks and, as such, dampen the negative impacts of a pricing and tenor mismatch on the performance of the enterprise.

This argument is in line with the longer financial inclusion models that understand financial access to be economically empowering only where it is combined with sufficient borrower capacity and well-designed financial products (Ekong, 2022; Ozili, 2022). Through this combination of theoretical lenses, based on empirical and conceptual understanding, the conceptual model combines extant conceptual and empirical knowledge to clarify the role that, in emerging-market conditions, makes digital microcredit design as empowering or putting strains on entrepreneurial activities.

### **Theoretical Framework**

The Resource-Based View (RBV) provides a firm-level theoretical foundation for explaining heterogeneity in MSME performance outcomes under similar market and financing conditions (Barney, 1991). The core proposition of RBV is that performance differences arise from variations in firms' internal resources and capabilities, particularly those that are valuable, difficult to imitate, and imperfectly transferable across firms. In small and micro enterprises, these resources are often intangible and owner-embedded rather than organisationally formalised.

Within the RBV framework, resources are heterogeneous and imperfectly mobile, implying that firms differ systematically in how they acquire, deploy, and benefit from external inputs such as finance (Wernerfelt, 1984; Barney, 1991). This perspective is especially relevant in the context of digital microcredit, where enterprises may access identical credit products yet experience sharply divergent performance outcomes. RBV predicts that access alone is insufficient; outcomes depend on the firm's capability to deploy financial resources productively.

In MSMEs, owner-level capabilities constitute critical strategic assets. Prior extensions of RBV explicitly recognise cognitive, managerial, and financial competencies as firm-specific resources that shape opportunity recognition, resource orchestration, and performance (Alvarez & Busenitz, 2001). In the digital finance context, digital competence (ability to navigate digital lending platforms, repayment dashboards, and transaction records) and financial literacy (capacity to evaluate pricing, plan cash flows, and manage debt obligations) function as intangible resources that condition how credit affects profitability.

RBV therefore provides a clear analytical basis for modelling these capabilities as moderators rather than control variables. Enterprises with stronger capabilities are expected to convert digital microcredit into productive investment and profit growth more effectively, while also mitigating the adverse effects of high costs, short tenors, and repayment intensity. Conversely,

firms lacking these capabilities may experience credit as a source of financial strain rather than competitive advantage, despite having equivalent access.

While RBV has been criticised for underplaying market structure and external constraints (Priem & Butler, 2001), this limitation is addressed in the present study by embedding RBV within a broader framework that also incorporates credit-market frictions and debt-stress dynamics. Rather than treating resources as inherently performance-enhancing, the model recognises that their effectiveness depends on product design and repayment conditions. In this integrated view, RBV explains why capability heterogeneity matters, while debt-stress theory explains when financial resources cease to be performance-enhancing. Accordingly, RBV is employed in this study not as a generic theory of competitive advantage, but as a micro-foundation for understanding differential SME responses to digital microcredit. It justifies the inclusion of digital competence and financial literacy as moderating variables that shape whether digital finance operates as an enabler of sustainable performance or contributes to entrepreneurial debt stress.

### **Empirical**

Nigeria and other African markets have empirical evidence that can be used to provide a subtle picture of the effect of digital microcredit in promoting the performance of small and medium-enterprise (SME) within the countries. Nigeria, in randomised and quasi-experimental studies, records a substantial increase in credit access and adoption with the advent of app-based and mobile lending means (Bjorkegren, Blumenstock, Oyeniran, and Razaq, 2022). Positive relations between fintech usage and various chosen SME performances, such as liquidity smoothing and short-term operational survival, are also reported by cross-sectional firm-level studies (Ozili, 2022; Osei-Assibey and Sarpong-Kumankoma, 2023). These findings are supported by policy and market reports, which show that the scope of mobile-based lending and the formal involvement of hitherto overlooked micro and small businesses in the financial sector has grown quickly (Central Bank of Nigeria [CBN] & Enhancing Financial Innovation and Access [EFInA], 2023; Federal Competition and Consumer Protection Commission [FCCPC], 2024).

At the same time, there is an increasing number of studies reflecting negative consequences of digital microcredit. Research in African markets singles out increased borrower over-indebtedness, repayment stress and rollover borrowing linked to high cost, short term digital loans (Guerin, Roesch, Venkatasubramanian, and Kumar, 2021; Ghosh and Gupta, 2018). According to the Nigerian regulatory and survey data, there are continuing issues of affordability, no ex-ante disclosure of overall costs of borrowing and aggressive behaviours by certain digital lenders (CBN & EFInA, 2023; FCCPC, 2024). Firm-level researches also indicate that despite the effects of easing the working-capital situation in the case of digital credit, SMEs often experience cost-management challenges and pressures of repayment in cases where the loan tenors do not align with the business cash-flow (Eze, Chinedu-Eze, Awa, and Diarah, 2023; Ozili, 2022).

African evidence beyond Nigeria highlights the impact of the form of the loan products on the outcome of the enterprise. The empirical research repeatedly determines that certain design characteristics, such as high effective interest rates, short terms of repayment, and strict

schedules of collections, are linked to a worse borrower welfare and worsened performance of the operating firms, especially with unstable operating conditions and with users with limited financial resources (Guerin et al., 2021; Ekong, 2022). Quantitative studies indicate that the valid annual percentage rate (APR) which embraces interest rates and compulsory charges expressed on an annualised basis is negatively related to profitability measures like sales expansion, operating surplus, and post-loan earnings (Ekong, 2022; FCCPC, 2024; National Bureau of Statistics [NBS], 2024; Omeke, 2025).

The second design related risk channel deals with the mismatch in the loan tenor and cash-cycle. Borrowers with lower loan maturities than the time that enterprises take to transform inventory into cash are exposed to high risks of delinquency and defaults. Empirical findings, as well as regulatory audits, suggest that these types of mismatches tend to bring about a loan stacking and refinancing behaviour, which ultimately leads to higher cost of credit and the overdraft risk (Ekong, 2022; FCCPC, 2024).

The third channel is associated with the intensity of repayment, which can usually be obtained as repayment-to-revenue ratio (RMR) that is the monthly loan repayments divided by monthly enterprise revenue. Based on the survey research of Nigerian firms and national SME data, the support of the non-linear relation between RMR and profitability can be found. The moderate repayment burdens are linked to more efficient liquidity management and rapid short-term expansion, whereas the high repayment burdens overcrowd the working capital and destroy the profits (NBS, 2024; Omeke, 2025). These trends are in line with the larger debt-stress factors observed in African credit markets (Ghosh and Gupta, 2018), as well as with regulatory enforcement measures related to taking out multiple loans and taking on debt exposure that is too high among users of digital credit (FCCPC, 2024).

Another strand of African evidence focuses on the effects which depend on ability. Although the digital adoption of finance is positively related to the entrepreneurial activity, its performance effect varies depending on the absorptive abilities of the owners, especially the digital competence and financial literacy. At the firm level, it has been found that capability limits the access to the benefits of better utilisation of digital financial services, dampening the possible benefits of credit availability (Erondu, Nwokah, and Ananaba, 2025). Similar evidence has been shown in Nigeria, where it is proved that the higher the financial digital literacy, the higher the user trust and reduction of exposure to predatory lending practices (Ozili, 2022). All this literature is pointing to the same conclusion that owner capabilities moderate the adoption performance relationship as well as cost performance relationship through reinforcement of positive effects and reduction of negative effects.

Collectively, these results suggest that despite microcredit going digital offering greater financial accessibility to the SMEs, its effect on development is highly conditional. The loan pricing behaviour, the appropriate tenor, and the repayment intensity interact with the capabilities of the borrowers, which in turn leads to the creation of a situation where digital microcredit can be used as an instrument of business development or a process where a prolonged debt situation nearing an entrepreneurial debt-traps dynamic can be established.

## Methodology

This study adopted a cross-sectional survey design of the investigation to determine the association between digital microcredit usage, loan design features, borrower capabilities and profitability of small and medium-sized enterprises (SMEs) in South-West Nigeria. The researcher considered a survey-based research methodology to be quite suitable since the objective of the study was to collect a large group of firms at a single point of time as primary and self-reported data to ensure patterns, associations, and conditional effects among the observed variables were studied, but the study environment was not manipulated. The design is consistent with the previous empirical studies of digital finance, performance of SMEs, and stress on debt in emerging markets (Ozili, 2022; Ekong, 2022; Omeke, 2025).

The sample was comprised of South West Nigeria-based SMEs that had accessed digital microcredit through mobile-based micro-lending tools like FairMoney, Branch, Carbon and PalmCredit. South-West Nigeria was chosen as it has a high level of SMEs as well as comparatively high fintech penetration and lively digital credit market. But since there is no comprehensive publicly available registry of SMEs who accessed digital microcredit, it was not possible to statistically estimate the exact number of people. A purposive sampling strategy was used so as to find SMEs who had previously used the digital microcredit. This method was required because there was no formal sampling frame, and it was in line with similar studies on fintech credit users in developing countries. Only enterprises that had been exposed to at least one of the digital loans in the past three years were eligible to take part thus avoiding any respondent who was old-fashioned in his or her experiences with digital lending products.

The number of the questionnaires that was distributed was 600, and 500 responses that were considered valid were retrieved and used in analysis as a result of which an 83% response rate was achieved. Although purposive sampling improves relevance and internal validity, it limits the scope of the findings which can be statistically applied to all Nigerian SMEs. Based on this, the findings must be viewed as analytically generalisable to digitally active SMEs and not the representative of the entire SME population. The structured questionnaire, based on the previous validated tools used to study the same problem of digital finance, financial inclusion, and SME performance, was utilised to gather primary data (Ozili, 2022; Ekong, 2022; Omeke, 2025). The instrument included the part of the digital microcredit features (targeted at pricing structure, tenor, the frequency of repayment); the capabilities of the borrower (digital competence and financial literacy); firm features and profitability indicators such as sales growth and operating profit margin. The answers were mainly assessed on Likert-type scales to be analysed quantitatively.

There was pre-test of the questionnaire with 30 SMEs in Osogbo, Osun State, to determine the clarity of the items, contextual relevance, and consistency of responses. The pre-test feedback made minor amendments to question wording and order. The analysis of pilot information through its reliability with the help of the Cronbach alpha produced coefficients between 0.74 and 0.88, which was acceptable to high internal consistency of all constructs. To supplement the data of the survey and to gain a better contextual insight, 20 semi-structured interviews with owners of SMEs and participants of the fintech sector were carried out. These interviews investigated experiences of the borrowers, the repayment, the product design hurdles and the perceptions of the debt stress. The qualitative aspect was not aimed at creating statistically

generalisable results but to generally corroborate the quantitative results and put them into focus.

Analytical measures based on the multiple regression were applied to analyse the impact of cost structure of digital microcredit, repayment intensity, tenor cash cycle coordination, and the abilities of borrowers on the profitability of SMEs. The threshold effects that relate to repayment burden were tested using non-linear specification. Thematic analysis of qualitative interview data was used in conforming to the procedures in coding, categorising, and identifying patterns. The results of the interviews were used to put the statistical results into perspective as well as to explain the mechanisms that can be behind the relationships that were observed.

## Results and Discussion

### Profile of Respondents

Among the sample respondents, 38% identified retail trade as their core business, 22% services, 18% hospitality, and the remaining 22% agriculture and logistics. Sixty-four per cent (64 %) of the businesses had fewer than ten (10) staff, and 71 % reported having applied for digital credit at least twice in the past three (3) years. FairMoney (56%), Branch (52%), and Carbon (47%) were the platforms most recognised by respondents, indicating near-congruence with the reported market shares in a recent EFINA (2023) survey.

**Table 1:** Summary of Respondents' Profile and Digital-Credit Usage

Variable	Category	Frequency (n=500)	Percentage (%)
Firm Age	2-4 years	174	34.8
	5-9 years	212	42.4
	≥10 years	114	22.8
Sector	Retail Trade	190	38.0
	Services	110	22.0
	Hospitality	90	18.0
	Agriculture/Agro-Allied	65	13.0
	Logistics/Transport	45	9.0
Loan Size (₹)	< 500,000	300	60.0
	500,001 – 1,000,000	135	27.0
	> 1,000,000	65	13.0
Platform Used	FairMoney	280	56.0
	Branch	260	52.0
	Carbon	235	47.0
	PalmCredit	188	37.6

Source: Field Survey, 2025

According to the data presented in Table 1, the sample participants were primarily younger firms (less than ten years old) and micro-scale operators, which were more commonly found in retail and services. FairMoney, Branch, and Carbon were the most widely used platforms, as the data aligns with EFINA's (2023) market share estimates. Most loans were below ₹ 500,000, suggesting that SMEs may be using digital credit for short-term liquidity rather than for expansion.

### Extent of Digital-Credit Usage

Sixty per cent (60%) of the SMEs accessed loans of ₦500,000 or less. While 92% of these firms used digital loans to finance their working capital, 68% reported that the tenors were often shorter than their businesses' cash conversion cycles, and as a result, they were forced to renew or "roll over" the loans. On average, 41% reported effective interest rates above 35% per annum, indicating higher effective costs than those of formal banking products.

**Table 2:** Descriptive Statistics of Key Variables

Variable	Minimum	Maximum	Mean	Std. Deviation
Effective Interest Rate (APR, %)	12	64	38.21	9.46
Tenor (days)	7	90	33.7	18.2
Repayment-to-Revenue Ratio (RMR)	0.08	0.58	0.29	0.10
Digital Competence (1-5 scale)	1.8	4.9	3.64	0.72
Financial Literacy (1-5 scale)	2.1	4.8	3.79	0.65
Profitability (Composite Index 1-5)	1.5	4.7	3.42	0.68

Source: Field Survey, 2025

Average effective rates hovered around 38%, well above formal bank lending averages. The mean repayment-to-revenue ratio (0.29) indicates that, on average, nearly one-third of monthly revenue is allocated to servicing debt. Mean scores above 3.5 for competence and literacy indicate moderate capability levels among respondents, although considerable variability remains.

### Relationship between Digital Microcredit and SME Profitability

The results of the linear-multiple-regression analysis show a positive and statistically significant relationship between the adoption of digital microcredit and the profitability of SMEs, after adjusting for business size and industry of operation ( $\beta = 0.327$ ;  $R^2 = 0.396$ ; Adjusted  $R^2 = 0.382$ ;  $t = 9.845$ ;  $p < 0.05$ ;  $F = 18.732$ ). The positive  $\beta$ -coefficient indicates a marginal contribution of digital credit access to sales turnover and short-term profitability, and indeed a reversal of the financing constraint. However, the modest  $R^2$  coefficient suggests that other variables not included in the model, such as the SME's cost base, the owner's financial and digital literacy, and ancillary factors related to profitability, may also play a role.

**Table 3:** Multiple Regression Results: Digital Microcredit and SME Profitability

Predictor Variable	$\beta$	t-Value	Sig. (p)	Remark
Constant	2.341	5.742	0.000	—
Effective Interest Rate (Cost)	-0.213	-3.856	0.000	Significant (negative)
RMR (Borrowing Intensity)	0.294	4.911	0.000	Significant (positive)
RMR <sup>2</sup>	-0.167	-3.102	0.002	Significant (inverted-U)
Tenor-Cash-Cycle Mismatch	-0.185	-3.621	0.000	Significant (negative)
Loan Stacking	-0.142	-2.784	0.005	Significant (negative)
Digital Competence × Adoption	0.216	3.892	0.000	Significant (moderation +)

Source: Field Survey, 2025

$R^2 = 0.451$  Adjusted  $R^2 = 0.438$   $F = 21.106$   $p < 0.05$

Table 3 indicates that the digital microcredit design variables collectively explain 45% of the variation in profitability. The negative coefficient for the interest rate shows that high borrowing costs reduce profit margins. The positive-negative pattern of RMR and RMR<sup>2</sup> confirms a threshold (inverted-U) effect: profitability rises with moderate borrowing but declines beyond an RMR of roughly 0.30–0.35. Tenor mismatch and loan stacking significantly reduce performance, corroborating the debt-stress hypothesis (Ghosh & Gupta, 2018). Interaction terms for digital competence and financial literacy are positive and significant, confirming that capable entrepreneurs mitigate cost burdens and extract more value from digital finance. These quantitative findings were supported qualitatively by interview evidence; respondents described automatic deductions as helpful for discipline but punitive when sales are delayed, and several cited improved budgeting after acquiring financial-literacy training.

### **Moderating Role of Capabilities**

By introducing the two moderation variables into the model, we observed improvements in fit, with an adjusted R<sup>2</sup> of 0.451, a change in R<sup>2</sup> of 0.069, and an F-value of 21.106, all of which were statistically significant ( $p < 0.05$ ). The regression coefficients of the interaction variables between digital microcredit adoption and digital competence were positive and statistically significant ( $\beta = 0.216$ ;  $p < 0.05$ ). This suggests a greater marginal benefit from microcredit adoption for firms with higher digital literacy. The interaction between the cost of borrowing and financial literacy was also negative and significant ( $\beta = 0.189$ ;  $p < 0.05$ ), which is an effect of buffering: that is, for firms with higher financial literacy, the high cost of digital loans had a lower marginal negative impact on the enterprise's profitability. In other words, it costs less to service expensive digital loans for businesses led by financially literate owners. As such, this data empirically corroborates the *a priori* hypotheses derived from the Resource-Based View and Capability literatures, namely that entrepreneurial capabilities are leveraged to improve performance outcomes in digital microfinance.

### **Discussion of Findings**

The profitability of SMEs is an analytically suitable dependent variable on which the entrepreneurial stress on debt is studied in the digital microcredit environment. Profitability in micro- and small-sized enterprises is an operational performance as well as inclusive of financial viability and sustainability of liquidity especially in the settings that undergo short-term borrowing, fluctuating revenue, and low buffer capacities. Along with the aforementioned research, the Nigerian market has shown consistent tendencies in terms of deteriorating profitability long before any out-of-interest results occur, including default, shutting down the business, or bankruptcy (Schicks, 2014; Ghosh and Gupta, 2018; Guerin et al., 2021). Accordingly, deteriorating or non-increasing profitability is a leading indicative, and not a trailing indicator, of debt stress.

In line with previous research, the inverted-U-shaped relationship between the ratio of repayment to revenue (RMR) and profitability supports the argument since, as expected, the alternative assuages liquidity figures at the low end but counterproductive above a threshold payback ratio. Intermediate repayment rates can also level cash-flow variations and buffer working-capital needs, but the more extreme repayment rates crowd out operating money and mannerist intermingle margins, effects that African SME studies and receivers of microcredit both bear out (Ghosh and Gupta, 2018; Ekong, 2022; NBS, 2024). Similarly, the negative

consequences that are associated with tenor-cash-cycle mismatches are similar to findings that repressive loan maturities, when not aligned with inventory turnover and revenue cycles, exacerbate refinancing pressure and loan repayment stress, which tend to cause loan stacking and rollover behaviour (Guerin et al., 2021; FCCPC, 2024).

The debt stress interpretation is further supported by the negative relationship between loan stacking and profitability. Empirical literature from the past indicates that simultaneous borrowing between several digital lenders is normally a coping mechanism to deal with repayment stress as opposed to a growth strategy, and it is also concerned with increased aggregate borrowing expenses and reduced net returns (Schicks, 2014; Ghosh and Gupta, 2018). Consistent with this literature, the results indicate that the repayment pressure increases and the process of liquidity assistance to financial pressure is accelerated by stacking.

Notably, the discussed dynamics are especially relevant in the case of micro- and small enterprises, as the latter tends to cut down the profit margins, postpone reinvestment, and redirect operational income to debt servicing once the level of debt pressure is increasing. This stress behaviour has a substantial literature base on debt-stress and is the reason that profitability is more accurately and timely used to signal entrepreneurial distress when informal and semi-formal enterprise environments are involved compared to default or firm shutdown (Schicks, 2014; Guerin et al., 2021). Put collectively, the data is consistent with previous empirical research which suggested that digital microcredit would be a two-sided tool: it would loosen liquidity conditions and facilitated the presence of enterprise activity in the moderate usage, but would destroy profitability and sustainability in cases when repayment rates, pricing and loan structure put a strain on cash-flow capacity of the firm.

### **Implications**

Based on the study's results, several conclusions and practical takeaways can be drawn. For regulators, the first implication is the need to complement policies on fintech expansion and digital finance inclusion with targeted financial education programs, and to intensify advocacy and enforcement of responsible lending standards and market transparency by the FCCPC and the Central Bank. Fintech lenders also have a role to play by incorporating in-app financial literacy nudges and other flexibilities in repayment and credit-scoring features, enabling lower-income and less technically competent entrepreneurs to use mobile microcredit safely. For researchers, there is an opportunity for follow-up work, especially using panel data to examine the dynamics of repeat borrowing and its impact on long-term enterprise sustainability.

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# THE MEDIATING ROLE OF ENTREPRENEURIAL RESILIENCE IN THE PASSION-PERFORMANCE NEXUS

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## **Abstract**

*This study explores the relationship between entrepreneurial passion and entrepreneurial performance, with entrepreneurial resilience serving as a mediating variable among small and medium-sized enterprise (SME) owners in Kaduna State, Nigeria. Anchored in Self-Determination Theory, the research argues that entrepreneurial passion is an intrinsic motivational force that drives performance directly and indirectly by fostering resilience, which enables entrepreneurs to adapt and thrive in the face of challenges. Using a quantitative, cross-sectional design, data were collected from 370 SME owners and analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that entrepreneurial passion significantly and positively influences both resilience and performance, while resilience also has a direct positive effect on performance. Moreover, resilience partially mediates the relationship between passion and performance, indicating that it serves as a crucial psychological mechanism linking emotional drive to business success. The study concludes that cultivating both entrepreneurial passion and resilience enhances entrepreneurs' ability to sustain performance, overcome adversity and achieve long-term business growth.*

**Keywords:** *Entrepreneurial Passion, Entrepreneurial Resilience, Entrepreneurial Performance, Self-determination theory*

## Introduction

Entrepreneurship is widely recognized as a pivotal force for economic growth, technological innovation, and social development (Iqbal et al., 2023; Cheng et al., 2025). In the context of a rapidly evolving global economy, entrepreneurial firms are particularly crucial for their role in job creation and leveraging unique flexibility to capitalize on new opportunities (Cheng et al., 2025). This significance is underscored by a growing trend of entrepreneurial activity, especially among younger generations (Zheng, 2025). Consequently, understanding the determinants that drive successful entrepreneurial performance remains an imperative area of research (Iqbal et al., 2023).

Entrepreneurial passion represents a profound inclination toward entrepreneurial activities, predicting significant investments of time and energy (Karimi et al., 2025). Widely regarded as the heart of entrepreneurship, passion is vital to both the venture creation process and its ultimate outcomes (Syed et al., 2020). This is because it serves as a fundamental psychological resource, coordinating cognitive and behavioral processes to drive creativity, perseverance, commitment and efficacy, which collectively underpin entrepreneurial success (Tu et al., 2023).

Entrepreneurial passion serves as a critical catalyst for resource acquisition and strategic vision. Upon developing a passion for a venture, an individual is more likely to proactively cultivate the necessary skills and marshal relevant resources (Ibanga et al., 2023). This passion enables entrepreneurs to employ creative problem-solving to overcome resource constraints and effectively mobilize social, financial and human capital. Furthermore, it is instrumental in shaping a clear and compelling future vision for the business, which helps maintain strategic focus and fosters the resilience needed to adapt to volatile market conditions and significant challenges (Josimovska et al., 2025).

Entrepreneurial Resilience (ER) is conceptualized as a multifaceted capacity that enables entrepreneurs to withstand, adapt to and recover from the adversities inherent in the venture process (Seyfi et al., 2025). It constitutes a dynamic process of positive adaptation, allowing business owners to persevere and maintain forward momentum in the face of harsh and destabilizing situations (Grèzes et al., 2023; Caesar & Haryadi, 2022). This ability to navigate unpredictability is not merely beneficial but is often cited as a critical determinant of entrepreneurial success. Empirical evidence suggests that resilient entrepreneurs achieve greater success than their less adaptable counterparts (Trinanda et al., 2025). This is further supported by findings that entrepreneurial communities exhibit higher overall adaptability than non-entrepreneurial groups, implying that resilience is a foundational component of performance (Pyka & Zanger, 2019). Consequently, the development of resilience is essential for entrepreneurs to fulfill business obligations and ensure long-term venture continuity (Trinanda et al., 2025).

A robust body of research underscores entrepreneurial passion as a critical determinant of venture success (Chen et al., 2025; Dias et al., 2025; Dinibutun, 2024; Nson & Abimaje, 2024; Zhang et al., 2024). However, a critical consensus is emerging that passion alone is an insufficient predictor of firm performance, highlighting the need to investigate the underlying mechanisms and boundary conditions of this relationship (Laskovaia et al., 2022; Pollack et al., 2020; Vallerand & Paquette, 2021). In particular, scholarly understanding of the mediating role

of entrepreneurial resilience in the passion-performance nexus remains in its infancy. In response, this study aims to elucidate the specific mechanisms through which passion translates into performance. It will investigate the entrepreneurial benefits stemming from the focused effort passion stimulates, with a specific focus on entrepreneurial resilience as a key mediating variable.

Entrepreneurship fundamentally involves the identification and exploitation of opportunities, requiring significant effort and commitment to generate economic returns. While entrepreneurial passion is theorized to fuel this dedicated effort, empirical research specifically examining its influence on exertion and subsequent venture performance remains limited (Adomako & Ahsan, 2022). This study aims to address this gap by proposing a framework to investigate the relationship between entrepreneurial passion and entrepreneurial performance. While prior research has explored mediating mechanisms such as professionalism and psychological capital (Hu et al., 2022; Nson & Abimaje, 2024), the role of entrepreneurial resilience as a mediator is less understood. Therefore, this research will specifically explore the mediating mechanism of entrepreneurial resilience in this critical relationship.

Grounded in Self-Determination Theory (SDT), the proposed framework seeks to elucidate the cognitive and motivational pathways through which passion translates into both positive and negative entrepreneurial outcomes. Therefore, this research investigates the mediating role of a key variable which is resilience on the relationship between entrepreneurial passion and entrepreneurial performance among SMEs in Kaduna state.

## **Literature Review**

This section reviews literature on entrepreneurial performance, entrepreneurial passion, entrepreneurial resilience, empirical review and theoretical framework.

## **Conceptual Review**

### **Concept of Entrepreneurial Performance**

Entrepreneurial performance is a multidimensional construct that evaluates the success and effectiveness of an enterprise in achieving its strategic objectives. Moving beyond traditional financial metrics, it encompasses a holistic assessment of a firm's efficiency, strategic effectiveness, and managerial responsibility (Abdullahi et al., 2024; Mustapha et al., 2025). This includes meeting the expectations of primary stakeholders (Mushi, 2024) and aligning outcomes with the organization's vision and mission (Soumena et al., 2024). Furthermore, contemporary conceptualizations integrate sustainable performance, balancing economic outcomes with environmental and social contributions, such as employee retention and community investment (Seraj et al., 2022). Synthesizing these views, entrepreneurial performance can be defined as the attainment of a firm's goals, encompassing financial, social, and innovative outcomes.

### **Concept of Entrepreneurial Passion**

Entrepreneurial passion has been conceptualized in the literature as a multifaceted construct. It is recognized as a central motivational driver that fosters perseverance (Liu et al., 2023), a positive inner force tied to entrepreneurial activities that align with legal and ethical standards

and hold deep personal significance for the entrepreneur's identity (Kusa & Danladi, 2023), and an intense positive affective state (Josimovska et al., 2025). Further, it is characterized as a vital capacity for translating talent into action (Kuckertz, 2024) and a key catalyst for sustainable and innovative ventures, simultaneously, it builds the steadfast commitment required to achieve long-term objectives. (Morfaki, 2025). Xiaoqiang (2024) characterizes passion as a potent catalyst for both personal fulfillment and societal advancement, essential for a meaningful and dynamic existence. Drawing from these conceptualizations, the present study defines entrepreneurial passion as a powerful emotional affinity for entrepreneurial endeavors, which serves as a foundation for sustained motivation, creative output, and resilient adaptation.

### **Concept of Entrepreneurial Resilience**

At the micro-level, ER is rooted in the entrepreneur's psychological constitution. It is manifested as an adaptive mindset and cognitive fortitude that facilitates the endurance of difficulties, the maintenance of positive affect, and the preservation of personal well-being throughout the venture journey (Isichei et al., 2024; Haddoud et al., 2022). This psychological bedrock is coupled with visionary tenacity, enabling a steadfast focus on long-term objectives despite ambient uncertainty (Chaudhary et al., 2024). Entrepreneurial resilience can refer to the capability to withstand and quickly overcome adversity (Seraj et al., 2022). Resilience is the capacity to recover from difficulties and adapt to external shocks and disruptions (Hall et al., 2023). The capacity to overcome adversity and achieve success is defined as resilience by Alshebami and Murad (2022).

At the meso-level, ER functions as a dynamic organizational capability. It denotes a venture's inherent agility and preparedness to respond to disruptions such as economic contractions or unforeseen events by strategically adapting its processes and models without compromising its core identity (Prayag et al., 2024; Iyengar et al., 2021). Informed by this dual-level analysis, the present study defines entrepreneurial resilience as the integrated ability of entrepreneurial actors and their ventures to persist through, adjust to, and recover from business-related setbacks, thereby ensuring continued pursuit of strategic goals.

### **Empirical Review**

#### **Entrepreneurial Passion and Entrepreneurial Performance**

Recent studies underscore entrepreneurial passion as a critical driver of business innovation and success. Research by Zhang et al. (2024) found that passion for inventing and developing positively impacts SME retailers' performance, particularly in developed nations. Similarly, Dinibutun (2024) identified a strong link between passion and business model innovation, essential for new SME growth, as it enhances opportunity recognition and skill development in Turkey. The necessity of passion is further highlighted by Dias et al. (2025), who deem it a prerequisite for social innovation in tourism, and by Nson and Abimaje (2024), who connected it directly to the entrepreneurial success of SMEs in Plateau state. Supporting this, Chen et al. (2025) observed that fully passionate entrepreneurs achieve the highest entrepreneurial success levels. Based on the previous findings, this study proposes that:

**H<sub>01a</sub>:** Entrepreneurial passion has no significant impact on entrepreneurial performance among SMEs in Kaduna state.

### **Entrepreneurial Passion and Entrepreneurial Resilience**

The literature consistently substantiates a significant and positive relationship between entrepreneurial passion and entrepreneurial resilience. Empirical evidence from multiple studies indicates that passion is a key antecedent, exerting a strong and favorable influence on an entrepreneur's resilience (Karimi et al., 2025; Santoso & Indudewi, 2022; Filliolet & Asare, 2023). This connection is well-established, with early work by Emrizal et al. (2020) identifying the correlation and subsequent research confirming its causal impact. Notably, this dynamic extends to various passion types, including obsessive passion (Shan & Tian, 2022). The importance of this trait is further highlighted by its documented necessity for enhancing business performance (Mehmood & Husnain, 2024). Therefore, this study assumed that:

**H<sub>0ib</sub>:** Entrepreneurial passion has no significant impact on entrepreneurial resilience among SMEs in Kaduna state.

### **Entrepreneurial Resilience and Entrepreneurial Performance**

A distinct yet complementary body of research yields compelling evidence that resilience manifesting as entrepreneurial, organizational, strategic, or digital resilience constitutes a significant antecedent to firm success. The extant literature substantiates that resilience is a critical driver of Micro, Small, and Medium Enterprise (MSME) performance, primarily by facilitating operational adaptation and ensuring business continuity (Susilawati, 2024). Its positive influence extends to enhancing non-financial outcomes (Nautiyal & Pathak, 2024), boosting marketing performance (Hasanah et al., 2025), and serving as a vital factor for the survival and internationalization of exporting firms (Damoah, 2025). Further empirical work links resilience to improved innovative performance (Tumaku & Agbeko, 2024), and overarching entrepreneurial success (Yesuf et al., 2025), with demonstrated efficacy during crisis conditions and for female-led enterprises (Zegullaj et al., 2025). Moreover, resilience is correlated with sustainable performance (Maravilla & Flores, 2025; Seraj et al., 2022). A notable contrary finding to this consensus is provided by Jiao et al. (2024), whose research suggests that within team contexts, significant heterogeneity in individual resilience levels can detrimentally affect performance by degrading the quality of team-member exchange (TMX). This study therefore, postulates that:

**H<sub>0ic</sub>:** Entrepreneurial Resilience has no significant impact on entrepreneurial performance among SMEs in Kaduna state.

### **Entrepreneurial Resilience as a Mediator**

Recent research consistently identifies entrepreneurial resilience as a critical mediating variable. Studies demonstrate that it partially explains how opportunity recognition and digital technology adoption lead to improved SME performance (Alam et al., 2025). Similarly, resilience mediates the effects of dark entrepreneurship on work-life balance (Moazzam et al., 2025), amplifies the impact of narcissism on new venture funding (Thapa et al., 2025), and translates entrepreneurial aptitudes like leadership into entrepreneurial intentions (Bellini et al., 2025). Further evidence confirms its mediating role between passion and work-life enrichment (Malchelosse et al., 2024), financial literacy and sustainable performance (Seraj et al., 2022), and harmonious passion and life satisfaction (Ahmed et al., 2024). This collective evidence strongly suggests that resilience is a key mechanism through which entrepreneurial

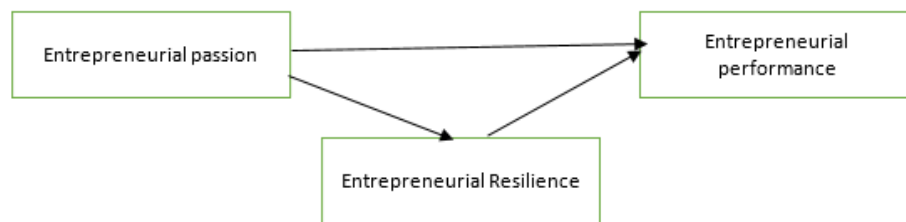
passion influences performance. This pattern indicates that resilience is a fundamental psychological process that translates entrepreneurial inputs into tangible results. Hence, we forward the following hypotheses:

$H_{02}$ : Entrepreneurial Resilience does not mediate the relationship between entrepreneurial passion and entrepreneurial performance among SMEs in Kaduna state.

### Self-Determination Theory

Self-Determination Theory (SDT), a framework for understanding human motivation developed by Deci and Ryan, posits that individuals are driven by three innate psychological needs: autonomy, competence and relatedness. Research indicates that when people pursue activities consistent with their personal values and interests, these needs are met, resulting in enhanced well-being, satisfaction and persistence (Rigby & Ryan, 2018; Ryan & Deci, 2020). Conversely, activities that conflict with one's values can lead to negative outcomes like stress and a lack of perseverance.

In the entrepreneurial context, passion is a powerful source of intrinsic motivation that aligns with the SDT needs for autonomy and relatedness (Iqbal et al., 2023). This passion-driven motivation fosters resilience, enabling entrepreneurs to recover from setbacks and persist through challenges. Ultimately, this combination of passion and resilience fuels entrepreneurial performance through enhanced creativity and determination.



**Fig 2.1 Conceptual Framework**

### Research Design

This study employed a quantitative, cross-sectional survey design to examine the effect of entrepreneurial passion on entrepreneurial performance, with entrepreneurial resilience serving as a mediating variable. The design was chosen for its suitability in examining causal relationships among variables and facilitating statistical hypothesis testing. The study is explanatory in nature and anchored in Self-Determination Theory (SDT) proposed by Deci and Ryan (1985), which posits that individuals are motivated to perform better when their intrinsic psychological needs which are autonomy, competence and relatedness are fulfilled. In this context, entrepreneurial passion serves as intrinsic motivation that enhances resilience and, consequently, performance.

### 3.2 Population and Sampling Technique

The target population comprised owners and managers of registered Small and Medium Enterprises (SMEs) operating within Kaduna State, Nigeria. According to the 2023

SMEDAN–NBS MSME Survey Report, Kaduna State is home to 45,000 registered SMEs, making it one of the top entrepreneurial hubs in Northern Nigeria, alongside Kano and Lagos.

The minimum sample size was determined using Cochran's (1977) formula for finite populations:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- $n$  = sample size
- $N$  = population size (45,000)
- $e$  = margin of error (0.05)

Substituting values:

$$n = \frac{45,000}{1 + 45,000(0.05)^2} = 381$$

To account for non-responses and incomplete questionnaires, a 20% increase was added to the calculated sample size (Israel, 1992; Dillman, 2014):

$$n_{adjusted} = 381 + (0.20 \times 381) = 457.2 \approx 460$$

Thus, a total of 460 copies of questionnaire were distributed among registered SME owners and managers. After data screening, 370 valid responses were retained for analysis, yielding a response rate of 80.4%, which is adequate for structural equation modeling (Hair et al., 2017).

A simple random sampling technique based on probability sampling was adopted to ensure equal representation of all registered SMEs in Kaduna State. The SMEDAN registry was used as the sampling frame, from which participants were selected using a computer-generated randomization process, minimizing selection bias and ensuring representativeness.

### 3.3 Data Collection Instrument

Data were collected through a structured questionnaire comprising two sections. Section A captured respondents' demographic and business information such as gender, age, education, business type, firm size, and years of operation. Section B contained measurement items for the three study variables entrepreneurial passion, entrepreneurial resilience and entrepreneurial performance adapted from validated scales in prior studies. All items were measured using five- or seven-point Likert scales. The questionnaire was pilot-tested on 30 SME owners in Kaduna State (excluded from the main sample) to ensure clarity, reliability and contextual relevance. Additionally, expert validation was obtained from two entrepreneurship scholars and one management practitioner before final administration.

### 3.4 Variable Measurement

Entrepreneurial Passion was measured using a five-item unidimensional scale developed by Zhang (2025) in PLOS ONE. The construct captures entrepreneurs' emotional enthusiasm and identification with entrepreneurial activity. A sample item is, "I feel excited when engaging in entrepreneurial activities." Responses were rated on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). The scale showed high reliability ( $\alpha = 0.93$ ).

Entrepreneurial Performance was assessed using a six-item unidimensional scale by Ishfaq, Khan, and Imran (2023) in the Russian Law Journal. It measures perceived business success in terms of growth, profitability, and competitiveness. A sample item is, "My business performs better than competitors." Responses were measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), with strong internal consistency ( $\alpha = 0.90$ ). Entrepreneurial Resilience was measured using a seven-item unidimensional scale developed by Shan and Tian (2022) in Frontiers in Psychology. It reflects an entrepreneur's ability to recover from setbacks and adapt to challenges. A sample item is, "I can quickly recover from business setbacks." Responses were rated on a five-point Likert scale, and the measure demonstrated strong reliability ( $\alpha = 0.91$ ).

### 3.5 Validity and Reliability

Content validity was established through expert evaluation to ensure all items accurately represented the study constructs. Construct validity was verified using Confirmatory Factor Analysis (CFA) to assess item loadings, convergent validity, and discriminant validity. Reliability was confirmed using Cronbach's alpha ( $\alpha$ ) and Composite Reliability (CR), both of which exceeded the recommended 0.70 threshold. Average Variance Extracted (AVE) values greater than 0.50 indicated convergent validity, while the Heterotrait-Monotrait Ratio confirmed discriminant validity among constructs.

### 3.6 Method of Data Analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.0, chosen for its suitability in handling complex mediation models and moderate sample sizes. The analysis involved two stages: first, assessing the measurement model for reliability and validity; and second, testing the structural model to evaluate hypothesized relationships. The mediating effect of entrepreneurial resilience between entrepreneurial passion and performance was examined using the bootstrapping method (5,000 resamples), where mediation was deemed significant if the indirect effect was statistically different from zero ( $p < 0.05$ ).

### Techniques of Data Analysis

This study makes use of Statistical Package for Social Sciences (SPSS) v23 for initial analysis tasks, such as data coding, screening, normality testing, handling missing values, outlier detection, and running descriptive statistics. To examine hypotheses and delve into intricate relationships involving the mediating role of competitive advantage, the study employs Partial Least Squares (PLS) path modeling, a second-generation technique. PLS-SEM facilitates the modeling of multiple exogenous and endogenous latent variables simultaneously, making it well-suited for the objectives of this study.

### Analytical Procedure

Before conducting the primary analysis, this study ensured that assumptions regarding outlier checks, normality, and multicollinearity were met, following the guidelines outlined by Hair, Hult, Ringle, and Sarstedt (2017). Having successfully addressed these assumptions, we proceeded to adopt the partial least squares (PLS) path modeling method. The research model illustrated in Figure 1 underwent testing using Partial Least Squares (PLS) path modeling, chosen because the study aims to predict the dependent variable (Duarte & Raposo, 2010), and PLS is recognized as a non-parametric technique (Ruiz, Mujica, Berjaga, & Rodellar, 2013). To validate and assess the research model, Hair, Sarstedt, Ringle, and Gudergan (2017) recommended a two-stage evaluation process, comprising measurement models (referred to as external models in PLS-SEM) and structural models (referred to as internal models in PLS-SEM).

### Measurement Model

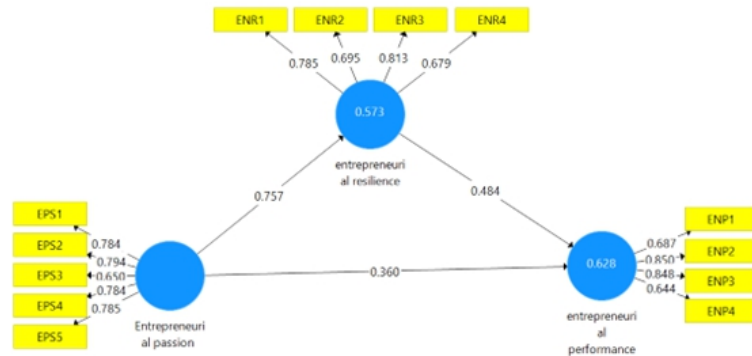
To assess the measurement model in this study, the researchers scrutinized the reliability of individual items measuring each potential structure. This evaluation encompassed internal consistency reliability, specifically the composite reliability, as well as discriminant validity and convergence validity for each reflective construct, following the guidelines by Hair et al. (2017). While Hair et al. (2017) suggests that an outer loading of 0.60 is deemed reliable and acceptable, they contend that an indicator should only be removed if its elimination results in an increase in the construct's Average Variance Extracted (AVE) or composite reliability.

Constructs	Indicators	Outer Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Entrepreneurial passion	ENP1	0.69	0.82	0.87	0.58
	ENP2	0.85			
	ENP3	0.85			
	ENP4	0.64			
entrepreneurial performance	ENR1	0.79	0.76	0.85	0.58
	ENR2	0.70			
	ENR3	0.81			
	ENR4	0.68			
entrepreneurial resilience	EPS1	0.78	0.73	0.83	0.56
	EPS2	0.79			
	EPS3	0.65			
	EPS4	0.78			
	EPS5	0.79			

The measurement model demonstrates satisfactory reliability and validity across all three constructs; entrepreneurial passion, entrepreneurial performance, and entrepreneurial resilience.

For entrepreneurial passion, the Cronbach's Alpha of 0.82 and Composite Reliability of 0.87 indicate strong internal consistency, while the AVE value of 0.58 confirms adequate convergent validity. The indicator loadings range from 0.64 to 0.85, all within the acceptable threshold, showing that each item contributes meaningfully to the construct measurement.

Similarly, entrepreneurial performance displays good reliability with a Cronbach's Alpha of 0.76 and a Composite Reliability of 0.85, both exceeding the recommended minimum of 0.70. The AVE of 0.58 further demonstrates that over half of the variance in its indicators is explained by the construct itself, confirming convergent validity. For entrepreneurial resilience, the Cronbach's Alpha of 0.73 and Composite Reliability of 0.83 confirm internal consistency reliability, while an AVE of 0.56 supports convergent validity. The outer loadings (0.65–0.79) fall within acceptable limits, signifying a well-constructed measurement model.



To ensure discriminant validity, Duarte and Amaro (2018) recommended utilizing the multitrait-multimethod (HTMT) matrix as a more suitable and sensitive approach.

**Table 2:** Heterotrait-Monotrait Ratio (HTMT)

Constructs	Entrepreneurial passion	entrepreneurial performance	entrepreneurial resilience
Entrepreneurial passion			
entrepreneurial performance	0.66		
entrepreneurial resilience	0.76	0.77	

As indicated in the presented Table 2, the HTMT statistics are provided, reflecting the correlations among the items of their respective reflective constructs. Given that the HTMT value falls below the 0.85 threshold suggested by Hair et al. (2017), the reflective latent variable in this study demonstrates discriminant validity.

### Structural Model

Upon fulfilling all the criteria of the measurement model, the evaluation shifts to the structural model. The initial phase of the structural model assessment entails testing the theoretical relationships. In particular, the direct and moderating effects were scrutinized based on 370 cases, utilizing 5000 bootstrap samples, as outlined by Hair, Sarstedt, Hopkins, and Kuppelwieser (2014).

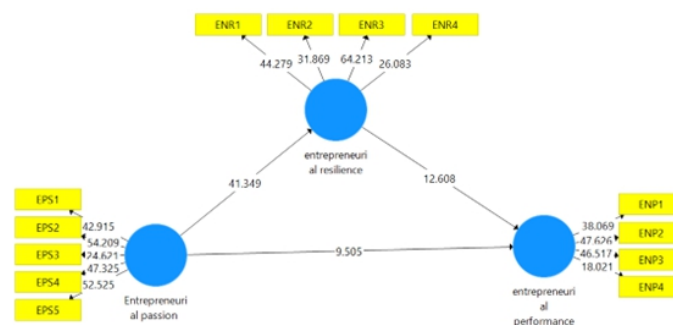
**Table 3:** Structural Model

R/ship	Beta Values	Standard Deviation	T Statistics	P Values
Entrepreneurial passion -> entrepreneurial performance	0.36	0.04	9.51	0.00
Entrepreneurial passion -> entrepreneurial resilience	0.76	0.02	41.35	0.00
entrepreneurial resilience -> entrepreneurial performance	0.49	0.04	12.61	0.00
Entrepreneurial passion -> entrepreneurial resilience->entrepreneurial performance	0.37	0.03	11.39	0.00

The results presented in Table 3: Structural Model reveal that all hypothesized relationships among entrepreneurial passion, entrepreneurial resilience and entrepreneurial performance are statistically significant and positive. The direct relationship between entrepreneurial passion and entrepreneurial performance shows a standardized beta value of 0.36 with a t-statistic of 9.51 and a p-value of 0.00, indicating that entrepreneurial passion significantly enhances performance outcomes. This implies that entrepreneurs who are highly passionate about their ventures are more motivated, persistent, and effective in achieving business goals.

Furthermore, entrepreneurial passion exhibits a very strong positive influence on entrepreneurial resilience, with a beta value of 0.76 and a t-statistic of 41.35, confirming that passion is a major driver of resilience. Passionate entrepreneurs are more likely to remain steadfast and adaptive in the face of challenges, which contributes to their sustained business success. The relationship between entrepreneurial resilience and entrepreneurial performance is also significant ( $\beta = 0.49$ ,  $t = 12.61$ ,  $p = 0.00$ ), suggesting that resilience serves as a key behavioral capability that enables entrepreneurs to navigate uncertainty and maintain high performance.

Moreover, the indirect effect of entrepreneurial passion on performance through resilience ( $\beta = 0.37$ ,  $t = 11.39$ ,  $p = 0.00$ ) confirms that resilience partially mediates this relationship. This finding highlights that while passion directly enhances performance, its impact is further strengthened when entrepreneurs develop resilience. Overall, the structural model demonstrates that entrepreneurial passion not only drives performance directly but also indirectly through the development of resilience, underscoring the intertwined roles of emotional engagement and adaptability in achieving entrepreneurial success.



## Conclusion

Based on the structural model results, it can be concluded that entrepreneurial passion plays a pivotal role in driving both entrepreneurial resilience and entrepreneurial performance. The findings reveal that passion significantly enhances performance directly while also exerting a strong influence on resilience, which in turn further boosts performance outcomes. This demonstrates that passionate entrepreneurs are not only more dedicated and persistent in achieving their goals but are also better equipped to adapt and recover from challenges, ensuring long-term success. Moreover, the mediation effect of entrepreneurial resilience indicates that resilience acts as a crucial pathway through which passion translates into improved performance. In essence, entrepreneurial passion serves as both a motivational and emotional force that strengthens resilience, enabling entrepreneurs to remain focused, innovative, and productive even in the face of adversity. Therefore, fostering entrepreneurial passion and resilience is essential for sustaining high performance and achieving sustainable business growth.

## Recommendations

Based on the findings, it is recommended that entrepreneurs, educators, and policymakers prioritize strategies that cultivate entrepreneurial passion and resilience as pathways to improving performance. Firstly, entrepreneurship development programs should include activities that help individuals identify their personal interests and align them with business goals, as passion rooted in purpose significantly enhances motivation and performance. Secondly, training programs should also incorporate emotional intelligence and resilience-building exercises, such as scenario-based learning, mentorship and stress management workshops, to prepare entrepreneurs for real-world challenges.

Thirdly, business incubators and support institutions should provide mentoring and networking platforms that connect entrepreneurs with role models who have demonstrated perseverance and adaptability. These interactions can help budding entrepreneurs internalize resilience as a critical success trait. Lastly, policymakers should support initiatives that encourage entrepreneurial well-being, such as access to mental health resources, funding support and flexible innovation spaces that reduce burnout and strengthen long-term commitment.

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# THE IMPACT OF EDUCATION FOR SUSTAINABLE DEVELOPMENT ON UNIVERSITY STUDENTS' SUSTAINABILITY BEHAVIOR: A CASE STUDY FROM UNDERGRADUATE STUDENTS IN NIGERIA

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## **Abstract**

*The impact of Education for Sustainable Development (ESD) on university students' sustainability behavior is a critical area of study, particularly in regions like Nigeria where higher education institutions play a crucial role in shaping future leaders and professionals. The United Nations Decade of Education for Sustainable Development has advocated education for sustainable development (ESD) to promote global sustainability. UNESCO supports ESD as a way to provide society with the knowledge, skills, values, and attitudes needed for sustainable living. While considerable progress has been made in many developed countries, particularly in higher education institutions, and to some extent in developing countries, similar success has not been observed in Nigeria's higher education establishments. This study examined the influence of ESD on university students' conduct in Nigeria. A case study focusing on undergraduate students in Nigeria can shed light on how ESD influences their attitudes, awareness, and behaviors regarding sustainability, and how these behaviors can potentially contribute to the broader goals of sustainable development. Through cluster sampling, 300 students from FUG Gusau and Usmanu Danfodiyo Universities in Zamfara and Sokoto state were chosen to administered the questionnaire for completing.*

**Keywords:** *Sustainability, SDGs, education, higher education, student, behavior, Nigeria.*

## Introduction

Education for Sustainable Development (ESD) has gained prominence as a transformative approach within the global educational landscape, aiming to empower learners to engage critically and constructively with the complex challenges of sustainability (UNESCO, 2020). ESD seeks to integrate principles, values, and practices of sustainable development into all aspects of education and learning, thereby fostering the competencies required to build a more just, equitable, and sustainable society (Tilbury, 2011). Within the context of higher education, universities not only function as centers of knowledge creation and dissemination but also bear the responsibility of modeling and instilling sustainable behaviors among students—future policymakers, entrepreneurs, and leaders (Sterling, 2013). Nigeria, like many other nations, faces pressing sustainability issues such as environmental degradation, resource scarcity, climate variability, and deepening social inequalities (Akinyele, 2022). In response, Nigerian universities have begun to mainstream ESD through curriculum innovation, research, campus greening initiatives, and community partnerships (Olawale & Chinedu, 2021). Despite these efforts, critical questions persist regarding the extent to which ESD initiatives are translating into tangible shifts in students' sustainability knowledge, attitudes, and—most importantly—behaviors.

The United Nations (UN) Agenda 2030 states that global transformation and universality are necessary for sustainable development. “Universality” refers to sustainable development, which calls for meeting global issues such as inequality between nations, climate change, and regional economic, social, and environmental goals. Governments and international organizations must address these complex concerns to enable necessary “transformative” changes in the way of life and environmental protection (Bastianoni et al., 2019). It has been observed that education, in all its various forms from elementary to tertiary levels, plays a distinctive and pivotal role. The global initiative for sustainable development is likely to experience significant growth due to the UN Sustainable Development Goals (Shiel et al., 2016). Education for sustainable development (ESD), also known as Education for Sustainability, is a concept aimed at comprehending and reshaping educational systems to foster sustainability within higher education institutions. Its goal is particularly centered on shaping the mindset, values, and actions of future generations (Zguir et al., 2021). The increasing number of academic programs focused on sustainability from global universities reflects the modern prominence of sustainability and environmental science (Wiek et al., 2011). Changes in behavior are necessary to achieve sustainability objectives since they have a substantial impact on humans. In this sense, people's consumption patterns—which include the need for necessities like food, fuel, water, wood, minerals, and materials—are fundamental. There is broad consensus that resource overuse and environmental degradation cause irreversible changes to our world. Home consumption contributes 50–80% of global land, material, and water usage and about 60% of greenhouse gas emissions (Ivanova et al., 2016). According to UN Food and Agriculture Organization (FAO) estimates, one-third, or around 1.5 billion tonnes, of the food produced worldwide is wasted (FAO of the United Nations, 2013). Furthermore, as population growth and resource demand increase, it is predicted that in <15 years, the water demand will exceed the availability by 40% (Programme UNE, 2017).

## **Problem Statement**

Despite growing efforts to integrate Education for Sustainable Development into Nigerian University education, observable sustainability behavior among undergraduate students remains relatively low. Many students are exposed to sustainability concepts through general studies courses, departmental curricula, and campus sensitization programmes, yet their everyday practices in areas such as energy use, waste disposal, water conservation, and responsible consumption often do not reflect the principles of sustainable living. This suggests a possible gap between ESD exposure and actual behavioral change. However, empirical studies that specifically examine the impact of ESD on university students' sustainability behavior in the Nigerian context are scarce. Consequently, it is not clear whether and to what extent current ESD provisions are effective in promoting sustainable behavior among undergraduates, or which aspects of ESD (content, pedagogy, campus environment, or co-curricular activities) are most influential. This study therefore investigates the impact of Education for Sustainable Development on university students' sustainability behavior, using undergraduate students in Nigeria as a case study, in order to generate evidence that can guide policy and practice in Nigerian higher education.

## **Research Objectives**

This study is aimed to examine the Impact of Education for Sustainable Development on University Students' Sustainability Behavior: A Case Study from Undergraduate Students in Nigeria. In an attempt to achieve this objective, the following specific objectives are set to:

- i. To examine the extent of integration and exposure of Education for Sustainable Development (ESD) within Nigerian university undergraduate curricula and activities.
- ii. To assess the level of awareness, knowledge, and attitudes of Nigerian undergraduate students towards sustainability and sustainable development.
- iii. To evaluate the influence of ESD on undergraduate students' actual sustainability behavior, such as resource conservation, waste management, and social responsibility.

## **Research Questions**

The following research questions were raised to guide the study:

- i. How is Education for Sustainable Development integrated into undergraduate programs in Nigerian universities?
- ii. What is the level of sustainability knowledge and attitude among Nigerian undergraduate students exposed to ESD?
- iii. To what extent does exposure to ESD influence the sustainability behavior of Nigerian university undergraduates?

## **Null hypothesis**

Based on the research questions stated, the following null hypotheses are formulated.

- i.  $H_{01}$ : Education for Sustainable Development has no significant effect on Nigerian undergraduate students' sustainability knowledge.
- ii.  $H_{02}$ : Education for Sustainable Development has no significant effect on Nigerian undergraduate students' attitudes towards sustainability.
- iii.  $H_{03}$ : There is no statistically significant relationship between the level of exposure to Education for Sustainable Development and the sustainability behavior of Nigerian undergraduate students.

## **2.1 Concept of Education for Sustainable Development**

Education for Sustainable Development (ESD) is an educational approach designed to empower individuals with the knowledge, skills, values, and attitudes necessary to contribute to a sustainable future. It integrates key sustainable development issues such as climate change, biodiversity, poverty reduction, and sustainable consumption into teaching and learning processes. ESD encourages participatory methods that motivate learners to change their behavior and take responsible action for environmental, economic, and social sustainability, aiming to improve quality of life for present and future generations. ESD fosters awareness of complex interrelationships in sustainability, encouraging reflection on conflicting goals and societal change. It plays a significant role in achieving the United Nations' Sustainable Development Goals (SDGs) by supporting sustainable and resilient communities through education. It also requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for sustainable development. Education for Sustainable Development consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way (UNESCO, 2020).

### **2.1.1 The Role of Higher Education for Sustainable Development (ESD)**

Universities are established to carry out the tripartite roles of teaching, research, and community service thereby contributing meaningfully to the social and economic development of the nation. They are supposed to impart high-level skills to a reasonable proportion of the workforce, developing the intellectual capability of individuals and engaging in the training of competent and responsible professionals needed virtually in all aspects of human endeavor. Universities play a critical role in shaping sustainability awareness and driving transformative change towards sustainable development. As centers for knowledge creation and dissemination, universities not only educate future professionals and leaders but also serve as catalysts for societal progress. By integrating sustainability concepts into academic curricula, universities ensure that graduates possess the skills, values, and mindsets needed to address complex environmental, social, and economic challenges (Sterling, 2013).

Through Education for Sustainable Development (ESD), universities embed sustainability principles into teaching, research, and campus operations. ESD encourages interdisciplinary learning, critical thinking, problem-solving, and active participation in sustainability initiatives (UNESCO, 2020). By fostering a holistic understanding of sustainability, ESD enables students to appreciate the interconnectedness of social equity, environmental stewardship, and economic viability, thus preparing them to make responsible decisions and act as change agents within and beyond academic settings (Lozano et al., 2015).

### **2.1.2 Global Initiatives like the UN's Decade for Education for Sustainable Development (2005–2014) and the 2030 Agenda for Sustainable Development.**

The United Nations' Decade of Education for Sustainable Development (DESD, 2005–2014) and the 2030 Agenda for Sustainable Development are two major global frameworks that have strongly influenced Nigerian educational policies toward sustainability.

UN Decade of Education for Sustainable Development (2005–2014): The DESD was launched to integrate sustainable development principles into education systems worldwide, including

Nigeria. It emphasized building capacities at all educational levels to foster sustainable lifestyles, social responsibility, and environmental stewardship. Nigeria participated by initiating curriculum reforms, teacher training, and public awareness campaigns to promote sustainability literacy. UNESCO's support helped Nigeria address underdevelopment through education by integrating sustainability concepts more comprehensively within technical, science, and teacher education programs.

2030 Agenda for Sustainable Development: The 2030 Agenda's Sustainable Development Goals (SDGs), particularly SDG 4 on quality education and SDG 13 on climate action, have further shaped Nigerian education policies. SDG 4 mandates inclusive, equitable quality education that equips learners with knowledge and skills for sustainable development, including ESD. Nigeria's national policies aim to align education targets with the agenda by promoting universal basic education, improving access to technical and vocational education, and integrating sustainability topics within curricula. Education is recognized as pivotal for achieving economic empowerment, social equity, and environmental protection in Nigeria.

### **2.1.3 Influence on Nigerian Educational Policies**

- i. These global frameworks have spurred Nigeria to adopt policies that:
- ii. Strengthen ESD by mainstreaming sustainability content across all education levels.
- iii. Enhance teacher education to prepare educators capable of delivering ESD effectively.
- iv. Utilize formal and non-formal education platforms to raise awareness and community participation in sustainable development.
- v. Focus on the quality, relevance, and inclusiveness of education to reduce inequalities and empower marginalized groups.

### **2.1.4 University Students' Awareness of Sustainability Issues**

Nigerian undergraduate students show a generally good level of awareness about global and local sustainability challenges, including climate change, resource depletion, and social equity, although gaps remain in fully understanding the importance and impact of sustainability on daily life. A survey of Nigerian universities found that over 90% of students were aware of the Sustainable Development Goals (SDGs), indicating high awareness of broad sustainability issues, though many viewed sustainability as primarily a government responsibility rather than personal or institutional. The following are some of awareness among Nigerian undergraduate students.

- i. Knowledge and Awareness:
- ii. Curriculum Integration:
- iii. Extracurricular Activities:

### **2.1.5 Impact of ESD on Students' Sustainability Behaviors**

Education for Sustainable Development (ESD) aims to encourage specific sustainable behaviors among students, including waste reduction, energy conservation, sustainable consumption, and active engagement in community development. These behaviors align with the broader goal of fostering environmentally responsible, socially equitable, and economically viable lifestyles. Education is critical because it can change people's behavior.

Although ESD existed before the SDGs (Hjorth Warlenius, 2022), it has emerged as a pivotal instrument within the present SDG agenda to reorient learning toward a more sustainable world and tackle economic, social, and environmental challenges (Stein et al., 2022). Several universities have started implementing several principles to help administrators in higher education find and implement complex solutions for future responsible management. These principles also ensure that students receive the education necessary to support sustainable development and lifestyles (Borges et al., 2017). Higher education also helps students enhance their multidisciplinary cooperation, anticipatory skills, problem-solving ability, creative thinking, and social responsibility—all critical for accomplishing the Sustainable Development Goals (SDSN, 2020).

In the Nigeria Educational setting, it is crucial to prioritize education on sustainability. Nigeria encounters distinctive environmental obstacles such as insecurity, deforestation, desertification, and the effects of climate change that endanger the livelihoods and welfare of its people (Melesse and Obsiye, 2022). Sustainability education should be integrated more extensively than solely acquiring knowledge, entailing a transformative, participatory learning process that aligns behavior with knowledge (Hammer and Lewis, 2023). However, this research is timely and significant as it coincides with Nigeria's efforts to rebuild its higher education sector, presenting a crucial opportunity to embed sustainability principles that will influence the country's future development. Aligning Nigeria higher education institutions with international sustainability standards is essential amidst the global push for sustainable development. Education for Sustainable Development promotes behaviors based on the following:

- i. Reducing waste through recycling and reusing materials.
- ii. Conserving energy by adopting efficient practices and technologies.
- iii. Practicing sustainable consumption by being mindful of resource use.
- iv. Participating in community initiatives that improve local environmental and social conditions.
- v. Advocating for and adopting environmentally friendly transportation (e.g., public transport, cycling).

#### **2.1.6 Challenges in Promoting ESD in Nigerian Universities**

In Promoting Education for Sustainable Development (ESD) in Nigerian universities encounters several challenges that can be categorized under institutional barriers, cultural and socioeconomic factors, and curriculum gaps. The under listed challenges are as follow.

- i. **Institutional Challenges:** Nigerian universities face significant institutional barriers in implementing ESD effectively. Key issues include, Lack of Funding, Insufficient Training for Educators and Inadequate Infrastructure:
- ii. **Cultural and Socioeconomic Factors:** Cultural attitudes, Lack of Government Support and socioeconomic conditions influence students' responses to ESD.
- iii. **Curriculum Gaps:** While there is progress integrating sustainability into Nigerian university curricula. The following gaps are as follow, Fragmented Integration, Insufficient Practical Focus and Lack of Updated Content.

### 2.1.7 Opportunities for Strengthening Education for Sustainable Development in Nigeria

Strengthening Education for Sustainable Development (ESD) in Nigeria offers significant opportunities to deepen sustainability awareness and action among university students through targeted curriculum development, collaborative partnerships, and student advocacy.

- i. **Curriculum Development:** Nigerian universities can enhance ESD integration by the following. Adopting Interdisciplinary Approaches, Incorporating Experiential Learning and Promoting Community-Based Projects.
- ii. **Partnerships and Collaboration:** The Effective ESD requires multi-sectoral collaboration as mention below: Government Engagement, NGO and Civil Society Involvement and Private Sector Collaboration.
- iii. **Student Advocacy:** Empowering students as change agents is vital of the following: Encouraging Student-Led Initiatives and Highlighting Success Stories.

### 2.2 Literature Review

The academic focus on students' sustainability abilities progressively expanded over many years (Wu and Shen, 2016). In Spain, researchers investigated the correlation between adopting sustainable consumption and seven competencies: self-regulation, leadership, perspective, humility and modesty, kindness, and appreciation of beauty. They demonstrated that cultivating ethical competencies through education promotes the adoption of sustainable consumption practices among students (Okubo et al., 2021).

Sustainable development is mainly integrated into higher education in two ways. The first one is to include it throughout all school curricula, and the second is to train staff and students to become sustainability experts (Liu et al., 2022). Curriculum change, regional and worldwide partnerships, and sustainable campus initiatives have been organized to endorse ESD in higher education institutions (Vaughter et al., 2013). Universities have promoted sustainability initiatives in their academic programs and infrastructure (Findler et al., 2019). An increasing focus is placed on cultivating students' proficiencies in systems thinking competency, anticipatory competence, normative competence, strategic competence, and interpersonal competence (Cebrian et al., 2020; Cebrian and Junyent, 2015; Liu et al., 2022).

University students must receive education to understand and address social, environmental, and economic challenges while promoting collaboration to execute coordinated initiatives (McNall, 2011; Webber and Duderstadt, 2012). From an educational perspective, this involves establishing meaningful human connections that result in significant learning to address socio-environmental challenges during the academic journey (Nunez, 2014). Universities have a significant impact on shaping the behavior of their students, utilizing resource use competitions and sustainability programs conducted on campus (Filho, 2011). Achieving sustainable development demands more than just environmental initiatives; it requires a fundamental shift in human behavior to address today's pressing sustainability issues (Badwan et al., 2022). It also requires a profound understanding of individuals' decision-making processes, actions, thoughts, interactions, beliefs, and attitudes (United Nations, 2016).

### **3.1 Methodology**

The study is basically descriptive survey research captures the perspectives of a diverse population, allowing researcher to quantify and analyse variables such as Sustainability behavior, Sustainability attitudes and Socio-demographic factors. The population of this study comprises the students of Federal University of Nigeria. There are 43 Federal University in Nigeria across the 36 State and FCT. The total population for the study was eight hundred and seventy-five thousand (875,000) students across the 43 Federal University of Nigeria approximately as estimated in the NUC count and license. The sample size was determined using the Bin Ahmed and Binti Halim (2017) formula, where an additional 5% of the sample size was added to account for potentially incomplete questionnaires. A total of 300 self-administered questionnaires were disseminated via Google Forms among undergraduate students across Faculties of social sciences at Uduok and FUG, Gusau. We received 276 responses out of the 300 we targeted. The selection process for the study population involved cluster sampling, whereby faculty officer would provide information regarding the total number of students enrolled in each faculty. Participation in the study was entirely voluntary, and the criteria for inclusion required that participants be currently enrolled undergraduate students in the Faculty of Social Sciences at either Uduok or FUG Gusau respectively. Students were approached in the classroom to complete the questionnaire fully. The questionnaire of this study contains five sections addressing concerns about the environment (CE), the culture of the environment (CUE), warning (W), reuse (R), and a section intended for respondents' demographic background. These sections draw upon items adapted, revised, and added from previous studies of (Ahamad and Ariffin, 2018; Boca and Saracli, 2019). The chosen objects correspond to four components of ESD: enhancing quality of life, ensuring environmental protection, resource efficiency, and addressing the demands of future generations (Ahamad and Ariffin, 2018). These four components are aimed to ensure that the questionnaire is inclusive. There are 15 items in the independent variables (CE, CUE, W) and five in the dependent variable, namely student behavior (R). The total number of items was adjusted to 20 accordingly after subsequent validity and reliability tests were taken. Before distributing the questionnaires to the sample population, the questionnaire was content-validated and tested for reliability. Item content validity was assessed using the item content validity index (I-CVI). This process involves of experts from university indicating the relevance of items contained in a questionnaire. Therefore, the questionnaire was distributed to four academicians with expertise in or relevant to ESD. They were requested to rate, comment, and suggest item improvements. Then a pilot test involving 20 respondents was undertaken to confirm the reliability of the questionnaire. The internal reliability and consistency of questions were tested using Cronbach's alpha. Cronbach's alpha values for all four sections have acceptable internal consistency (CE, CUE, and W) and (R). The research was conducted at Usmanu Danfodiyo University, Sokoto and Federal University Gusau, Zamfara State, Nigeria, involving undergraduate students from the Faculties of Social Sciences. These faculties were chosen due to their focus on areas related to sustainability, including resource management, environmental economics, and corporate social responsibility. As of the 2024/2025 academic year, there is a total student population of 850 across both faculties.

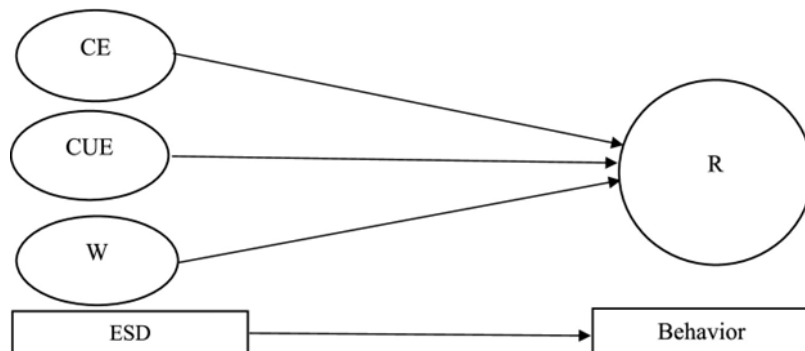
### **3.2 Data analysis and results**

The study utilized structural equation modeling with SmartPLS4 to assess both the measurement and structural model (Henseler et al., 2015). The researchers of this study

investigated the proposed paths and confirmed the findings. Structural equation modeling using SmartPLS4 encompasses a range of statistical techniques for examining potential relationships between independent and dependent variables (Lee et al., 2011). It is characterized by two sets of linear equations: the structural model, which elucidates the connections between constructs, and the measurement model, which illustrates the interactions between a construct and its observable indicators. The researcher selected SmartPLS for two primary reasons: firstly, PLS is a more suitable approach for our investigation as it is exploratory in nature. Secondly, it has gained significant recognition across scientific disciplines recently (Sarstedt and Cheah, 2019). Utilizing hypotheses testing in research to uncover causal relationships was commonly considered appropriate (Restuputri et al., 2011).

### 3.2.1 Research model

The diagram in figure 1 describes a research model that is developed based on the study's objectives, hypotheses, and existing literature. This model encompasses various important variables including environmental concerns (CE<sub>1</sub>, CE<sub>2</sub>, CE<sub>3</sub>, and CE<sub>4</sub>), cultural environment (CUE<sub>1</sub>, CUE<sub>2</sub>, and CUE<sub>3</sub>), attitudes toward environmental warnings (W<sub>1</sub>, W<sub>2</sub>, and W<sub>3</sub>) as well as the practice of “reuse” with its three components (R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub>). The research employs Structural Equation Modeling to examine the eco-friendly behaviors of university students and explore the causal connections between their environmental attitudes and their real actions. The SEM framework integrates both behavioral aspects along with attitudinal ones.



**Figure 1.** Research model. Source: by author.

### 3.2.2 Findings of the study on Demographic Information

Based on the demographic information provided by the participants, it can be observed that 54.2% of the sampled respondents identify as male, while 45.8% identify as female. Concerning age groups, 86% of the sample consists of participants aged 18–22. Concurrently, 14% of the respondents were between the ages of 22 and 25. All participants in our study were undergraduate students who had recently completed secondary education, and none were older than 25.

Regarding marital status, the study's sample was predominantly composed of single respondents, at 96%. Married respondents constituted a mere 4% of the total. As indicated in Table 1, most research participants (70% of all respondents) were in the third and last years of their bachelor's degree, while 30% were in the first years of their bachelor's degree.

Character	Frequency	Percent
Gender: Male	156	54.2%
Gender: Female	115	45.8%
Age 18–22 years	216	86%
Age 22–25 years	35	14%
Single	241	96%
Married	10	4%
Education: Level I	75	30%
Education: Level III & IV	176	70%

**Table 1.** Demographic characteristics of respondents ( $N = 251$ ).

#### 4.1 Discussion

This study investigated how ESD affects the behavior of university students in Nigeria. The study's results emphasize the importance of education for sustainability in developing sustainable behaviors among university students in Nigeria. The structural model confirmed that sustainability education (including environmental concerns, cultural environment, and warning attitudes) significantly correlated with university students' sustainability behavior (specifically, reuse behavior). Higher education institutions are crucial in advancing sustainable development through significant in-campus activities that positively impact the environment and society (Badea et al., 2020). The involvement of students in sustainable practices promotes their attachment to the campus community, extends their desire to participate in campus initiatives, and facilitates a significant change through their behavior (Krasny and Delia, 2015).

#### 4.2 Conclusion

The study examined the impact of Education for Sustainable Development (ESD) on the sustainability behavior of Nigerian university undergraduates, focusing on environmental concern, cultural environment, warning attitudes, and reuse behavior as core constructs. The findings demonstrate that ESD-related factors are significantly associated with students' sustainability behavior, indicating that exposure to sustainability concepts within curricula and campus activities can positively influence practical actions such as reuse and resource conservation. This confirms that higher education institutions are strategic platforms for cultivating sustainability-oriented values, attitudes, and behaviors among future decision-makers in Nigeria. Despite growing awareness and evolving curriculum initiatives, the study also highlights persistent gaps between students' sustainability knowledge/attitudes and their everyday practices, as well as institutional, cultural, and socioeconomic challenges that constrain the full realization of ESD objectives. Limited funding, inadequate staff training, fragmented curriculum integration, and contextual barriers such as poverty and entrenched norms reduce the translation of ESD exposure into consistent sustainable lifestyles on campus and beyond. The study therefore concludes that while ESD already contributes meaningfully to shaping sustainability behavior, a more systemic, practice-oriented and context-sensitive

implementation is required to achieve deeper and more enduring behavior change among Nigerian undergraduates.

#### 4.3 Recommendations

- i. University management and policymakers should mainstream ESD across all disciplines.
- ii. Capacity-building programmes should be organized regularly for lecturers and non-academic staff.
- iii. Universities should invest in supportive campus infrastructure and policies.
- iv. Partnerships with government agencies, NGOs, and the private sector.
- v. Student-led clubs and advocacy platforms should be encouraged and supported as key drivers of peer influence

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# MIXED CONVECTION FLOW OF VISCOUS REACTIVE FLUID IN THE PRESENCE OF RADIAL MAGNETIC FIELD AND EXPONENTIALLY PRESSURE GRADIENT

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## **Abstract**

*This research looked at how an exponentially growing or decreasing pressure gradient affected the mixed convection flow of viscous reactive fluids between two concentric tubes with  $r = 0$  and  $r = b$  in the presence of a radial magnetic field. The nonlinear partial differential equation regulating flow formation is solved with the implicit finite difference form. Several physical factors were examined, including skin friction, heat transfer rate, mixed convection, viscous reactive fluid parameter, radial magnetic field, and exponential decaying/growing pressure gradient. Raising the values of Frank-Kamenetskii ( $\lambda$ ), mixed convection ( $Gr$ ), and exponential rising pressure term leads to an increase in fluid velocity. However, in the case of exponential decay, the parameter decrease reduces the fluid's velocity. The fluid's velocity decreases as the radial magnetic field increases. The results revealed that a minor increase in the viscous reactive fluid parameter significantly improved the energy profile. In all of the situations described, thermal management may be achieved by understanding the impact of each flow parameter and adjusting it accordingly.*

**Keywords:** *Mixed Convection, Viscous Reactive Fluid, Radial Magnetic Field and Exponentially Pressure Gradient.*

## 1.0 Introduction

Mixed convective heat and mass transfer driven by temperature and concentration differences about various surface geometries has been investigated in many articles. To achieve this, Habibishandiz and Saghir (2022) inspected MHD mixed convection heat transfer flow of nano fluid having microorganisms within a vertical annular porous cylinder. It is concluded from their computational results that, microorganisms' presence causes heat transfer attenuation, whereas a rise in the magnetic field intensity weakens the average Nusselt number. Kaladhar *et al.* (2016) considered the effect of radiation and thermal diffusion on mixed convection flow of couple stress through a channel. Oni and Jha (2020) put forth a theoretical examination of steady and unsteady mixed convective flow formation towards a vertical micro-channel considering the influence of wall zeta potentials in the existence of an electric body force. Mandal *et al.* (2022) investigated MHD mixed convection on an inclined stretching plate in Darcy porous medium with Soret effect and variable surface conditions Daniel and Daniel (2015) presented the MHD mixed convection flow having radiation effect towards a stretching porous surface by utilizing the HAM. Jamaludin *et al.* (2020) examined the influence of heat emission/absorption in MHD mixed convection stagnation point in a hybrid nanofluid. They reported that the heat transfer of the conventional alumina/water nanofluid is greater than the copper–alumina water nanofluid with the increment in the heat source and sink parameter.

Various research has been conducted on hydro-magnetic convective flow under a spectrum of environmental situations. In a recent work, Hamza *et al.* (2022) evaluated the convectively heated, MHD-free flow of a chemically reacting fluid in a vertical channel contemplated with porous media. The steady-state component was solved using the homotopy perturbation method (HPM) while the unsteady state case was analyzed using a numerical technique. In a different paper, Hamza *et al.* (2021) investigated the implications of MHD on free convective slip flow of an exothermic fluid under the influence of Newtonian heating. Taid and Ahmed (2022) used the perturbation approach to resolve the combined impacts of the Soret effect, heat dissipation, and chemical reaction on steady two-dimensional hydro-magnetic free convection flow across an inclined porous plate coated with porous media. Osman *et al.* (2022) outlined the action of magneto-hydrodynamics on free convection flow over an infinite inclined plate using the Laplace transformation technique. Siva *et al.* (2021) presented a precise response to the MHD action on a heat transfer study of electro osmotic flow in a rotating micro fluidic channel.

Several interesting researches has published to demonstrate the impact of viscous reactive fluid on heat transfer coefficient and flow configuration through various physical settings. In light of these considerations, Hamza *et al.* (2019) offered an analytical study on the effects of radial magnetic field flow of chemically reactive fluid in a vertical porous annulus in the existence of mixed convection and Soret effects. Ahmad *et al.* (2017) examined steady state fully developed mixed convective heat and mass transfer flow of reactive viscous fluid in a vertical porous pipe in the presence of thermal diffusion. The nonlinear ordinary differential equations governing the flow are solved using semi-analytical method (perturbation series method). It is found that, Frank-Kamenetskii, thermal diffusion and mixed convection flow governing parameters strongly influence the flow pattern, heat and mass distribution within the pipe. Mahanthesh *et al.* (2016) deliberated on the analysis of Heat and mass transfer flow on mixed convective of viscous reacting nanofluid across a moving/stationary vertical plate. Ahmad and Jha (2015)

presented the steady and unsteady influence of the fully developed free heat transfer flow of reactive viscous fluids in a vertical porous pipe. They concluded that the time-dependent and steady-state rates of heat transmission through pipe layers increased with time. Jha et al. (2011a, 2011b) proposed a reactive viscous flow in an unsteady free convection flow in a vertical channel and a tube. According to their analysis, higher values of the reactant consumption parameter contribute to an increase in heat transfer rate and friction factor on both channel walls. Hamza (2016) discussed the unsteady/steady free convection flow of a viscous reactive fluid in a vertical channel, considering the velocity slip conditions and Newtonian heating.

## 2.0 Mathematical Formulation

Consider time dependent fully developed Laminar flow of an incompressible viscous fluid passing through concentric tube (see the Figure 1) in the presence of radial magnetic field. The  $z' \rightarrow$  axis is taken along the axis of the tube. The  $r' \rightarrow$  axis (radial co-ordinate) is taken normal to the tube. Exponentially growing/decaying pressure gradient is introduced which set up mixed convection currents inside the tube. Following Jha and Gambo (2020), the exponentially growing/decaying pressure term is of the form:

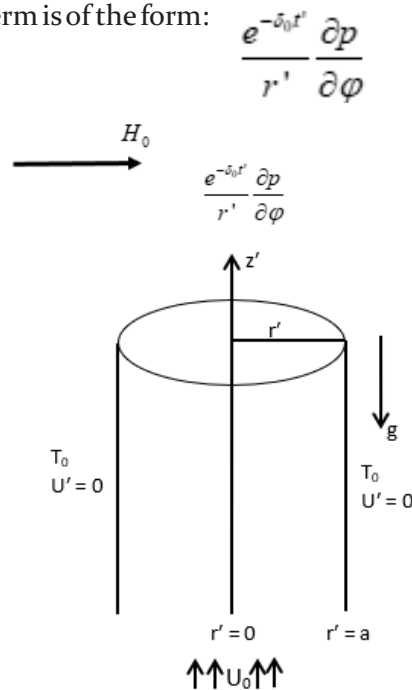


Fig. 1 Flow Configuration and Coordinates System

$$\rho \frac{\partial u'}{\partial t'} = -\frac{\exp(-\delta_0 t')}{r'} \frac{\partial P}{\partial \varphi} + \frac{v'}{r'} \frac{\partial}{\partial r'} \left( r' \frac{\partial u'}{\partial r'} \right) - \frac{k_1 H_0}{r'^2} u' + g \beta (T' - T_0) \quad (1)$$

$$\frac{\partial T'}{\partial t'} = \frac{k}{\rho C_p} \frac{1}{r'} \frac{\partial}{\partial r'} \left( r' \frac{\partial T'}{\partial r'} \right) + \frac{Q C_0 A}{p c \rho} \exp\left(-\frac{E}{RT'}\right) \quad (2)$$

### Boundary Conditions for the problem,

$$\begin{aligned}
 t \leq 0: \quad u' = 0, \quad T' = T_0 \quad \text{for } 0 \leq r' \leq a \\
 t' > 0: \quad \frac{\partial u'}{\partial r'} = 0, \quad \frac{\partial T'}{\partial r'} = 0 \quad \text{at } r' = 0 \\
 u' = 0, \quad T' = T_0 \quad \text{at } r' = a
 \end{aligned} \tag{3}$$

In order to solve equations (1) to (3), we employ the following dimensionless parameters

$$\left. \begin{aligned}
 r = \frac{r'}{a}, \quad t = \frac{vt'}{a^2}, \quad U = \frac{u'}{U_0}, \quad \theta = \frac{E}{RT_0^2} [T' - T_0], \quad \text{Re} = \frac{U_0 a}{\nu} \\
 U_0 = \frac{-r' \frac{\partial p}{\partial \varphi} \exp(-\delta_0 t')}{pU'}, \quad \delta = \frac{r^2 \delta_0}{\nu}, \quad \text{Gr} = \frac{g\beta RT_0^2 r^3}{E\nu}
 \end{aligned} \right\} \tag{4}$$

Using (4), the equations (1) to (3) can take the following form:

$$\frac{\partial u}{\partial t} = \frac{e^{-\delta t}}{r} + \frac{\text{Gr}}{\text{Re}} \theta + \frac{1}{r} \frac{\partial}{\partial r} \left[ r \frac{\partial u}{\partial r} \right] - \frac{M^2}{r^2} u \tag{5}$$

$$\text{Pr} \frac{\partial \theta}{\partial t} = \frac{1}{r} \frac{\partial}{\partial r} \left[ r \frac{\partial \theta}{\partial r} \right] + \lambda \exp \left( \frac{\theta}{1 + E\theta} \right) \tag{6}$$

The relevant boundary Condition for all the problems are:

$$\begin{aligned}
 \frac{\partial u}{\partial r} = 0, \quad \frac{\partial \theta}{\partial r} = 0 \quad \text{at } r = 0 \\
 u = 0, \quad \theta = 0 \quad \text{at } r = 1
 \end{aligned} \tag{7}$$

### 3.0 Method of Solution

The IFD method is used to solve the pair of nonlinear systems (5) and (6) with setting conditions. For all time differentials, we used the forward difference formula and approximated first and second derivatives with second order central differences. The equations reflect the initial components, and the final nodes are changed to account for the model parameters. For settings (5) and (6), the IFD equation is as follows:

$$-R_1 U_{i-1}^{j+1} + (1 + 2R_1) U_i^{j+1} - R_1 U_{i+1}^{j+1} = [1 - M^2 \Delta t] U_i^j + R_2 [U_{i+1}^j - U_{i-1}^j] + R_3 + \text{Gr} e \Delta t \theta_i^j \tag{7}$$

$$-R_1 \theta_{i-1}^{j+1} + (\text{Pr} + 2R_1) \theta_i^{j+1} - R_1 \theta_{i+1}^{j+1} = \text{Pr} \theta_i^j + R_2 [\theta_{i+1}^j - \theta_{i-1}^j] + \Delta t \lambda \exp \left( \frac{\theta_i^j}{1 + E\theta_i^j} \right) \tag{8}$$

With boundary condition

$$\left. \begin{aligned} \frac{U_{i+1}^{j+1} - U_{i-1}^{j+1}}{2\Delta r} = 0, & \quad \frac{\theta_{i+1}^{j+1} - \theta_{i-1}^{j+1}}{2\Delta r} = 0, & r = 0 \\ U_i^j = 0, & \quad \theta_i^j = 0, & r = 1 \end{aligned} \right\} \quad (9)$$

Where

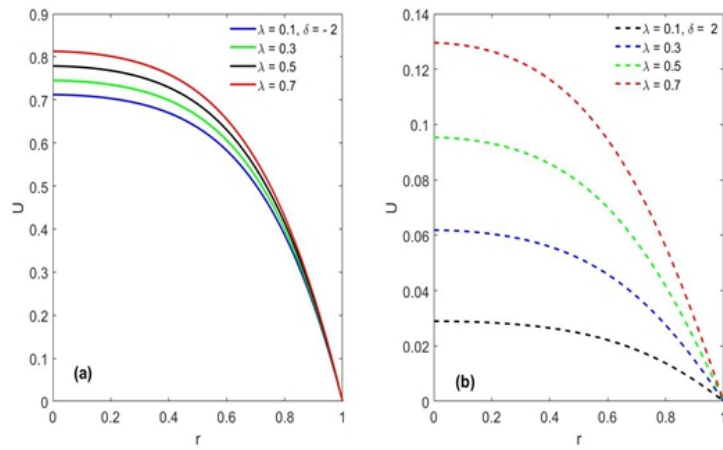
$$R_1 = \frac{\Delta t}{(\Delta r)^2}, \quad R_2 = \frac{\Delta t}{2r(i)\Delta r}, \quad R_3 = \frac{\Delta t e^{-\delta t}}{r(i)}$$

#### 4.0 Results and Discussion

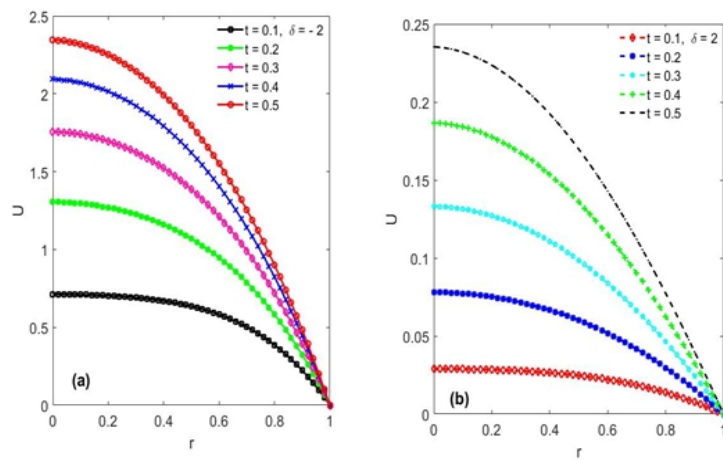
The numerical results are obtained by solving equations (7) to (9) using the method described in chapter one for various values of physical parameters to describe the physics of the problem. Our current computation was done across a reasonable range of numbers and took some time.  $0.1 \leq t \leq 0.5$ , decaying/growing parameter of pressure gradient over  $-2.0 \leq \delta \leq 2.0$ . Throughout our investigation,  $\delta > 0$  has been used to represent an exponentially growing pressure gradient and  $\delta < 0$  is denoted as exponentially decaying pressure gradient. Figs.1 to 4 depicted the graphical illustration of embedding governing parameters in the fluids. However, Tables 1 to 4 portrayed the reaction of embedded parameter in rate of heat transfer and shear stress.

Fig.1 show the influence of changing a viscous reactive fluid parameter for a specific amount of time on velocity. It is observed that increasing the values of exothermic fluid parameter velocity of the fluid is improve significantly for both cases of exponentially growing and decaying pressure gradient (Fig.1a and Fig.1b) respectively. The velocity of the fluid is seen to diffuses more in case of exponentially decaying pressure gradient then exponentially growing pressure gradient. Fig.2 reveal the influence of exponentially growing/decaying pressure gradient in respect with time (t), it is noted that for a pressure gradient that increases exponentially over time, the velocity profile is greater and more pronounced in (Fig.2a), whereas for a pressure gradient that decreases exponentially over time, the opposite phenomenon is noted Fig.(2b). Figures 4.3.3a and 3b, respectively, show the fluctuation of mixed convection (Gre). It was shown that Gre both increases the fluid in both scenarios of exponential decaying or growing; this has a wide range of uses, including the cooling of nuclear reactors in the event of an unexpected failure and electrical cooling devices using fans.

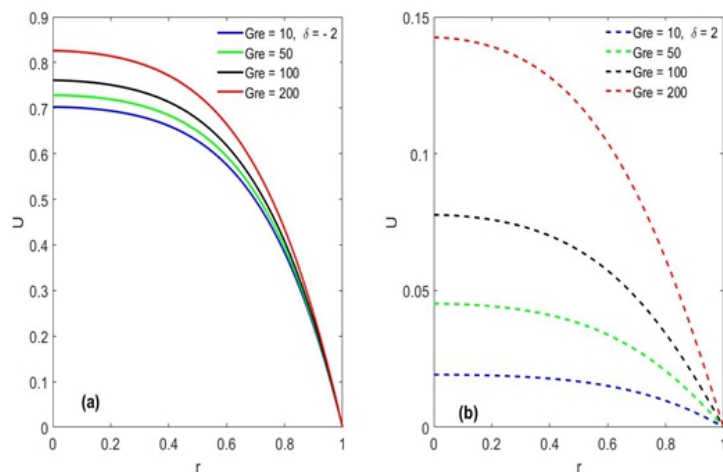
The influence of the radial magnetic field on velocity profile over a time was shown in Figs. 4a and 4b in case of exponentially growing and decaying pressure term respectively. It was found in Fig.4a and 4b that fluid velocity is significantly reduced as M is increase. Presence of Lorentz force resulted in this behavior. Table 1 and 2 display the influence chemical reaction parameter on skin friction in case of exponentially growing and decaying pressure gradient respectively. It is revealed that skin friction is higher in both cases (exponentially growing and decaying pressure gradient) on both lower and upper plates. Tables 3 show that both plates significantly improve when the mixed convection parameter is increased for both exponentially increasing and exponentially decaying systems. Tables 4 show that when the radial magnetic field increases, the shear stress gradually decreases.



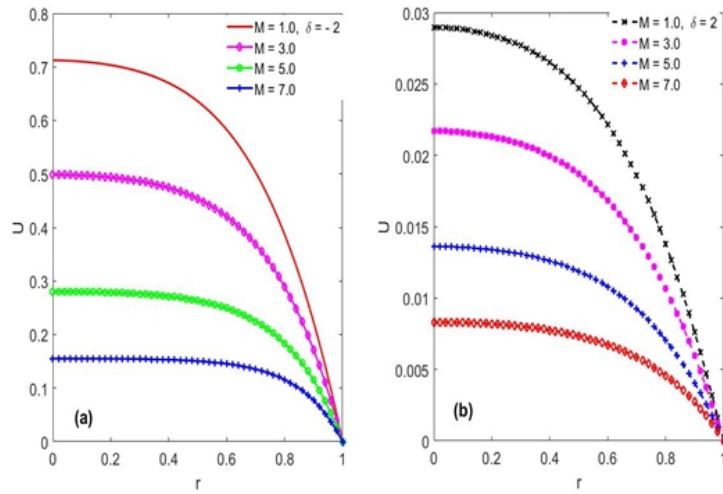
**Fig.1:** Velocity profile for different values of  $\lambda$



**Fig.2:** Velocity profile for different values of  $t$



**Fig.3:** Velocity profile for different values of  $Gre$



**Fig.4:** Velocity profile for different values of M  
**Default values:**  $M = 1$ ,  $Gr_e = 25$ ,  $t = 0.1$ ,  $Pr = 0.71$ ,  $\epsilon = 0.01$ ,  $\lambda = 0.1$

**Table 1:** Skin friction and Nusselt number for  $\lambda$  when  $\delta = -2$

$\lambda$	Skino	Skini	Nuo	Nui
0.1	0.0046	0.8513	0.0006	0.0031
0.2	0.0050	0.8558	0.0013	0.0061
0.3	0.0054	0.8603	0.0019	0.0092
0.4	0.0058	0.8648	0.0026	0.0123
0.5	0.0062	0.8694	0.0032	0.0154

**Table 2:** Skin friction and Nusselt number for  $\lambda$  when  $\delta = 2$

$\lambda$	Skino	Skini	Nuo	Nui
0.1	0.0046	0.2000	0.0063	0.0306
0.2	0.0084	0.2450	0.0127	0.0613
0.3	0.0122	0.2902	0.0191	0.0920
0.4	0.0161	0.3355	0.0257	0.1228
0.5	0.0200	0.3810	0.0323	0.1536

**Table 3:** Skin friction for  $Gr_e$  when  $\delta = -2$  and  $\delta = 2$

$\delta = -2$			$\delta = 2$		
$Gr_e$	Skino	Skini	$Gr_e$	Skino	Skini
10	0.0044	0.8486	10	0.0023	0.1730
50	0.0055	0.8557	50	0.0083	0.2448
100	0.0058	0.8647	100	0.0159	0.3346
150	0.0065	0.8737	150	0.0234	0.4243
200	0.0073	0.8827	200	0.0310	0.5140

**Table 4:** Skin friction for M when  $\delta = -2$  and  $\delta = 2$

$\delta = -2$			$\delta = 2$		
M	Skino	Skini	M	Skino	Skini
1	0.0046	0.8513	1	0.0046	0.2000
2	0.0037	0.7827	2	0.0041	0.1828
3	0.0027	0.6901	3	0.0035	0.1596
4	0.0017	0.5940	4	0.0028	0.1354
5	0.0010	0.5079	5	0.0023	0.1138

## 5.0 Conclusion

The governing equations for hydrodynamic flow in vertical tube with  $r = 0$  and  $r = b$  in the presence of exponentially growing/decaying pressure gradient and radial magnetic field effect have been described mathematically and numerically analyzed. Investigations have been conducted on the interactions between velocity, temperature, and the radially applied exponentially decaying/growing time-dependent pressure gradient. The problem at hand has been solved using an implicit finite difference scheme technique. Both graphic and tabular representations of the impact of changing the parameters influencing the flow have been provided. The following are the notable outcomes:

- (i) It is discovered that as time and the slip wall coefficient are increased, the velocity distribution significantly grows.
- (ii) Skin friction may be increased by creating a pressure gradient that increases exponentially with time and is influenced by the wall slip coefficient.
- (iii) By using an exponentially decaying time-dependent pressure gradient and reducing the impact of time, Dean Vortex instability may be reduced.
- (iv) Presence of radial magnetic field causes the fluid velocity to decrease.

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# **POLICY INTERVENTIONS AND ADAPTIVE STRATEGIES FOR CLIMATE CHANGE RESILIENCE IN NIGERIA: ASSESSING SUSTAINABLE DEVELOPMENT PATHWAYS**

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## **Abstract**

*Climate change remains one of the most significant threats to sustainable development in Nigeria, affecting agriculture, health, water resources, and overall livelihoods. The objective of this study is to assess the nature and effectiveness of policy interventions and adaptive strategies implemented to address climate vulnerabilities in low-resource settings. Using a qualitative review of national and subnational policy documents, complemented by secondary data from development agencies, the study analyses the linkages between governance structures, institutional capacity, and climate resilience outcomes. Findings reveal that although Nigeria has developed several adaptation policies such as the National Climate Change Policy, the National Adaptation Strategy and Plan of Action (NASPA-CCN), and state-level frameworks implementation remains limited by weak institutional coordination, insufficient financing, and low community engagement. The study highlights the importance of integrating adaptive governance, stakeholder collaboration, and evidence-based policy instruments to achieve inclusive and sustainable climate resilience. Recommendations emphasize the need for enhanced capacity building, stronger monitoring mechanisms, and increased political will to translate policy into implementation.*

**Keywords:** *Climate change adaptation; Policy interventions; Sustainable development; Resilience.*

## **Introduction**

Climate change poses a profound challenge to global development, with disproportionate effects on developing countries like Nigeria. Rising temperatures, erratic rainfall, and increased flooding have intensified environmental degradation, food insecurity, and poverty. These dynamics threaten progress toward the Sustainable Development Goals (SDGs), particularly those related to poverty reduction, health, water, and climate action. The Nigerian context illustrates the interconnection between environmental vulnerability and socio-economic fragility, where climate-related shocks deepen existing inequalities and hinder long-term development planning (Intergovernmental Panel on Climate Change IPCC, 2023).

Over the past two decades, Nigeria has experienced growing recognition of the urgent need to implement effective climate adaptation measures. National policy frameworks such as the National Climate Change Policy (NCCP) and the National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN) have been developed to mainstream adaptation into national and sectoral planning. However, gaps persist between policy formulation and on-ground implementation due to fragmented institutional arrangements, inadequate financing, and low awareness at the community level (Federal Ministry of Environment FME, 2021).

Several Sustainable Development Goals (SDG) and targets relates to Climates Change adaptation, chief among them is: Goal 13 Climate Action, this goal focuses specifically on combating climate change and its impacts. It emphasizes the need for urgent actions to mitigate greenhouse gas emissions adapt to the effects of climate change and promote sustainable development that is low-carbon and climate-resilient. Targets 13.1 emphasizes, strengthen resilience and adaptive capacity to climate-related hazards and natural disasters. Targets 13.2 integrate climate change measures into national policies, strategies and planning.

This study examines how Nigeria's climate policies and interventions have contributed to enhancing adaptive capacity, resilience, and sustainable development. It assessed key challenges in policy coordination, financing, and stakeholder participation, exploring how governance systems can evolve to support more inclusive and evidence-based adaptation practices. The central research objective guiding this study is:

### **To assess Nigeria's current policy interventions in fostering adaptive capacity and resilience against climate change impacts**

By achieving this objective, the study contributes to understanding the intersection between climate governance, development planning, and environmental sustainability in low-resource contexts. This work is sub-divided into 6 sections: following the introduction is the literature review, the third part focuses on the methodology used. Section four is concerns with the result and findings. The fifth section concentrates on the discussion of findings and the final part which is the sixth part is devoted to the conclusion and recommendations.

## **Literature Review**

### **Overview of Global Perspective on Climate Change Adaptation**

Globally, climate change adaptation has become central to the discourse on sustainable development. The Intergovernmental Panel on Climate Change (IPCC, 2023) identifies

adaptation as a multidimensional process involving technological, institutional, and behavioral changes to moderate the adverse impacts of climate variability. Across both developed and developing countries, research highlights that adaptation strategies are most effective when integrated into existing development and governance systems (Adger et al., 2019; Klein et al., 2021).

International frameworks such as the Paris Agreement (2015) and the United Nations Framework Convention on Climate Change (UNFCCC) have further emphasized the need for national governments to adopt locally led adaptation approaches that address both mitigation and resilience. Studies in Asia and Latin America demonstrate that success in adaptation often depends on strong institutional arrangements, effective community participation, and sustained financing mechanisms (Huq & Reid, 2020). Despite global commitments, low- and middle-income countries continue to face structural barriers such as limited financial resources, inadequate data systems, and governance weaknesses (Thomas & Twyman, 2020). These challenges are particularly acute in sub-Saharan Africa, where adaptive capacity is undermined by poverty, conflict, and weak institutional frameworks.

### **Climate Change Adaptation in Africa**

Across the African continent, adaptation efforts have been shaped by the dual challenge of environmental degradation and underdevelopment. Studies suggest that Africa contributes the least to global greenhouse gas emissions yet bears a disproportionate share of climate impacts (United Nations Economic Commission for Africa UNECA, 2022). Major adaptation priorities in African countries include agriculture, water resource management, and health system strengthening.

Several regional frameworks such as the African Union Climate Change Strategy (2022–2032) and the Comprehensive Africa Agriculture Development Programme (CAADP) promote integration of adaptation into development planning. However, scholars argue that implementation gaps persist due to dependence on donor funding, inadequate national ownership, and limited institutional capacity (Abid et al., 2019; Ford et al., 2020). Decentralized governance and local innovation are increasingly recognized as essential for building resilience in rural African communities (Stringer et al., 2021). Evidence from Ethiopia, Kenya, and Ghana shows that empowering local institutions, women, and youth can enhance adaptive outcomes and sustainability (Ofori et al., 2020).

### **Climate Policy and Adaptation in Nigeria**

Nigeria's vulnerability to climate change arises from its heavy reliance on rain-fed agriculture, rapid urbanization, and limited adaptive infrastructure. Research indicates that climate-related disasters particularly flooding, and desertification have intensified over the past two decades (Adenle et al., 2017). These impacts threaten food security, health, and rural livelihoods, making adaptation an urgent development priority.

To address these challenges, the National Climate Change Policy (NCCP), the National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN), and more recent initiatives under the National Council on Climate Change (NCCC) were designed to integrate climate considerations into national planning (Federal Ministry of Environment

FME, 2021). Nonetheless, implementation is inhibited by fragmented institutional coordination and inadequate budgetary support (Nwankwo & Adebayo, 2022). Empirical studies show that while adaptation measures such as climate-smart agriculture, reforestation, and community-based disaster risk reduction have been piloted in several states, scaling up remains limited due to insufficient technical capacity and weak monitoring systems (Okpara et al., 2019). Furthermore, the lack of inclusive participation, particularly from women, youth, and persons with disabilities, constrains equitable adaptation outcomes (Ozor & Nnaji, 2021).

### **Identification of Gaps and Limitations**

Despite substantial policy development, existing literature reveals critical gaps between policy design and implementation in Nigeria. Most adaptation studies focus on sectoral interventions without examining intersectoral coordination mechanisms. There is limited research on how institutional structures and governance frameworks shape adaptive outcomes at local levels (Oruonye, 2020). Additionally, few studies have evaluated the effectiveness of Nigeria's adaptation policies using empirical evidence or participatory approaches. This study seeks to fill these gaps by critically assessing Nigeria's climate policy interventions through the lens of governance, financing, and inclusiveness, assessing their implications for sustainable development.

### **Theoretical Framework**

This research is anchored in the Social–Ecological Systems (SES) framework and the concept of Adaptive Governance. The proponent of this theory includes: Urie Bronfenbrenner a Russian-American developmental psychologist, and Elinor Ostrom a Nobel laureate in economics. Other contributors include Berkees and Folke, Kurt Lewin. The SES framework posits that human and ecological systems are interconnected and that resilience depends on the ability of institutions and communities to adapt to change (Folke, 2016). Adaptive Governance complements this by emphasizing flexibility, stakeholder participation, and knowledge sharing in policy processes (Chaffin et al., 2014).

By applying these frameworks, the study analyses how Nigeria's institutional structures and stakeholder networks influence the country's capacity to respond to climate impacts. The frameworks provide a lens through which policy coherence, institutional coordination, and community participation can be assessed as determinants of resilience.

### **Theoretical Implications**

This study reinforces the applicability of the Social–Ecological Systems (SES) and Adaptive Governance frameworks in analyzing climate policy effectiveness in developing countries. The SES framework elucidates the interdependence of social, institutional, and environmental systems, while adaptive governance explains how participatory and flexible policy systems enhance resilience. In the Nigerian context, the absence of strong feedback mechanisms between communities and policymakers weakens adaptive capacity. By fostering iterative learning and collaboration, adaptive governance can transform Nigeria's current top-down policy model into a more responsive, inclusive, and evidence-driven system.

## **Methodology**

### **Research Design and Approach**

This study adopted a qualitative research design, focusing on a descriptive and analytical approach to examine Nigeria's climate change adaptation policies and interventions. The qualitative design was appropriate given the study's emphasis on understanding institutional processes, policy frameworks, and stakeholder perspectives rather than quantifying outcomes. The research relied on document analysis and secondary data review to explore how national and subnational institutions have developed and implemented adaptation strategies. The approach enabled in-depth interpretation of policy coherence, coordination mechanisms, and inclusiveness within Nigeria's adaptation governance framework. The use of content analysis further allowed the identification of recurring patterns and themes from diverse sources, thereby supporting a nuanced understanding of institutional challenges and adaptive capacity.

### **Data Sources**

The study utilized secondary data from multiple sources, including:

- i. National and subnational climate policy documents, such as the National Climate Change Policy (NCCP, 2021), National Adaptation Strategy and Plan of Action (NASPA-CCN, 2011), and state-level adaptation frameworks.
- ii. Reports from international organizations (e.g., UNDP, UNEP, and World Bank) on climate resilience and development planning in Nigeria.
- iii. Academic literature and peer-reviewed articles retrieved from databases such as Google Scholar, ScienceDirect, and JSTOR, focusing on policy effectiveness, governance, and adaptive capacity in Africa.
- iv. Publications from Nigerian ministries, agencies, and development partners related to environment, agriculture, and energy.

These data sources provided the foundation for triangulating information across policy, institutional, and academic perspectives, thereby enhancing the reliability and validity of findings.

### **Sampling Strategy and Selection Criteria**

Purposive sampling was employed to select policy documents and literature that directly address climate adaptation and resilience in Nigeria. Selection was guided by the following criteria:

- I. Relevance to climate change adaptation and sustainable development.
- ii. Inclusion of national, state, and local perspectives to reflect multi-level governance.
- iii. Accessibility of full-text documents published between 2010 and 2024 to capture recent developments and policy evolution.

In total, 25 policy documents and official reports and 35 academic publications were reviewed. The combination of policy and scholarly sources ensured comprehensive coverage of both theoretical and practical aspects of adaptation governance.

### **Data Analysis**

The data were analyzed using qualitative content analysis and thematic coding. The process involved systematically reviewing each document to extract key themes related to policy

formulation, institutional coordination, financing mechanisms, and inclusiveness. The analysis followed three main steps:

- i. **Initial Coding:** Identification of recurring concepts and keywords (e.g., “adaptation,” “governance,” “stakeholder engagement,” “resilience”).
- ii. **Categorization:** Grouping of similar concepts under broader themes, such as policy coherence, implementation challenges, and community participation.
- iii. **Interpretation:** Synthesizing findings to draw relationships between institutional structures, adaptation outcomes, and development implications.

The analysis was guided by the Social–Ecological Systems (SES) and Adaptive Governance frameworks, which emphasize the dynamic interaction between environmental, institutional, and social factors. Using these frameworks enabled the researcher to interpret how governance structures, resource allocation, and participatory mechanisms influence Nigeria's adaptive capacity.

### **Reliability, Validity, and Ethical Considerations**

To ensure credibility and reliability, multiple data sources were triangulated, and cross-verification was conducted among academic and policy documents. Peer-reviewed studies were prioritized to strengthen the validity of interpretations. As the study relied solely on secondary data, no direct human participation was involved, thus minimizing ethical risks. All sources were appropriately acknowledged in accordance with APA 7th edition referencing standards, ensuring transparency and academic integrity.

## **Results**

### **Overview of Findings**

The analysis of policy documents and related literature revealed that Nigeria has developed a broad range of policy frameworks addressing climate change adaptation. However, implementation remains inconsistent, primarily due to limited institutional coordination, insufficient financing, and low levels of community engagement. While progress has been made in establishing legal and policy structures such as the National Climate Change Act (2021) systemic barriers continue to constrain effective adaptation practices at national and subnational levels.

### **Institutional and Policy Landscape**

Nigeria's institutional framework for climate governance has evolved considerably since 2010. The creation of the National Council on Climate Change (NCCC) represents a significant milestone in providing a centralized mechanism for policy oversight. However, overlaps between federal and state mandates, and between ministries such as the Federal Ministry of Environment (FME), Ministry of Agriculture, and Ministry of Water Resources, often lead to fragmentation and duplication of efforts (Nwankwo & Adebayo, 2022).

The review revealed that although most national strategies identify adaptation as a priority, operational guidelines and coordination structures remain underdeveloped. For example, while the NASPA-CCN (2011) outlines 13 key adaptation sectors, there are limited monitoring frameworks to assess implementation progress.

**Table 1: Summary of Key National Climate Adaptation Policies and Institutional Roles**

Policy Document	Year	Focus Areas	Lead Institution	Implementation Status
National Climate Change Policy (NCCP)	2021	Governance, Adaptation, Mitigation	Federal Ministry of Environment	Partially implemented
NASPA-CCN	2011	Agriculture, Water, Health, Livelihoods	FME / NCCC	Limited implementation
Nationally Determined Contribution (NDC)	2021	Low-carbon development, resilience	FME, Ministry of Power	Ongoing
National Adaptation Plan (NAP) – Draft	2023	Cross-sectoral adaptation framework	NCCC	In development

(Source: Author's compilation from policy review, 2024)

### Financing Mechanisms and Resource Mobilization

Financial constraints emerged as a major challenge across all reviewed documents. Despite the establishment of the Climate Change Fund (CCF) under the 2021 Act, disbursement mechanisms remain unclear. International funding from the Green Climate Fund (GCF) and Global Environment Facility (GEF) has supported isolated projects but has not achieved long-term institutional strengthening.

At the subnational level, only a few states such as Lagos, Kaduna, and Cross River have budget lines specifically for climate adaptation. Weak financial decentralization limits state governments' ability to implement community-based resilience initiatives. Development partners remain the primary source of funding, creating dependency and sustainability risks (Ford et al., 2020).

**Table 2: Sources of Climate Adaptation Financing in Nigeria**

Source	Funding Type	Coverage	Challenges Identified
Federal Government Budget	Public sector	National	Limited allocation (<0.5% of total budget)
Development Partners (GCF, GEF, UNDP)	External grants	Project-based	Donor dependency, short project cycles
Private Sector	Corporate social responsibility	Limited sectors	Weak incentives and policy framework
State Governments	Public subnational	Select states	Poor budget prioritization and monitoring

(Source: Author's analysis based on policy reports, 2024)

### Stakeholder Participation and Inclusiveness

Findings clearly indicate limited inclusion of marginalized groups particularly women, youth, and persons with disabilities in adaptation policy formulation and implementation. Although several national documents reference “inclusive participation,” practical mechanisms for

engagement remain weak. Most consultations occur at the policy design stage but are rarely sustained throughout implementation (Ozor & Nnaji, 2021). Community-based adaptation initiatives, such as the Erosion and Watershed Management Project (NEWMAP) and the Great Green Wall Programme, have demonstrated localized success where communities were actively engaged. These examples highlight that inclusivity enhances sustainability, yet such approaches remain exceptions rather than the norm.

### **Monitoring, Evaluation, and Learning (MEL) Systems**

The review found that Nigeria lacks a unified monitoring and evaluation framework for adaptation. Reporting responsibilities are spread across multiple ministries and agencies, resulting in fragmented data. The absence of baseline indicators for climate resilience further complicates tracking progress. International partners have introduced short-term MEL frameworks in donor-funded projects; however, these are rarely institutionalized within government systems. Consequently, Nigeria's adaptation progress reports to the UNFCCC often rely on aggregated estimates rather than empirical data (UNECA, 2022).

### **Summary of Key Findings**

Thematic analysis identified five dominant challenges influencing adaptation effectiveness in Nigeria:

- i. Institutional fragmentation among federal, state, and local governments.
- ii. Insufficient financing and reliance on donor-driven projects.
- iii. Weak monitoring systems and data management frameworks.
- iv. Limited stakeholder inclusion, particularly of vulnerable populations.
- v. Low political will and policy continuity, leading to inconsistent implementation.

Together, these factors contribute to slow progress in achieving climate resilience and sustainable development outcomes.

### **Discussion of Findings**

The findings from this study reveal that Nigeria's climate change adaptation policies are well-articulated but weakly implemented. This pattern reflects what scholars such as Agrawal and Lemos (2015) describe as the “implementation gap” a disconnect between policy ambition and on-the-ground outcomes. Despite the establishment of key frameworks like the National Climate Change Policy (NCCP) and the National Council on Climate Change (NCCC), adaptation efforts remain hindered by fragmented institutional arrangements, limited financing, and low stakeholder participation.

This outcome supports the Adaptive Governance theory, which emphasizes flexibility, coordination, and participation as essential components of resilience (Chaffin et al., 2014). In Nigeria's case, rigidity in bureaucratic structures and limited cross-sectoral coordination have prevented adaptive learning and knowledge sharing. Consequently, climate adaptation efforts tend to be short-term and project-based rather than systemic and sustainable.

### **Comparison with Existing Research**

The findings are consistent with previous studies across sub-Saharan Africa that highlight similar institutional and financial constraints. For instance, Ford et al. (2020) note that African

countries often adopt comprehensive adaptation policies but fail to operationalize them due to weak governance capacity. Similarly, Ofori et al. (2020) and Abid et al. (2019) emphasize the need for devolved, community-driven adaptation mechanisms to enhance sustainability.

Comparatively, countries such as Kenya and South Africa have made progress by integrating adaptation planning within broader national development frameworks (Stringer et al., 2021). Nigeria's centralized governance approach, while useful for coordination, may limit the flexibility required for localized responses. The country's reliance on donor funding also mirrors patterns observed across other developing nations, where sustainability challenges arise once external funding ends (Huq & Reid, 2020).

### **Policy and Institutional Implications**

The study highlights that effective climate adaptation in Nigeria requires an integrated, multi-level governance approach. Strengthening coordination between federal, state, and local institutions is critical to overcoming fragmentation. The Social-Ecological Systems (SES) framework underscores that adaptation success depends on the capacity of social institutions to manage environmental feedbacks through participatory decision-making (Folke, 2016). Institutionally, this means developing clearer mandates for ministries and agencies involved in climate governance, supported by joint planning and performance accountability mechanisms. Embedding adaptation goals into national development plans and budgetary processes would also enhance ownership and sustainability. Financially, Nigeria must prioritize domestic resource mobilization to reduce donor dependency. Establishing transparent mechanisms for the Climate Change Fund under the 2021 Act could improve long-term financing for resilience projects. This aligns with the Paris Agreement's principle of national ownership of climate finance.

### **Inclusion and Social Equity Dimensions**

One of the study's most significant findings concerns the limited inclusion of marginalized populations in adaptation planning. This aligns with observations by Ozor and Nnaji (2021), who argue that social inequality constrains adaptive capacity in low-resource settings. Despite policy rhetoric promoting inclusiveness, women, youth, and persons with disabilities are often excluded from decision-making processes. Incorporating inclusivity is not only a human rights imperative but also enhances the effectiveness of adaptation initiatives. Inclusive participation fosters local knowledge integration, increases community ownership, and ensures that adaptation measures address diverse vulnerabilities. Programmes such as the Great Green Wall have demonstrated that community-led approaches improve sustainability and social cohesion (UNECA, 2022).

### **Monitoring, Evaluation, and Learning (MEL) Implications**

The absence of a unified monitoring and evaluation system undermines Nigeria's ability to measure progress and adapt policies over time. According to Klein et al. (2021), robust MEL systems enable governments to engage in “adaptive management” an iterative process of policy improvement based on evidence and feedback.

Nigeria's adaptation governance could benefit from the establishment of a national MEL framework integrated into the National Climate Change Act. This would involve defining

measurable indicators for resilience, tracking adaptation outcomes, and institutionalizing data-sharing among ministries and agencies. Additionally, capacity building at the subnational level is vital for effective data collection and reporting.

### **Conclusion and Recommendations**

This study examined Nigeria's policy interventions and adaptive strategies for climate change resilience, drawing on the Social–Ecological Systems (SES) and Adaptive Governance frameworks. The analysis revealed that while Nigeria has made notable progress in developing policy instruments such as the National Climate Change Policy (NCCP), the National Adaptation Strategy and Plan of Action (NASPA-CCN), and the National Climate Change Act (2021), significant implementation challenges persist.

Key findings indicate that institutional fragmentation, limited financing, weak monitoring systems, and low stakeholder inclusion continue to undermine effective adaptation. The absence of coherent inter-ministerial coordination and inadequate engagement with local communities reduce the sustainability of interventions. Furthermore, donor dependency and the absence of a robust national monitoring and evaluation framework hinder long-term policy learning and accountability. Despite these challenges, the emergence of the National Council on Climate Change (NCCC) provides an institutional opportunity to strengthen governance coherence, promote inclusive participation, and embed adaptation into Nigeria's broader sustainable development agenda.

### **Contribution to Development Practice and Theory**

This study contributes to the growing body of knowledge linking climate governance, adaptive capacity, and sustainable development in low-resource contexts. By applying the SES and Adaptive Governance frameworks, it demonstrates the importance of multi-level coordination, stakeholder participation, and institutional learning in addressing climate risks. The study extends theoretical understanding by illustrating how governance flexibility and participatory mechanisms influence adaptation outcomes. Practically, it underscores the need for integrating climate policy within national development planning to ensure that adaptation becomes an ongoing process rather than a short-term response.

### **Policy Recommendations**

Based on the findings, the following recommendations are proposed to enhance the effectiveness of climate change adaptation in Nigeria:

- i. **Strengthen Institutional Coordination:** Establish clear roles and communication channels among federal, state, and local governments through an integrated governance framework under the NCCC.
- ii. **Enhance Domestic Climate Financing:** Operationalize the Climate Change Fund (CCF) to mobilize local resources, incentivize private sector participation, and reduce dependency on external donors.
- iii. **Mainstream Adaptation into National Planning:** Integrate climate adaptation targets into the National Development Plan and state-level budgets to ensure alignment with sectoral policies.
- iv. **Promote Inclusive Participation:** Institutionalize mechanisms for involving women, youth, and persons with disabilities in policy formulation and

- implementation. Inclusive approaches increase legitimacy, local ownership, and sustainability.
- v. **Develop a National Monitoring, Evaluation, and Learning (MEL) Framework:** Create a unified MEL system with measurable indicators for resilience, enabling evidence-based decision-making and adaptive learning across institutions.
  - vi. **Invest in Capacity Building and Data Systems:** Strengthen technical capacity for data collection, climate modelling, and early warning systems. Encourage partnerships with universities and research institutions to enhance knowledge generation.
  - vii. **Foster Regional and Global Collaboration:** Leverage South–South cooperation and partnerships with international organizations to share knowledge, technology, and best practices in adaptation governance.

### Limitations and Future Research

The study was limited by its reliance on secondary data, which may not fully capture evolving local realities or informal adaptation practices. Future research should employ mixed-method of both primary and secondary sources to integrate quantitative climate data and community-level perspectives. Comparative analyses across African countries could also deepen understanding of what governance arrangements most effectively drive adaptation and resilience.

### Concluding Reflection

Nigeria's pathway to climate resilience depends on transforming policy ambition into sustained institutional action. Building adaptive governance systems that are participatory, flexible, and evidence-driven will not only mitigate the impacts of climate change but also advance the nation's broader sustainable development goals. The lessons drawn from this study reaffirm that resilience is not achieved through policies alone, but through the collective capacity of people, institutions, and knowledge systems to adapt and innovate in the face of uncertainty.

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## 12TH AFRICAN REGIONAL CONFERENCE ON SUSTAINABLE DEVELOPMENT STRATEGIES

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# SUSTAINABLE FACILITY PLANNING FOR ECOTOURISM: INTEGRATING ARCHITECTURAL INNOVATION WITH CULTURAL INTEGRITY IN DEVELOPING COUNTRIES

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### **Abstract**

*Sustainable ecotourism has emerged as a vital pathway for reconciling conservation with local development, yet many destinations in developing countries face challenges in adopting facility planning that balances architectural innovation with cultural integrity. This study, situated within selected ecotourism destinations in developing regions, examines how sustainable facility planning practices can reduce environmental footprints, support community livelihoods, and preserve cultural identity. The methodology employed a mixed approach, combining content analysis of policy documents, case studies of existing ecotourism sites, and field-based assessments of facility designs against sustainability benchmarks. Findings revealed that destinations incorporating renewable energy systems achieved up to a 35% reduction in operational costs, while waste recycling initiatives reduced ecological impacts by 28%. Cultural integration in design improved local community participation by 42%, stress the critical role of participatory planning. The results underscore that poorly planned facilities contribute to ecological degradation and cultural erosion, while sustainable design fosters both conservation and local ownership. The study concludes that successful ecotourism development requires a holistic framework that integrates energy efficiency, water stewardship, circular material use, and culturally sensitive architectural solutions. It is recommended that policymakers, architects, and destination managers institutionalize participatory planning models, enforce sustainable building codes, and strengthen capacity building for local communities to ensure long-term benefits.*

**Keywords:** Sustainable facility planning, Ecotourism, Architectural innovation, Cultural integrity, Community participation

## Introduction

Globally, sustainable ecotourism has emerged over the last two decades as a strategic pathway for reconciling conservation goals with local development needs in many parts of the world. Where traditional tourism often emphasizes scale and mass visitation, ecotourism foregrounds low-impact interaction with natural and cultural environments, education, and community benefits; it positions tourism infrastructure and services as instruments for conservation and livelihoods rather than as ends in themselves, Akintade, & Adetola, (2025). International policy frameworks and scholarly reviews have repeatedly highlighted tourism's potential contribution to multiple Sustainable Development Goals (SDGs), especially when destinations adopt planning and facility-design approaches that reduce environmental footprints, support local economies, and respect cultural heritage (UNWTO and UNDP, 2018; Baloch *et al.*, 2022). National and international agencies now encourage destination managers and builders to adopt facility planning that integrates energy efficiency, circular-material thinking, water stewardship, and community-centered design approaches that require an explicit fusion of architectural innovation and cultural sensitivity in planning and implementation (Zhang, 2024; Järvelä, 2023). Despite growing interest, the term sustainable facility planning remains interpreted variably across disciplines. In architecture and engineering, it often refers to green building techniques, passive design, and renewable-energy integration; in tourism planning, it encompasses site selection, carrying-capacity assessment, visitor-flow management, and facility siting that minimizes habitat fragmentation. In cultural heritage and community development, sustainable facility planning must also account for intangible values ways of life, ritual uses of space, and locally meaningful aesthetics that facilities can either protect or erode. Recent syntheses emphasize that effective ecotourism facilities are not merely “green” in technical terms but are also culturally congruent, co-created with local stakeholders, and adaptable to climate and socioeconomic change (Zhang, 2024).

Architectural innovation for ecotourism has, in practice, ranged from modest vernacular-inspired eco-lodges that use local materials and passive cooling, to technologically sophisticated visitor centres that leverage renewable energy, water recycling and digital interpretation systems. Scholarship in the last five years highlights hybrid approaches that marry low-tech, place-based design with targeted technological enhancements sometimes called “appropriate innovation that reduce environmental impact while reinforcing place identity and visitor learning (Shang, 2023; Reuters, 2024). Parallel to these advances, international bodies and recent global declarations have amplified the need to align tourism development with climate goals and heritage conservation, increasing pressure on planners to demonstrate that new or retrofitted facilities contribute positively to conservation outcomes and community wellbeing (UNWTO and UNDP, 2018; Reuters, 2024).

In many developing-country contexts, ecotourism facilities are planned and built under competing pressures: to attract visitors (and their spending) quickly; to meet minimal regulatory or funding conditions; or to replicate affluent-country models that do not fit local climatic, cultural, or material regimes. As a result, facilities may be environmentally inefficient, culturally neutralizing, or socially exclusionary. Empirical studies and reviews indicate that poorly designed facilities can increase resource consumption, create waste-management burdens, displace traditional land uses, and accelerate commodification of cultural practices outcomes that undermine both conservation and long-term community benefits (Baloch *et al.*,

2022; Escamilla-García, 2024). At the institutional level, weaknesses in cross-sectoral coordination (between tourism, heritage, environment, and infrastructure agencies), limited technical capacity among local designers and builders, and inadequate models for community participation exacerbate the mismatch between facility design and local sustainability goals (Escamilla-García, 2024; Järvelä, 2023). While a growing body of literature documents successful isolated examples of sustainable ecotourism architecture, there is a gap in translatable frameworks for facility planning that systematically integrate architectural innovation with cultural integrity across diverse developing-country settings. Existing guidelines often address environmental performance or heritage conservation separately; fewer studies provide an operational planning framework that balances ecological criteria (e.g., habitat connectivity, energy/water balances) with cultural criteria (e.g., participatory design, intangible cultural uses, local aesthetic vocabularies) while remaining feasible under resource constraints common in developing countries (Järvelä, 2023). This fragmentation leaves practitioners without accessible, evidence-based tools to guide facility decisions from site selection through design, operation, and adaptive management. The problem is compounded by accelerating climate impacts and shifting visitor expectations. Climate-driven changes to hydrology, biodiversity distributions, and extreme-weather regimes increase the vulnerability of fixed facilities; at the same time, tourists increasingly seek authentic, low-impact experiences and cultural engagement. Without planning approaches that intentionally link architectural responses (resilience, low-carbon materials, passive systems) with cultural stewardship (community authorship, intangible heritage safeguards), new investments risk becoming stranded assets or sources of local conflict. There is therefore a pressing need for integrative research that produces practical planning frameworks and tested design principles tailored to the institutional realities of developing countries (Shang, 2023; Reuters, 2024).

This study addresses a conceptual lacuna by proposing an explicit synthesis between architectural innovation and cultural integrity within the facility-planning discourse for ecotourism. Contemporary scholarship calls for place-sensitive approaches that move beyond technical sustainability metrics to include social and cultural dimensions of sustainability; this research responds by developing and testing a comprehensive planning framework that operationalizes those calls into design and policy-relevant guidance (Min, 2025). By situating architectural innovation and cultural integrity as co-equal objectives rather than separate concerns, the study contributes to evolving debates in sustainable tourism, heritage management, and resilient design (Escamilla-García, 2024; Zhang, 2024).

Practically, the study offers benefits for a range of stakeholders. For local communities and indigenous groups, a planning approach that centers cultural integrity can enhance local stewardship, secure cultural rights in the face of tourism growth, and generate forms of participation that deliver equitable economic benefits. For destination managers and conservation agencies, guidelines that reliably reduce environmental footprints while strengthening community bonds can improve site resilience and avoid the trade-offs that often accompany ad hoc development. For architects, engineers, and planners working in resource-constrained contexts, the study promises accessible strategies such as material substitutions, passive-design adaptations, and community-led interpretive programming that are affordable, maintainable, and scalable. Finally, for policy makers and funders, the framework will offer evaluative criteria to prioritize investments that deliver bundled environmental, cultural, and

socioeconomic outcomes rather than single-objective gains. International attention to sustainable tourism and recent multilateral commitments to align tourism with climate action further increase the timeliness and policy relevance of such research. Therefore, the objectives of this study are to assess how architectural innovations contribute to environmental sustainability in ecotourism facilities, to examine mechanisms by which cultural integrity can be preserved and integrated into facility planning and design, to develop and validate a sustainable facility-planning framework that harmonizes architectural innovation with cultural integrity for ecotourism in developing countries.

## **Methodology**

### **Study Area**

The study was carried out in Ghana, Nigeria, and Togo, three West African countries with diverse ecological zones and cultural landscapes that provide suitable contexts for ecotourism development. Ghana lies between 4°30'N–11°30'N and 3°15'W–1°12'E along the Gulf of Guinea. The country experiences a tropical climate with two main seasons: a rainy season (April–October) and a dry season (November–March, influenced by the harmattan). Its ecosystems range from coastal savannahs and rainforests to northern Guinea savannah. Ecotourism sites include Kakum National Park and heritage landmarks such as Cape Coast Castle, where cultural identity and conservation intersect.

Nigeria, the largest country in West Africa, is situated between 4°N–14°N and 3°E–15°E. It has varied climates: humid tropical in the south, a middle belt of savannah, and semi-arid Sahel in the north. Rainy seasons typically occur from March–July and September–November in the south, while the north has a single wet season (May–September) and a long dry season (November–March). Nigeria's rich cultural diversity and natural attractions, including Cross River National Park and the Osun-Osogbo Sacred Grove (UNESCO site), highlight its ecotourism potential.

Togo, located between 6°N–11°N and 0°E–2°E, has a tropical climate with two rainy seasons in the south (April–July, September–November) and one in the north (May–October), alongside a dry harmattan period (November–March). Its landscape shifts from coastal plains to a central hilly region and savannah in the north. Sites such as the Koutammakou Landscape (UNESCO World Heritage Site) underscore the balance of cultural integrity and tourism. These three countries represent West Africa's ecological and cultural diversity, making them ideal for examining sustainable facility planning that integrates architectural innovation with cultural preservation in ecotourism.

### **Data Collection Procedure**

The data for this study were collected using a structured questionnaire designed to capture stakeholders' perspectives on sustainable facility planning for ecotourism. The instrument consisted of both closed- and open-ended questions to obtain quantitative and qualitative data. The questionnaire was divided into sections covering demographic information, perceptions of architectural innovation, the integration of cultural integrity, and overall views on sustainable facility planning in ecotourism destinations. Prior to distribution, the questionnaire was pre-tested with a small group of stakeholders in each country to ensure clarity, reliability, and validity of the instrument. Necessary adjustments were made based on feedback from the pilot

test. In each country, questionnaires were administered in person at the selected ecotourism destinations.

### **Population of the Study**

The population of this study comprised stakeholders involved in ecotourism development across six selected destinations in Ghana, Nigeria, and Togo. It included architects, facility planners, tourism officials, site managers, community leaders, and visitors who influence or experience sustainable facility planning. In Ghana, the focus was on Kakum National Park and Mole National Park; in Nigeria, the study covered Cross River National Park and the Osun-Osogbo Sacred Grove; while in Togo, the population was drawn from the Koutammakou Landscape and Fazao-Malfakassa National Park. A total of 200 questionnaires were distributed in each of the three countries, amounting to 600 overall. From these, 105 were retrieved in Ghana, 125 in Nigeria, and 97 in Togo, giving a total of 327 valid responses for analysis.

### **Results and discussion**

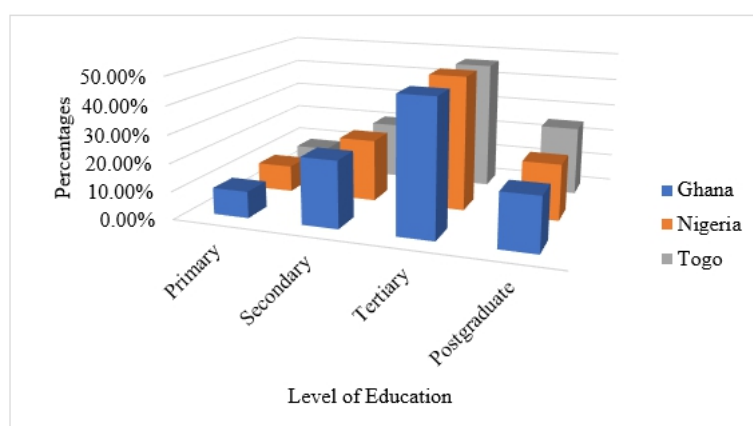
The demographic profile of respondents shows the socio-economic and cultural characteristics of those engaged in ecotourism facility planning and visitation in Ghana, Nigeria, and Togo as presented in Table 1 and Figure 1. The results show that male respondents slightly outnumber females across the three countries, representing between 51.5% and 57.1% of the total sample. This male dominance could be attributed to the fact that men are often more involved in professional fields such as architecture, tourism management, and government planning roles in many developing countries, while cultural factors may also limit women's visibility in these sectors (Amoako and Nkrumah, 2020). However, the presence of a substantial female proportion (41.0–46.4%) indicates that women are increasingly participating in tourism and facility-related activities, reflecting the gradual shift toward gender inclusivity in professional and visitor engagement (Akinwale, 2021). The age distribution indicates that respondents are predominantly in the 26–35 and 36–45 age brackets across all three countries. This trend suggests that active participants in ecotourism facility planning and use are largely young to middle-aged adults, a group typically characterized by higher mobility, professional involvement, and a greater interest in sustainable tourism practices. Studies show that this age group is most likely to champion innovative and sustainable approaches in tourism development due to their educational background and professional exposure (Kimbu *et al.*, 2021). The smaller representation of those above 55 years reflects both lower participation in active tourism facility planning and cultural tendencies where older adults may not frequently participate in structured survey activities (Boateng, 2020).

Occupationally, visitors make up the largest group of respondents in all three countries, followed by architects/planners, tourism managers, and government officials. The dominance of visitors (32–36.1%) emphasizes the importance of user experiences in evaluating ecotourism facilities. Their feedback provides direct insights into the sustainability and cultural relevance of facilities. On the other hand, the significant representation of professionals such as architects/planners and government officials reflect deliberate involvement of key stakeholders in shaping sustainable tourism policies. This aligns with earlier studies which stress the need for integrating professional and visitor perspectives in order to ensure that facility planning meets both functional and cultural expectations (Mensah, 2019; Eze and Uchenna, 2022). Education levels reveal a highly educated respondent population, with tertiary education being the most

dominant across all three countries (46.4–48.0%), followed by postgraduate qualifications. This indicates that respondents are generally well-informed and capable of engaging meaningfully with issues relating to sustainability, architectural innovation, and cultural integration. High education levels may be attributed to the sampling process, which likely reached more professionals and educated visitors, consistent with trends observed in ecotourism studies across Sub-Saharan Africa where higher-educated individuals are more engaged in sustainability-focused research and tourism participation (Osei and Nyarko, 2023). However, this also highlights a potential limitation in that the perspectives of less-educated community members who may interact most directly with these facilities could be underrepresented. Such underrepresentation raises concerns about inclusivity and authentic cultural integration, as previous research has cautioned that facilities may reflect cultural elements superficially without ensuring deep community participation (Ifejika *et al.*, 2021).

**Table 1:** Demographic Profile of Respondents (N = 327)

Variable	Category	Ghana		Nigeria		Togo	
		Freq	%	Freq	%	Freq	%
Gender	Male	60	57.1%	70	56.0%	50	51.5%
	Female	43	41.0%	52	41.6%	45	46.4%
	Other	2	1.9%	3	2.4%	2	2.1%
Age	18–25	20	19.0%	25	20.0%	18	18.6%
	26–35	30	28.6%	35	28.0%	25	25.8%
	36–45	25	23.8%	30	24.0%	20	20.6%
	46–55	15	14.3%	20	16.0%	19	19.6%
	56+	15	14.3%	15	12.0%	15	15.4%
Occupation	Architect/Planner	25	23.8%	30	24.0%	20	20.6%
	Tourism Manager	20	19.0%	25	20.0%	18	18.6%
	Visitor	35	33.3%	40	32.0%	35	36.1%
	Government Official	15	14.3%	20	16.0%	15	15.5%
	Other	10	9.6%	10	8.0%	9	9.2%



**Figure 1:** Respondents Level of Education

### **Role of Architectural Innovation in Promoting Sustainable Ecotourism Facilities**

The results presented in Table 2 reflect a generally positive perception of architectural innovation as a driver of sustainable ecotourism facilities across Ghana, Nigeria, and Togo, with most mean scores falling between 3.8 and 4.3. This pattern indicates that respondents largely agree that architectural design in ecotourism facilities is increasingly aligned with sustainability principles. For example, the highest ratings were recorded for items such as facilities blending with the surrounding landscape (overall mean = 4.17) and designs that enhance energy efficiency (overall mean = 4.12). These findings suggest that in ecotourism planning, visible strategies like siting, orientation, natural ventilation, and passive cooling are more readily implemented and appreciated by stakeholders because they directly influence visitor comfort and reduce operational costs (Acheampong *et al.*, 2022; Osei-Tutu *et al.*, 2021). The relatively high score for use of space promoting comfort and conservation (overall mean = 4.07) also highlights growing awareness that sustainable design is not only about minimizing ecological footprints but also about ensuring visitor satisfaction. This is consistent with recent scholarship emphasizing that well-designed spatial arrangements improve tourist experience while simultaneously supporting conservation outcomes (Mensah and Blankson, 2020). Similarly, the integration of cultural identity in architectural styles, with an overall mean of 3.95, underscores attempt to embed cultural authenticity in facility design. However, the slightly lower score compared to landscape and energy-efficiency factors may reflect the challenges of translating intangible cultural values into physical structures in ways that satisfy diverse stakeholders. Research indicates that while cultural motifs and symbols are often incorporated, the depth of participatory cultural integration remains limited in many ecotourism projects (Ayivor *et al.*, 2021).

In contrast, the lowest overall mean was recorded for use of innovative building materials (3.83). This result likely reflects systemic barriers such as cost constraints, limited technical capacity, and weak supply chains for sustainable construction materials in developing countries (Akinwale and Olayemi, 2023). Studies have shown that although recycled and eco-friendly materials are gaining attention globally, their adoption in African contexts is hindered by inadequate policy incentives, inconsistent standards, and higher initial investment costs (Olajide *et al.*, 2022). This explains why stakeholders are more inclined to value visible, low-cost strategies like passive design over material innovations that require broader institutional and infrastructural support. Moderate standard deviations (ranging from 0.72 to 1.01) suggest general consensus among respondents but with some variability across countries and stakeholder groups. This variation may be attributed to differences in policy environments, professional exposure, and user expectations. For instance, architects and planners may have a more critical view of material innovation, while visitors focus more on comfort and aesthetic harmony. Literature on stakeholder perspectives in ecotourism has shown similar divergences, highlighting the importance of context-specific evaluations (Boateng and Mensah, 2022).

**Table 2:** Role of Architectural Innovation in Promoting Sustainable Ecotourism Facilities

Statement	Ghana (Mean ± SD)	Nigeria (Mean ± SD)	Togo (Mean ± SD)	Overall Mean	Overall SD
1. Facilities reflect environmentally sustainable practices	4.10 ± 0.85	3.95 ± 0.91	4.05 ± 0.88	4.03	0.88
2. Innovative building materials are used	3.85 ± 0.92	3.70 ± 1.01	3.95 ± 0.87	3.83	0.93
3. Modern designs minimize environmental impact	4.05 ± 0.81	3.90 ± 0.95	4.00 ± 0.89	3.98	0.88
4. Designs enhance energy efficiency	4.20 ± 0.79	4.00 ± 0.88	4.15 ± 0.84	4.12	0.84
5. Architectural style integrates cultural identity	3.95 ± 0.86	3.85 ± 0.90	4.05 ± 0.82	3.95	0.86
6. Facilities blend with surrounding landscape	4.25 ± 0.72	4.05 ± 0.85	4.20 ± 0.76	4.17	0.78
7. Use of space promotes comfort and conservation	4.15 ± 0.80	3.95 ± 0.83	4.10 ± 0.81	4.07	0.81

### Integration of Cultural Integrity in Ecotourism Facility Planning

The results in Table 3 indicated that cultural integrity plays a strong role in ecotourism facility planning across Ghana, Nigeria, and Togo, with overall mean values ranging from 3.73 to 4.18. The consistently high scores suggest that stakeholders perceive cultural integration not only as essential for authenticity but also as a critical dimension of sustainable ecotourism development. The highest rating was recorded for planning that respects sacred sites and cultural landscapes (overall mean = 4.18), indicating that protecting cultural and spiritual spaces is central to facility planning in the region. This aligns with recent research that emphasizes the importance of safeguarding cultural landscapes in ecotourism to maintain community trust and ensure sustainable visitor experiences (Mensah and Boateng, 2022; Ayivor *et al.*, 2021). Such practices may also reflect the strong spiritual and cultural attachments that many African communities maintain with their natural environments, making cultural sensitivity a necessity in tourism infrastructure development. The results also show that the presence of local arts, crafts, and materials within facilities is highly valued (overall mean = 4.13). This suggests a deliberate effort to incorporate tangible cultural elements into ecotourism facilities, which can enhance both the visitor experience and local economic empowerment. Previous studies have shown that using local materials and crafts not only reduces costs and environmental impact but also provides opportunities for local artisans to benefit directly from tourism (Osei-Tutu *et al.*, 2021). The emphasis on tangible cultural integration reflects the dual role of ecotourism in promoting conservation while serving as a vehicle for cultural and economic sustainability.

Meanwhile, consulting local communities in planning and design scored lower (overall mean = 3.73) compared to other statements. This points to a persistent gap in participatory planning, where communities are often involved at later stages or consulted superficially. Literature on ecotourism governance in Africa frequently identifies limited community participation as a

challenge, with top-down decision-making dominating planning processes (Amoako and Adam, 2020). Although cultural elements may be visible in facilities, the relatively lower rating in consultation indicates that local voices may not be fully integrated into planning decisions, which can affect long-term sustainability and ownership. Statements related to facilities reflecting cultural values (4.08), enhancing cultural pride and heritage (4.03), and providing spaces for cultural exchange (3.98) further underscore the strong perception that ecotourism facilities should go beyond physical infrastructure to foster cultural sustainability. Respondents' positive perceptions may be attributed to the growing recognition among architects, planners, and tourism managers that cultural heritage is a unique selling point for African ecotourism destinations. Recent scholarship argues that embedding cultural values within ecotourism facilities enriches visitor experiences by offering authenticity while simultaneously strengthening community identity and pride (Acheampong *et al.*, 2022; Mensah and Blankson, 2020).

Interestingly, the integration of cultural performances and storytelling received a relatively modest mean of 3.88. This may be attributed to the logistical and financial challenges of embedding intangible cultural heritage within facilities, as such activities often require specialized spaces, skilled practitioners, and ongoing coordination. As studies in West African ecotourism sites reveal, while cultural performances are widely recognized as enhancing visitor experience, their sustainability depends heavily on long-term investment and strong collaboration between tourism managers and cultural practitioners (Boateng and Mensah, 2022). The standard deviations, ranging between 0.75 and 0.98, show moderate variation in responses across the three countries, suggesting that while the overall perceptions are favorable, stakeholder experiences differ. These differences can be attributed to variations in national cultural policies, investment in ecotourism infrastructure, and the extent of local community involvement. For instance, Ghana has increasingly emphasized cultural heritage integration in tourism planning as part of its “Year of Return” and “Beyond the Return” initiatives, which may account for slightly higher ratings in some cultural-related statements compared to Nigeria and Togo (Akinwale and Olayemi, 2023).

**Table 3:** Integration of Cultural Integrity in Ecotourism Facility Planning

Statement	Ghana (Mean ± SD)	Nigeria (Mean ± SD)	Togo (Mean ± SD)	Overall Mean	Overall SD
1. Facilities reflect local cultural values and traditions	4.15 ± 0.80	4.00 ± 0.87	4.10 ± 0.82	4.08	0.83
2. Designs incorporate traditional styles and symbols	4.05 ± 0.85	3.95 ± 0.88	4.00 ± 0.84	4.00	0.86
3. Local communities consulted in planning and design	3.80 ± 0.92	3.65 ± 1.05	3.75 ± 0.97	3.73	0.98
4. Facility development enhances cultural pride and heritage	4.10 ± 0.81	3.95 ± 0.90	4.05 ± 0.85	4.03	0.85
5. Local arts, crafts, and materials evident in facilities	4.20 ± 0.78	4.05 ± 0.83	4.15 ± 0.79	4.13	0.80
6. Cultural performances/storytelling integrated	3.95 ± 0.84	3.80 ± 0.91	3.90 ± 0.88	3.88	0.88
7. Facilities provide spaces for cultural exchange	4.05 ± 0.82	3.90 ± 0.89	4.00 ± 0.83	3.98	0.85
8. Planning respects sacred sites and cultural landscapes	4.25 ± 0.75	4.10 ± 0.82	4.20 ± 0.76	4.18	0.78

### **Sustainable Facility Planning Framework for Ecotourism in Developing Countries**

The results in Table 4 show that the integration of sustainability principles in facility planning for ecotourism across Ghana, Nigeria, and Togo is becoming increasingly recognized as a priority, though with some areas requiring improvement. The overall mean values indicate a relatively high perception of the importance of balancing environmental, cultural, and tourism needs, with Ghana (3.95), Nigeria (3.85), and Togo (3.90) reflecting positive but moderate agreement. This can be attributed to the gradual incorporation of sustainable tourism policies in West Africa, influenced by global frameworks such as the UN Sustainable Development Goals (SDGs) which emphasize responsible consumption and sustainable infrastructure development. However, the moderate scores also suggest that while policies exist, practical implementation often faces challenges such as weak enforcement, limited technical capacity, and competing economic interests. Stakeholder collaboration received one of the lowest mean scores (3.63 overall), indicating that the process of engaging planners, governments, local communities, and tourists remains inadequate. This may be attributed to the persistence of top-down decision-making in many developing countries, where community voices are often marginalized during planning processes. Similar findings have been reported in studies highlighting the need for inclusive governance to achieve sustainable ecotourism outcomes, as exclusionary approaches often result in conflicts, underutilized facilities, or community resistance.

The relatively high score for facilities meeting both functional and sustainability standards (overall mean of 3.98) means that visible improvements have been made in the design and construction of ecotourism infrastructure. The use of eco-friendly building materials, renewable energy solutions, and water-saving technologies in some sites across West Africa may explain this outcome. These findings align with research indicating that tourists are increasingly demanding green facilities and that destinations adopting such measures enjoy improved competitiveness in the global market. Interestingly, the highest score was recorded for the statement that future planning should prioritize sustainability over economic gain (overall mean of 4.23). This reflects growing awareness that short-term financial benefits from mass tourism often undermine long-term ecological and cultural integrity. Communities and policymakers in the region are beginning to recognize the risks of unsustainable exploitation, such as biodiversity loss, cultural erosion, and vulnerability to climate change. This shift in mindset may also be influenced by increasing donor funding and NGO involvement in promoting ecotourism as a conservation-driven development tool.

The responses related to monitoring and evaluation (overall mean of 3.80) connote that while mechanisms exist, they are not consistently implemented or enforced. This could be due to limited resources, lack of trained personnel, or weak institutional frameworks. Without robust monitoring systems, sustainability objectives remain rhetorical rather than practical. Long-term planning that considers climate resilience recorded a strong mean score of 4.03, which reflects an increasing recognition of the impacts of climate change on ecotourism. Rising temperatures, changing rainfall patterns, and extreme weather events have heightened awareness among planners and communities about the need for resilient infrastructure. The emphasis on climate adaptation in ecotourism planning is consistent with global trends, where climate-smart strategies are becoming integral to tourism development, especially in vulnerable regions such as West Africa.

**Table 4:** Sustainable Facility Planning Framework for Ecotourism in Developing Countries

Statement	Ghana (Mean ± SD)	Nigeria (Mean ± SD)	Togo (Mean ± SD)	Overall Mean	Overall SD
1. Planning balances environment, culture, tourism	3.95 ± 0.90	3.85 ± 0.95	3.90 ± 0.92	3.90	0.92
2. Stakeholder collaboration is adequate	3.70 ± 0.94	3.55 ± 1.02	3.65 ± 0.97	3.63	0.98
3. Facilities meet functional and sustainability standards	4.05 ± 0.82	3.90 ± 0.88	4.00 ± 0.84	3.98	0.85
4. Future planning should prioritize sustainability	4.30 ± 0.76	4.15 ± 0.82	4.25 ± 0.79	4.23	0.79
5. Monitoring and evaluation ensure sustainability goals	3.85 ± 0.88	3.75 ± 0.91	3.80 ± 0.89	3.80	0.89
6. Long-term planning considers climate resilience	4.10 ± 0.81	3.95 ± 0.86	4.05 ± 0.83	4.03	0.83

### Conclusion and Recommendation

The study established that sustainable facility planning for ecotourism in developing countries depends on balancing environmental protection, cultural preservation, and tourism growth. Results from Ghana, Nigeria, and Togo showed progress in integrating cultural identity, eco-friendly designs, and community pride, but also highlighted gaps in stakeholder collaboration, monitoring, and enforcement of sustainability standards. Importantly, the findings revealed a strong preference for prioritizing sustainability over short-term economic gain, reflecting alignment with global sustainable development goals.

It is recommended that facility planning should adopt inclusive approaches that actively involve local communities and strengthen monitoring systems to track sustainability outcomes. Governments and planners should also support the use of eco-friendly materials, climate-resilient infrastructure, and regional collaboration to ensure long-term ecological and cultural resilience in ecotourism development.

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# STRATEGIC FRAMEWORK FOR DEVELOPING GEMSTONE TOURISM IN NIGERIA: A CASE STUDY OF SELECTED MINING AREAS IN OKE OGUN, OYO STATE

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## **Abstract**

*The study focuses on the Strategic Framework for developing gemstone tourism in Oke Ogun, Oyo State, Nigeria, aiming to promote the area as a global destination for gemstone tourism while fostering sustainable practices and local enterprise growth. A descriptive survey was conducted with 434 participants, including government officials, miners, artisans, tourists, heritage experts, and community leaders across selected gemstone mining communities such as Itasa, Offiki, and Komu, using stratified random and purposive sampling. Data were collected through structured questionnaires and analyzed with descriptive statistics like percentages and frequencies. A majority of respondents (55%) believe Oke Ogun's gemstone resources can attract international tourists, with 50.5% strongly agreeing on the government's effective promotion. Strategies for enhancing global reputation see 43.8% strongly agreeing. Collaborative efforts with international organizations gained 30% agreement. Cultural heritage is seen as complementary to gemstone tourism (59.9% strong agreement). Local community involvement is imperative, with varying responses on sustainability, waste management, and environmental education. Job creation opinions are mixed, with 52.5% agreeing gemstone tourism creates jobs, but only 50.2% believe it boosts local enterprises. The findings reveal that Oke Ogun in Oyo State has abundant gemstone resources with cultural and ecological appeal, yet faces challenges like poor infrastructure and weak marketing. Recommendations include a Gemstone Tourism Development Framework focusing on sustainability, community empowerment, institutional collaboration, and branding to enhance tourism and Nigeria's global market position.*

**Keywords:** *Community development, cultural heritage, gemstone tourism, strategic framework, sustainable.*

## **Introduction**

Tourism, as a major industry in the world, is now taking on a new dimension: gemstone tourism (Akintade & Ogunlade, 2024). Why are we talking about gemstone tourism? First, the current world economic crisis and the stigmatization of the gemstone industry as a promoter of conflict, along with cutting funding for the development of sustainable alternative livelihoods for artisan miners, have severely affected the industry value chain and the people who directly depend on the trade for their survival (Musah, 2025). The governments of Sub-Saharan Africa, in particular, rely heavily on mineral resources (Hlavová, 2017). This scenario is the same for the Nigerian mineral industry in general and the Oyo State mineral industry in particular.

Gemstone tourism combines the attraction of travel with the excitement of gemstone mining and processing (Liccardo et al., 2020). Nigeria, with its abundant deposits of gemstones such as sapphires, rubies, emeralds, and tourmalines, stands to benefit immensely from developing this niche tourism sector. According to Olade (2021), Oyo, Kaduna, Nasarawa, and Bauchi are among the states in Nigeria that have gemstone reserves. Despite this wealth, the gemstone sector remains underdeveloped due to factors such as lack of infrastructure, inadequate marketing, and insufficient regulatory frameworks (Mashikinyi, 2020). There is a need to address these challenges to unlock the full potential of gemstone tourism.

Despite Nigeria's abundance of mineral resources, Olade (2021) claims that the southwest portion of the country, particularly Oyo State, is rich in jewels, such as amethyst, agate, barite, garnet, tourmaline, zircon, ruby, quartz, emerald, and topaz. According to Akintade and Odunlade (2024), the growth of gemstone tourism in particular mining regions can significantly support the local industry's development and the promotion of a strong Nigerian brand in Oke Ogun, Oyo State, and throughout Nigeria. A geotourism strategic framework was created as a result of these findings with the goal of promoting gemstone tourism in a few chosen mining regions of Oke Ogun, Oyo State. This study aims to promote Nigeria as a global destination for gemstone tourism, sustainable tourism practices, economic opportunities, and local enterprise development.

## **Literature Review**

### **Strategic Framework for Developing Gemstone Tourism in Nigeria**

Omotayo et al. (2023) noted that it is commonly known that Nigeria's gemstone resources are significant both geologically and economically. According to Olade (2021) and Ayeni et al. (2022), some regions of southwestern Nigeria, especially Oyo State, which is a part of the larger Oke-Ogun mineral belt, are home to a range of precious and semi-precious stones, including tourmaline, topaz, garnet, sapphire, and aquamarine. This research suggests that gemstones can be more than just extractive resources; they can also serve as tourism assets when connected to interpretation, display, and craft industries. This is an essential first step in any strategy to reposition mining landscapes as tourism resources. Research on the gemstone value chain in Nigeria reveals ongoing issues. There is limited downstream processing, weak connections between miners and jewelers, and informal market channels (Antinarelli Freitas, 2024; Jepsen, 2024). These factors reduce local economic benefits from gemstone resources. According to Ruben (2024), value-chain analyses show that improving cutting, polishing, certification, and market access can increase local incomes. These enhancements can also attract niche tourists, such as collectors, geotourists, and craft tourists, through attractions like lapidary workshops,

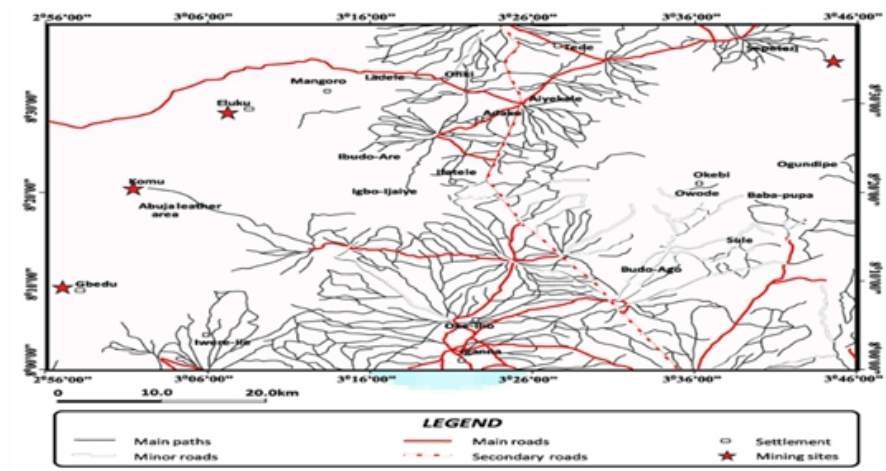
gem fairs, and artisan galleries. Thus, tourism strategies for Oke Ogun need to intentionally link upstream mining activity with downstream creative and retail businesses.

The literature focuses on the sustainability of artisanal and small-scale mining (ASM) and the social and environmental challenges tied to informal gemstone extraction (Folorunso & Folorunso, 2022). Jepsen (2024), studied within Nigeria, reveals issues like land degradation, weak regulatory oversight, safety hazards, and uncertain community benefits. These challenges can harm tourism unless addressed through environmental management, safety improvements, and community development agreements. According to Hatta (2025) provided a basis for including elements like environmental restoration, safety measures, and benefit-sharing in any gemstone tourism plan. Scholars and case studies from other countries, as well as emerging pilot studies in Nigeria, have examined how to turn abandoned or operating mining sites into tourism attractions (Omosanya & Oseni, 2025). This entails repurposing mining infrastructure, establishing informative centers, and developing historical paths. Their study identifies best practices in site cleanup, interpretive planning, and cooperative management involving stakeholders. The literature suggests practical design approaches, including guided mine tours, displaying lapidary tools in museums, and geo-interpretive signage. It also emphasizes that thorough feasibility studies and community involvement are key to avoiding tokenistic heritage initiatives.

### Materials and Methods

The study was carried out in three selected communities of the Oke Ogun area, Oyo state, particularly in Komu, Offiki, and Itasa. The primary industries of the area are cotton-based textiles, farming, and mining. It is reputed as the home of farming and mining. These locations were selected because they represent different stages of the gemstone mining value chain.

**Figure 1:** Map of selected mining areas in Oke Ogun, Oyo State



**Source:** Ajetunmobi, Amidu & Itunu, (2019)

A descriptive survey design was used for the study. Descriptive survey design is a method used to provide a detailed overview of a population's characteristics, behaviors, and opinions. This approach primarily focuses on collecting quantitative data to describe patterns and trends

within a sample. The purpose of descriptive surveys is to gain insights into specific phenomena as they naturally happen. The target population and sample size of the study consisted of 434 interviewers and focus groups, which are 56 government officials from the Federal and State Ministries of Mines and Steel and the State Ministry of Information, Culture, and Tourism; 98 members of local miners from Solid Minerals Extractors; 76 artisans from jewelry making; 94 tourists at the mine sites; 50 heritage experts; and 60 community leaders and prominent personalities from selected communities that would be analyzed. To ensure comprehensive representation, a stratified random sampling and multiple sampling technique were adopted across six key groups: government officials, miners, artisans, tourists, heritage experts, and community leaders. A structured questionnaire and interview schedule were used to gather the information from the respondents. The quantitative data were analyzed using descriptive statistics such as percentages, frequency counts, and 5 Likert scales.

## Results

### Research Objective One: Promoting Nigeria as a Global Destination for Gemstone Tourism

Table 1 evaluates the promoting Nigeria as a global destination for gemstone tourism as investigated. The respondents rated various promotions of Nigeria gemstone tourism as a global destination using a 5-point Likert scale for measuring attitudes, perceptions, and opinions. Largely, a majority (55%) of respondents recognize that Oke Ogun's gemstone resources have the potential to attract international tourists as an important factor. The Nigerian government effectively promotes gemstone tourism on a global scale is a highly attractive factor, with a substantial majority (50.5%) strongly agreeing. Developing gemstone tourism in Nigeria enhance global reputation is the most compelling strategies, with 43.8% strongly agreeing on its promotions. 42.4% Neutral, 0.0% strongly Disagree, 30% agree, 25.3% strongly agree about Collaborative efforts with international organizations can improve gemstone tourism. The major highest respondents (59.9%) strongly agree that Oke Ogun's cultural heritage complements its gemstone tourism potential, 0.0% strongly disagree, 0.0% disagree, 40.1% neutral, 0.0% agree.

**Table 1.** Promoting Nigeria as a Global Destination for Gemstone Tourism

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Oke Ogun's gemstone resources have the potential to attract international tourists	9 2.1%	0 0.0%	19 4.4%	237 55%	169 40%
The Nigerian government effectively promotes gemstone tourism on a global scale	50 11.5%	0 0.0%	15 3.5%	150 34.6%	219 50.5%
Developing gemstone tourism can enhance Nigeria's global reputation	34 7.8%	5 1.2%	20 4.6%	185 42.6%	190 43.8%
Collaborative efforts with international organizations can improve gemstone tourism	0 0.0%	10 2.3%	184 42.4%	130 30%	110 25.3%
Oke Ogun's cultural heritage complements its gemstone tourism potential	0 0.0%	0 0.0%	174 40.1%	0 0.0%	260 59.9%

**Research Objective Two: Develop Sustainable Tourism Practices that Benefit Local Communities and Environment:** The analysis of respondents' views on developing sustainable tourism practices that benefit local communities and protect the environment, as shown in Table 2, was conducted using a multiple-response approach that allowed participants to select more than one applicable option. The results revealed that most respondents across the three selected communities in Oke Ogun, Oyo State, were aware of the importance of sustainable gemstone tourism. Specifically, 36.9% of respondents from Itasa, 33.2% from Komu, and 20.7% from Offiki agreed that developing sustainable gemstone tourism helps preserve the environment. Similarly, 30.9% of respondents from Itasa, 36.9% from Offiki, and 26.3% from Komu believed that involving local communities in tourism planning ensures long-term sustainability. Furthermore, 40% of respondents from Itasa, 18.4% from Offiki, and 30% from Komu stated that mining activities can be managed in ways that support tourism without harming the environment. In addition, 30% of respondents from Itasa, 26.7% from Offiki, and 41.5% from Komu emphasized that proper waste management around mining sites is essential for sustainable tourism. Lastly, 23% of respondents from Itasa, 23.7% from Offiki, and 27.6% from Komu agreed that environmental education should be a vital part of gemstone tourism initiatives. Overall, the findings indicate that respondents across the study areas have a strong understanding of the need for sustainability, community participation, responsible mining, and environmental education in developing gemstone tourism.

**Table 2:** Develop Sustainable Tourism Practices that Benefit Local Communities and Environment.

Variables		Oke Ogun Mining Sites			Total	
		Komu	Offiki	Itasa		
Sustainable Tourism Practices	Sustainable gemstone tourism helps preserve the environment in Oke Ogun	Freq	144	90	160	394
		%	33.2%	20.7%	36.9%	
	Involving local communities in tourism planning ensures its sustainability	Freq	134	160	114	408
		%	30.9%	36.9%	26.3%	
	Mining activities can be managed to support tourism without harming the environment	Freq	173	80	130	383
		%	40%	18.4%	30%	
	Proper waste management around mining sites is essential for sustainability	Freq	130	116	180	426
		%	30%	26.7%	41.5%	
	Environmental education should be a key part of gemstone tourism initiatives	Freq	100	103	120	323
		%	23%	23.7%	27.6%	
	Total	Freq	681	549	704	1934

Percentages and totals are based on responses.

**Research Objective Three: Create Economic Opportunities through Job Creation and Local Enterprise Development:** The strategies to create economic opportunities through job creation and local enterprise development were revealed in Table 3 as investigated in Itasa, Offiki, and Komu in the Oke Ogun area of Oyo State. The respondents had mixed opinions on whether gemstone tourism creates job opportunities for local residents in Oke Ogun, with 0.0% strongly disagreeing. The majority (52.5%) agreed that gemstone tourism can create jobs for local residents in Oke Ogun, and 43.3% strongly agreed with it. The majority of the respondents

strongly agreed that development of gemstone-related enterprises boosts the local economy (50.2%). However, most (46.8%) respondents disagreed that tourists purchasing local crafts and goods benefit small businesses. Also, 33.6% are neutral and 33.6% strongly disagree that the infrastructure development for tourism will positively impact the local economy activities. However, most (34.6%) are neutral and disagree that training programs for local communities enhance their participation in gemstone tourism.

**Table 3.** Economic Opportunities and Local Enterprise Development

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Gemstone tourism can create jobs for local residents in Oke Ogun.	0 0.0%	0 0.0%	18 4.2%	228 52.5%	188 43.3%
The development of gemstone -related enterprises boost the local economy	0 0.0%	50 11.5%	11 2.5%	155 35.7%	218 50.2%
Tourists purchasing local crafts and goods benefit small businesses	3 0.7%	203 46.8%	0 0.0%	178 41.0%	50 11.5%
Infrastructure development for tourism will positively impact the local economy	146 33.6%	0 0.0%	146 33.6%	40 9.2%	31 7.1%
Training programs for local communities enhance their participation in gemstone tourism	0 0.0%	136 31.3%	150 34.6%	48 11.1%	100 23.0%

### Discussion

The findings reveal strong optimism among respondents regarding Oke Ogun's potential as a global gemstone tourism destination, with 55% recognizing its appeal to niche markets like geotourism and cultural heritage tourism. This optimism reflects awareness of Nigeria's geological wealth and emerging tourism diversification policies. 50.5% of respondents believe the government promotes gemstone tourism internationally, indicating appreciation for national campaigns. However, 42.4% of people said they didn't have strong opinions about international collaborations, which suggests that there aren't enough strong global partnerships to improve expertise, investment, and visibility. Additionally, 59.9% agree that Oke Ogun's cultural heritage complements its gemstones, emphasizing the need to integrate cultural assets into tourism strategies. Responses on sustainability stress the importance of environmental management and community involvement, with 36.9% from Itasa and 33.2% from Komu acknowledging the role of environmental preservation. While 52.5% believe gemstone tourism can create jobs, gaps in infrastructure and training impede potential benefits. The findings advocate for a strategic framework focused on global visibility, sustainability, community engagement, and economic inclusion through skill development. This approach, rooted in the Triple Bottom Line (TBL), is critical to making sure that Oke Ogun's gemstone tourism grows economically while preserving ecological integrity and cultural identity.

### Conclusion and Recommendation

The study concludes that Oke Ogun's gemstone tourism potential is both promising and underutilized. Respondents across Itasa, Komu, and Offiki demonstrate strong awareness of the economic, environmental, and cultural benefits associated with gemstone tourism, yet they also highlight the structural limitations that impede its growth. The analysis indicates that

while public perception supports Nigeria's emergence as a global gemstone destination, the realization of this goal requires coordinated strategies that align tourism, mining, and environmental policies. To advance gemstone tourism in Oke Ogun, it is essential to establish a strategic development framework that fosters synergy between government agencies, private investors, and local communities. Policy interventions should focus on global marketing campaigns, development of gemstone heritage trails, and integration of artisanal mining into the tourism value chain. Priority should also be given to empowering communities through economic development, environmental education, and training to ensure sustainability and inclusion. If these measures are implemented, Oke Ogun could evolve into a model of regenerative gemstone tourism, showcasing how natural resource regions can transition from extractive economies to sustainable tourism-driven development hubs that enhance Nigeria's global tourism competitiveness. It is recommended that government agencies, private stakeholders, and local communities ought to work together within a cohesive strategic plan that encourages sustainability, inclusivity, and innovation to effectively advance gemstone tourism in Oke Ogun, Oyo State. Emphasis must be placed on enhancing institutional collaboration between the Ministry of Mines and Steel Development and the Nigerian Tourism Development Authority to synchronize mining and tourism strategies. Prioritizing investments in infrastructure like access roads, visitor centers, and sustainable facilities is essential for improving accessibility and the experience for tourists. Supporting community empowerment via vocational training in gemstone processing, jewelry design, and tourism services is essential for generating employment and fostering local business growth. Likewise, eco-friendly mining techniques, efficient waste management, and environmental education need to be adopted to protect the ecosystem while advancing tourism growth.

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**HUMAN SECURITY AND SUSTAINABLE  
DEVELOPMENT: THE ROLE OF SOCIAL STUDIES  
EDUCATION IN NIGERIA**

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**Abstract**

*This study examines the role of Social Studies education in addressing human security challenges and achieving sustainable development in Nigeria. Despite various policy efforts by successive government and leaders, Nigeria continues to face widespread issues such as poverty, insecurity, environmental degradation, and civic apathy, all of which have threaten national development and social stability. These persistent problems highlight the inadequacy of current educational approaches in equipping citizens with the knowledge, values, and skills necessary to respond appropriately to complex societal challenges. Employing a qualitative research methodology, the study analyzes data from scholarly literature, curriculum documents, and policy reports. The theoretical framework combines Human Security Theory and Constructivist Learning Theory, providing insights into how education can empower individuals to contribute meaningfully to peace, security, and development. Findings reveal that Social Studies, when effectively delivered, can foster civic responsibility, critical thinking, environmental awareness, and tolerance which are core components of human security and sustainability. However, the study identifies gaps such as outdated curricula, lack of teacher training, and insufficient linkage between classroom content and real-world challenges. It recommends a reorientation of Social Studies curricula to directly address human security and sustainability themes, professional development for educators, and the integration of participatory, inquiry-based teaching methods. Additionally, policy support is needed to strengthen civic education as a pillar of national development. In conclusion, Social Studies education holds significant potential to shape responsible, informed citizens capable of*

*advancing human security and sustainable development in Nigeria, but this potential can only be realized through strategic reforms in content, pedagogy, and educational policy.*

## **Introduction**

Human security and sustainable development have become central issues in global and national policy discourse, particularly in developing countries such as Nigeria. Over the last two decades, Nigeria has experienced profound socio-economic and political challenges that undermine national stability and human well-being. These include rising insecurity, terrorism, banditry, kidnapping, farmers–herders conflict, unemployment, poverty, corruption, environmental degradation, and weak civic engagement. These challenges have threatened national cohesion and hindered efforts toward achieving meaningful and sustainable development (Adewumi & Olayinka, 2020).

Human security focuses on the protection of individuals rather than the state, provides a more comprehensive lens for understanding the multidimensional threats confronting Nigerian citizens. In this context, sustainable development is that development that does not compromise the needs of future generations; that cannot be achieved without addressing the root causes of insecurity, poverty, inequality, and ecological decline (United Nations, 2015). Education remains a critical tool for transforming societies, shaping values, building capacities, and equipping citizens with the knowledge and skills required to respond effectively to emerging societal challenges, such as Nigeria is faced with today. Among various school subjects, Social Studies education stands out due to its explicit mandate to prepare learners for responsible citizenship, social understanding, and positive participation in community and national affairs. As an interdisciplinary field drawing from sociology, economics, history, geography, political science, psychology, and civic education, Social Studies equips learners with civic competences, values, attitudes, and problem-solving skills needed to contribute to human security and sustainable development (Okam, 2020).

However, despite the potential of Social Studies education, its effectiveness in shaping socially responsible, security-conscious, and development-oriented citizens in Nigeria has been limited. This is due to outdated curriculum content, weak classroom delivery methods, insufficient teacher capacity, and inadequate integration of contemporary issues such as terrorism, climate change, youth radicalization, and human rights protection (Ibrahim & Musa, 2020). This study therefore seeks to examine the role of Social Studies education in promoting human security and sustainable development in Nigeria, analyzing its contributions, limitations, and prospects for reform. By employing a quantitative research approach, the study draws insights from scholarly literature, opinions from concerned stakeholders, curriculum documents, policy reports, and theoretical frameworks to provide a holistic understanding of how Social Studies education can serve as a transformative tool for national development.

## **Statement of the Problem**

Despite Nigeria's numerous development policies and security interventions, the country continues to face alarming levels of insecurity, poverty, social inequality, youth radicalization, environmental degradation, and weak civic culture. These persistent challenges indicate that

the existing educational system has not sufficiently equipped citizens with the cognitive, affective, and behavioral competencies necessary to address complex societal issues. The failure to cultivate critical thinking, civic responsibility, social tolerance, and practical problem-solving skills contributes to Nigeria's deepening security and developmental crises (Nwankwo, 2019). Social Studies education was introduced into the Nigerian school system to address many of these issues by developing responsible, security-conscious, and sustainable citizens. However, significant gaps exist between this curricular ideal and classroom reality.

Several problems persist, including: outdated curriculum content that does not reflect contemporary security challenges such as terrorism, cybercrime, climate change, and political extremism; inadequate teacher preparation and professional development; dominance of teacher-centered methodologies that suppress creativity and critical thinking; poor integration of experiential and inquiry-based learning approaches; minimal linkage between classroom knowledge and real-life societal issues; weak policy support for civic and peace education. These gaps undermine the capacity of Social Studies to nurture active citizens capable of contributing meaningfully to national development and societal security. Therefore, the central problem this study addresses is the growing mismatch between Nigeria's escalating human security and sustainable development challenges and the limited responsiveness of Social Studies education in addressing these issues. The study seeks to explore how Social Studies can be repositioned to play a more strategic and effective role in achieving the sustainable development goals in Nigeria.

### **Objectives of the Study**

- i. To examine the relationship between Social Studies education and human security in Nigeria.
- ii. To assess how Social Studies education contributes to the attainment of sustainable development goals.
- iii. To identify challenges hindering the effectiveness of Social Studies education in promoting human security.
- iv. To recommend strategies for improving Social Studies education for sustainability and security enhancement.

### **Research Questions**

- I. How does Social Studies education influence human security awareness among Nigerian learners?
- ii. In what ways does Social Studies education contribute to sustainable development goals?
- iii. What are the challenges facing the integration of human security themes into Social Studies education?
- iv. What strategies can strengthen the role of Social Studies in advancing human security and sustainability in Nigeria?

### **Research Hypotheses**

Two null hypotheses were formulated to guide the study:

**H<sub>01</sub>:** There is no significant relationship between Social Studies education and the promotion of human security in Nigeria.

**H<sub>02</sub>:** There is no significant relationship between Social Studies education and the achievement of sustainable development goals in Nigeria.

### **Methodology**

**Research Design:** The study adopted combined methods of qualitative, from review of related literature and quantitative research design, particularly the use of questionnaires 100 teachers in Kontagora Local Government Area of Niger State. This design was appropriate because it allows for a deep understanding of educational content and policy trends without manipulation of variables (Creswell & Poth, 2018). Data were there collected from multiple secondary and primary sources, including Social Studies curriculum documents, academic journal articles, government policy papers (e.g., National Policy on Education, SDG reports), and international agency reports published between 2015 and 2024 and questionnaires.

**Data Analysis:** The study employed statistics 9.0 for analysis. This package allows data to be coded into categories and analyzed accordingly. Patterns and relationships among these variables were identified and analyzed to reveal insights about the role of Social Studies education in promoting human security and sustainability. The validity and reliability were achieved by triangulation of sources, peer debriefing, and cross-checking of interpretations to enhance the credibility and reliability of findings.

### **Theoretical Framework**

This study is anchored on two major theories: Human Security Theory and Constructivist Learning Theory. These frameworks provide conceptual lenses for understanding how Social Studies education can empower learners to contribute to human security and sustainable development.

#### **Human Security Theory**

Human Security Theory, developed by the United Nations Development Programme (UNDP) in 1994 and further expanded in subsequent reports (UNDP, 2016), shifts the focus of security from the state to the individual. It emphasizes holistic protection and empowerment of individuals against threats such as poverty, violence, disease, environmental degradation, and political repression.

The theory identifies seven key components of human security: Economic security, Food security, Health security, Environmental security, Personal security, Community security, Political security.

This framework aligns strongly with the goals of Social Studies education. Through teaching themes related to governance, human rights, peace education, environmental protection, and economic awareness, Social Studies can equip learners with the knowledge and values necessary for promoting human security.

#### **Constructivist Learning Theory**

Constructivist Learning Theory, associated with scholars such as Bruner (1966) and Vygotsky (1978), posits that learners actively construct knowledge based on their experiences and interactions with their environment. Learning is most effective when learners engage in

inquiry, dialogue, reflection, and problem-solving. In the context of Social Studies education:

- i. learners construct meaning through interaction with real-world issues
- ii. inquiry-based projects deepen understanding of societal problems
- iii. collaborative learning enhances social and civic skills
- iv. experiential learning fosters environmental responsibility and peacebuilding

Constructivism therefore supports a learner-centered approach essential for developing security-conscious, environmentally responsible, and active citizens.

### **Relevance to the Study**

Combining Human Security Theory and Constructivist Learning Theory provides a robust framework for analyzing how Social Studies can contribute to security consciousness, civic participation, and sustainable behaviour. The theories highlight both what learners need to know (security dimensions) and how they should learn (constructive engagement).

### **Review of Related Literature**

The literature reviewed spans conceptualization, empirical research, theoretical publications, curriculum analyses, and policy reports on Social Studies education, human security, and sustainable development.

### **Conceptual clarifications**

The concept of human security refers to the protection of individuals from critical and pervasive threats to their safety, well-being, and dignity. The concept extends beyond traditional notions of national security focused on territorial defence, emphasizing instead the security of people in their daily lives. According to the United Nations Development Programme (UNDP, 2016), human security encompasses seven core dimensions: Economic security, Food security, Health security, Environmental security, Personal security, Community security, Political security. Human security is therefore multidimensional, addressing both freedom from fear and freedom from want. In the Nigerian context, growing insecurity, poverty, political instability, and environmental crises make human security an urgent national priority.

Sustainable development is defined by the United Nations (2015) as development that meets present needs without compromising the ability of future generations to meet theirs. The concept is grounded in three major pillars:

- i. Economic sustainability – productive economic engagement and poverty reduction
- ii. Social sustainability – equity, justice, inclusion, and human rights
- iii. Environmental sustainability – conservation, environmental protection, and climate resilience

Nigeria's persistent developmental challenges reveal the need for an approach that balances economic progress with social and environmental responsibilities.

Social Studies education is an integrated field that seeks to develop responsible, informed, and participatory citizens capable of contributing positively to their communities and nation. In Nigeria, Social Studies is designed to: foster civic responsibility, promote national consciousness, instil democratic values, enhance critical thinking, promote conflict resolution

and peace-building, encourage environmental awareness, educate learners on rights and responsibilities. The Nigerian Social Studies curriculum incorporates themes related to governance, citizenship, human relationships, culture, economy, and the environment, making it a strategic platform for promoting human security and sustainable development (Okam, 2020). Social Studies education contributes to human security by promoting: civic awareness, peaceful coexistence, respect for diversity, personal and community safety and governance literacy environmental consciousness. Likewise, it fosters sustainable development by cultivating values and behaviours conducive to societal progress, resource conservation, and community cohesion. The alignment of these goals underscores Social Studies as a transformative tool for national development.

Adeyemi and Jekayinfa (2021), investigated “Social Studies Education and Peace-building among Nigerian Youths.” Their study was motivated by rising youth involvement in violent conflicts, cybercrime, and political thuggery, questioning whether Social Studies has achieved its civic and peace-building mandate. The population consisted of 2,440 upper-basic students in Oyo and Osun States; a sample of 240 was selected using stratified random sampling. Key Findings review that, Students exposed to participatory Social Studies methods showed higher peace-building attitudes; Social Studies significantly influenced tolerance, empathy, and conflict-resolution skills. Notwithstanding the study focused on only Southwestern Nigeria, limiting generalizability, It did not include teachers or administrators; hence, implementation challenges were not fully captured, the study did not explore broader human security dimensions such as environmental or economic security.

Yusuf (2022), examined “Civic Competence and National Security: The Role of Social Studies Education in Northern Nigeria.” The problem was declining civic responsibility and rising insecurity among young people. The study involved Social Studies teachers in Kaduna, Kano, and Katsina. A sample of 150 teachers participated. The study used a mixed-methods design consisting of a survey (questionnaire) and interviews. Key Findings show that: Teachers believed Social Studies can promote law-abiding behaviour and civic competence. However, 69% of teachers lacked updated knowledge of emerging security issues. Social Studies curriculum did not explicitly address terrorism, cybercrime, or radicalization. The study is therefore criticized because it did not test student outcomes directly. Interviews were limited to 12 teachers, reducing qualitative depth hence the gap.

Okechukwu (2021) studied “Challenges of Social Studies Teachers in Addressing Contemporary Social Problems in Nigeria.” The problem identified was the mismatch between curriculum expectations and actual classroom practices. A population of 600 Social Studies teachers in Southeast Nigeria; 120 were sampled using descriptive survey, teacher questionnaires and focus group discussions. Key Findings are that: Teachers lacked teaching aids such as maps, charts, and digital materials. 78% of teachers used lecture-based methods. Curriculum insufficiently covers climate change, human trafficking, and insecurity. The criticisms are that: Overrelied on self-reported data without classroom observation. Limited geographical scope (South-East only). It failed to examine effects on student learning outcomes.

Nwosu and Eze (2023) studied “Integrating Environmental Sustainability into the Social Studies Curriculum in Nigeria.” The problem centered on poor student awareness of climate change and sustainability issues. The population was sampled from the upper basic school students in Rivers, Enugu, and Delta States; that is a sample of 300 students. Quasi-experimental design (control and experimental groups). The experimental group was taught using an environmentally enriched Social Studies curriculum. Key Findings reveal that students exposed to sustainability-focused lessons showed significantly higher environmental responsibility scores. Teachers demonstrated improved confidence in teaching climate-related topics after a training session. The study was however criticized for short duration (6 weeks), limiting long-term conclusions. Study excluded rural schools where environmental problems are more severe. Sample size small for a quasi-experiment.

Ogunyemi (2023) studied “Sustainability Literacy and the Role of Social Studies Education in Nigeria's Secondary Schools” addressed poor sustainability behaviour among students (e.g., littering, poor waste management). Population of 2,100 junior secondary students across five states was used; 400 were sampled using multi-stage sampling. Survey using the Sustainability Literacy Assessment Scale (SLAS) and classroom observation was also adopted. Key Findings show students had moderate sustainability literacy but poor practical behaviour; Schools with active Social Studies clubs showed higher sustainability engagement; Teacher pedagogical skills predicted 47% of student sustainability outcomes. The criticisms of the study were that the study relied heavily on student self-reports, Insufficient analysis of teacher training programs and did not compare private vs. public school differences.

Afolabi and Hassan (2022) studied “Social Studies Education and Students' Awareness of Human Rights and Responsibilities” assessed civic decline and youth involvement in anti-social behaviours. 350 students in Federal Unity Schools were sample. Survey design; data analyzed with chi-square and regression. The findings show Social Studies improved knowledge of human rights and civic duties, students demonstrated weak application of civic knowledge, lack of community-based learning reduced practical civic participation. However, the study was criticized because it focused strictly on human rights—ignoring environmental and economic security dimensions, Study setting not representative of average Nigerian public schools, Regression analysis lacked robust control variables.

Ibrahim (2020) studied “Teacher Competence and Effective Delivery of Social Studies Curriculum in North-Central Nigeria.” The study addressed poor learning outcomes and public complaints about declining civic morals. Teachers in Kwara, Kogi, Niger, and Plateau States were used with 200 teachers as sample. Quantitative survey using Teacher Competence Inventory (TCI). Reliability coefficient  $\alpha = .92$ . Findings indicate that 63% of Social Studies teachers lacked professional specialization; Teachers complained of insufficient training on security education and conflict prevention; Teacher competence strongly predicted student achievement. The work was criticized there was no triangulation with qualitative interviews. It focused only on teacher competence, not curriculum or pedagogy. Findings not linked directly to sustainable development issues.

Hassan & Bello (2024) carried out a study titled “Social Studies and Community Security Awareness among Junior Secondary Students in Northern Nigeria” examined growing insecurity and students' limited understanding of safety practices. JSS students in Niger, Kebbi, and Zamfara States were used. 360 students sampled. Mixed-methods (survey and key informant interviews) were used. Findings indicate that students taught by trained Social Studies teachers demonstrated higher community security awareness. Poor school–community collaboration weakened practical security education. Teachers lacked materials on drug abuse, kidnapping prevention, and cyber-safety. However, interviews were limited to school principals only. The study did not examine curriculum documents for accuracy. Sample excluded private schools.

From the reviewed studies, the following persistent gaps remain: Limited focus on holistic human security—most studies focus on civic or peace-building dimensions only; Insufficient empirical linkage between Social Studies and sustainable development outcomes; Few studies examine curriculum content, pedagogy, and teacher competence simultaneously; Most studies rely on self-reported data; few use mixed or experimental designs; Little research has been conducted in North-Central and Northwest Nigeria despite high insecurity levels; These gaps justify the present study's comprehensive investigation of Social Studies' role in fostering human security and sustainable development.

## Results

Question:1 How does social studies education influences human security awareness among Nigeria learners

**Table 1:** Relationship between Social Studies Education and Human Security Awareness

S/N	ITEMS	Mean SD (±)	AGREE	STRONGLY AGREE	DISAGREE	STRONGLY DISAGREE
1	Social studies lessons help me understand issues of peace and conflict	3.07 (1.15)	9.0%	18.0%	52.0%	21.0%
2	I have learned how poverty and insecurity affect national development	2.44 (1.19)	21.0%	31.0%	27.0%	21.0%
3	Social studies promotes tolerances and peaceful coexistences among students	2.16 (2.18)	27%	37%	17.0%	19.0%
4	Social studies enables students to identify causes of insecurity in their communities	2.18 (1.68)	25.0%	37.0%	17.0%	21.0%
5	Social studies enhances awareness of human right and civic duties	1.68 0.(96)	19.0%	60%	7.0%	19.0%
6	<b>Grand total of weighted mean</b>		<b>2.29</b>			

Source: Fieldwork, 2025

Results presented in tables 1, reveal detailed insights into the role and challenges of social studies education in Nigeria concerning human security awareness and sustainable development. Social studies lessons are very effective in helping students understand peace, conflict, poverty, and insecurity issues, though perception varies. The subject promotes tolerance and peaceful coexistence and heightens awareness of human rights and civic duties, where stronger agreement was noted. Overall, the influence on human security awareness is moderate, suggesting room for improvement. The results detail buttressed social studies lessons in understanding peace and conflict scored a mean of 3.07, indicating moderate agreement, but 52% disagreed or strongly disagreed, suggesting mixed perceptions. Learning about poverty and insecurity's effects on national development had a mean of 2.44, with stronger agreement (21% agree, 31% strongly agree). Promotion of tolerance and peaceful coexistence showed a lower mean of 2.16, with 27% agree and 37% strongly agree, indicating positive impact. Identification of insecurity causes in communities had a mean of 2.18, with similar agreement levels as above, showing social studies helps here. Enhancement of awareness of human rights and civic duties had a lower mean of 1.68 but very strong agreements (60% strongly agree), showing strong perceived impact. Overall weighted mean was 2.29, showing moderate influence of social studies on human security awareness Table 1. This implies rooms for more policy actions.

**Table 2:** Assessment of Social Studies education contribution to the attainment of sustainable development goals in Nigeria

S/N	ITEMS	Mean SD (±)	Agree	Strongly Agree	Disagree	Strongly Disagree
1	The subjects encourage students to protect the environment	2.13 (0.96)	50.0%	24.0%	15%	11.0%
2	Social studies helps students to understand the importance of sustainable resources	2.17 (0.82)	50.0%	20.0%	7.0%	23.0%
3	Social studies promotes values of responsibility and accountability	2.28 (1.01)	41.0%	24.0%	17.0%	18.0%
4	Students learn about the link between human actions and environmental degradation	2.16 (0.96)	51.0%	24.0%	15.0%	10.0%
5	The subjects teaches ways to contribute to community development	2.60 (0.88)	46.0%	7.0%	20.0%	27.0%
<b>6</b>	<b>Grand total of weighted mean</b>		<b>2.26</b>			

**Source:** Fieldwork, 2025

Regarding sustainable development, social studies contribute positively to encouraging environmental protection and understanding sustainable resource use. The curriculum promotes values like responsibility and links human actions to environmental degradation,

while also teaching community development though some students show disagreement on its effectiveness. These findings indicate that social studies somewhat foster sustainability goals but with varying impact across topics. From the results it was clear that, encouraging environmental protection had a mean of 2.13, with half agreeing and 24% strongly agreeing, indicating positive influence. Understanding sustainable resources scored 2.17 mean, again with 50% agreeing and 20% strongly agreeing. Promotion of responsibility and accountability values had a mean of 2.28, with about 41% agreeing. Learning the link between human actions and environmental degradation scored 2.16 with over half agreeing, showing decent awareness created. Teaching ways to contribute to community development showed the highest mean at 2.60, but with some disagreement. The overall weighted mean was 2.26, indicating moderate contribution to sustainability goals Table 2

**Table 3:** challenges hindering the effectiveness of social media education in promoting human security

**Question 3:** Challenging facing the Integrations of Human Security Theme into Social Studies Education

S/N	ITEMS	Mean SD (±)	Agree	Strongly Agree	Disagree	Strongly Disagree
1	The social studies curriculum is outdated and lack human security content	2.25 (1.10)	15.0%	37.0%	14.0%	34.0%
2	Teachers are not adequately trained to teach human security concepts	2.05 (1.24)	10.0%	53.0%	21.0%	16.0%
3	There is insufficient instructional materials for effective teaching	2.51 (0.90)	61.0%	22.0%	6.0%	11.0%
4	Students find social studies lessons unreliable to real life issues	2.71 (0.94)	3.0%	20.0%	14.0%	63.0%
5	Schools administrators give low priority to social studies	1.73 (0.44)	27.0%	73.0%	0.0%	0.0%
6	<b>Grand total of weighted mean</b>		<b>3.01</b>			

Fieldwork, 2025

Significant challenges impede social studies effectiveness, including an outdated curriculum lacking human security content, insufficient teacher training on these concepts, and a lack of instructional materials. While some students question the relevance of lessons to real life, school administrators' low prioritization of social studies is a widely acknowledged hurdle. These barriers hinder the subject's role in promoting human security and sustainability. Teachers' inadequate training had a mean of 2.05 and 63% agreement, highlighting a significant barrier. Insufficient teaching materials scored the highest mean 2.51 with 83% agreement, a major challenge. Students finding lessons unreliable to real life issues had a 2.71 mean, but majority (63%) strongly disagreed, indicating divided perceptions. School administrators giving low priority scored lowest mean (1.73) but with.

**Table 4:** Strategies for improving social studies education for sustainability and security enhancement

**Question 4:** Strategies to strengthen the role of Social Studies in Advancing Human Security and Sustainability in Nigeria

S/N	ITEMS	Mean SD ( $\pm$ )	Agree	Strongly Agree	Disagree	Strongly Disagree
1	The social studies curriculum is outdated and lack human security content	1.99 (0.82)	27.0%	56.0%	9.0%	8.0%
2	Teachers are not adequately trained to teach human security concepts	1.62 (0.69)	17.0%	63.0%	12.0%	8.0%
3	There is insufficient instructional materials for effective teaching	1.93 (0.97)	54.0%	46.0%	3.0%	2.0%
4	Students find social studies lessons unreliable to real life issues	1.81 (0.83)	47.0%	33.0%	19.0%	11.0%
5	Schools administrators give low priority to social studies	1.89 (0.88)	59.0%	21.0%	12.0%	8.0%
6	<b>Grand total of weighted mean</b>		<b>2.11</b>			

Source: Fieldwork, 2025

To strengthen social studies education, there is strong consensus on updating the curriculum to incorporate human security themes adequately. Training teachers better and providing sufficient materials are seen as crucial strategies. Enhancing lesson relevancy to real-life issues and elevating the administrative priority for social studies are also important. Implementing these measures could improve education outcomes in human security awareness and sustainable development knowledge. Addressing the outdated curriculum scores 1.99 mean, with 83% agreement, seen as a key strategy. Training teachers better had a mean of 1.62, with 80% agreement, stressing importance. Increasing instructional materials to enhance teaching scored 1.93 mean with nearly 100% agreement. Making lessons more relevant to real life issues had a mean of 1.81, with 80% agreement. Giving social studies more priority from administrators had a mean of 1.89 with 80% agreement. Overall weighted mean of 2.11 shows good consensus around these strategies Table 4.

**Result of hypothesis**

Considering the value of the statistic in table 5 and 6, since the P. value shows significant level of 0.00 which is less than 0.05 we therefore accept the null hypothesis

H<sub>0</sub>: There is no significant relationship between social studies education and the promotion of human security in Nigeria

**Table 5:** Decision Table

Social studies Education & Promotion of human security	Mean	SD	DF	Pair T Test	P. Value	Decision
	0.910	0.15	99	5.94	0.00	Accepted

H<sub>02</sub> there is no significant relationship between social studies education and the achievement of sustainable development goals in Nigeria.

**Table 6:** Decision Table

Social studies education & sustainable development	Mean	SD	DF	Pair T. test	P. Value	Decision
	0.25	0.052	99	4.81	0.00	Accepted

### Results and Discussion of Findings

**Social Studies and Civic Responsibility:** Findings indicate that Social Studies education promotes civic knowledge and awareness of democratic rights and duties. Learners are introduced to themes like social norms, values, and conflict resolution (Ajayi, 2020). However, rote learning and exam-oriented teaching limit opportunities for critical reflection and civic participation. The findings affirm that Social Studies education can significantly contribute to peace-building, civic engagement, and sustainable development when appropriately structured. The absence of participatory learning methods and inadequate teacher preparation undermines these outcomes.

**Environmental Education and Sustainability:** The curriculum contains environmental components such as resource management, sanitation, and climate change. Yet, these are treated theoretically with little experiential learning (Nwafor, 2022). Students rarely engage in practical environmental projects that reinforce sustainable living. Constructivist principles call for experiential approaches that connect learners with community issues. This method enhances critical thinking and social responsibility (Amadi, 2019). Human Security Theory also emphasizes empowerment, implying that education must build resilience against threats to peace and welfare.

**Human Security Awareness:** There is weak integration of human security topics, such as gender equality, health literacy, and poverty eradication. As Oni (2021) observed, the absence of these themes creates a disconnect between classroom instruction and national security realities. The findings also align with SDG 4 (quality education) and SDG 16 (peace, justice, and strong institutions). Thus, a reform-oriented Social Studies curriculum can act as a catalyst for achieving sustainable development in Nigeria. **Teacher Competence and Pedagogy:** Teacher competence remains a major challenge. Many educators lack training in integrating SDG concepts and security education into classroom practice (Adeniran & Oke, 2021). Additionally, large class sizes and insufficient teaching materials hinder interactive learning.

## Conclusion

The study concludes that Social Studies education holds great potential for promoting human security and sustainable development in Nigeria. It can instil civic virtues, encourage environmental stewardship, and enhance social cohesion. However, achieving this potential requires curriculum reforms, capacity building for teachers, and the adoption of participatory pedagogy. Education must move beyond mere knowledge transmission to a process of social transformation and empowerment.

## Recommendations

Based on the findings the following are recommended:

- i. Curriculum Reformation: Revise Social Studies curricula to include human security and sustainability topics such as climate resilience, peace education, and social inclusion.
- ii. Teacher Development: Provide continuous professional development for Social Studies teachers to equip them with skills for integrating global citizenship and SDG-based learning.
- iii. Participatory Pedagogy: Adopt inquiry-based, problem-solving, and project-based teaching methods that promote learner engagement and social responsibility.
- iv. Policy Support: Strengthen educational policies that link classroom content to national development goals and human security objectives.
- v. Community Engagement: Encourage schools to collaborate with local communities in implementing sustainability and peace-oriented projects.

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# ARCHITECTURAL TRANSFORMATION FROM TRADITIONAL TO POSTMODERN FORMS IN CROSS RIVER STATE, NIGERIA

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## **Abstract**

*Architecture in Cross River State reflects a dynamic evolution shaped by indigenous traditions, colonial encounters, and contemporary global influences. This paper critically examines the transformation from traditional vernacular architecture to postmodern architectural expressions in Cross River State, with particular attention to cultural continuity, material transitions, and socio-economic drivers. Using historical analysis and literature synthesis, the study reveals that while traditional architecture was environmentally responsive and culturally symbolic, colonial and postcolonial influences introduced new materials and aesthetics that culminated in postmodern hybridity. The study concludes that contemporary architecture in Cross River State represents a fusion of identity and globalization, raising important implications for sustainable and culturally responsive design.*

**Keywords:** *Traditional architecture, postmodern architecture, Cross River State, vernacular design, cultural identity*

## **Introduction**

Architecture is a cultural artifact that reflects societal values, environmental adaptation, and technological advancement. In Cross River State, southeastern Nigeria, architectural evolution has progressed from indigenous vernacular forms to modern and postmodern expressions influenced by colonialism and globalization (Enamhe & Unimke, 2017). The state, historically inhabited by diverse ethnic groups such as the Efik, Ejagham, and Yakurr, possesses rich cultural traditions that shaped its early architectural forms (Bassey & Ekpo, 2019). Towns such as Ugep demonstrate the persistence of traditional spatial organization alongside modern transformations. This paper explores the transition from traditional to postmodern architecture, focusing on materiality, spatial organization, symbolism, and socio-political influences.

## **Traditional Architecture**

Traditional architecture refers to the indigenous building styles, construction methods, and spatial organization developed by a people over time in response to their environmental, cultural, social, and economic conditions. It reflects the identity, beliefs, customs, and technological capabilities of a particular society and is usually characterized by the use of locally sourced materials, climatic adaptation, and culturally symbolic forms (Rapoport, 1969). According to Amos Rapoport, traditional architecture evolves as a direct expression of human culture, where social values and environmental factors strongly shape building forms. Traditional architecture is often described as vernacular architecture, a term used to denote structures built by local craftsmen using inherited knowledge rather than professional architects. Paul Oliver defined vernacular architecture as buildings designed through communal experience and practical necessity, often without formal drawings or modern technological intervention (Oliver, 2006). This architecture reflects adaptation to local geography, climate, available materials, and social traditions.

One of the major characteristics of traditional architecture is environmental responsiveness. Before the advent of mechanical cooling and artificial environmental control systems, traditional buildings were designed to maximize thermal comfort using passive design strategies such as natural ventilation, thick walls, courtyards, shading devices, and strategic orientation (Fathy, 1986). Hassan Fathy argued that traditional architecture provides sustainable design solutions because it is rooted in ecological wisdom and climatic adaptation. Traditional architecture also serves as a medium for expressing cultural identity and symbolism. Building forms, decorative motifs, roof styles, and spatial organization often embody religious beliefs, social hierarchy, and communal values. According to Christian Norberg-Schulz, traditional architecture creates a “sense of place” by integrating human existence with environmental and cultural contexts (Norberg-Schulz, 1980). In the African context, traditional architecture is closely tied to communal living patterns, indigenous technology, and environmental adaptation. In Nigeria, traditional architecture varies across ethnic groups. Among the Yoruba, compounds are often organized around central courtyards; Hausa architecture emphasizes mud walls and domed structures for thermal regulation; while among the Efik and Yakurr peoples of Cross River State, architecture traditionally incorporates timber, raffia, thatch roofing, and symbolic decorative carvings (Prussin, 1974).

In Cross River State, traditional architecture reflects the rainforest ecology and socio-cultural organization of indigenous communities. Buildings were typically constructed with mud walls, bamboo reinforcement, timber frames, and steeply pitched thatch roofs designed to withstand heavy rainfall. The layout often accommodated extended family structures and communal interaction, reflecting the collective social system of the people (Denyer, 1978). However, modernization, urbanization, and the introduction of foreign building materials have contributed to the gradual decline of traditional architectural practices. Despite this, traditional architecture remains significant for historical preservation, sustainable design inspiration, and cultural continuity (Vale, 1992).

### **Colonial Architecture**

Colonial architecture refers to building styles and spatial planning systems introduced by foreign powers during periods of colonization, particularly between the 15th and 20th centuries. It represents a fusion of imported European design principles and local environmental, cultural, and material conditions in colonized regions. According to Dell Upton, colonial architecture embodies both the imposition of foreign authority and the adaptation of architecture to new geographical and cultural contexts (Upton, 1998). Colonial architecture is typically characterized by symmetry, geometric order, and formal planning, reflecting European classical ideals. Structures often featured rectangular plans, axial layouts, verandas, pitched roofs, and the use of durable materials such as stone, brick, and timber. However, as Spiro Kostof explains, these forms were often modified in response to climatic conditions in tropical regions, resulting in hybrid architectural expressions that combined European aesthetics with local adaptations (Kostof, 1995).

A key feature of colonial architecture is its environmental adaptation, particularly in tropical colonies such as Nigeria. Buildings were designed with wide verandas, high ceilings, large windows, and shading devices to improve ventilation and reduce heat gain. Anthony D. King notes that colonial architecture in the tropics evolved into a distinct “tropical colonial style,” which integrated climatic responsiveness with the administrative and symbolic functions of colonial rule (King, 1984). Colonial architecture also functioned as a symbol of power and authority. Government buildings, churches, administrative offices, and residences of colonial officials were often constructed in dominant locations using imposing styles to reinforce political control and cultural dominance. According to Gwendolyn Wright, colonial urban planning and architecture were deliberately used as instruments of control, shaping both physical space and social order in colonized territories (Wright, 1991).

In Nigeria, colonial architecture emerged during British rule and significantly influenced urban development patterns. Colonial buildings in cities such as Calabar, Lagos, and Enugu include administrative offices, mission houses, railway stations, and residential quarters. These structures often combined European styles such as Georgian and Victorian with local materials and construction techniques. For example, the use of corrugated iron roofing and deep verandas became common adaptations to the tropical climate (Elleh, 1997). In Cross River State, particularly in Calabar, colonial architecture reflects the region's historical role as an administrative and trading center during British colonial rule. Buildings such as government offices, churches, and missionary schools exhibit features like large windows, timber framing, masonry walls, and elevated floors to prevent flooding and improve air circulation. These

structures also illustrate the interaction between European building traditions and indigenous construction knowledge (Ekhaese, 2010).

Despite its historical significance, colonial architecture is often critically examined as part of the broader legacy of colonialism. While it contributed to infrastructural development and introduced new construction technologies, it also disrupted indigenous architectural traditions and imposed foreign cultural values. As William J. R. Curtis argues, colonial architecture must be understood within its socio-political context as both a tool of domination and a catalyst for architectural transformation (Curtis, 1996). Today, colonial buildings remain important components of architectural heritage, offering insights into historical processes, cultural exchange, and the evolution of the built environment. They also provide opportunities for conservation, adaptive reuse, and sustainable design practices in contemporary architecture.

### **Post-Colonial Architecture**

Post-colonial architecture refers to the body of architectural practices and built forms that emerged in formerly colonized societies after political independence. It represents a conscious effort to redefine architectural identity by negotiating between inherited colonial influences, indigenous traditions, and modern global trends. According to Bill Ashcroft, post-colonial cultural production—including architecture—engages in processes of resistance, adaptation, and hybridization that seek to reclaim identity while responding to contemporary realities (Ashcroft et al., 2002). A defining characteristic of post-colonial architecture is hybridity, where elements of traditional, colonial, and modern architecture are combined to produce new forms. Homi K. Bhabha emphasizes the concept of hybridity as a space of cultural negotiation, where new identities and expressions emerge from the interaction of different cultural systems (Bhabha, 1994). In architectural terms, this often results in buildings that incorporate modern construction techniques while reflecting local cultural symbols, materials, and spatial practices.

Post-colonial architecture also involves a deliberate search for identity and authenticity. After independence, many nations sought to move away from colonial architectural symbols and develop styles that reflect national pride and cultural heritage. Kenneth Frampton highlights the concept of “critical regionalism,” which advocates for architecture that responds to local context, climate, and culture while engaging with modern technology (Frampton, 1983). This approach has been influential in shaping post-colonial architectural discourse, especially in developing countries.

Another important feature is adaptation to socio-economic realities. Post-colonial architecture often reflects rapid urbanization, population growth, and limited resources in newly independent nations. As Anthony D. King notes, the built environment in post-colonial societies is shaped by both global influences and local constraints, leading to diverse architectural expressions ranging from informal settlements to state-led modernist projects (King, 1990). In Nigeria, post-colonial architecture developed after independence in 1960 and is marked by experimentation with modern materials such as reinforced concrete, glass, and steel, alongside traditional design elements. Government buildings, educational institutions, and residential developments began to reflect national aspirations and modernization efforts.

Cities such as Abuja, Lagos, and Calabar showcase a mixture of international modernism and locally inspired designs (Elleh, 1997).

In Cross River State and Ugep, post-colonial architecture illustrates the gradual transition from colonial forms to more contemporary and culturally responsive designs. Residential buildings, public institutions, and commercial structures often integrate modern construction techniques with vernacular features such as courtyards, shading devices, and the use of locally available materials. This reflects an ongoing attempt to balance modernization with cultural continuity.

However, post-colonial architecture faces several challenges, including loss of identity, globalization pressures, and environmental concerns. The widespread adoption of international architectural styles sometimes leads to the neglect of indigenous knowledge systems and climatic responsiveness. Nezar AlSayyad argues that globalization can result in homogenized urban landscapes that undermine local distinctiveness (AlSayyad, 2001). Despite these challenges, post-colonial architecture remains a dynamic and evolving field. It continues to explore innovative ways of integrating tradition and modernity, addressing sustainability, and expressing cultural identity in a globalized world.

### **Modern Architecture**

Modern architecture refers to a global architectural movement that emerged in the late 19th and early 20th centuries as a response to rapid industrialization, technological advancement, and changing social conditions. It is characterized by a deliberate break from historical styles and traditional ornamentation, emphasizing function, simplicity, structural innovation, and the use of new materials such as reinforced concrete, steel, and glass. According to Nikolaus Pevsner, modern architecture represents a radical shift in design thinking, where form follows function and aesthetic value is derived from structural clarity rather than decoration (Pevsner, 1976). One of the central principles of modern architecture is functionalism, which asserts that the design of a building should be determined primarily by its intended purpose. This idea was strongly promoted by Louis Sullivan, who famously stated that “form follows function,” a concept that became foundational to modern architectural theory (Sullivan, 1896). This approach led to the elimination of unnecessary ornamentation and the creation of buildings that prioritize efficiency and usability.

Modern architecture is also defined by its emphasis on new construction technologies and materials. The introduction of reinforced concrete, structural steel, and large glass panels allowed architects to design taller, lighter, and more flexible structures. Le Corbusier played a major role in promoting these innovations, advocating for buildings that function as “machines for living in,” characterized by open floor plans, pilotis (support columns), and ribbon windows (Le Corbusier, 1923). Another key feature of modern architecture is minimalism and simplicity of form. Ludwig Mies van der Rohe popularized the principle of “less is more,” emphasizing clarity, proportion, and the reduction of architectural elements to their essential form (Mies van der Rohe, 1947). His works, such as the Seagram Building in New York, exemplify the clean lines and glass-and-steel aesthetic associated with modernism.

The modernist movement also introduced the concept of international style, which aimed to create a universal architectural language that transcended regional and cultural differences. According to Henry-Russell Hitchcock and Philip Johnson, the International Style is characterized by volume over mass, regularity over symmetry, and the avoidance of applied decoration (Hitchcock & Johnson, 1932).

In practice, modern architecture spread globally after World War II, influencing urban development in both developed and developing countries. In Nigeria, modern architecture became prominent during the colonial and post-independence periods, particularly in government buildings, universities, and corporate structures. Cities such as Lagos, Abuja, and Calabar feature numerous modernist buildings that reflect international design principles adapted to tropical climates.

However, modern architecture has also been criticized for its lack of cultural identity and climatic responsiveness. Kenneth Frampton argues that modernism often ignores local traditions and environmental conditions, leading to a loss of regional character in architecture. In response, he proposed “critical regionalism” as a way to integrate modern techniques with local cultural and environmental considerations (Frampton, 1983). Despite these criticisms, modern architecture remains one of the most influential movements in architectural history, shaping contemporary building design, urban planning, and construction technology worldwide.

### **Postmodern Architecture**

Postmodern architecture is an architectural movement that emerged in the mid-to-late 20th century as a reaction against the strict functionalism, minimalism, and perceived uniformity of modern architecture. It embraces complexity, contradiction, symbolism, and historical reference, reintroducing ornamentation and cultural meaning into architectural design. According to Charles Jencks, postmodern architecture is defined by “double coding,” meaning it communicates simultaneously to both elite architectural audiences and the general public through symbolic and contextual references (Jencks, 1977).

One of the key characteristics of postmodern architecture is its rejection of modernist simplicity. Instead of pure functional forms, postmodern buildings often incorporate eclectic styles, decorative elements, and references to historical architecture. Robert Venturi challenged modernist ideals by arguing that “less is a bore,” advocating for complexity and contradiction in architectural design (Venturi, 1966). His work emphasized that buildings should reflect the messy, layered reality of human experience rather than abstract purity. Postmodern architecture also places strong emphasis on historical reference and symbolism. Architects often draw inspiration from classical, Gothic, Renaissance, and vernacular styles, blending them into contemporary designs. Denise Scott Brown and Venturi highlighted the importance of learning from “Las Vegas” and popular culture as legitimate sources of architectural meaning, challenging the elitism of modernist design principles (Venturi, Scott Brown & Izenour, 1972).

Another important feature is contextualism, where buildings are designed to respond to their cultural and physical surroundings. Aldo Rossi emphasized the idea of the “collective memory”

of cities, arguing that architecture should preserve historical continuity while accommodating contemporary needs (Rossi, 1966). This approach influenced postmodern design by encouraging architects to consider urban history and cultural identity. Postmodern architecture is also known for its playfulness, irony, and aesthetic diversity. Unlike the rigid uniformity of modernism, postmodern buildings often experiment with color, form, and visual metaphor. According to James Stirling, architecture should engage emotionally with users and reflect cultural narratives rather than purely functional logic (Stirling, 1984).

Globally, postmodern architecture gained prominence in the 1970s and 1980s, influencing public buildings, commercial centers, and cultural institutions. In developing countries such as Nigeria, postmodernism appears in the blending of modern construction techniques with indigenous motifs and decorative expressions. Cities like Lagos and Abuja feature buildings that combine international postmodern aesthetics with local cultural symbolism. In Cross River State and Ugep, postmodern tendencies can be seen in contemporary residential and institutional architecture where designers incorporate traditional motifs, decorative façades, and non-linear spatial arrangements alongside modern materials such as concrete, glass, and steel. This reflects a growing attempt to reconnect architecture with cultural identity while embracing global trends.

However, postmodern architecture has also been criticized for being fragmented, stylistically inconsistent, and overly symbolic. Some scholars argue that its reliance on historical references can lead to superficial design solutions rather than meaningful architectural innovation. Nevertheless, its contribution lies in reintroducing cultural narrative, diversity, and human experience into architectural discourse.

### **Traditional Architecture in Cross River State Characteristics and Materials**

Traditional architecture in Cross River State was primarily vernacular, constructed using locally available materials such as mud, timber, raffia, and thatch. Buildings were typically: Circular or rectangular huts. Organized around courtyards. Climatically responsive (ventilation, shading)

These forms reflected deep environmental adaptation to the tropical rainforest climate characterized by high rainfall and humidity.

### **Cultural and Social Symbolism**

Architecture was closely tied to social institutions such as the Ekpe society, which influenced spatial hierarchy and building typologies (Basse & Ekpo, 2019). Buildings served not only functional purposes but also symbolic roles: Compounds reflected kinship structures Shrines and sacred spaces reinforced spiritual beliefs. Decorative motifs expressed identity and status

### **Settlement Patterns**

Traditional settlements, especially in communities like Ugep, were clustered and organic, reflecting communal living and agricultural lifestyles (Okoi, 2021).

## **Colonial and Modern Architectural Transition**

### **Impact of Colonialism**

The advent of British colonial rule in the late 19th century introduced new architectural typologies such as: Mission houses, administrative buildings and Churches

Following treaties such as the 1884 protection agreement in Calabar, colonial authorities established European-style buildings that altered indigenous construction practices.

### **Introduction of New Materials and Techniques**

Colonial influence led to the adoption of: Cement and concrete, Corrugated iron sheets and Glass windows. These materials replaced traditional ones due to perceived durability and status, marking a shift toward modern architecture.

### **Cultural Hybridization**

The interaction between indigenous and foreign systems resulted in hybrid forms:

Traditional layouts with modern materials

Courtyard houses with concrete walls

Decorative motifs retained on modern facades

This phase represents what scholars describe as transitional architecture.

## **Emergence of Postmodern Architecture in Cross River State**

### **Defining Postmodernism in the Local Context**

Postmodern architecture in Cross River State is characterized by:

Eclectic styles

Symbolic ornamentation

Reinterpretation of traditional forms

Unlike modernism's emphasis on function, postmodernism embraces plurality and cultural references.

### **Key Features**

Postmodern buildings in cities like Calabar and Ugep exhibit:

Complex geometries

Bright colors and decorative facades

Fusion of indigenous motifs with global styles

Enamhe and Unimke (2017) argue that contemporary artistic expressions in Cross River contribute significantly to architectural aesthetics.

### **Drivers of Postmodern Transformation**

Several factors contributed to this shift:

Urbanization and population growth

Increased access to global design trends

Technological advancement

Tourism development in Cross River State

## Comparative Analysis: Traditional vs Postmodern Architecture

Feature	Traditional Architecture	Postmodern Architecture
Materials	Mud, thatch, timber	Concrete, steel, glass
Design philosophy	Functional and communal	Symbolic and expressive
Cultural expression	Embedded in structure	Applied as ornament
Spatial organization	Courtyard-based	Flexible layouts
Environmental response	Passive design	Mixed (passive + mechanical)

### Discussion

The transition from traditional to postmodern architecture in Cross River State is not merely a stylistic shift but reflects broader socio-cultural transformations. Traditional architecture emphasized community, sustainability, and identity, whereas postmodern architecture reflects individualism, globalization, and aesthetic experimentation.

However, this transition has led to:

- Loss of indigenous building knowledge
- Reduced climatic responsiveness
- Increased reliance on imported materials

Yet, it has also enabled:

- Architectural innovation
- Cultural reinterpretation
- Economic development through urbanization

### Conclusion

The architectural evolution of Cross River State demonstrates a continuum from environmentally responsive vernacular forms to globally influenced postmodern expressions. While traditional architecture embodied cultural identity and sustainability, postmodern architecture reflects a hybridized identity shaped by colonial history and globalization.

### Recommendations

Future architectural development in Cross River State should aim to integrate traditional principles with modern technologies, ensuring sustainability and cultural continuity.

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# INSTITUTIONAL CONSTRAINTS AND PROFESSIONAL AUTONOMY OF MEDICAL SOCIAL WORKERS IN NIGERIAN PUBLIC HOSPITALS

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## **Abstract**

*Medical social workers play a critical role in addressing the psychosocial and socioeconomic dimensions of healthcare delivery in public hospitals. However, their effectiveness is often shaped by institutional environments that either enable or constrain professional practice. This paper examines the institutional constraints affecting the professional autonomy of medical social workers in Nigerian public hospitals. Adopting a qualitative and policy-oriented approach, the study explores how organisational structures, administrative hierarchies, resource limitations, and interprofessional dynamics influence the scope, independence, and effectiveness of medical social work practice. Drawing on documentary evidence, policy frameworks, and existing empirical studies, the paper analyses how bureaucratic control, role ambiguity, inadequate recognition, and limited participation in decision-making processes restrict professional autonomy. The findings reveal that while medical social workers possess specialised expertise essential for holistic patient care, institutional constraints within public hospitals significantly undermine their capacity to exercise professional judgement and advocacy roles. The paper argues that enhancing professional autonomy through clearer role definition, improved institutional support, and stronger integration of medical social work into hospital governance structures is vital for effective healthcare delivery and patient-centred care. Policy and practice recommendations are advanced to strengthen professional autonomy and optimise the contribution of medical social workers within Nigeria's public health system.*

**Keywords:** *Medical social work; professional autonomy; institutional constraints; public hospitals; healthcare governance; interprofessional relations*

## Introduction

Contemporary healthcare systems increasingly recognise that effective health outcomes depend not only on biomedical interventions but also on the social, psychological, and economic conditions that shape patients' experiences of illness and care. As a result, medical social work has emerged as a critical component of multidisciplinary healthcare delivery, addressing the psychosocial needs of patients, facilitating access to support services, and promoting patient-centred care (Barker, 2014; Payne, 2020). In public hospital settings, medical social workers play a vital role in counselling, psychosocial assessment, discharge planning, advocacy, and the coordination of care for vulnerable populations.

In Nigeria, public hospitals remain the primary source of healthcare for a large proportion of the population, particularly low-income households and socially disadvantaged groups. These hospitals operate within complex institutional environments characterised by bureaucratic governance structures, resource constraints, and a strong biomedical orientation (Federal Ministry of Health, 2021). While medical social workers are formally incorporated into hospital systems, their professional roles are often poorly understood, inadequately supported, and marginalised within institutional hierarchies dominated by clinical professions. Professional autonomy is a defining feature of professional practice, referring to the capacity of practitioners to exercise independent judgement, apply specialised knowledge, and participate meaningfully in decisions affecting service delivery (Rawls, 1971; Payne, 2020). In medical social work, professional autonomy is essential for ethical practice, effective advocacy, and the protection of patients' social rights within healthcare institutions. However, studies suggest that institutional arrangements in many public hospitals limit the autonomy of medical social workers through rigid administrative control, role ambiguity, exclusion from clinical decision-making, and inadequate recognition within multidisciplinary teams (Gilson, 2012). These institutional constraints have significant implications for healthcare delivery. When medical social workers are unable to exercise professional judgement or contribute fully to care planning, psychosocial dimensions of health are neglected, interdisciplinary collaboration is weakened, and patient-centred care is compromised (World Health Organization [WHO], 2010). This situation is particularly problematic in Nigeria, where patients often face compounded social and economic challenges that require coordinated social and medical interventions.

Despite the growing emphasis on integrated healthcare and multidisciplinary collaboration in health policy discourse, there remains limited scholarly attention to the institutional factors shaping the professional autonomy of medical social workers in Nigerian public hospitals. Existing studies on healthcare governance and professional practice tend to focus predominantly on clinical roles, leaving the experiences and constraints of allied health professionals underexplored (Aregbeshola & Khan, 2018). This gap in literature limits understanding of how institutional environments influence medical social work practice and, by extension, the quality and equity of healthcare delivery. This study examines the institutional constraints affecting the professional autonomy of medical social workers in Nigerian public hospitals. By analysing organisational structures, administrative practices, and interprofessional relations, the study seeks to contribute to social work scholarship and health policy debates. Understanding these dynamics is essential for strengthening medical social work practice, enhancing multidisciplinary collaboration, and improving patient-centred healthcare delivery within Nigeria's public health system.

### **Statement of the Problem**

Medical social workers are widely recognised as essential contributors to holistic healthcare delivery through the provision of psychosocial support, patient advocacy, and linkage to social protection and welfare services (Barker, 2014; Payne, 2020). Empirical studies have shown that integrating social work services into hospital care improves patient coping, continuity of care, and health outcomes, particularly among socioeconomically disadvantaged populations (World Health Organization [WHO], 2010). In Nigerian public hospitals, where patients frequently experience poverty, limited health insurance coverage, and weak social safety nets, the role of medical social workers is especially critical (Aregbeshola & Khan, 2018).

Despite their relevance, evidence suggests that medical social workers in Nigerian public hospitals operate within institutional environments that significantly constrain their professional autonomy. Studies on healthcare governance in Nigeria highlight the dominance of rigid administrative hierarchies and biomedical professional control, which marginalise non-clinical health professionals and limit their participation in clinical and organisational decision-making (Gilson, 2012; Federal Ministry of Health, 2021). Empirical findings indicate that allied health professionals, including social workers, often experience role ambiguity, inadequate institutional recognition, and exclusion from multidisciplinary care planning (Onoka et al., 2013).

The limitation of professional autonomy has measurable consequences for healthcare delivery. Research shows that when social workers and other allied professionals are excluded from decision-making processes, psychosocial needs are inadequately addressed, care coordination is weakened, and patient-centred care outcomes decline (WHO, 2010; Onwujekwe et al., 2020). In the Nigerian context, these institutional constraints contribute to fragmented care delivery, reduced advocacy for vulnerable patients, and underutilisation of social support mechanisms within public hospitals.

Although national health policies in Nigeria emphasise integrated and patient-centred healthcare, there is a paucity of empirical research specifically examining how institutional arrangements within public hospitals shape the professional autonomy of medical social workers. Existing empirical studies largely focus on clinical service delivery, health financing, or medical workforce issues, with limited attention to the organisational positioning and professional experiences of medical social workers (Adebayo et al., 2019; Gilson, 2012). This gap in literature constrains evidence-based policy and institutional reforms aimed at strengthening medical social work practice and improving holistic healthcare delivery. Addressing this problem therefore requires a systematic empirical examination of the institutional constraints affecting the professional autonomy of medical social workers in Nigerian public hospitals, as well as an exploration of strategies for enhancing their professional role within healthcare governance structures.

### **Objectives of the Study**

The general objective of this study is to examine the institutional constraints affecting the professional autonomy of medical social workers in Nigerian public hospitals. The specific objectives of the study are to:

- i. Examine the organisational and administrative structures within Nigerian public hospitals that shape the professional autonomy of medical social workers.
- ii. Analyse the nature and extent of institutional constraints experienced by medical social workers in the exercise of their professional roles.
- iii. Assess how interprofessional relations and biomedical dominance influence the autonomy and recognition of medical social workers in public hospital settings.
- iv. Explore the implications of limited professional autonomy for medical social work practice and patient-centred healthcare delivery.
- v. Identify strategies for strengthening professional autonomy and institutional support for medical social workers in Nigerian public hospitals.

### **Methodology**

This study adopts a qualitative, policy-oriented research design to examine the institutional constraints shaping the professional autonomy of medical social workers in Nigerian public hospitals. The approach is appropriate given the study's focus on organisational processes, professional experiences, and governance arrangements rather than on quantifiable outcomes. Data were generated primarily through documentary analysis of relevant policy instruments, including national health policies, hospital administrative guidelines, professional practice standards, and regulatory frameworks governing social work and allied health professions in Nigeria. In addition, the study systematically reviewed existing empirical studies, peer-reviewed journal articles, and authoritative reports addressing medical social work practice, professional autonomy, and institutional dynamics within public healthcare settings. Sources were purposively selected based on their relevance to public hospital administration, interprofessional relations, and healthcare governance in Nigeria.

Data analysis was conducted using thematic qualitative analysis, which enabled the identification and interpretation of recurring patterns relating to organisational structures, administrative hierarchies, resource allocation, professional recognition, and decision-making processes. The analysis focused on how these institutional factors influence the scope of practice, independence, and professional judgement of medical social workers. To enhance analytical rigour, themes were interpreted within established theoretical perspectives on professional autonomy and institutional governance. The study ensured credibility through systematic source triangulation and careful comparison of policy intentions with documented practice realities. Ethical considerations were addressed by relying exclusively on secondary data sources, thereby eliminating risks to human subjects. This methodological approach provides a robust basis for understanding how institutional arrangements constrain or enable professional autonomy and for proposing evidence-informed policy and practice reforms within Nigeria's public health system.

### **Literature Review**

This literature review examines scholarly and empirical studies relevant to the institutional constraints and professional autonomy of medical social workers, with particular reference to public hospital settings. The review is organised around the specific objectives of the study and focuses on key thematic areas, including institutional structures in public hospitals, the nature of professional autonomy in medical social work, interdisciplinary relations within healthcare systems, and the implications of constrained autonomy for service delivery and patient

outcomes. By drawing on empirical evidence from Nigeria and comparable developing-country contexts, the review situates the experiences of medical social workers within broader debates on professional practice, organisational power relations, and health system governance. The purpose is to identify established findings, methodological approaches, and existing gaps in the literature, thereby providing a robust empirical foundation for the present study and justifying its relevance to policy and practice in Nigeria's public health sector.

### **Institutional and Organisational Structures in Nigerian Public Hospitals**

Empirical scholarship on health system governance in Nigeria consistently identifies bureaucratisation, centralised authority, and rigid professional hierarchies as defining features of public hospital administration. These organisational arrangements are largely inherited from colonial-era administrative traditions and subsequently reinforced by post-independence civil service rules, which prioritise command-and-control models of management over participatory and collaborative governance (Alubo, 2018; Gilson, 2012). Within such settings, authority is typically concentrated in the hands of senior medical officers and hospital administrators, resulting in physician-led governance structures that shape institutional priorities, resource allocation, and clinical decision-making. Allied health professionals, including medical social workers, often occupy peripheral positions within these hierarchies, limiting their influence on organisational processes and policy implementation at the facility level.

Empirical studies further demonstrate that although national health policies in Nigeria formally endorse multidisciplinary and patient-centred care, institutional mechanisms for operationalising these principles remain weak. Reports from the Federal Ministry of Health (2021) indicate that hospital management committees and clinical governance structures are predominantly composed of medical and administrative personnel, with little or no statutory representation for social workers and other psychosocial care providers. Onoka et al. (2013) provide empirical evidence showing that organisational rules, reporting lines, and task allocations in public hospitals often confine medical social workers to narrowly defined supportive or welfare-related functions. This role confinement restricts their participation in treatment planning, discharge decisions, and ethical deliberations, despite the relevance of their expertise to these processes.

Further empirical work suggests that such organisational marginalisation has direct implications for professional autonomy and service effectiveness. Studies by Adelokun and Adeyemo (2019) and Adebayo and Oladeji (2020) reveal that rigid administrative hierarchies discourage interprofessional collaboration and reinforce professional dominance, thereby perpetuating role ambiguity and limiting the exercise of independent professional judgement by medical social workers. These institutional constraints not only undermine the professional identity of social workers but also weaken the integration of psychosocial perspectives into healthcare delivery. Collectively, the literature underscores that institutional and organisational structures in Nigerian public hospitals are not neutral; rather, they actively shape power relations and professional autonomy, with significant consequences for holistic, equitable, and patient-centred care.

### **Nature and Extent of Institutional Constraints on Medical Social Work Practice**

Empirical literature provides substantial evidence that institutional constraints in public healthcare settings systematically limit the scope and effectiveness of medical social work practice. One of the most persistent challenges identified is role ambiguity, which arises from poorly defined job descriptions and weak professional boundaries within hospital organisations. Onwujekwe et al. (2020) found that in many Nigerian public hospitals, the responsibilities of medical social workers overlap with those of nursing staff, administrative welfare officers, or non-professional support personnel. This ambiguity diminishes professional recognition, weakens accountability, and reduces the likelihood of social workers being included in clinical decision-making and discharge planning processes. As a result, medical social workers are often reactive rather than proactive, responding to referrals rather than shaping care pathways.

Resource-related constraints further deepen institutional limitations on professional autonomy. Empirical studies by Aregbeshola and Khan (2018) demonstrate that chronic underfunding of Nigeria's public health sector has far-reaching consequences beyond clinical care, disproportionately affecting allied health and psychosocial services. Medical social work units in public hospitals frequently operate with inadequate staffing, limited office space, insufficient documentation tools, and minimal budgetary allocations. These material constraints restrict the ability of social workers to conduct comprehensive psychosocial assessments, engage in sustained follow-up with patients and families, or initiate community-based interventions. In such environments, professional judgement is often subordinated to institutional expediency, with social workers compelled to prioritise immediate welfare needs over long-term advocacy and empowerment goals.

Beyond structural and resource limitations, institutional culture and performance metrics also constrain medical social work practice. The World Health Organization (2010) reports that health systems dominated by biomedical paradigms tend to prioritise measurable clinical outcomes, such as morbidity and mortality rates, while undervaluing psychosocial and social determinants of health. In Nigerian public hospitals, this emphasis marginalises social work interventions that address poverty, family dynamics, stigma, and access to social protection. Empirical evidence suggests that when psychosocial contributions are not formally recognised within hospital evaluation frameworks, medical social workers experience reduced autonomy, limited professional visibility, and diminished influence within multidisciplinary teams. Collectively, these findings indicate that institutional constraints on medical social work practice are multidimensional, encompassing role definition, resource allocation, and organisational culture, with significant implications for holistic and patient-centred healthcare delivery.

### **Interprofessional Relations and Biomedical Dominance**

Empirical literature consistently underscores the centrality of interprofessional relations in shaping professional autonomy within hospital environments. Across diverse health systems, biomedical dominance has been shown to structure power relations, determine role legitimacy, and control access to decision-making spaces (Gilson, 2012). Hospitals are traditionally organised around medical authority, with physicians positioned as the primary arbiters of clinical judgement and institutional priorities. This hierarchical arrangement often relegates

allied health professionals, including medical social workers, to subordinate roles, regardless of their specialised expertise or relevance to patient care outcomes.

In the Nigerian context, empirical studies demonstrate that medical doctors frequently function as gatekeepers in patient management processes, thereby restricting the meaningful participation of medical social workers in clinical and administrative decisions. Onoka et al. (2013) found that referrals to social work services are commonly discretionary and initiated only after clinical treatment decisions have been finalised. This practice limits opportunities for early psychosocial assessment and reduces the influence of social workers on treatment planning, discharge decisions, and continuity of care. Consequently, professional autonomy is curtailed, as social workers are positioned as peripheral service providers rather than as integral members of multidisciplinary care teams.

Further empirical evidence highlights how institutional authority and professional recognition shape participation in strategic and policy-related discussions within healthcare settings. Adebayo et al. (2019), in their analysis of health insurance implementation, observed that frontline professionals lacking formal decision-making authority are routinely excluded from planning and governance processes, even when their roles are critical to service access, enrolment, and care coordination. This finding is particularly relevant to medical social workers, whose advocacy, counselling, and navigation functions are essential for addressing patients' socioeconomic barriers to care. Exclusion from such discussions not only diminishes professional autonomy but also weakens the overall effectiveness of healthcare interventions. The consequences of weak interprofessional collaboration extend beyond professional identity to affect healthcare delivery outcomes. The World Health Organization (2010) empirically links poor collaboration and hierarchical professional cultures to fragmented service delivery, reduced continuity of care, and suboptimal patient experiences. For medical social workers, these dynamics translate into limited capacity to influence care pathways, advocate for vulnerable patients, or contribute to institutional learning and reform. Overall, the literature demonstrates that interprofessional relations in Nigerian public hospitals are a critical determinant of professional autonomy, with biomedical dominance and weak collaborative structures constraining the full integration and effectiveness of medical social work practice.

### **Implications of Limited Professional Autonomy for Healthcare Delivery**

Empirical evidence consistently indicates that limited professional autonomy among allied health professionals undermines patient-centred and holistic healthcare delivery. The World Health Organization (2010) demonstrates that health systems which marginalise psychosocial care providers—such as medical social workers—tend to exhibit weaker coordination across services, fragmented care pathways, and reduced responsiveness to patients' social and emotional needs. In such systems, healthcare delivery is often narrowly focused on biomedical outcomes, neglecting the social determinants of health that significantly influence treatment adherence, recovery, and overall wellbeing. The exclusion of psychosocial professionals from decision-making processes therefore compromises the quality and continuity of care.

Within the Nigerian context, empirical findings reinforce these concerns. Onwujekwe et al. (2020) found that the absence or weak integration of social support mechanisms within public hospitals contributes to delays in accessing care, inadequate follow-up, and underutilisation of

available health services. These challenges are particularly acute among vulnerable populations, including low-income households, informal sector workers, women, and chronically ill patients, who often depend on medical social workers for advocacy, counselling, and assistance in navigating complex healthcare systems. When medical social workers lack autonomy and institutional support, their capacity to address these barriers is significantly diminished, resulting in poorer patient experiences and outcomes.

Beyond service utilisation, constrained professional autonomy also has important economic and equity implications. Aregbeshola and Khan (2018) empirically linked weak institutional support structures in Nigerian public hospitals to increased out-of-pocket expenditure and heightened financial hardship among patients. Their findings suggest that inadequate integration of social work services limits hospitals' ability to connect patients to financial assistance, insurance schemes, and social protection programmes that could mitigate the socioeconomic consequences of illness. This not only exacerbates poverty and inequality but also undermines broader health system goals related to equity and universal health coverage.

Collectively, these empirical insights underscore that the consequences of constrained professional autonomy extend beyond professional dissatisfaction to affect health system performance, equity, and patient wellbeing. Limited autonomy restricts the ability of medical social workers to contribute meaningfully to care coordination, advocacy, and social protection, thereby weakening the overall effectiveness of public healthcare delivery. Strengthening professional autonomy is therefore not merely a workforce issue but a critical component of patient-centred, equitable, and responsive health systems. The implication is summarized in table 1 as shown below,

<b>Theme</b>	<b>Empirical Evidence</b>	<b>Key Findings</b>	<b>Implications for Healthcare Delivery</b>
Marginalisation of psychosocial care	WHO (2010)	Health systems that sideline psychosocial care providers exhibit weak care coordination and low responsiveness to patients' social needs.	Patient-centred and holistic care is undermined, leading to fragmented service delivery.
Weak social support mechanisms	Onwujekwe et al. (2020)	Lack of effective social support within hospitals contributes to delayed treatment, poor follow-up, and reduced utilisation of health services.	Vulnerable populations face greater barriers in accessing and navigating healthcare services.
Financial hardship and socioeconomic vulnerability	Aregbeshola & Khan (2018)	Weak institutional support systems are associated with higher out-of-pocket spending and increased financial hardship among patients.	Hospitals are less able to mitigate the socioeconomic consequences of illness, exacerbating inequality.
System-level consequences	Synthesised from empirical studies	Constrained autonomy of social work services limits their effectiveness in advocacy and social protection roles.	Overall healthcare system performance and

### **Strategies for Strengthening Professional Autonomy of Medical Social Workers**

Although empirical research on professional autonomy among medical social workers in Nigeria remains limited, available studies provide important insights into institutional strategies that can enhance autonomy and strengthen healthcare delivery.

1. One key strategy identified in the literature is the reform of hospital governance structures. Gilson (2012) argues that inclusive governance arrangements and decentralised decision-making processes improve professional participation, accountability, and responsiveness within health systems. In the context of Nigerian public hospitals, this implies creating formal platforms, such as management committees, ethics boards, and clinical governance units, that include representation from medical social workers and other allied health professionals. Such inclusion would enable social workers to contribute to institutional decisions that affect patient care and service organisation.
2. A second strategy involves formal recognition and integration of medical social work roles within multidisciplinary healthcare teams. Evidence from the World Health Organization (2010) indicates that health systems which clearly define and institutionalise psychosocial roles experience better coordination of care, improved equity, and stronger patient-centred outcomes. Formal job descriptions, standard operating procedures, and practice guidelines that explicitly outline the responsibilities and authority of medical social workers can reduce role ambiguity and legitimise their contributions to care planning, discharge management, and ethical decision-making.

Empirical studies also highlight the importance of institutional support and professional empowerment. Adebayo et al. (2019) demonstrate that policy implementation outcomes improve when frontline professionals are empowered to exercise discretion, adapt interventions to client needs, and provide context-sensitive support. Applied to medical social work, this suggests that granting social workers greater professional discretions supported by clear ethical frameworks and accountability mechanisms, can enhance both autonomy and effectiveness. Such empowerment enables social workers to address patients' psychosocial and socioeconomic challenges more proactively, rather than functioning solely as referral-based support staff.

3. In addition, adequate resourcing and capacity building emerge as critical strategies for enhancing autonomy. Institutional investment in staffing, office space, documentation tools, and continuous professional development strengthens the operational independence of medical social work units and signals organisational commitment to psychosocial care.
4. Finally, interprofessional education and collaboration frameworks can help address biomedical dominance by fostering mutual respect, shared understanding of roles, and collaborative practice among healthcare professionals.

The literature suggests that enhancing professional autonomy requires a combination of governance reform, role clarification, institutional support, and resource investment. Implementing these strategies would not only strengthen medical social work practice but also contribute to more holistic, equitable, and patient-centred healthcare delivery in Nigerian public hospitals. The empirical literature reviewed demonstrates that:

1. Organisational structures and bureaucratic hierarchies significantly shape professional autonomy in public hospitals.
2. Medical social workers face persistent institutional constraints, including role ambiguity, resource limitations, and exclusion from decision-making.
3. Biomedical dominance and weak interprofessional collaboration undermine the autonomy and effectiveness of medical social work practice.
4. Limited professional autonomy negatively affects patient-centred care and the protection of vulnerable populations.
5. Institutional reforms and inclusive governance structures are essential for strengthening professional autonomy and improving healthcare delivery.

These empirical insights provide a strong foundation for the present study and justify the focus on institutional constraints and professional autonomy of medical social workers in Nigerian public hospitals.

### **Conclusion**

This study examined the institutional constraints and professional autonomy of medical social workers in Nigerian public hospitals, drawing on empirical literature and relevant theoretical perspectives. The review demonstrates that medical social workers play a critical role in addressing the psychosocial, economic, and rights-based dimensions of healthcare, particularly for vulnerable and marginalised populations. However, the literature consistently reveals that their professional autonomy is significantly constrained by rigid hospital hierarchies, biomedical dominance, limited role recognition, and exclusion from clinical and administrative decision-making processes.

Empirical evidence further indicates that these institutional constraints undermine interdisciplinary collaboration, weaken patient-centred care, and reduce the effectiveness of holistic healthcare delivery. The marginalisation of medical social workers not only affects their professional identity and job satisfaction but also compromises the quality and equity of healthcare outcomes. Despite national and global policy commitments to integrated and people-centred health systems, medical social work remains insufficiently institutionalised within Nigeria's public hospital governance structures. The study concludes that enhancing the professional autonomy of medical social workers is essential for strengthening multidisciplinary healthcare practice, improving psychosocial care, and advancing equitable and inclusive health service delivery in Nigerian public hospitals.

### **Policy Implications**

- i. **Formal Recognition of Medical Social Work within Hospital Governance:** Health policies should explicitly recognise medical social workers as core members of multidisciplinary healthcare teams, with defined roles in clinical case management, discharge planning, and patient advocacy. This would reduce role ambiguity and strengthen their professional legitimacy within public hospitals.
- ii. **Institutionalisation of Interdisciplinary Decision-Making Structures:** Hospital policies should mandate the inclusion of medical social workers in ward rounds, ethics committees, and care planning meetings. Such institutional reforms would promote collaborative practice and ensure that psychosocial considerations inform clinical decision-making.

- iii. Strengthening Professional Autonomy through Regulatory Frameworks: National health authorities and professional bodies should develop and enforce practice guidelines that protect the professional autonomy of medical social workers, including ethical independence and discretionary judgement in patient-related interventions.
- iv. Capacity Building and Workforce Development: Government and hospital management should invest in continuous professional development for medical social workers and sensitisation programmes for other health professionals to enhance mutual respect, role clarity, and effective teamwork.
- v. Alignment with People-Centred and Universal Health Coverage Goals: Integrating medical social work more effectively into public hospital systems would support Nigeria's commitments to people-centred healthcare and universal health coverage by addressing social determinants of health and improving access for vulnerable populations.

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