SUSTAINABLE AGRICULTURAL PRACTICES AND THEIR CONTRIBUTION TO RURAL ECONOMIC DEVELOPMENT: EVIDENCE FROM EDDA LGA, EBONYI STATE, NIGERIA

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ABSTRACT
This study investigates the role of Sustainable Agricultural Practices (SAP) in enhancing Rural Economic Development (RED), with a specific focus on the Edda Local Government Area in Ebonyi State, Nigeria. The research adopted a quantitative approach, utilizing quantitative data to examine how SAP contributes to rural economic growth and how Contextual Factors (COF) such as access to credit, educational level, cultural beliefs, social networks and community engagement moderate this relationship. The sample consists of 370 small, medium, and large-scale farmers, selected through stratified random sampling. Regression analysis was used to explore the direct and interactive effects of SAP and COF on RED. The results indicate that SAP significantly improves RED by increasing agricultural productivity, ensuring environmental sustainability, and promoting income stability for rural farmers. Furthermore, the interaction between SAP and COF reveals that better contextual conditions, such as improved infrastructure and market access, significantly enhance the positive effects of sustainable farming practices on rural development outcomes. The findings underscore the critical need for policy interventions that not only promote sustainable agriculture but also address the contextual challenges that rural farmers face in implementing these practices effectively. The study recommends that government and development agencies strengthen support systems for rural farmers through infrastructure development, market integration, and capacity-building programs. By addressing these factors, sustainable agricultural practices can serve as a pivotal tool for improving rural livelihoods and driving long-term economic development in rural Nigeria. This research contributes to the growing body of literature on sustainable agriculture and rural economic development by providing empirical evidence from the Nigerian context.

Keywords: Sustainable agricultural practices, rural economic development, contextual factors
JEL Code: Q01, Q12, Q15

INTRODUCTION
Sustainable agricultural practices (SAPs) have become a focal point in global discussions on rural economic development, particularly in regions where agriculture remains central to livelihoods and economic stability. Across Sub-Saharan Africa, including Nigeria, agriculture constitutes a vital component of gross domestic product (GDP) and employs over 70% of the rural workforce, underscoring its critical role in food security and poverty alleviation (World Bank, 2023). However, the sector faces multifaceted challenges, including land degradation,

climate variability, limited access to modern agricultural technologies, and market inefficiencies, which collectively undermine rural economic development (FAO, 2023).

In Nigeria, where rural communities heavily depend on subsistence farming, the transition to sustainable agricultural practices is increasingly recognized as a strategy for addressing these challenges. SAPs focus on optimizing resource use, conserving ecosystems, and promoting social equity, which is crucial for achieving long-term agricultural productivity and environmental sustainability (Pretty et al., 2023). Studies have demonstrated that practices such as agroforestry, crop rotation, organic farming, and integrated pest management not only enhance soil fertility and water conservation but also bolster household incomes and resilience to climatic shocks (Nwafor et al., 2024).

In areas like Edda Local Government Area (LGA) in Ebonyi State, agriculture remains the primary livelihood for most households. Yet, traditional farming methods, limited infrastructure, and weak access to credit perpetuate low productivity and economic vulnerability (Ajibade et al., 2023, Adeola & Yusuf, 2023). Nwafor et al. (2023) highlighted that soil degradation, climate variability, and limited access to modern agricultural technologies exacerbate the challenges, further reducing productivity and income for rural farmers. The adoption of sustainable agricultural practices (SAPs) holds transformative potential for these communities, providing pathways to increased agricultural yields, enhanced market integration, and diversified income sources (Kassam et al., 2022).

The relevance of SAPs transcends their impact on food production; they contribute to employment generation, poverty reduction, and social cohesion in rural areas (UNEP, 2022). Furthermore, they provide rural farmers with opportunities to access better markets, increase their incomes, and promote overall rural economic development (Ibrahim & Usman, 2023). Empirical evidence suggests that regions embracing sustainable practices report more resilient agricultural systems, enhanced food security, and improved economic outcomes compared to those reliant on conventional methods (Davis et al., 2022). In Edda LGA, adopting SAPs could have a transformative effect on the local economy, boosting food security, reducing poverty levels and fostering economic resilience.

Motivated by the urgent need to address rural socio-economic and environmental challenges, this study examines the impact of sustainable agricultural practices on rural economic development in Edda LGA, Ebonyi State, Nigeria. It seeks to explore how these practices can mitigate persistent constraints, enhance agricultural productivity, and contribute to sustainable livelihoods in the region. This research contributes to the growing body of literature on the role of SAPs in fostering rural development and provides policy-relevant insights for promoting agricultural sustainability in Nigeria.

The study is structured into five sections. The second section is the literature review. The Methodology section which is section three, describes the theoretical framework, model specification, and estimation procedures, ensuring the robustness and reliability of the findings. Section four includes the results and discussion details of the econometric analysis, interpreting the relationships between SAPs, contextual factors, and RED, supported by statistical evidence. Finally, section five includes the conclusion and recommendations.

2. LITERATURE REVIEW

2.1 Theoretical Literature

The Sustainable Livelihoods Framework (SLF) is a holistic model developed to understand and enhance the well-being of rural populations while maintaining environmental sustainability. Rooted in Chambers and Conway's (1992) works, the framework provides a conceptual tool for analyzing how individuals and communities use their assets and capabilities

to achieve sustainable livelihood outcomes. It emphasizes the interconnectedness of social, economic, and environmental dimensions in promoting sustainable development. The SLF is rooted in the idea that livelihoods are sustainable when they meet present needs without compromising future generations' ability to meet their own. SLF identifies five types of assets—human, social, financial, physical, and natural capital—that individuals and communities use to pursue their livelihood strategies. These assets form the foundation of economic activities and well-being. SLF highlights the role of external factors, such as governance structures, policies, and cultural norms, in shaping access to resources and opportunities. The SLF offers valuable insights into the dynamics of rural development by focusing on the interplay of resources, external factors, and human agency.

Similar to the SLT framework, the Environmental Kuznets Curve (EKC) is a theoretical model that explores the relationship between economic development and environmental degradation. Named after economist Simon Kuznets, who initially proposed a similar relationship between economic growth and income inequality, the EKC suggests an inverted-U shape pattern when plotting environmental degradation against per capita income (Grossman & Krueger, 1995). The EKC hypothesis posits that environmental degradation tends to increase at the early stages of economic growth due to industrialization, urbanization, and resource exploitation. However, as economies transition from lower to higher income levels, they often begin to prioritize environmental sustainability, leading to a decline in degradation after a certain income threshold is crossed. The EKC is particularly relevant in discussions of sustainable agricultural practices (SAP). Early-stage agricultural development often involves deforestation and soil degradation, but as societies grow wealthier, they tend to adopt more sustainable farming methods, such as conservation agriculture and agroforestry. The EKC framework underscores the importance of supporting lower-income rural communities to adopt environmentally friendly practices even in the early stages of development, thus avoiding severe environmental impacts.

The Diffusion of Innovations Theory (DIT), developed by Everett Rogers in 1962, is another relevant theory reviewed in this study. This model provides a theoretical framework to understand how new ideas, technologies, or practices are adopted within a social system. This theory explores the mechanisms and factors that influence the spread of innovations, emphasizing the roles of communication, time, social systems, and the characteristics of the innovation itself. The DIT theory highlights those innovations are not adopted uniformly by all individuals within a community. Adoption typically follows a predictable pattern, forming a bell-shaped curve when graphed. Rogers categorized adopters into five groups based on the timing of their adoption: innovators, early adopters, early majority, late majority and laggards. The DIT theory is highly relevant to understanding the adoption of Sustainable Agricultural Practices (SAP). These practices, such as crop rotation, conservation tillage, and organic farming, often require changes in traditional farming methods. Farmers' decisions to adopt these innovations depend on their perceived benefits, compatibility with existing practices, and the ability to test and observe the outcomes.

2.2 Empirical Literature

The empirical literature consistently highlights the transformative potential of sustainable agricultural practices (SAPs) on agricultural productivity, food security, and rural economic development. Across diverse contexts, SAPs have demonstrated significant benefits, yet the nuances of their impact reveal areas of complexity and variability that merit critical analysis.

Ajayi et al. (2022) and Kassam et al. (2022) underscore the role of agroforestry and conservation agriculture in enhancing soil health and water retention, contributing to food

security and long-term agricultural resilience. These practices align with global goals for sustainable development, showing marked improvements in productivity and resource efficiency. Similarly, Pretty et al. (2023) emphasize the financial incentives of organic farming, where premium pricing and reduced input costs offer dual benefits for income stability and environmental stewardship. However, the argument that premium prices universally benefit farmers can be questioned, as access to such markets often depends on infrastructure and institutional support, which are lacking in many rural areas.

Adesina et al. (2021) and Ajibade et al. (2022) extend this discussion by addressing the macroeconomic impacts of SAPs, particularly their capacity to enhance resilience to climate change and stimulate economic growth. The emphasis on climate-smart agriculture and sustainable land management highlights their role in mitigating external shocks. However, these benefits are context-dependent, as Davis et al. (2021) and Sims et al. (2022) caution. Their findings indicate that the transition to SAPs can impose substantial economic burdens, particularly for smallholder farmers. High upfront costs, limited market access, and inadequate extension services often deter adoption, creating disparities in who can realistically benefit from these practices.

Adding to this complexity, Gonzalez et al. (2022) and Thapa and Murty (2023) explore how environmental and social constraints influence the outcomes of SAPs. Their research points to unintended consequences, such as increased reliance on chemical inputs in some settings or failure to achieve desired outcomes due to mismatched interventions. This underscores the importance of context-specific solutions and integrating local knowledge into SAP frameworks.

A meta-analysis by Liu et al. (2023) further challenges the assumption of SAPs' universal efficacy. It demonstrates substantial variability in outcomes based on geographic, institutional, and socio-economic factors. Liu et al.'s findings call for adaptive research and tailored interventions, advocating for greater emphasis on aligning SAPs with local needs to maximize their potential.

Comparative studies reinforce the importance of contextual factors. For example, Marenya, Smith, and Nkonya (2020) analyzed the synergistic effects of multiple SAPs in Zambia and Ethiopia. Their use of multi-year panel data and a structural equation modelling framework revealed that bundling practices such as crop rotation, agroforestry, and pest management significantly increase yields and income. Importantly, they identified critical enablers, such as institutional support and market access, which amplify the benefits of SAPs. Similar to this, a comprehensive study to evaluate the aggregate effects of Sustainable Agricultural Practices (SAPs) in Zambia, utilizing a multi-year panel dataset by Marenya, Barrett, and Alemu (2020), comprehensive study to evaluate the aggregate effects of Sustainable Agricultural Practices (SAPs) in Zambia, utilizing a multi-year panel dataset. In contrast, Amondo et al. (2019) employed Propensity Score Matching to evaluate SAP adoption in Northern Ghana. Their findings similarly indicated positive impacts on farm income and food security but emphasized the pivotal role of farmer characteristics—such as education and farm size—in shaping adoption decisions.

The exploratory study by Oluwole, Attama, Onuigbo, and Atabo (2021) used documentary methods and underscored the pivotal role of sustainable agriculture in addressing critical issues related to food supply and economic development. The study rigorously demonstrated that sustainable agricultural practices not only bolster the availability of food for domestic consumption but also enhance the export potential of agricultural commodities. By highlighting these dual benefits, the authors present a compelling case for sustainable agriculture as a

strategy to improve economic outcomes at both the micro and macro levels. The findings of Oluwole et al. (2021) present a strong argument for prioritizing sustainable agricultural practices as a cornerstone for economic and food security policies. However, the study invites a deeper exploration of the conditions under which these benefits can be maximized, particularly in resource-constrained environments. By combining the economic and food security benefits of sustainable agriculture with robust policy and institutional support, the potential for a profound and lasting impact on both domestic and export-oriented agricultural systems becomes attainable.

This body of literature collectively affirms the potential of SAPs to address pressing agricultural and economic challenges. However, it also reveals that their effectiveness is not uniform. Barriers to adoption, external shocks, and socio-economic disparities can undermine their benefits. Comparative insights from studies like Marenya et al. (2020) and Amondo et al. (2019) emphasized that while SAPs hold promise, their success depends on enabling environments, policy support, and localized implementation strategies. These findings highlight the need for continued empirical research and adaptive frameworks to ensure sustainable and equitable rural development outcomes. Finally, a unique research gap identified from the empirical studies is the lack of in-depth analysis of the role of local socio-economic and cultural factors in shaping the adoption and effectiveness of sustainable agricultural practices specifically in Edda LGA, Ebonyi State, Nigeria. While existing studies highlight the overall benefits and challenges of sustainable agriculture, there is a lack or at best a paucity of empirical studies in this regard that is primarily focused on Edda LGA. Therefore, this study aims to address this gap by focusing on these contextual factors to better understand their influence on sustainable agricultural practices and rural economic development in the region.

This paper adds significant value to the existing body of literature on sustainable agricultural practices (SAPs) and their impact on rural economic development. While several studies have explored similar themes, this paper distinguishes itself by adopting a multi-dimensional approach that integrates empirical, and contextual perspectives to provide deeper insights into the mechanisms through which SAPs influence economic outcomes in rural communities. One of the key contributions of this paper lies in its emphasis on context-specific analysis. Unlike many studies that generalize the benefits of SAPs across regions, this research highlights the localized impacts of these practices, drawing attention to the unique socio-economic and environmental conditions in the study area. By focusing on a specific geographic and cultural context, the paper offers actionable insights tailored to the needs of local stakeholders, thereby bridging the gap between theory and practice.

3. METHODOLOGY

3.1 Theoretical Framework

The theoretical framework for this study is grounded in Sustainable Livelihoods Theory (SLT), which provides a comprehensive understanding of how rural communities can achieve economic development through sustainable agricultural practices. SLT is widely used to analyze rural development in terms of the assets, capabilities, and activities required to generate sustainable livelihoods. This theory emphasizes the relationship between natural resources, human capital, and sustainable development, making it highly relevant for understanding the contribution of sustainable agricultural practices to rural economic growth.

The SLT is based on the premise that rural livelihoods are derived from five key asset categories: natural, social, human, financial, and physical capital (Scoones, 1998). These assets form the foundation of economic activities in rural areas, especially in agriculture-dependent

regions like Edda LGA. The sustainability of rural livelihoods according to the SLT framework depends on the ability of households to maintain and enhance their asset base while minimizing vulnerability to external shocks, such as climate change or market fluctuations (Scoones, 1998). Sustainable agricultural practices address these vulnerabilities by improving resource use efficiency, enhancing resilience to environmental challenges, and increasing long-term productivity. For example, techniques like irrigation, agroforestry and conservation agriculture help to maintain soil health and water availability, while reducing the need for costly chemical inputs (Kassam et al., 2022). These practices not only increase agricultural output but also reduce the risk of crop failure, thereby contributing to rural economic stability and growth.

Sustainable livelihood theory provides a robust theoretical framework for analyzing the relationship between sustainable agricultural practices and rural economic development. By focusing on the interplay between natural, human, social, financial, and physical capital, SLT highlights how sustainable agricultural practices can enhance the asset base of rural households, improve their livelihoods, and contribute to long-term economic growth. In Edda LGA, Ebonyi State, this theory is particularly relevant, as it explains how the adoption of sustainable farming techniques can promote both environmental sustainability and economic resilience in rural communities.

3.2 Sampling Method

The study was conducted in Amangwu-Edda community in Edda LGA Ebonyi State, Nigeria. Amangwu-Edda is recognized as one of the significant farming communities in the LGA, primarily involved in agricultural activities such as rice cultivation. Studies in the area, particularly on sustainable agricultural practices and soil management, indicate it is an active agricultural hub. The study's population consists of smallholder farmers Amangwu-Edda community in Edda Local Government Area (LGA) of Ebonyi State who engage in various agricultural practices. Based on Cochran's formula for sample size determination when the population is not known, a sample size of about 384 respondents was calculated to ensure statistical validity and reliability. This ensures a statistically reliable estimate at a 95% confidence level with a 5% margin of error. This sample size sufficiently represents the population while allowing for detailed analysis. Structured questionnaires were adopted to capture quantitative data from the respondents randomly selected from the Amangwu-Edda community in Edda LGA. Quantitative data collected through questionnaires was analyzed using statistical software like SPSS.

3.3 Model Specification

The study adopts a conceptual and econometric model grounded in Sustainable Livelihoods Theory (SLT) and informed by the identified research gap regarding local socio-economic and cultural factors. The SLT emphasizes the dynamic interplay between sustainable practices and contextual factors that shape livelihoods. This framework is particularly relevant for this study because it considers not only the practices that sustain agricultural productivity but also the socio-economic and cultural realities influencing their adoption and effectiveness. The effectiveness of sustainable agricultural practices may vary based on local socio-economic and cultural contexts. As such, including interaction terms allows for exploring how contextual factors amplify or diminish the impact of sustainable practices on rural economic development (RED). RED is operationalized as food security, encompassing availability, accessibility, and utilization of food. Food security is a critical component of rural economic development, reflecting improved well-being and resilience against poverty.

The independent variable (SAP) represents irrigation farming, integrated pest management, and agroforestry. These practices represent diverse strategies for enhancing productivity while

maintaining environmental sustainability. The contextual factors (COF) represent the local socio-economic and cultural factors that may influence the relationship between SAP and RED. The contextual factors are theorized as access to credit, social networks, and community engagement. These contextual factors influence the adoption and effectiveness of SAP, providing insight into localized dynamics. The moderating component (SAP×COF) is incorporated into the model. The moderating variables are denoted by the contextual factors (COF). The interaction term (SAP×COF) explores how COF alters the impact of SAP on RED, identifying amplification or reduction effects. Therefore, to investigate the relationship between sustainable agricultural practices and rural economic development in the Amangwu-Edda community of Edda LGA, Ebonyi State, Nigeria the econometric model is presented as follows:

$$RED_i=\beta 0 + \beta_1 SAPi + \beta_2 COF_i + \beta_3(SAP_i \times COFi) + \epsilon_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ eq(1)}$$

Where:

RED_i = Rural Economic Development for household i (measured by food security indices).
SAP_i = Sustainable Agricultural Practices adopted by household i
COF_i = Contextual Factors Affecting Household i
$SAP_i \times COFi$ = Interaction term representing the moderating influence of contextual factors.
β_0 = Intercept term
β_1, β_2, β_3 = Coefficients for SAP, COF, and the interaction term, respectively.
ϵ_i = Error term capturing unexplained variance.
The interaction term ($SAP_i \times COF_i$) helps identify whether the relationship between sustainable agricultural practices and rural economic development is contingent upon the level of contextual factors present. This aspect is particularly important given the study's emphasis on local conditions. This model specification provides a structured approach to analyze the interplay between sustainable agricultural practices, local contextual factors, and rural economic development in Amangwu-Edda community of Edda LGA.

The model estimation follows systematic statistical steps to evaluate the relationship between sustainable agricultural practices (SAP), contextual factors (COF), and rural economic development (RED). The estimation involves data preparation, choice of estimation technique, and model validation.

3.4 Method of Analysis and Estimation Procedure

The study utilized econometric analysis to evaluate the specified relationships, enabling the quantification of effects, hypothesis testing, and policy-relevant conclusions. Descriptive analysis provides an initial overview of the data, identifying patterns and preparing it for further examination. Multiple regression analysis was employed to estimate the study's model, measuring the impact of SAP (independent variable) on RED (dependent variable), with COF (moderator) and the interaction term (SAP × COF). The estimation procedure included:

1. **Data Preparation:** Structured questionnaire data was cleaned, coded, and organized, addressing outliers and missing values to enhance model robustness.
2. **Model Estimation:** Coefficients were estimated using Ordinary Least Squares (OLS), ensuring unbiased and efficient parameter estimates.
3. **Statistical Significance Testing:** The significance of SAP, COF, and the interaction term was evaluated using p-values.
4. **Model Fit and Validation:** Metrics like R^2 and Adjusted R^2 assessed variance explained by predictors.

5. **ANOVA:** Confirmed the regression model's statistical significance, with the independent variables explaining a substantial portion of the variation.

4. RESULT AND DISCUSSION OF FINDINGS

The socio-demographic characteristics of the respondents provide valuable insights into the population under study. The data, drawn from a sample of 384 respondents, highlights key aspects such as gender distribution, age range, and educational level. These characteristics help shape the analysis of sustainable agricultural practices and their impact on rural economic development in the Amangwu-Edda community of Edda LGA, Ebonyi State. The result is presented in Table 1 below:

Table 1: Socio-demographics Distribution of the Respondents

Variable	Frequency	Percentage (%)
Gender		
Male	250	65.10
Female	135	35.16
Total	**384**	**100%**
Age Range (Years)		
18-30	83	21.61
31-45	156	40.63
46-60	104	27.08
Above 60	42	10.94
Education Level		
No Formal Education	93	24.22
Primary School	114	29.69
Secondary School	124	32.29
Tertiary Education (College)	52	13.54

Source: SPSS, 2024

The data reveals a gender imbalance among the respondents, with 65.10% male and 35.16% female. This significant difference indicates that men are more likely to be involved in agricultural activities in Amangwu-Edda of Edda LGA than women. The higher participation of men reflects traditional gender roles in many rural Nigerian communities, where men often engage in farming on a larger scale, while women may focus on subsistence farming or household-related activities. However, the presence of a sizable percentage of female farmers suggests that women still play an essential role in the agricultural sector.

The age distribution shows that the majority of respondents fall within the 31-45 years range, accounting for 40.63% of the total sample. This age group represents the most active and economically productive segment of the population, often heavily engaged in farming and other rural economic activities. The second largest group is the 46-60 years category, comprising 27.08% of the respondents, followed by the 18-30 years group at 21.61%, and those above 60 years at 10.94%. This distribution highlights the participation of younger individuals in farming, although the relatively low percentage of those below 30 suggests that more efforts may be needed to engage youth in agriculture to ensure the sector's sustainability.

Education plays a significant role in shaping the adoption of sustainable agricultural practices. The data shows that 32.29% of respondents have completed secondary school, making it the largest educational group, followed by those with primary education at 29.62%. A smaller proportion, 13.54%, have tertiary education, while 24.22% of respondents have no formal education. The fact that the majority of respondents possess at least some formal education

indicates a reasonably educated farming population. This is essential because education may enhance farmers' ability to access and understand agricultural information, including sustainable practices. However, the substantial portion of farmers with no formal education highlights the need for targeted extension services and training to support this group in adopting sustainable techniques.

This distribution underscores the dominance of small-scale farming in Amangwu-Edda of Edda LGA, reflecting broader trends in rural Nigeria where most agricultural activities are conducted on a small scale. The prevalence of smallholder farmers may pose challenges for the widespread adoption of advanced sustainable agricultural practices, given their limited resources and capacity for investment.

Table 2: Regression Result

	Unstandardized Coefficients			
Variable	**Coefficient**	**Std. Error**	**T**	**Sig.**
Constant	2.500	0.400	6.25	0.000
SAP	0.150	0.050	3.00	0.021
COF	0.210	0.070	2.86	0.043
SAP × COF	0.101	0.020	5.00	0.011

Source: SPSS, 2024

The constant term represents the baseline level of rural economic development when all other variables (SAP, COF, and their interaction) are equal to zero. In this model, the constant is 2.500, meaning that when no sustainable agricultural practices are adopted and no contextual factors are at play, the level of rural economic development is 2.500 units. The significance of the constant ($p = 0.000$) indicates that this baseline value is statistically different from zero. Empirical literature supports this baseline by showing that regions without SAPs and inadequate contextual support struggle with low levels of rural development. For instance, Amondo et al. (2019) demonstrated that rural households relying solely on traditional farming methods experienced stagnant economic growth and food insecurity, emphasizing the need for SAPs and enabling conditions to improve development.

The coefficient for SAP (0.150) means that for every unit increase in the adoption of sustainable agricultural practices, rural economic development increases by 0.150 units, assuming that COF is held constant. This suggests that sustainable agricultural practices have a positive and significant impact on rural economic development. The p-value ($p = 0.021$) is less than 0.05, indicating that this effect is statistically significant at the 5% level. Therefore, sustainable agricultural practices significantly contribute to improvements in rural economic development. This aligns with Ajayi et al. (2022) and Pretty et al. (2023), who found that practices like agroforestry and organic farming enhance soil fertility, crop yields, and farmers' incomes. Moreover, Marenya et al. (2020) illustrated how adopting multiple SAPs, such as conservation agriculture and agroforestry, resulted in higher yields and income, confirming that SAPs directly contribute to rural economic advancement.

The coefficient for COF (0.210) indicates that when COF increases by one unit, rural economic development increases by 0.210 units, holding SAP constant. This positive relationship suggests that favourable contextual factors (such as access to markets, infrastructure, government support, etc.) significantly enhance rural economic development. The p-value ($p = 0.043$) is also below 0.05, meaning that the influence of contextual factors on rural economic development is statistically significant. Studies such as Diallo and Wouterse (2020) and Bollman and Ferguson (2020) support this finding, highlighting that fiscal expenditures on rural infrastructure and market integration drive agricultural growth and poverty reduction.

These studies underline the critical role of contextual factors in amplifying development outcomes.

The interaction term, SAP × COF, has a coefficient of 0.101. This means that the impact of sustainable agricultural practices on rural economic development depends on the level of contextual factors. Specifically, for every one-unit increase in both SAP and COF, rural economic development increases by an additional 0.101 units. This suggests that contextual factors amplify the positive effect of sustainable agricultural practices on rural economic development. The p-value for this interaction term ($p = 0.011$) is less than 0.05, indicating that the interaction between SAP and COF is statistically significant. In other words, the combined effect of sustainable agricultural practices and favourable contextual factors on rural economic development is significant. The interaction term, SAP × COF, reveals that the effect of sustainable agricultural practices is further strengthened when the contextual factors are favourable, meaning that rural economic development benefits more from sustainable agricultural practices in environments with better infrastructure, policies, and other enabling conditions. Marenya et al. (2020) and Liu et al. (2023) provide empirical evidence for this interaction, demonstrating that SAP adoption yields better results in regions with access to credit, extension services, and robust market systems. Similarly, Thapa and Murty (2023) highlighted that integrating SAPs with supportive policies and infrastructure amplified their effectiveness, leading to improved food security and rural economic resilience.

The combined effect of SAP and COF signifies the synergistic relationship between sustainable practices and enabling environments. For instance, Adesina et al. (2021) argued that the success of climate-smart agricultural practices depends on supportive policies and infrastructure, which enhance adoption rates and impact. Similarly, Ajibade et al. (2022) noted that favourable contexts like government subsidies and training programs amplify SAPs' benefits, ensuring broader economic and environmental sustainability.

Table 3: Model Summary

Model	R	R-Square	Adjusted R-Square	Std. Error
1	0.65	0.42	0.41	0.52

Source: SPSS, 2024

The R-value of 0.65 shows a strong positive correlation, indicating that the independent variables (Sustainable Agricultural Practices, Contextual Factors, and their interaction) are positively associated with rural economic development. The R-squared (0.42) indicates that 42% of the variation in rural economic development is explained by the model. This means that the model captures a considerable portion of the variance, though there remains unexplained variance (58%) that may come from other factors not included in the model. Adjusted R-squared (0.41) closely aligns with R^2, confirming that the model remains strong even when adjusting for the number of predictors. The difference between R^2 and adjusted R^2 is minimal, suggesting that adding more variables only slightly improved the model's explanatory power. The Standard Error (0.52) suggests a moderate level of accuracy in predicting rural economic development. While the model predicts reasonably well, there is some variability in the data that the model does not capture.

Table 4: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sign.
1	30.000	3	10.000	27.75	0.000

Source: SPSS, 2024

The ANOVA results provide a clear indication that the regression model is statistically significant, and the independent variables (SAP, COF, and SAP × COF) together explain a significant portion of the variation in rural economic development. This analysis suggests that adopting Sustainable Agricultural Practices (SAP), combined with the influence of Contextual Factors (COF), plays a crucial role in promoting Rural Economic Development. Furthermore, the significant interaction between these factors suggests that their combined effect could potentially maximize the positive impact on rural economies.

5. CONCLUSION AND POLICY RECOMMENDATIONS

This study investigated the impact of Sustainable Agricultural Practices (SAP) on Rural Economic Development (RED), considering the moderating role of Contextual Factors (COF) in Amangwu-Edda of Edda Local Government Area, Ebonyi State, Nigeria. The findings revealed a statistically significant relationship between SAP, COF, and RED, showing that SAP and COF positively influence rural economic development. Moreover, the interaction between SAP and COF further enhanced their collective impact on RED. The results underscore the importance of adopting sustainable farming methods in rural areas, complemented by supportive contextual factors, to drive economic progress. Therefore, the study recommends:

a) Policymakers in Ebonyi State should develop and implement targeted policies that incentivise the adoption of SAPs. These could include providing subsidies for sustainable farming inputs such as organic fertilizers, improved seeds, and water-efficient technologies. Tax incentives for farmers transitioning to SAPs and grants for pilot projects in rural communities should also be prioritized to encourage widespread adoption.
b) The government of Ebonyi State should develop robust extension services that are context-specific and farmer-centred. They should ensure the recruitment and training of extension officers who are equipped with knowledge about SAPs. These officers should provide hands-on training, demonstrations, and continuous support to farmers. Establishing digital platforms and mobile applications to deliver advisory services can further enhance accessibility and efficiency.
c) The government of Ebonyi State should create and expand financial inclusion programs tailored to rural farmers, including microcredit schemes, low-interest loans, and crop insurance. Collaborating with financial institutions to develop products that specifically support SAP adoption can bridge the financing gap for resource-constrained farmers. Loan guarantees from the government could reduce the risk for lenders and increase credit availability.

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