NIGERIAN ECONOMY AND RURAL LIVELIHOODS: OPPORTUNITIES AND RESILIENCE

PROCEEDINGS

of the

33rd ANNUAL NATIONAL Congress

of the

RURAL SOCIOLOGICAL ASSOCIATION OF NIGERIA (RuSAN)

held at

UNIVERSITY OF ILORIN, ILORIN, KWARA STATE
BETWEEN 7TH AND 11TH OCTOBER 2024

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7th October and 11th October 2024

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GENERAL INFORMATION

The Nigerian Rural Sociological Association (NRSA) was formed on January 7, 1981. Its inaugural congress was held from November 7 to 11, 1983 with the theme "Agriculture and Social Development in Nigeria".

NRSA is a broad-based professional association with membership cutting across universities, agricultural research institutes and other agricultural/rural development agencies both from the public and private sectors. Membership is open to all professionals who are interested in advancing the development of the rural folks.

This volume is the proceeding of the **33rd Annual National Congress** held at the **University of Ilorin, Ilorin, Kwara State** between **7th and 11th October 2024**. The plenary papers contained herein were reviewed before this publication.

The association gratefully acknowledges the moral and financial contributions of many organisations and individuals to the success of the congress.

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2022	Poverty, governance, and social values in rural context	Prof John Oladeji	Federal University, Oye-Ekiti
2021	Transforming rural environment: The sociological perspective	Prof John Oladeji	Ogun State
2020	Emancipation of the Rural Family in Contemporary Nigeria	Prof. Kolawole Adebayo	Landmark University, Omu Aran, Kwara State
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2018	Rural Social Fortification and Development in Nigeria	Prof. Kolawole Adebayo	Ahmadu Bello University, Zaria
2017	Grassroots Development and Dividend of Democracy	Prof. Kolawole Adebayo	Michael Okpara University of Agriculture, Umudike
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Year	Theme	Editor-in-Chief	Venue/Location
2014	Social Engineering on Sustainability of the Agricultural Transformation Agenda	Prof. F. A. Kuponiyi	University of Benin, Benin
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2012	Challenges and Approaches to Sustainable Rural Development in sub-Saharan Africa	Prof. F. A. Kuponiyi	University of Ibadan, Ibadan
2011	Socioeconomic Analysis of Entrepreneurial Education Food Security Poverty Alleviation Linkages in Nigeria	Prof. F. A. Kuponiyi	Fed Coll of Agric Produce Tech, Hotoro, Kano
2010	Approaches towards the Transformation of Rural and Agricultural Economy in Nigeria	Prof. A. A. Ladele	University of Agriculture, Makurdi
2009	Globalization of the Socio-Political Economy of Rural Development	Dr A. A. Ladele	Akure
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2007	Powering Agricultural Rural Transformation Process in Nigeria.	Dr A. A. Ladele	BOWEN, Iwo
2006	Unlocking the Agricultural and Rural Potentials of Nigeria	Dr A. A. Ladele	UNAD, Ado-Ekiti
2005	Promoting Rural and National Economic Transformation through Agricultural Revolution	Prof. A. A. Jibowo	OOU, Ago-Iwoye

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DEVELOPMENT OF SUSTAINABLE FOOD AGRICULTURAL AREAS FOR FOOD RESILIENCE AND NATIONAL ECONOMIC GROWTH: A CASE STUDY OF MERAUKE REGENCY, INDONESIA

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ABSTRACT
The development of Sustainable Food Agriculture Areas is a key strategy for achieving food Resilience and self-sufficiency in Indonesia. This research focuses on the development of a Rice Development Centre Area in Merauke Regency, which has significant potential in the agricultural sector. With a total area of 4,645,662.64 hectares, fertile soil, and abundant water availability from the Maro River, Merauke is a strategic region for food agriculture development. The primary objective of this study is to analyse the land potential, infrastructure, spatial planning policies, and economic value of developing this area within the framework of sustainable agriculture. The research methodology includes literature review, field surveys, interviews with stakeholders, and spatial analysis using Geographic Information Systems (GIS). The results indicate that Merauke Regency has 1,071,448 hectares of land classified as highly suitable (S1) for rice cultivation, supported by fertile alluvial soil characteristics and stable water availability. Agricultural infrastructure, such as adequate irrigation networks, also serves as a key factor in optimizing land potential. However, drainage issues remain a challenge that needs to be addressed to ensure optimal land productivity. The development of Sustainable Food Agriculture Areas in Merauke demonstrates strong financial feasibility. With an investment of 30,481,766 million rupiah, the project yields an Internal Rate of Return (IRR) of 27.19%, significantly above the Weighted Average Cost of Capital (WACC) of 13.34%. These figures indicate that the development promises an optimal return on investment. Beyond its financial potential, the development of these Sustainable Food Agriculture Areas is also expected to enhance resource allocation efficiency, contribute significantly to local economic growth, and strengthen national food resilience.
Keywords: Sustainable Food Agriculture Areas, Rice Development centre Area, Food Resilience, Merauke Regency, Indonesia

INTRODUCTION

Sustainable agricultural areas are regions designated for agricultural activities, including both Sustainable Food Agricultural Land and Reserve Sustainable Food Agricultural Land. The primary goal of these areas is to support self-sufficiency or food independence. Productive rice fields are a key component of food production and a major requirement for strengthening the role of the agricultural sector in achieving food self-sufficiency. The presence of rice fields not only serves as a cultivation area for food crops but also forms the foundation for food security at both local and national levels.

With proper management, these rice fields can provide stable and sustainable food production, reducing reliance on imports and increasing the availability of domestic food supplies. In addition, maintaining and developing rice fields also means preserving agricultural ecosystems, which support environmental balance and protect the economic value of farmland, contributing to farmers' welfare.

The management of Sustainable Food Agricultural Areas requires a strategic role that involves long-term planning and comprehensive spatial policies. Urban and regional planners have a critical responsibility in ensuring these areas are maintained and developed according to their primary function, which is to support food security and the well-being of farmers.

Planners play a role in formulating spatial policies that consider appropriate land allocations for agriculture, especially in areas with great potential to support food self-sufficiency. They must ensure that both Sustainable Food Agricultural Land and Reserve Sustainable Food Agricultural Land are protected from excessive land conversion, such as being repurposed for residential or industrial uses. These spatial policies should be created with a focus on balancing economic development and environmental sustainability, so agricultural land is not eroded by uncontrolled urban expansion.

Planners also play a role in facilitating infrastructure development that supports agricultural productivity. Good accessibility, efficient irrigation networks, and modern technological support are some aspects that should be considered in the development plans for agricultural areas. Through this approach, planners can help improve food production efficiency, enhance farmers' welfare, and maintain food supply stability at the national level.

In balancing urban development with the sustainability of agricultural areas, planners need to collaborate with other stakeholders, including local governments, farming communities, and the private sector. Such collaboration is essential for designing policies that optimize the function of agricultural areas without neglecting urban development needs. Integrating data-driven regional planning with proactive policies to preserve agricultural land will be key to achieving sustainable food security.

Merauke Regency, which covers an area of 4,645,662.64 hectares and is known for its potential

for large-scale agricultural development, has been chosen as a sustainable food agricultural area. This designation is intended to ensure sustainable food security and economic independence, particularly in eastern Indonesia, including Merauke Regency. Geographically, the region consists of relatively flat lowlands with fertile soil, ideal for rice cultivation. Additionally, the presence of large rivers such as the Maro River provides ample water for irrigation, making the area well-suited to becoming a food production hub. The Rice Development centre in Merauke, encompassing an Area of Interest (AOI) of 1,051,382 hectares, holds significant potential for sustainable agricultural development. In this context, the importance of the Decision on Space Utilization Activity Suitability becomes highly relevant, especially following the Focus Group Discussion (FGD). This decision allows for sugarcane cultivation and the addition of Industrial Plantation Forests, requiring the AOI to adapt to new dynamics in land use. The presence of a Sustainable Food Area in the spatial plan provides an important foundation for maintaining harmony between agriculture and other land uses. Therefore, close collaboration between local governments, the private sector, and local communities is crucial in managing land use wisely. With the right strategies,

the Rice Development Centre can focus on increasing rice production and supporting national food security. Peljor and Minot (2010) in Salasa (2021) explain that food self-sufficiency, or food independence, occurs when a country can meet the food consumption needs of its population through domestic production. In other words, the country does not rely on imports or purchases from abroad to fulfil its food needs. This condition demonstrates the country's ability to independently produce food to ensure sufficient availability for its people.

METODOLOGY

The analysis of Sustainable Food Designation Areas in the Rice Development Centre of Merauke Regency begins with a comprehensive literature review. In this stage, researchers gather and analyse various sources of information, including regulatory documents, reports from Focus Group Discussions (FGDs), and relevant previous studies. This approach aims to understand the policy framework governing land use, as well as the social and economic contexts that influence sustainable agricultural development in the area. With a deep understanding of the existing policies and conditions, the analysis can be conducted more accurately and effectively.
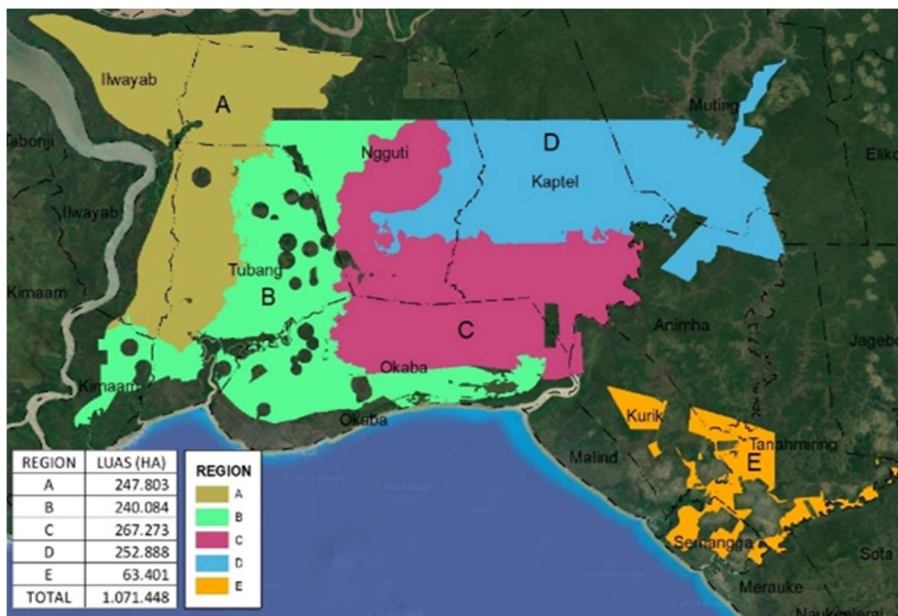
Figure 1 AOI of Merauke Regency

Primary data is collected through field surveys to obtain more concrete information about the social, economic, and environmental conditions in the 1,051,382-hectare Area of Interest (AOI). Interviews with key stakeholders, including farmers, local government officials, and the private sector, are conducted to explore their perspectives on the issue. In addition, spatial analysis using mapping technology and geographic information systems (GIS) helps evaluate current land use and

assess the potential of available land. By analysing the alignment between spatial planning and agricultural development needs, this study seeks to assess the impact of spatial changes on rice production capacity and food security in the Rice Development Centre area. Consequently, this methodology will provide a solid foundation for understanding the dynamics of sustainable agricultural development in this context.

RESULTS AND DISCUSSION
Land potential and agricultural infrastructure

Based on Land Potential and Agricultural Infrastructure in Merauke Regency, the findings from the study show that the region possesses vast agricultural potential, with an Area of Interest (AOI) covering 1,051,382 hectares. This potential is supported by geographical conditions, including fertile lowland plains and the availability of water resources from the Maro River, which flows through the area (Study of Food Production Centre Areas, 2024). These factors make Merauke highly suitable for rice cultivation, a key commodity that plays a crucial role in supporting national food security.

The development of the Rice Development Centre in Merauke is designed to optimize agricultural land within the framework of Sustainable Agricultural Areas. This involves protecting productive land that can be relied upon for long-term food production. The existence of agricultural infrastructure, such as efficient irrigation networks and adequate road access, is essential to ensure the smooth distribution of agricultural products and to enhance the stability of food production (Study of Food Production Centre Areas, 2024).

In addition to physical infrastructure, land management and suitability are crucial for maintaining productivity. The suitability of land in Merauke is supported by alluvial soil types (ArcGIS Analysis, 2024), which are rich in nutrients and suitable for cultivating rice and maize. These soils also have the necessary depth and texture for water retention, which supports sustainable agricultural production (Study of Food Production Centre Areas, 2024). Stable climatic conditions and sufficient rainfall also contribute to the agricultural potential of this region. With the availability of land and strong infrastructure support, proper management will strengthen Merauke Regency's position as a strategic area in achieving food self-sufficiency. Careful planning in preserving Sustainable Agricultural Areas, along with clear spatial planning policies, will help maintain production stability and improve the welfare of local farmers (Study of Food Production Centre Areas, 2024).

Effectiveness of Spatial Planning Policies and Land Suitability

Based on an analysis of spatial planning policies in Merauke Regency, the study reveals that these policies play a crucial role in protecting both Sustainable Agricultural Land and Agricultural Reserve Land. These policies are designed to prevent the conversion of productive agricultural land into non-agricultural areas, such as residential or industrial zones, which could jeopardize regional food security. By maintaining strategic land allocations for food production—especially rice cultivation—the policies are key to supporting national food self-sufficiency goals.

The effectiveness of these policies is evident in the Land Use Compatibility Analysis conducted in the region. A Focus Group Discussion (FGD), involving stakeholders such as farmers, local governments, and the private sector, highlighted the adaptability of land-use practices. For example, the policies allow for the development of sugarcane and Industrial Forest Plantations without compromising the focus on rice cultivation (Findings from the Food Production Centre study, 2024). This demonstrates the flexibility of land-use management that continues to prioritize food security through the protection of core agricultural land.

From a technical perspective, the fertile alluvial soils in the lowland areas of Merauke are highly suitable for food crops, particularly rice. The Maro River, serving as the main irrigation source, is essential for sustaining agricultural productivity (Findings from the Food Production Centre study, 2024). Spatial planning policies that manage water resources and irrigation efficiently contribute to the sustainability of food production, while also ensuring the stability of the agricultural ecosystem.

In conclusion, the strategic implementation of spatial policies in Merauke demonstrates both flexibility and effectiveness in maintaining agricultural land use, balancing economic growth with environmental sustainability, and supporting long-term food security.

Suitability of rice land

The analysis of rice land suitability is a comprehensive evaluation process aimed at determining the degree of appropriateness of a given area for rice cultivation, considering various environmental factors and soil characteristics. First, climatic conditions are a major determining factor. Rice requires warm temperatures between 20 and 30°C, along with adequate water availability, whether through rainfall or irrigation systems. The patterns of rainfall and the number of wet months need to be evaluated, as the risk of drought or prolonged flooding can hinder rice growth and reduce land productivity.

Next, soil quality plays a crucial role in determining land suitability. Soil with fine textures, such as clay or sandy loam, is ideal for rice growth as it supports good root penetration. A minimum soil depth of 25 cm is necessary to ensure optimal root growth. On the other hand, soil pH must also fall within an appropriate range, specifically slightly acidic to neutral (pH 5.5-7), to prevent nutrient absorption issues. Cation exchange capacity (CEC) is also an important indicator in assessing the soil's ability to provide nutrients to plants.

Drainage aspects and water management significantly influence rice cultivation. Poor drainage systems can lead to excessive flooding that damages crops, while overly dry land is also unsuitable for rice. Therefore, land with a gentle slope (0-2%) is highly recommended, as it

minimizes erosion risks and facilitates water management. The selection of rice varieties suitable for local soil and climatic conditions, along with the addition of organic materials and liming to improve soil quality, can enhance land suitability for achieving optimal yields.

Food resilience is a complex concept that encompasses the ability to maintain food production and security amidst environmental and socioeconomic challenges (Hoddinott, 2014; Bullock et al., 2017). This concept operates at various scales, from field level to global level, and involves ecological, technological, and social interventions. Strategies to enhance food resilience include crop diversification, the adoption of adaptive farming practices, and the optimization of ecosystem functions (Bullock et al., 2017). A holistic approach to food system resilience requires interdisciplinary considerations, given the complexities of agro-food systems, value chains, the retail-consumption nexus, and existing governance frameworks (Doherty et al., 2019).

Quantitative assessments of household resilience to food insecurity can be conducted through the development of resilience indices, which can predict food security outcomes and identify vulnerable groups (Ciani and Romano, 2014). Therefore, addressing food resilience necessitates comprehensive responses that integrate across spatial scales and combine ecological knowledge with agronomic solutions and socioeconomic transformations (Bullock et al.,

2017). This highlights the need for a coordinated effort to strengthen food resilience, involving all stakeholders and optimally utilizing available resources.

The analysis results indicate that land Categorised as Highly Suitable (S1) in the AOI KSPP Merauke area has very high potential for rice cultivation. Optimal average temperatures, supportive rainfall, and deep, fertile soils make this land ideal for intensive rice production. Although there are slight drainage issues, other factors such as soil texture and low acidity (soil pH between 5.5 and 7) can support high rice productivity, making this land an excellent choice for sustainable agricultural development. Land Categorised as Moderately Suitable (S2) is still considered viable for rice cultivation, although it presents some challenges such as poor drainage and limited soil depth. This condition requires careful management regarding water management and fertilization. Despite the risk of flooding, with proper management, rice production can still be maintained at a fairly good level. Land Categorised as Marginally Suitable (S3) faces more challenges, including poor drainage, coarse soil texture, and very high acidity. Limited soil depth also restricts space for optimal root growth. However, with additional treatments such as improving soil quality through the addition of organic materials and liming, as well as good water management, this land can still be utilized for rice production, albeit with lower yields compared to S1 and S2 lands.
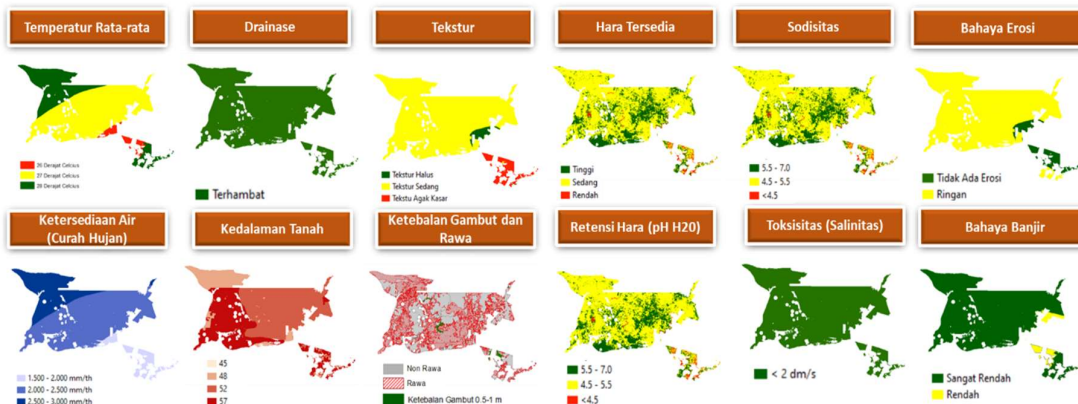
Figure 2: Land Suitability Parameter Data in the AOI of Merauke Regency
Source: Analysis Results, 2024
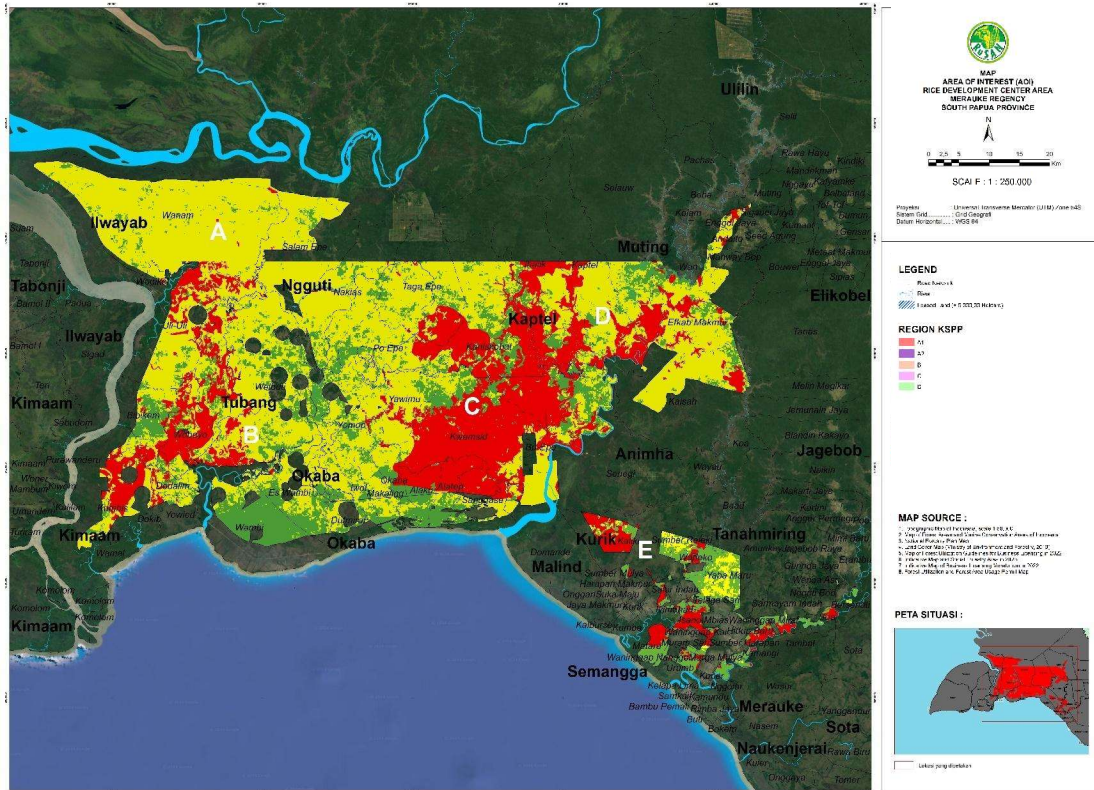
Figure 3 Rice Land Suitability Analysis
Source: Analysis Results, 2024

Table 1 Rice land suitability analysis

REGION	LAND SUITABILITY	WIDE (Ha)
A	S1	74,035
	S2	145,593
	S3	20,455
B	S1	46,810
	S2	125,127
	S3	95,336
C	S1	37,852
	S2	135,334
	S3	79,702
D	S1	22,565
	S2	187,330
	S3	37,909
E	S1	33,081
	S2	8,765
	S3	21,311
Total		1,071,204

Source: Analysis Results, 2024

Economic Suitability Analysis

Based on the investment feasibility analysis from a financial perspective, the development of a food production centre in Merauke Regency shows positive results, with an investment value of 30,481,766 million rupiah, indicating that the project meets the criteria for economic viability. This figure reflects significant profit potential and

efficient resource allocation in supporting the development of the local agricultural sector. The development of this area is expected to enhance food productivity and contribute to the stability of food security in the region, while also having a positive impact on regional economic growth.

The Internal Rate of Return (IRR) achieved is 27.19%, significantly higher than the Weighted Average Cost of Capital (WACC) at 13.34%. This indicates that the investment return of this project exceeds the risk and capital costs involved. Therefore, the development project for the food production centre in Merauke Regency is not only financially feasible but also offers optimal investment return prospects, making it a valuable strategic alternative to consider in the context of sustainable agricultural sector development.

Table 2 Revenue Obtained from Production Volume

Region	1 Year	2 Year	3 Year	4 Year	5 Year
A	Rp7.816.273.353	Rp10.630.131.760	Rp16.257.848.575	Rp16.570.499.509	Rp16.883.150.443
B	Rp7.866.556.372	Rp7.694.403.434	Rp10.694.403.434	Rp16.350.097.558	Rp16.558.589.965
C	-	Rp8.266.978.111	Rp11.234.611.279	-	Rp17.169.877.616
D	-	-	-	Rp6.843.879.829	Rp9.297.346.183
E	Rp1.819.629.203	Rp2.474.695.716	Rp3.784.828.742	Rp3.857.613.911	Rp3.930.399.079

Source: Economic Analysis Results, 2024

CONCLUSION

The development of Sustainable Food Agricultural Areas in Merauke Regency plays a crucial role in achieving national food Resilience and supporting self-sufficiency in food production in Indonesia. The Merauke region, with an area of 4.6 million hectares, has significant potential for agricultural development, particularly rice cultivation, supported by fertile alluvial soil and water availability from the Maro River. According to the analysis, there are over 1 million hectares of land that are highly suitable for rice cultivation. However, challenges need to be addressed, such as drainage issues that affect land productivity. Effective spatial planning policies are also necessary to protect Sustainable Food Agricultural Areas from land conversion that could threaten food production. From an economic perspective, the development project in Merauke has proven feasible, with a high investment value and optimal return rate (IRR of 27.19%), well above the cost of capital (WACC of 13.34%). This project is expected to enhance food production efficiency, improve farmer welfare, and contribute to national food security stability. Appropriate land management strategies, supporting infrastructure, and sound spatial planning policies will enable Merauke to become a centre for sustainable agriculture, capable of supporting Indonesia's food self-sufficiency, reducing dependence on food imports, and strengthening the local economy.

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ASSESSMENT OF ARTISANAL FISHERIES ACTIVITIES AMONG THE FISHING COMMUNITIES IN SHIRORO AND KAINJI DAMS NIGERIA

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ABSTRACT

This study assessed artisanal fisheries activities among the fishing communities in Shiroro and Kainji dams, Nigeria. The questionnaire was used to collect data from 460 respondents. Multi-stage and proportionate sampling techniques were used in selecting the respondents. Descriptive and inferential statistics were used for data analysis. The results of the study showed that majority of the fishers 51.3% were within the age bracket of 29-41years, indicating that respondents were middle aged fishers who fall within the active fishing age. Majority 87.0% of the fishers were married with an average household size of 12 people. Findings on artisanal fisheries activities engagement by the fishers showed that fish catch, and marketing accounted for the majority 79.1%, closely followed by fish catch, processing and marketing 63.3%. In conclusion, the study showed that, artisanal fisheries activities is an important livelihood activity in the lives of the fishers as it enhances food security and income of fishers. The study therefore recommended that the government should give financial assistance to the fishers to enable them to seamlessly undertake their fishing activities. Fishery extension agents should advise fishers to join a membership association to access credit facilities and other benefits with a view to improving productivity. Government should provide subsidy on fishing inputs such as modern fishing gears to fisher. The government should also make formal credit available at a one-digit interest rate. More extension officers should be recruited by the government to provide more extension services to fishers that could boost artisanal fisheries practices around the two dams and in the country at large.

Keyword: Assessment, Artisanal Fisheries, Fishing Communities, Shiroro and Kainji Dam

INTRODUCTION

Artisanal fisheries are an important source of income, high-quality protein, and contributes to the socioeconomic development of fishing villages in Nigeria. The fisheries subsector of Nigerian agriculture is a vital tool for rural development (Abolagba and Olabimitan, 2005). Due to the benefits that Nigerians receive from fish and other fish products, as well as the subsector's importance to the country's economy, there is a significant demand for fishery products. The federal government of Nigeria has executed a number of initiatives aimed at augmenting the local fish supply with great success. It is impossible to overstate the significance of the fishing industry to people's lives and the economies of many industrialized and developing nations. It is noteworthy that fish, particularly in poorer nations, accounts for about 60.0% of global protein intake. Nigerians living in both rural and urban areas might sense its significance both directly and indirectly. Fisheries constitute a significant subsector in Nigeria, accounting for around 3.00–5.00% of the country's GDP share derived from agriculture neglect. Because artisanal fishing provides more food, jobs, and cash, it helps the impoverished improve their standard of living (Adaka *et al*., 2014). According to Balogun *et al.,* (2000), 43.5 million individuals were actively involved in aquaculture or artisanal fishing as a means of producing fish. The majority of the 43.5 million individuals who fish for artisanal products are small-scale operators who fish both inland and coastal waters. Millions of people depend on artisanal fishing and aquaculture for their livelihoods, which also help to reduce poverty and ensure food security (Baruwa *et al*., 2012).

The growing population, fast urbanization, and rising income levels in Nigeria are directly contributing to the widening imbalance between the supply and demand of fish and fish products. Nigeria thus pays enormous sums of money to import fish to augment fish produced by aquaculture and fish caught from open water sources. The government's expenditure on fish imports might be decreased and the domestic fish supply could be increased through artisanal fishing. There is a dearth of information or research regarding the impact of artisanal fishing on the livelihood of the fishing communities along the Shiroro and Kainji Dams, even though artisanal fishing is extensively studied throughout Nigeria. According to earlier research, there is a significant surplus demand for fish in Nigeria when comparing the overall number of fish consumed with the total amount of fish caught in the nation.

Objectives of the Study

The broad objective of the study is to assess artisanal fisheries among fishing communities in Shiroro and Kainji dams, Nigeria. The specific objectives are to:

1. describe the socio-economic characteristics of artisanal fishers
2. identify the artisanal fisheries activities engaged in by fishers

METHODOLOGY

Between latitudes 9°5' and 10°55'N and longitudes 4°21' and 4°45'E is where you may find Kainji Lake. It is primarily found in Niger state,

however, it crosses both Niger and Kebbi states. According to Baruwa *et al.,* (2012), Kainji is the largest artificial lake in Nigeria and the second-largest lake in Africa. It was established in 1968 as a result of the Niger River being obstructed by the building of the Kainji Dam at New Bussa, in the Niger State local government area of Borgu. From April to October, the Lake receives between 1,100 and 1,250 mm of precipitation annually (Asaku, 2017).

The population of Shiroro is projected in 2020 to be 322,918 people using 3.2% growth rate (NPC, 2006).The climate, edaphic features and hydrology of the state allows sufficient opportunities for harvesting fresh water fish such as Tilapia spp, Bagrus spp, Clarias spp, Gymnarchus niloticus etc and permit the cultivation of most of Nigeria's staple crops such as maize, yam, rice, millet and sorghum. The Shiroro hydropower reservoir is a storage based hydroelectric facility located in Shiroro Local Government, Niger State at the Shiroro Gorge with approximately between Latitude 9° 57' 25N and Longitude 6° 49' 55E. It is located approximately 90 km southwest of Kaduna on River Dinya.

Primary data was obtained using structured questionnaires designed in line with the study objectives. The copies of which were administered to the respondents selected for the study. Data collected included information on the socioeconomic characteristics of the fishers and artisanal fisheries activities. Secondary data were collected from relevant textbooks, internet data bases, journal articles, seminar documents etc.

Data collected were analyzed using descriptive statistics such as frequency distribution count, percentages, mean and ranking.

RESULTS AND DISCUSSION

The socioeconomic characteristics of the fishermen are displayed in Table 4.1. The results show that (51.3%) of the respondents are between the ages of 29 and 41, (24.2%) are between the ages of 42 and 54, (21.7%) are between the ages of 55 and above, and (2.8%), the lowest percentage of respondents in terms of age distribution structure, are between the ages of 16 and 28 with a mean of 46.5. The chart makes it clear that most of the responders are young, middle-aged fishermen who are within the active fishing age range and have the vigor and energy to significantly contribute to the development of fisheries. With a mean age of 46.5 years, the age distribution of the respondents, as displayed in the table, indicates that the majority of the fishermen were between the ages of 16 and 28. This suggests that the majority of those working in artisanal fishing were still active and capable of paddling the canoes. Table 4.1's data also revealed that men made up the bulk of respondents (82.2%), with women making up the minority (17.8%). This study supports the findings of Ajayi and Talabi (2019), who assert that men made up the majority of study participants (58%) and that men were more prevalent in artisanal fishing operations in the study area, demonstrating that men dominate this sector of the economy. In terms of marital status, the respondents were (87.0%) married (8.9% single), 1.3% divorced, (0.8%) widowed, and 2.0% widower. According to the results, the majority of respondents (73.3%) were married, while 25.8% were single and just 1% were separated. The majority of fishing households surveyed saw artisanal fishing as a family industry, with most family members having fished at some point. Table 4.1's results revealed that 14.1% of respondents had only completed primary school, 16.3% had completed junior secondary school, 32.6%) had completed senior secondary school, 7.4% had completed tertiary education, and 29.6% had not completed any formal education and had only completed adult or Qur'anic education. This could affect their way of life in some ways. The respondents' demand for and access to bank credit as well as their interactions with extension agents may be impacted by their low level of education.The results in this table showed that, among respondents, 40.0%, or the majority, have 6–13 people living in their households; 35.0% have 14–21 people living in their households; 10.0% have 22 people or more living in their households; and 15,0% have fewer than 5 people living in their households. Even while this contributed to a rise in fish production, the household also consumed a sizable quantity of fish, which decreased the revenue of the household as a whole. The findings also showed that, whilst just 25.0% of fishermen are members of any kind of fishing association, 75.0% of fishermen do not belong to any kind of cooperative society.

Table 1: Socioeconomic Characteristics of the Artisanal Fishers (n = 460)

Variables	Frequency	Percentage	Mean
Age			
16---28	13	2.8	
29 – 41	236	51.3	
42 – 54	111	24.2	46.0
55 and above	100	21.7	
Sex			
Female	82	17.8	
Male	378	82.2	
Total	**460**	**100**	
Marital Status			
Married	400	87.0	
Single	41	8.9	
Divorced	6	1.3	
Widow	9	0.8	
Widower	4	2.0	
Level of Education			
Primary Education	65	14.1	
Junior Secondary Education	75	16.3	
Senior Secondary Education	150	32.6	
Tertiary Education	34	7.4	
No Formal Education	136	29.6	
Household Size			
Less than 5	69	15.0	
6 – 13	185	40.0	12.0
14 – 21	166	35.0	
22 and above	40	10.0	
Membership of Association			
Member	115	25.0	
Non-Member	345	75.0	
Total	**460**	**100**	

Source: Field Survey, 2023

Table 2 reveals the artisanal fisheries activities engaged by the fishers. The result shows that (79.1%) indicated fish catch and marketing as the most highly engaged activity that ranked 1st, closely followed by fish catch, processing and marketing with (63.3%) respondents ranking 2nd. Similarly, fish catch, transportation and marketing had (54.8%) respondents and was ranked 3rd, with fish catch, packaging and marketing having 48.7% and ranking 4th, fish packaging and marketing constituting (36.5%) fish marketing only having (31.9%) respondents, fish transportation and marketing constituting (27.2%) and fish catch, preservation and marketing having 26.3% respondents. Similarly, the category of respondents having least frequencies includes fish processing and marketing having (23.9%) respondents, fish preservation and marketing having (23.5%) respondents and lastly fish catch only accounting for (22.6%) respondents. It is clear from the results in this table that majority of the respondents were into fish catch and marketing. This is closely followed by fish catch processing and marking and fish catch transportation and marketing. The least of the respondents were found engaging in fish processing and marketing, fish preservation and marketing and fish catch only. Observation from the field showed that some boats were attached with outboard engines while others were non-motorized. The motorized boats enable the fishers to travel further off the shore. Findings reveal that respondents' catch ranged between 50Kg and 62.5Kg, which was sustainable for their livelihood. Transportation is carried out either by foot, bicycles or motorcycles or motor vehicles especially to urban centres (Asaku, 2017). The most practiced methods in Africa particularly Nigeria include drying, roasting and smoking (Egesi, 2016). This accounted for 4.6% respondents. Fish Packaging is the process of putting and wrapping fish products in certain materials or containers such as bags, cans, nylons, cartons and so on. It is the loading of fish products into any of the containers in readiness for storage or sale. Additionally, 21.3% fishers were into fish catch, preservation, processing, packaging and marketing and 18.2% engages in fish catch, preservation, processing and marketing respectively.

Table 2: Distribution of the Fishers According to Artisanal Fisheries Activities Engaged (n = 460)

Activities	Frequency*	Percent	Ranking
Fishing and marketing	364	79.1	1
Fishing, processing and marketing	291	63.3	2
Fishing, transportation and marketing	252	54.8	3
Fishing, packaging and marketing	224	48.7	4
Fishing packaging and marketing	168	36.5	5
Fishing Marketing only	148	31.9	6
Fishing transportation and marketing	125	27.2	7
Fishing catch, preservation and marketing	121	26.3	8
Fishing processing and marketing	110	23.9	9
Fishing preservation and marketing	108	23.5	10
Fishing only	104	22.6	11
Fishing, preservation, processing, packaging and marketing	98	21.3	12
Fishing, preservation, processing and marketing	86	18.7	13

Source: Field Survey, 2023
* Multiple responses were recorded

CONCLUSION AND RECOMMENDATIONS

Conclusively, the research showed that, artisanal fisheries activities are important livelihood activities that impacted positively on the lives of the fishers along the two dams. The following recommendations will go a long way to improve fish output and livelihood conditions of the fishers. Fishers should be provided with soft loans and subsidized fishing and processing inputs. Trainings and seminars on livelihood diversification strategies should be provided by private organizations with the necessary support of the government. Government should also make formal credit available at one digit interest rate. More extension officers should be recruited by government to provide more extension services to fishers that could boost artisanal fisheries practices around the two dams and in the country at large.

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EVALUATION OF THE SUSTAINABILITY OF LIVELIHOOD ASSETS POSSESSED BY THE FISHING COMMUNITIES ALONG SHIRORO AND KAINJI DAMS, NIGERIA

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ABSTRACT

This study evaluated the sustainability of the livelihood assets possessed by the fishing communities along Shiroro and Kainji dams, Nigeria. Questionnaire was used to collect data from 460 respondents. Multi-stage and proportionate sampling techniques were used in selecting the respondents. Descriptive and were used for data analysis. Livelihood assets mostly possessed by the fishers were access to water bodies with a mean ($\overline{x}$ = 4.66) and access to agricultural land ($\overline{x}$ = 3.61). These activities and assets promote efficient fishing and farming activities among the fishers. Findings on sustainability assessment of artisanal fisheries activities along Shiroro and Kainji dams indicated that fishing communities' location is not remote for any improvement in livelihood portfolios ($\overline{x}$ =2.93, SD = 0.763), migration to better and more favourable fishing location ($\overline{x}$ = 2.64, SD = 0.696) and capable of maintaining and sustaining fisheries resource base ($\overline{x}$ =2.60, SD = 0.524) were the most sustainable fisheries activities by the fishers in the study locations. Further results showed that respondents were capable in maintaining and sustaining fisheries resource base arising from the use of fisheries resources which demonstrates evidence of fishery co-management system in the area. In conclusion, the study showed that, livelihood assets base of the fishers is an important aspect of the fisher's livelihood sustainability that enhances food security and income of fishers. The study therefore recommended that extension agents should advise fishers to join membership associations to access credit facilities and other benefits with a view to improving productivity.

Keywords: Livelihood Assets, Livelihood sustainability, Fishing Communities, Shiroro and Kainji Dams

INTRODUCTION

Artisanal fisheries generate income, high-quality protein, and contributes to the socioeconomic development of fishing villages in Nigeria, the fisheries subsector of Nigerian agriculture is a vital tool for rural development (Abolagba and Olabimitan, 2005). Due to the benefits that Nigerians receive from fish and other fish products, as well as the subsector's importance to the country's economy, there is a significant demand for fishery products. It is impossible to overstate the significance of the fishing industry to people's lives and the economies of many industrialized and developing nations. It is noteworthy that fish, particularly in poorer nations, accounts for about 60.0% of global protein intake. Nigerians living in both rural and urban areas might sense its significance both directly and indirectly. Fisheries constitute a significant subsector in Nigeria, accounting for around 3.00–5.00% of the country's GDP share derived from agriculture neglect. Because artisanal fishing provides more food, jobs, and cash, it helps the impoverished improve their standard of living (Adaka *et al.*, 2014). According to Balogun *et al.,* (2000), 43.5 million individuals were actively involved in aquaculture or artisanal fishing as a means of producing fish. The majority of the 43.5 million individuals who fish for artisanal products are small-scale operators who fish both inland and coastal waters. Millions of people depend on artisanal fishing and aquaculture for their livelihoods, which also help to reduce poverty and ensure food security (Baruwa *et al.*, 2012).

The growing population, fast urbanization, and rising income levels in Nigeria are directly contributing to the widening imbalance between the supply and demand of fish and fish products. Nigeria thus pays enormous sums of money to import fish to augment fish produced by aquaculture and fish caught from open water sources. The government's expenditure on fish imports might be decreased and the domestic fish supply could be increased through artisanal fishing. There is a dearth of information or research regarding the impact of artisanal fishing on the livelihood of the fishing communities along the Shiroro and Kainji Dams, even though artisanal fishing is extensively studied throughout Nigeria.

The broad objective of the study is to evaluate the livelihood assets possessed by the fishing communities along Shiroro and Kainji dams, Nigeria. The specific objectives are to:

3. identify the livelihood assets possessed by fishers
4. assess the sustainability of the livelihood activities in the study area

METHODOLOGY

Kainji dam lies Between latitudes 9°5' and 10°55'N and longitudes 4°21' and 4°45'E. It is primarily found in Niger state, however, it crosses both Niger and Kebbi states. According to Baruwa *et al.,* (2012), Kainji is the largest artificial lake in

Nigeria and the second-largest lake in Africa. It was established in 1968 as a result of the Niger River being obstructed by the building of the Kainji Dam at New Bussa, in the Niger State local government area of Borgu. From April to October, the Lake receives between 1,100 and 1,250 mm of precipitation annually (Asaku, 2017).

Shiroro dam approximately lies between Latitude 9° 57' 25N and Longitude 6° 49' 55E. It is located approximately 90 km southwest of Kaduna on River Dinya. The population of Shiroro is projected in 2020 to be 322,918 people using 3.2% growth rate (NPC, 2006).The climate, edaphic features and hydrology of the state allows sufficient opportunities for harvesting fresh water fish such as Tilapia spp, Bagrus spp, Clarias spp, Gymnarchus niloticus etc and permit the cultivation of most of Nigeria's staple crops such as maize, yam, rice, millet and sorghum.

Primary data was obtained using structured questionnaires designed in line with the study objectives. The copies of which were administered to the respondents selected for the study. Data collected included information on livelihood assets possessed by the fishers and livelihood sustainability. Secondary data was collected from relevant textbooks, internet databases, journal articles, seminar documents etc.

Livelihood assets analysis

Livelihood Assets Analysis were used to achieve objective 1. Capital assets (natural assets, human assets, physical assets, social assets and financial assets) enumeration was done by rating respondents on the quality of livelihood assets using Likert scale of Excellent (abundant assets base) - coded 5, very good (progressive) - 4, good (sustainable assets base) - 3, poor (constrained assets base) - 2 and very poor (unsustainable assets base) - 1. Based on their responses, any score below the mean (3.00) indicated weak and restricted livelihood assets status while a score of 3.00 and above indicate otherwise.

Sustainability Index

Sustainability index was used to achieve objective 2. It was used to measure the sustainability of artisanal fisheries activities in the study area. Livelihood sustainability is the ability of the household to cope with and recover from stresses and shocks related to vulnerability. It also deals with the ability to maintain its capacity and assets base. This was achieved by rating respondents on four-point Likert scale of strongly agreed = 4, agreed = 3, disagreed = 2, and strongly disagreed = 1, based on their responses. In calculating the sustainability index, the mid-point values of the scale (1+2+3+4) were summed up to get 10. The sum was further divided by 4 to obtain 2.5 which is the weighted mean. The mean for each sustainability source was obtained by multiplying the point scale by the number of respondents in each point scale. Any sustainability source with a mean score equal or

above the cut off mean of 2.5 was regarded as an important (agreed) source of sustainability and any mean score of lower than 2.5 was regarded as not an important (not agreed) source of sustainability. To get the sustainability index, respondents scores on the 10 items were summed up and divided by the expected total score on the 10 items (which in this case is 40 that is10 multiply by 4, the highest scale representing strongly agreed).

RESULTS AND DISCUSSION

Table 1 reveals the livelihood assets possessed by the fishers. Assets are stocks of direct and indirect productive factors that produce a stream of cash and endowments. The livelihood asset-base of the fishers considered for the study include natural assets, human assets, physical assets, social assets and financial assets as shown in Table 1. The distribution revealed that majority of the respondents fell between poor (constrained) and good (sustainable) assets from all the categories enumerated. The result revealed that respondents' access to fishing ground ($\bar{x}$=4.66, SD=0.61)) and agricultural land ($\bar{x}$=3.61, SD=0.89) was sustainable. This is significant in promoting active fishing and farming livelihoods in the study area. Further analyses shows that respondents operate below sustainable educational status ($\bar{x}$=1.71, SD=0.61). This is significant in the kind of non-fishing livelihoods that fishing households could be engaged in. Respondents show low level of skill and capacity in other livelihoods ($\bar{x}$=2.28, SD=0.68). This is a major entry requirement for non-fishing livelihoods. Infrastructure/social amenities ($\bar{x}$=1.47, SD=0.54) were abhorrently inadequate and absent in most of the communities. This implies that they are disconnected and have no access to infrastructure/social amenities that could improve livelihood opportunities. This explains the total absence of the three tiers of government in most of the fishing communities. The community members travel for a distance of not less than 10km to access health care facilities. There were no schools in over 90.0% of the fishing communities in spite of government effort on achievement of basic primary education for Nigeria. Most of the fishers lamented on their state of abandonment with respect to schools, hospitals, road networks and electricity. Socially, most (80.0%) of the assets enumerated were near a sustainable level. This indicates that there is strong social cohesion in fishing communities and is known to rely heavily on social networks for livelihood improvement. This implies that social networking allows the development of organized structures for non-subsistence activities, adequate to compensate for restriction in livelihood assets and provide diverse employment and income generation. In respect of financial assets, about 60.0% of the assets enumerated were unsustainable. This remains a fundamental problem among fishing

households that wish to diversify from fishing to non-fishing livelihoods.

Table 1: Livelihood Assets Possessed by the Fishers in the Study Area (n = 460)

Livelihoods assets	Mean	Std. Deviation
Natural assets		
Access to water body (fishing ground)	4.66*	0.61
Fisheries resources	2.02	0.47
Access to agricultural land	3.61*	0.89
Forest resources	2.48	0.84
Access to mineral deposit	1.69	0.75
Seasonal benefit had from the climate	2.25	0.66
Human assets		
Health status	2.43	0.64
Family labour (skilled)	2.64	0.83
Educational status (formal)	1.71	0.61
Skill / capacity in another livelihood	2.28	0.68
Physical assets		
Ownership of building / housing	2.35	0.72
Possession of fishing gears and craft	1.92	0.57
Presence of good infrastructure / social amenities	1.47	0.54
Possession of modern household appliances	2.07	0.43
Social assets		
Social network	2.91	0.65
Membership of association	2.50	0.78
Access to market	1.96	0.77
Access to community leaderships	2.61	0.87
Access to hospitals	2.15	0.66
Financial assets		
Remittances	2.19	0.69
Access to credit	1.68	0.74
Investment worth	1.95	0.76
Cash elsewhere (lend)	2.36	0.73
Cash at hand	1.22	0.47

Source: *Field Survey, 2023*   *Good (mean ≥ 3.00)*

Table 2 shows the mean values of sustainability assessment of respondents in artisanal fisheries activities. Fishers agreed that the location of fishing communities is not too remote for any improvement in livelihoods portfolios ($\bar{x}$=2.93, SD=0.76). This is an indication that fishers are optimistic that someday they will be part of rural transformation. The result further revealed that migration to a better and more favourable fishing location ($\bar{x}$=2.64, SD=0.70) encouraged fishers in artisanal fisheries production. Respondents' capabilities in maintaining and sustaining fisheries resource base ($\bar{x}$=2.60, SD=0.52) and effective resolution of conflict ($\bar{x}$=2.60, SD=0.78) arising from the use of fisheries resources are evidence of fishery co-management system in the area. In the face of fast depleting capture fisheries resources, respondents agreed to remain in fishing business ($\bar{x}$=2.50, SD=0.76) implying that artisanal fisheries livelihood account significantly for their household daily disposable income. Daily return from sales of fish caught contributes in meeting the day to day needs of fishers' households. Low responses on accessibility of fishing communities ($\bar{x}$=1.83, SD=0.81) and access to credit facilities to support other livelihoods (=1.33, SD=0.62) depict weak physical and financial assets that sustain fisheries production. Respondents felt that increase in fishers' number will likely lead to increase pressure on fisheries resources ($\bar{x}$=2.0, SD=0.78). Respondents disagreed that their market situation is favourable to enhanced fishing livelihood ($\bar{x}$=2.39, SD=0.76). Also, unfavourable market situation to fishing livelihood implies exploitation of fish mongers in the chain of distribution. Most of the fishers received loans from mongers for procurement of fishing input. These loans were remitted by fishers with fish caught and the bargaining power lies in the hands of the mongers.

Table 2: Sustainability Assessment of Artisanal Fisheries Activities (n = 460)

Sustainability assessment	Mean	Std. Deviation
Fishing communities' location is not remote for any improvement in livelihood portfolios	2.93*	0.763
Migrate to better and more favourable fishing location	2.64*	0.696
Capable of maintaining and sustaining fisheries resource base	2.60*	0.524
Conflict is not a problem in the area	2.60*	0.778
Planning to remain in fishing business	2.50*	0.758
Market situation is favourable to fishing livelihood	2.39	0.763
Changes in flood / rain cycle is not a problem	2.10	0.876
Increased number of fishers in the area is not a problem to fishing livelihood	2.00	0.777
Community is accessible despite poor road network	1.83	0.811
Have access to credit facilities to support other livelihoods Activities	1.33	0.621

Source: Field Survey, 2023   *Agreed (mean ≥ 2.50)

CONCLUSION AND RECOMMENDATIONS

Respondents possessed various livelihood assets to generate income for sustainable livelihood and this significantly helped in improving livelihood sustainability of the fishers. Similarly, livelihood assets mostly possessed by the fishers have access to water body and access to agricultural land and these assets promote efficient fishing and farming activities among the fishers. Considering the immense benefits that can be derived from sustainable exploitation of the nation's water bodies and to overcome the challenges that confront the artisanal fisheries industry, the following recommendations are made. Training and seminars on livelihood assets management and livelihood diversification strategies should be provided by private organizations with the necessary support of the government. This will enlighten the fishers on how best to distribute their eggs among baskets and withstand shock that could arise from the failure of their major livelihood source. Government should provide credit to fishers and make the formal credit available at a one-digit interest rate to enable fishers expand their assets base.

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RURAL-URBAN MIGRATION AND SOCIOECONOMIC LIFE OF RURAL COMMUNITIES IN BORNO STATE, NIGERIA

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ABSTRACT

The continuous and high rate of rural-urban migration in Nigeria has become a societal tumour and a great concern not only to the receiving communities but also to the rural areas, which has grave consequences. This study, therefore, investigates the causes and; effects of rural-urban migration on the socio-economic life of the rural communities in Borno state, Northeastern Nigeria, focusing on Maiduguri the capital city. The study attempted to find answers to research questions using survey design and purposive sampling techniques to collect data from 372 respondents through a structured questionnaire and personal interview. The respondents comprised heads of households of migrants in the New Settlement Areas (NSAs) within the Metropolis. Data for this study were edited, coded and analysed using Statistical Packages for Social Science (SPSS-v20) and descriptive statistics. The finding revealed that most migrants migrated for fear of insecurity with corresponding values (M = 3.43, SD = 0.86). It is also revealed that the effect of rural-urban migration on the socio-economic life of the rural communities is a decrease in agricultural production with statistical value (M =3.89, SD 1.89). Based on the findings, the paper recommended that the government provide adequate security measures by eliminating all forms of social and political barriers to the security of the rural communities in the state among others.

Keywords: Rural-urban migration, Socioeconomic life, Insecurity, Rural community.

INTRODUCTION

Rural-urban migration has been a notable aspect of human society since time immemorial. Various factors compel individuals and families to depart from rural settings to pursue opportunities in urban centres. The allure of enhanced economic prospects in cities is a primary catalyst for rural-urban migration. Urban areas often promise higher wages, a broader array of job opportunities, and access to crucial services like healthcare and education (Islam, Jahan and Yesmin, 2022; Nkweke, 2012). In the same vein, Tunde (2005) also observe that rural-urban migration is motivated by the persistent inequality in the distribution of social and economic infrastructure such as pipe-borne water, good roads, electricity, health facilities and industries among others in rural and urban communities.

The prevalence of mass influx of migrants to the urban centres, have posed a serious threat to the socio-economic life of the rural communities. This paper, therefore, sought to investigate the rural urban migration and its impact on rural livelihood with view to proffer viable recommendations that will improves the livelihood of the rural communities in Borno state.

Objectives of the Study
1. Investigate the causes of rural-urban migration in Borno State,
2. Determine the effects of rural-urban migration on the socio-economic life of rural communities,

The movement of people from one settlement to another, apparently in search of a better livelihood is not a novel phenomenon. Scholars like Udo (1980); (Adewale, 2005 and Badolo (2020),) described migration as the movement of people from one geographical region to another, which may be on a temporary or permanent basis, depending on the situation at hand. The decision to migrate may vary from one person to another and it is mostly influenced by some prevailing conditions. Adewale (2005) observed that migration mostly occurs in response to economic development, as well as social, cultural, environmental, and political factors, affecting both the areas of origin and destination. Tunde (2005); Jahan (2012); Adewole, (2005) and Bukar, Hussaini and Ngada, (2021) saw causes of migration as being motivated by the disparity in economic opportunities between rural areas and urban centres.

A study conducted by the scholars like Tacoli, (2004) and Tunde (2009 and Ishiaque and Ullah (2013) demonstrated unanimously agreement that the migration process especially rural-urban often has grave consequences on the rural economy as it affects food production. In like vein, Ajarero and Madu (2014); Lykke, 2002 in Omonigho and Olaniyan, (2013) lamented that rural-urban drift causes rural depopulation and this cause a lot of problems in terms of rural development as the young, skilled adults are missing.

Tunde (2009) conducted an exploratory and descriptive research on rural- urban migration and agricultural development in Nigeria. The study revealed that the massive influx of people to the urban centres is due to the dearth of agricultural infrastructure and economic opportunities and the neglect suffered by the agricultural sector.

Theoretical framework

This study hinged on Everett Spurgeon Lee's (1966) theory of migration to explain the causes of rural-urban migration in the study area. Lee, a Professor of Sociology at the University of Georgia is known for his pioneering theory of migration, which is known as the "Push and Pull Theory". Lee identified push" and pull factors as propelling forces for migration. The Push factors are associated with the area of origin, such as political instability, food scarcity, unemployment, and poor living conditions,

while pull factors relate to the destination area, including job opportunities, better living conditions, and access to education and healthcare services.

METHODOLOGY

The study used a descriptive survey research design. The population for the study comprised all household heads of migrants' families in Maiduguri the capital city of Borno state, Nigeria. A purposive sampling technique was used to select six new settlement areas occupied mostly by migrants. A total of 372 respondents were randomly selected for the study. From each New Settlement Area (NSA), 62 household heads of rural-urban migrants were randomly selected for the study. A descriptive questionnaire was used for data collection. It was a questionnaire with three sections. Section (A)

sought information about the migrants' demographic characteristics, section (B) consisted of 17 items focusing on scenario questions on reasons for rural urban migration and section C consisted of 12 items on the effect of rural-urban migration on the socio-economic life of rural communities rated on a 4-points Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD).

RESULTS

Figure 1 revealed that the majority of the respondents75(20.2) are within the age group of 36 years-40 years. This shows that most of the respondents who responded to the questionnaire were young and head of household.

Age of the Respondents
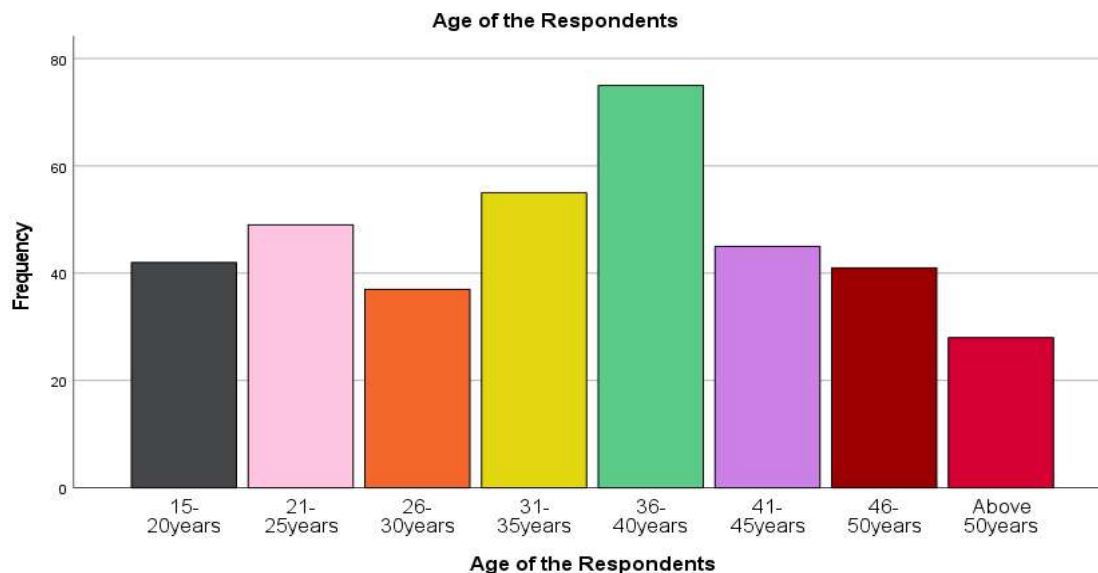
The one shows that 217(58.3%) of the respondent are on temporary migration

While 155 (41.7%) of the migrants have left the rural area permanently.

Table 1: Duration of stay of Respondents

Variable	Respondents	Frequency	Percentage (%)
Duration of Been There	Permanent	155	41.7
	Temporary	217	58.3
	Total	**372**	**100**

Migrants' mean score on the perceived factors responsible for rural-urban migration. Table 2 shows the mean provides a comprehensive view of the causes driving rural-to-urban migration. The

highest mean scores reflect that "Fear of insecurity" (M = 3.43, SD = 0.860) and "For better healthcare service" (M = 3.09, SD = 1.13) are the most influential factors.

		n=372		
SN	Variables	X	SD	DECISION
1	Fear of insecurity	3.43	0.86	Agree
2	Family disagreement	2.84	1.00	Agree
3	For children's education	2.88	1.12	Agree
4	To reunite with my family members	1.89	1.10	Disagree
5	For better healthcare service	3.09	1.13	Agree
6	You were poor in the village	2.79	1.49	Agree
7	For better-paying jobs in urban area	3.08	1.50	Agree
8	Occurrence of famine	2.38	1.07	Disagree
9	Land degradation	3.09	1.88	Agree
10	Inadequate capital for the modern farming system	3.01	1.10	Agree
11	Inadequate infrastructure in villages	3.07	1.01	Agree
12	You came with your family after marriage	3.12	1.01	Agree
13	To get better opportunities for your own education	3.21	1.10	Agree
14	To become self-employed	3.17	1.34	Agree
15	Because of job transfer	2.94	1.39	Agree
16	There are entrepreneurial opportunities in urban areas	2.11	0.199	Disagree
17	I am tired of poor living conditions in the village	3.17	1.01	Agree

Source: Field Survey 2024

Research Question Two

Impacts of rural-urban migration on the socio-economic life of rural communities in Borno state.
Table 3 examines the effects of rural-to-urban migration on the socio-economic life of rural communities. The highest mean scores are observed for "Reduction of the tax base in rural areas" (M = 3.88, SD = 1.94) and "Increase poverty levels in rural areas" (M = 3.86, SD = 1.02), indicating that respondents perceive these as significant adverse impacts of migration.

Table 3: Mean Score of the Migrants' Response on the impact of Rural Urban Migration on the Socio-economic Life of Rural Communities.

S/N	Variables	X	SD	DECISION
1	Decrease in agricultural production	3.89	1.79	Agree
2	Reduction of the rural population	3.88	1.02	Agree
3	Loss of cultural heritage	2.99	1.33	Agree
4	Low enrolment in schools	3.09	1.03	Agree
5	Loss of talent and experts in rural areas (Brain drain)	3.41	1.07	Agree
6	Reducing housing facilities in the rural areas	3.88	1.94	Agree
7	Reducing job opportunities in rural areas	3.22	1.12	Agree
8	Loss of traditional skills	3.12	1.00	Agree
9	Increasing medical costs due to lower living standard	3.22	1.21	Agree
10	Reduction of the tax base in rural areas	3.77	1.03	Agree
11	Loss of labour force in rural areas	3.79	0.99	Agree
12	Increase poverty levels in rural areas	3.86	1.01	Agree

Source: Field Survey 2024

This study intended to survey the causes and effects of rural-urban migration on the socio-economic life of rural communities in Borno state, Nigeria. The findings revealed that there are spontaneous reasons for migrant's exodus to the urban centres. The result in Table 2 shows that the major factors responsible for rural-urban migration are socioeconomic factors as presented in the order of their magnitude. Thus: fear of insecurity; seeking better health care; better-paying jobs in urban areas; land degradation and better educational opportunities. This result partly agrees with the findings from Bukar, Hussaini and Ngada (2021); Jahan (2012); Adewole, 2005; Braun (2009); (IDMC, 2019); Onuoha, 2014 and Tacoli, 2011) and

Bukar, Hussaini and Ngada (2021) who also found that rural-urban migration were mostly triggered by push factors like unsafe environment, crop failure, natural disasters like floods, better, infrastructural facilities and healthcare services. However, the current study has additional information such as fear of insecurity in the rural areas as the reason that has compelled majority of the migrants to the urban centres for safer environment.

Research question 2 investigated the consequences of rural urban migration on the socio-economic life of the rural communities in Borno state and the results presented in Table 3. The results revealed that the serious consequences of rural urban migration on socioeconomic life of the rural

communities in Borno state include decrease in agricultural production, decreasing in rural population and rising in poverty level among others have a rampaging impact on the rural dwellers. This is in line with the findings of Ajarero and Madu (2014) Lykke, Omonigho and Olaniyan, (2013); Tacoli, (2004) and (Tunde (2009; Mini (2001) and Ishiaque and Ullah, (2013) who lamented that rural-urban migration often has grave consequences as it affects food production, agricultural exports, loss of manpower necessary for agricultural activities as younger, more productive individuals move to urban centres seeking better opportunities.

CONCLUSION AND RECOMMENDATIONS

Rural urban migration has posed a serious threat to the socio-economic lives of the rural communities of the study areas. The security threats have had a negative impact on rural livelihood; as agricultural productivity decreases. The paper provided some vital recommendations as follows:

1. Elimination of all forms of security threats in the rural communities. This can be done through deployment of security personnels and the local vigilante groups to most vulnerable rural communities.

2. Provision of socio-economic infrastructures, such as healthcare services, electricity, good housing conditions, pipe-borne water, and other basic socio-economic services for the rural areas. This could be achieved through collaboration between government, NGOs and local communities' income earning jobs.

3. Transformation of traditional agriculture to modern agriculture by encouraging agricultural activities through the provision of interest-free loans and highly subsidized agro-chemical products which will improve the agricultural productivity of the rural communities.

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CASSAVA FARMERS PERCEPTION OF THE QUALITY OF AGRICULTURAL RADIO PROGRAMMES IN IFO LOCAL GOVERNMENT AREA OF OGUN STATE

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ABSTRACT
This study evaluated cassava farmers' perceptions of the quality of agricultural radio programmes in Ifo Local Government Area, Ogun State, Nigeria. Primary data were collected from 85 cassava farmers through semi-structured questionnaires and interviews. Radio, as a primary medium for news and information in rural communities, holds immense potential to influence change and drive rural development. However, the effective use of this medium for disseminating agricultural information has been inconsistent, limiting the ability of rural farmers to access timely and relevant knowledge that can enhance their productivity and livelihoods. The findings of this study underscore the impact of targeted radio programmes on agricultural development. A significant majority (83.4%) of farmers found the radio programmes beneficial, with 94% reporting improved access to agricultural inputs and better farm management practices. Additionally, 97.6% of the farmers agreed that these programmes provided essential information, and 88.3% noted that the information was timely. OGBC 90.5 FM (Agbe Afokosoro) and FUNAAB Radio (Agbelere) were identified as the primary stations farmers tuned into. The study further reveals that 90.3% of the farmers found the information from these programmes to be of high quality, positively impacting their farming practices. The study's hypothesis indicated significant relationship (P ≤ 0.005) between the perceived benefits of agricultural programmes and the quality of information transferred. Overall, cassava farmers had a favourable perception of these radio programmes, finding them useful and beneficial. The study recommends that more educational radio programmes be aired and that farmers be encouraged to listen to them for greater benefits.
Keywords: Cassava farmers, Information, Agricultural radio programmes, Perception

INTRODUCTION

Cassava production is a crucial agricultural sector with tremendous potential for enhancing food security, generating employment, and reducing poverty, making its development essential for sustainable progress. In Nigeria, cassava is indispensable, providing food and income to over 30 million farmers due to its resilience and adaptability (Koyenikan and Edeoghon, 2010; Abdoulaye *et al*., 2014). This sector sustains numerous livelihoods, especially in Nigeria's rural areas, where access to timely knowledge and resources can be transformative. As agriculture is highly dependent on information, readily accessible and accurate data is fundamental for sustainable development, supporting SDGs focused on eradicating poverty and hunger (Padre *et al*., 2003). Effective communication systems, particularly radio, are crucial in transferring agricultural knowledge directly to farmers.

Radio stands out as a powerful tool, as it reaches even the most remote areas, empowering farmers with timely information that supports decision-making and enhances productivity. Programmes covering crop and animal farming, agroforestry, agro-fisheries, and soil conservation help farmers tap into opportunities and adopt sustainable practices (LEISA, 2002; Njoku, 2016). The mass media, especially radio, plays an influential role in promoting positive agricultural change by raising awareness, fostering innovation, and spreading best practices. With radio programs widely accessible, even in rural areas, cassava farmers gain critical information that enables them to increase production and meet local and export demands (Nwachukwu, 2003; Gurstein, 2003; Patrick, 2001). This study examined the socio-economic characteristics of cassava farmers, highlighted the benefits of agricultural radio programs, assessed farmers' perceptions of these programs, identified popular radio programs among cassava farmers, and evaluated the quality of information conveyed. As new agricultural research outputs continue to grow, radio remains a pivotal channel for reaching cassava farmers, ensuring they have the information they need to make informed decisions that enhance both productivity and sustainability (Osikabor *et al*., 2011).

METHODOLOGY

The study focused on cassava farmers in the Ifo Local Government Area of Ogun State, using multistage sampling to select respondents. Data on cassava farmers were first obtained from the Ogun State Agricultural Development Programme (OGADEP), providing a sampling frame of 511 farmers. Taro Yamane's formula was then applied to calculate a sample size of 85 farmers, who were then randomly selected. Data collection involved a structured, pretested questionnaire, and SPSS software was used for quantitative analysis. Descriptive statistics, frequency counts, percentages, means, and standard deviations summarized the data. A five-point Likert scale evaluated farmers' perceptions of agricultural radio programs, and a two-point scale assessed radio listenership frequency.

RESULTS AND DISCUSSIONS
Socioeconomic characteristics
The findings in Table 1 suggest that a young, active farming workforce among cassava farmers is well-positioned to adopt innovative practices, with family labour support from predominantly married farmers potentially reducing costs and boosting productivity. The farmers' high educational level indicates strong receptivity to complex agricultural information, particularly through radio, making educational outreach highly impactful. Low average farming experience highlights a need for training on best practices, while small landholdings underscore the importance of high-yield techniques and policies to improve land access. Additionally, farmers' preference for short radio programs suggests that concise, engaging content is essential for effective agricultural extension.

Table 1: Distribution of respondents by their selected socio-economic characteristics (n=85)

Variables	Frequency	Percentage	Mean	SD
Age				
20 – 30	33	38.8		
31 – 40	24	28.2	36	11
>40	28	33		
Marital Status				
Single	25	29.4		
Married	56	65.9		
Widowed	2	2.4		
Separated	2	2.4		
Educational Level				
No formal education	4	4.7		
Primary education	5	5.9		
Secondary education	20	23.5		
Tertiary education	56	65.9		
Household size (Person)				
1 -3	20	23.5		
4 – 6	52	61.2	5	2
7 – 9	13	15.3		
Farming Experience (Years)				
1 – 7	42	49.4		
8 – 14	20	23.5	9.4	6.4
15 – 21	20	23.5		
22 – 27	3	3.5		
Number of hectare (ha)				
0 – 5	62	72.9		
6 – 10	16	18.8	4.3	3.6
11 – 15	7	8.2		
Number of radio program listen to				
1 – 5	52	61.2		
6 – 10	31	36.5	5	3
11 – 15	2	2.4		
Frequency of listening to programme (minute)				
1 – 5	52	61.2		
6 – 10	32	37.6	5	2
11 – 15	1	1.2		
Minimum duration of listening to programme (minute)				
1 – 30	75	88.2		
31 – 60	8	9.4	25.3	18.4
61 – 90	1	1.2		
91 – 120	1	1.2		

Benefits of agricultural related programmes
The findings in Table 2 highlight the vital role of agricultural programs in providing farmers with essential resources, improving farm management, and boosting income, which collectively enhance economic stability and operational efficiency. Programs are particularly valued for facilitating access to inputs, loan awareness, and market opportunities, which support financial growth and market integration. Farmers also benefit from learning new technologies and connecting with peers, aiding the shift toward commercial

agriculture. However, areas like free information access and implementing recommended practices reveal challenges, possibly due to resource constraints. Strengthening community-based extension interactions and providing additional support could further enhance program effectiveness and foster a collaborative learning environment.

Table 2: Benefits of Agricultural Related Program (n=85)

Benefits	SA	A	U	D	SD	x
There is better access to agricultural inputs from the information released	23(27.1)	54(63.5)	5(5.9)	1(1.2)	2(2.4)	4.11
Improved farm management	29(34.1)	51(60.0)	3(3.5)	1(1.2)	1(1.2)	4.24
Increased farmers' income	36(42.2)	35(41.2)	8(9.4)	3(3.5)	3(3.5)	4.15
Awareness on loan facility	32(37.6)	33(38.8)	6(7.1)	9(10.6)	5(5.9)	3.91
Increased marketing opportunities	27(31.8)	42(49.4)	7(8.2)	5(5.9)	4(4.7)	3.97
Opportunities to learn new agricultural technologies	33(38.8)	41(48.2)	2(2.4)	9(10.9)	0(0.0)	4.15
Ability to interact with fellow farmers through the radio programme	36(42.4)	35(41.2)	5(5.9)	9(10.6)	0(0.0)	4.15
The programme teaches me what to cultivate at the right time	33(38.8)	37(43.5)	6(7.1)	3(3.5)	6(7.1)	4.03
The programme teaches me improved cultural practices at the right time	25(29.4)	48(56.5)	3(3.5)	9(10.6)	0(0.0)	4.04
The programme encourages me to practice commercial agriculture	21(24.7)	51(60.0)	5(5.9)	2(2.4)	6(7.1)	3.92
It is my best means to receive Agricultural innovation	16(18.8)	43(50.6)	13(15.3)	12(14.1)	1(1.2)	3.71
Means of learning from the extension agents	22(25.9)	50(58.8)	6(7.1)	5(5.9)	2(2.4)	4.00
Create awareness to innovation with no cost	19(22.4)	25(29.4)	9(10.6)	18(21.2)	14(16.5)	3.20
They are difficult to implement	19(22.4)	34(40.0)	10(11.8)	13(15.3)	9(10.6)	3.48
Opportunity to earn more profit	24(28.2)	47(55.3)	3(3.5)	6(7.1)	5(5.9)	3.92

Cassava farmers' perceptions of radio programs

The result in Table 3 indicate that radio programs are a vital source of agricultural information for rural farmers, particularly those in remote areas with limited access to other resources. Farmers trust radio for reliable knowledge, which aids in improving productivity, adopting new farming practices, and managing farms more effectively. Programs provide critical insights on timing, marketing, storage, and cassava varieties, helping farmers make informed decisions, reduce losses, and boost yields. Additionally, information on credit facilities through radio aids farmers in securing financial resources, thus supporting farm expansion and sustainability.

Table 3: Cassava farmer's perception of Agricultural related radio program (n=85)

Perception statement	Mean
Radio programmes serve as a source of information in remote areas	4.61
Knowledge and information are basic ingredient to increased agricultural production, and these are shared on radio programmes	4.29
Radio programmes help to adopt innovations	4.00
Radio agricultural programme assisting getting improved farm management	3.97
It provides information on the right time for crop cultivation and provides increased marketing opportunities for farm produce	4.08
It provides information on storage and preservation practices	4.02
Agricultural related radio program provides more information on improved species of cassava	4.21
It provides information on technological innovation	4.22
Weeding and fertilizer information are enhanced through radio programme	4.04
Radio programme provides information on available credit facilities	4.04

Radio stations cassava farmers listen to

The results in Table 4 show that many cassava farmers (65.0%) regularly tune into OGBC 90.5 FM (*Agbe Afokosoro*), while 58.8% listen to FUNAAB Radio (*Agbelere*). This high listenership suggests that these stations are perceived as particularly beneficial sources of agricultural information, especially for cassava farming activities. Additional stations include Faaji 106.5 FM (45.9%), Sweet

107.5 FM (41.7%), and Paramount 94.5 FM (36.4%), though their reach is somewhat lower.

Table 4: Radio stations cassava farmers listen to (n=85)

Radio stations*	F (%)
OGBC 90.5 FM (*Agbe Afokosoro*)	55 65.0)
Sweet 107.5 FM	35 (41.7)
Faaji 106.5 FM	39 (45.88)
Fresh 107.9 FM	30 (35.2)
Rock City 101.9 FM	28 (32.9)
Paramount 94.5 FM	31 (36.4)
FUNAAB radio (Agbelere)	50 (58.8)

Quality of Information Transferred

Most cassava farmers find specific types of information conveyed via radio to be highly useful for their farming needs. Notably, 61.2% of farmers rated information on fertilizer availability and application as "very useful." Similar appreciation was shown for information on disease and pest control (61.2% found it very useful) and new farming techniques (52.9%).

Farmers also place high value on content related to agricultural management (mean score = 2.35), self-development (65.9% rated it as useful), and information on health necessities (58.8% found it useful). A large majority (90.3%) acknowledged that the quality of agricultural information provided by radio programs is beneficial, underscoring radio's role in supporting informed decision-making.

Table 5: Quality of Information Transferred (n=85)

Information Transferred	Very Useful F(%)	Useful F(%)	Not Useful F(%)	x
Fertilizer availability and application	52(61.2)	32(37.6)	1(1.2)	2.60
New farming techniques	45(52.9)	39(45.9)	1(1.2)	2.51
Disease and pest control	52(61.2)	33(38.8)	0(0.0)	2.61
Agricultural support services	30(35.3)	53(62.4)	2(2.4)	2.32
Government regulation	28(32.9)	52(61.2)	5(5.9)	2.27
Information on supply of inputs	31(36.5)	50(58.8)	4(4.7)	2.31
Income generation	32(37.6)	51(60.0)	2(2.4)	2.35
Innovation	29(34.1)	53(62.4)	3(3.5)	2.30
Agricultural management	32(37.6)	51(60.0)	2(2.4)	2.35
Sales and marketing	34(40.0)	50(58.8)	1(1.2)	2.38
Human capacities or growth	27(31.8)	51(60.0)	7(8.2)	2.23
Health	26(30.6)	50(58.8)	9(10.6)	2.20
Fertilizer availability and application	40(47.1)	38(44.7)	7(8.2)	2.38
Gender capacities	28(32.9)	31(36.5)	26(30.6)	2.02
Self-development	27(31.8)	56(65.9)	2(2.4)	2.29

Hypothesis testing

The significant positive relationship (r=0.551, p≤0.005) between the benefits of agricultural programs and the quality of information transferred on the radio implies that high-quality information on radio programs is associated with greater perceived benefits among farmers. This suggests that the effectiveness and perceived value of agricultural radio programs are closely tied to the clarity, relevance, and applicability of the information provided, emphasizing the importance of ensuring accurate, practical, and well-communicated content to maximize program impact on farmers.

Table 6: Result of PPMC analysis

Variable	r-value	p-value	Decision
Benefits of agricultural related programme and quality of information transferred on radio	0.551	0.000	S

CONCLUSION AND RECOMMENDATIONS

It was concluded that the cassava farmers have a good perception of agricultural related radio programs and that they find it favourable and useful as beneficial information are shared on the radio which have a positive impact on their production.

Programme administrators should consider these barriers and potentially offer additional support, such as training sessions, subsidies, or follow-up assistance, to bridge the gap between knowledge acquisition and practical application.

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FACTORS INFLUENCING ROLE PERFORMANCE OF COMMODITY LEADERS IN PERIODIC MARKETS OF ONDO STATE

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ABSTRACT

The study investigated critical factor that influenced role performance of commodity leaders in periodic markets in Ondo State by employing multistage sampling procedure to select 390 respondents. Primary data collected with the aid of a structured interview schedule and key informant interview were analysed using descriptive analysis and Factor analysis. The study revealed that a large proportion of the leaders (61.0% and 23%) were female and married respectively with a mean age of 44±8.39 years and a mean household size of 6 persons. Election (47.5%) and Nomination (38.5%) were the predominant criteria used for leadership emergence. Leading discussion in market meetings ($\bar{x} = 2.37$), representing the association in general market body ($\bar{x} = 2.36$), dissemination of market information ($\bar{x} = 2.19$), resolving conflicts among members and customers ($\bar{x} = 2.13$) were major roles performed. Critical factors found that influenced role performance of commodity leaders in periodic market were personal status, socioeconomic status, leadership base and institutional support. The study concluded that the identified were important to role performance. It was therefore recommended that the criteria for emergence of commodity leaders should take into consideration the identified factors to enhance market growth and the overall economic landscape of the State.

Keywords: Commodity leaders, Periodic markets, Factors, Role performance

INTRODUCTION

Human societies are fundamentally shaped by exchanging goods and services, leading to the creation of markets as culturally significant social institutions (Desai, 2013). Kio-Lawson et al. (2015) Categorise markets into daily and periodic types, while Olayiwola (2020) introduces "special markets" held on notable events or holidays. Daily markets provide continuous goods and services, while periodic markets, occurring weekly or monthly, serve remote areas with limited store access. These markets support local farmers and artisans, enriching the economic and social fabric of rural communities (Omole, 2012). Periodic markets particularly impact Nigeria's rural economy, generating employment, boosting incomes, and enhancing rural development (Babajo et al., 2018). However, their growth faces challenges from limited government support and infrastructure (Elenwo and Weje, 2019). Leadership in these markets plays a critical role in maintaining operations, mediating conflicts, and advocating for government aid (Mgbada and Agumagu, 2007; Ozor and Nwankwo, 2008).

This study assesses the performance of commodity leaders in periodic markets across Ondo State, Nigeria, using a multistage sampling method. Initially, three Local Government Areas (LGAs) were purposively selected from each senatorial district, totalling nine LGAs. A proportionate sampling technique then identified 50% of periodic markets within each LGA, resulting in 26 markets. Finally, three executives from each of five commodity associations—yam, tomatoes/pepper, plantain/fruit, palm oil, and fish—were randomly selected per market, totalling 390 respondents, with two key informants per market for in-depth interviews. Data were collected through interviews and analysed using SPSS, focusing on leaders' roles, performance levels, and influencing factors

RESULTS AND DISCUSSIONS

Socioeconomic characteristics

Most respondents (75.9%) were between 30 and 50 years old, with an average age of 44. This demographic is thought to combine maturity, experience, and physical ability, beneficial for leadership roles. A significant majority (61%) were female, highlighting the cultural view of markets as a female-oriented space. Most respondents were Yoruba (92.8%), and 77.9% were indigenous, showing a strong connection to their communities. Many respondents (67.4%) had lived in their communities for 30-50 years, reinforcing the importance of local status in leadership selection.

Leadership emergence

Leadership roles were primarily obtained through elections (47.7%), nominations (39.5%), or appointments (12.8%). Selection criteria emphasized experience (43.6%), integrity (36.4%), charisma (33.6%), and gender (40.5%). Leaders were actively involved in tasks like leading discussions, representing their associations, disseminating information, and resolving conflicts. This finding was supported by excerpt from the KII session conducted across the study area: *As one of the commodity leaders in this market, I came into leadership position as a result of election carried out among yam traders in the market.* (KII excerpt from a periodic leader from Oja Ogbese in Akure North LGA) The use of diverse criteria suggests a comprehensive approach that takes into account various aspects when making decisions, both individually and collectively. This finding was supported by excerpt from the KII session conducted across the study area: *In this market, the selection criteria are based on the individual's character and experience within the market system.* (KII excerpt from a periodic leader from Oja Owena in Ondo East LGA)

Role performance of commodity leaders in periodic markets

The results on the performance of commodity leaders in periodic markets show that key roles such as leading discussions in market meetings (mean = 2.37), representing the association in general market bodies (mean = 2.36), disseminating market information (mean = 2.19), resolving conflicts among members and customers (mean = 2.13), and contributing resources like levies and donations (mean = 2.07) all scored above the grand mean of 1.90, highlighting their importance in market operations. Other significant roles included maintaining peace (mean = 2.04), enforcing market rules (mean = 2.03), and ensuring the security of members and goods (mean = 1.93). In contrast, roles like promoting member communication (mean = 1.61), ensuring market sanitation (mean = 1.59), organizing collective purchases (mean = 1.29), and regulating prices (mean = 1.24) scored below the grand mean, indicating they are less central responsibilities.

Key Informant Interviews (KII) reinforced these findings: one leader described using personal funds to support members and arranging group purchases and transportation to cut costs, while another highlighted sharing new market information for members' benefit. Both quantitative and qualitative data indicate a strong commitment among market leaders to fulfil their roles.

Factors influencing role performance of commodity leaders in periodic markets

Results of factor analysis indicate the influence of various factors on role performance of commodity leaders in periodic markets, with four key factors explaining a cumulative variance of 65.107%. Socioeconomic factors accounted for the largest variance at 30.272%, followed by institutional factors (12.936%), literacy factors (11.539%), and constraints factors (10.360%). An additional unknown factor contributed 34.893% to the variance.

Socioeconomic factors: Key variables included age, years of marketing experience, years of residence, years in leadership, household size, and leadership characteristics. These factors positively impact role performance, as greater age, experience, and leadership tenure foster decision-making and responsibility. **Institutional factors:** involving annual income, household size, and institutional roles, highlighted the significance of governmental and family institutions. Institutional support enhances leaders' performance by providing resources and infrastructure, which aligns with findings from Famakinwa, Adisa, and Alabi (2019) that institutional involvement in rural development supports leadership.

Literacy factors: were influenced by years of formal education, leaders' perception of their roles, and leadership characteristics. These underscore the role of education and perception in improving leadership effectiveness. **Constraints:** such as political instability and role conflicts negatively impacted performance. Key variables affecting constraints included leaders' role perception and identified barriers like corruption and trader illiteracy, which hindered effective leadership.

Table 6: Results of Principal Component Analysis showing the variables contributing to factors influencing the performance of periodic market leaders

Factors and Contributing variables	L	L²	⋋
Socioeconomic factor			
Age	0.890	0.7921	
Years of marketing experience	0.871	0.758641	
Years of residence	0.855	0.731025	
Years in leadership position	0.774	0.599076	3.245463
Household size	0.390	0.1521	
Leadership characteristics	0.461	0.212521	
Institutional factor			
Annual income	0.645	0.416025	
Institutional overall score	-0.623	0.388129	
Household size	-0.491	0.241081	1.286316
Leaders' role perception	0.491	0.241081	
Literacy factor			
Leaders' role perception overall score	-0.409	0.167281	
Years of formal education	0.765	0.585225	1.10297
Leadership characteristics	0.592	0.350464	
Constraint factor			
Leaders' role perception	-0.475	0.211375	0.900275
Constraints	0.830	0.6889	

Source: Field Survey, 2024.

L= Loading factors

L2 = Square of loading factor

⋋ = Latent root for the factor (summation of the square loading)

CONCLUSION

The study concluded that leadership in periodic markets emerges through elections or nominations, with selection based on experience and gender. Key roles performed by commodity leaders include leading discussions in market meetings, representing associations in general market bodies, and disseminating market information. The main factors influencing leaders' performance are socioeconomic, institutional, literacy, and constraints. It is recommended that these factors be carefully considered in selecting leaders to strengthen market leadership structures and support development.

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ANALYSIS OF WOMEN'S PARTICIPATION IN AGRO-ENTREPRENEURSHIP ACTIVITIES FOR IMPROVED LIVELIHOOD IN KOGI STATE, NIGERIA

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ABSTRACT

The role of women in agricultural production can never be over emphasized. If the problem of food insecurity is to be tamed, women's entrepreneurs must be empowered to compete effectively with their male counterparts. The study analysed women's participation in agro-entrepreneurship activities for improved livelihood in Kogi State, Nigeria. Three-stages sampling procedure was used to select four hundred and thirty-three (433) rural women. Structured questionnaire complimented with interview schedule was used for data collection. Information were garnered on agro-activities of rural women, their level of participation in agro-entrepreneurship activities, and constraints facing women agro-entrepreneur. Data was analysed using descriptive statistics (frequency, percentage, and mean). The most agro-entrepreneurship activities performed by woman were crop farming (97.2%) and poultry farming (55.7%). Also, 89.4% of rural women had low level of participation in agro-entrepreneurship activities. The most constraints facing women agro-entrepreneurship were limited access to resources ($\bar{X}$=2.65) and insufficient funds ($\bar{X}$=2.62) and lack of access to infrastructure ($\bar{X}$=2.50). It is recommended that women should venture into other agro-entrepreneurship activities apart from farming for improved livelihood. Also, incentives and other resources should be provided for women in order to boost their interest in agro-entrepreneurship.

Keywords: Women participation, Agro-entrepreneurship, Improved livelihood

INTRODUCTION

Agricultural is a key sector in Nigeria, employing a significant portion of the population and contributing to national development (Pelemo *et al.,* 2022). Entrepreneurship is a dynamic process of creating incremental wealth for the betterment of the populace (Esiobu *et al.,* 2024). Agro-entrepreneurship combines elements and agriculture and entrepreneurship for better development. The goal of agro-entrepreneurship is to create value, income generation, and enhance agricultural development. Women agro-entrepreneurs are women engage in total agricultural activities, who take the risks involved in effective utilization of human and material resources in a unique way by taking advantages of the opportunity identified in their immediate environment in the production of goods and services for the benefits of mankind (Egwuonwu and Iwunwanne, 2020). Women in Nigeria contribute substantially to agriculture through food production, processing, marketing, and distribution. Participation of women in agro entrepreneurship activities in Nigeria have skyrocketed in recent years due to the federal government initiatives to promote women economic empowerment and changing the social norms has been one of the motivating factors. Women have been traditional involved in agricultural activities but have been often marginalized and excluded in the decision making and access to production resources. Nigeria government efforts at empowering women have not yielded positive result. Women continue to face barriers such as limited land, inadequate access to finance, lack of adequate training, cultural and social norms. The main objective of the study is to analyse of women's participation in agro-entrepreneurship activities for improved livelihood in Kogi State, Nigeria. The objectives of this study were to: identify the agro-entrepreneurship activities performed by women, determine the level of participation of women in agro entrepreneurship activities; and identify the constraint facing women agro-entrepreneur.

METHODOLOGY

The study was done in Kogi State of Nigeria. The State lies between latitude $6^0 33^1$ and $8^0 44^1$ N and longitude $5^0 22^1$ and $7^0 49^1$E, and located in the Guinea savannah ecological zone. Kogi State has a total population of 3,278,487 in (NPC, 2006) and with growth rate of 3.2%, the State has estimated population of 4,636,071 in 2017. The State has land area of about 30,354.74 square kilometres (Kogi State Ministry of Information Working Document, 2016). The State has about 2 million hectares of cultivable land with only about 0.5 million hectares currently under cultivation (Kogi State Ministry of Information working document, 2016). The State is well endowed with river valleys and swamp lands for dry season farming. The major food crops grown in the State are yam, cassava, maize, sorghum, rice, millet, cowpea, pigeon pea, groundnut, Bambara nut, cocoyam, sweet potato, benniseed, melon, banana, plantain and cotton. The major agro entrepreneurship activities performed by women in the state includes poultry, farming, processing, fishery, snail farming, livestock production, and organic farming. Three-stages sampling procedure was employed for this study. The first stage involved random selection of one (1) Local Government Area (LGAs) each from the four (4) agricultural zones in the State. The second (2) stage involved random selection of five (5) villages each from the selected LGAs making a total of twenty

(20) villages. The third (3) stage involved the use of proportional sampling to select 10% of rural women from the sampling frame which now gave a total of four hundred and thirty-three (433) respondents. Primary was employed for this study. The study objectives were achieved using descriptive statistics (frequency, percentages and mean). Level of participation in agro-entrepreneurship activities was achieved based on number activities performed by women. The agro-entrepreneurship activities in the study area includes poultry farming, organic farming, fishery, fruit farming, fertilizer application, selling of herds, selling of seeds, bee keeping, crop farming, agricultural supplies, snail farming, farm consultant, farm market and mushroom farming. A total number of 14 activities were Categorised into high medium and low. The respondents that fell into 1-5=low, 6-10=medium, >10=high.

RESULTS AND DISCUSSION
Agro-entrepreneurship activities performed by women

Table 1 revealed that crop farming (97.2%) and (55.7%) were the most agro-entrepreneurship activities in the study area. This shows that most of the women produce crops and poultry. This finding aligns with Egwuonwu and Iwunwanne (2020) who reported that crop farming and poultry are few of the most participated agro-based entrepreneurial activities in Imo State, Nigeria. Other agro-entrepreneurship activities performed by women includes organic farming (44.3%), fruit (28.9%), agricultural supplies (13.6%), and selling of seeds (12.2%). The least agro-entrepreneurship activities performed by women were mushroom (0.9%) and bee keeping (0.6%).

Table 1: Agro-entrepreneurship activities performed by women (n=433)

Variables	Frequency	Percentages	Ranking
Crop farming	421	97.2	1st
Poultry farming	241	55.7	2nd
Organic farming	192	44.3	3rd
Fruit selling	125	28.9	4th
Agricultural supplies	59	13.6	5th
Selling of seeds	53	12.2	6th
Fertilizer	25	7.6	7th
Fishery	31	7.1	8th
Selling of herbs	27	6.2	9th
Farmers market	14	3.2	10th
Snail farming	12	2.8	11th
Farm consultant	10	2.3	12th
Mush room farming	4	0.9	13th
Bee keeping	3	0.6	14th

Sources: Field survey, 2023

Level of participation of women in agro-entrepreneurship activities

Table 2 indicated that 86.4% of the respondents had low activities while 10.5% had medium. This signifies that larger proportion of women had low participation in agro-entrepreneurship activities.

Low participation is expected to be the wealth creation and livelihood status of agro-entrepreneurs in the study area. This finding is in consonance with that of Egwuonwu and Iwunwanne (2020) that women were not adequately involved in agro-based entrepreneurial activities in Imo State, Nigeria.

Table 2: Level of participation of women in agro-entrepreneurship activities (n=433)

Variables	Frequency	Percentage
High	14	3.2
Medium	45	10.5
Low	374	86.4

Sources: Field survey, 2023

Constraint facing women agro entrepreneur

Table 3 revealed that limited access to resources ($\bar{X}$=2.65), insufficient funds ($\bar{X}$=2.62), and lack of access to infrastructure ($\bar{X}$=2.50) were the most constraints facing women participation in agro entrepreneurship. Women in Nigeria have been

discriminated against access to resources due to custom and traditional beliefs. Women in Nigeria are at major disadvantages when it comes to access to resources. The finding is in agreement with that of Esiobu et al. (2015) who stated that inadequate access to resources and funds are one of the problems facing women entrepreneurs in Imo State of Nigeria.

Table 3: Constraint facing women agro-entrepreneur (n=433)

Variables	Very severe	Severe	Not severe	Mean	Ranking
Limited access to resources	321 (74.1)	74 (17.1)	38 (8.8)	2.65	1st
Insufficient funds	207 (47.8)	150 (34.6)	76 (17.6)	2.62	2nd
Lack of access to infrastructure	285 (65.8)	81 (18.7)	67 (15.5)	2.50	3rd
Family responsibilities	253 (58.4)	141 (32.6)	39 (9.0)	2.49	4th
Gender discrimination	219 (50.6)	130 (30.0)	84 (19.4)	2.31	5th
Cultural norms	170 (39.3)	186 (42.9)	77 (17.8)	2.21	6th
Lack of networking activities	152 (35.1)	149 (34.4)	132 (30.5)	2.05	7th

Sources: Field survey, 2023

CONCLUSION AND RECOMMENDATIONS

It can be concluded that crop farming and poultry farming were the most activities performed by women in the study area. Majority of women had low participation in agro entrepreneurship activities. Limited access to resources and insufficient funds were the most severe constraint facing women agro-agro-entrepreneurs. It is recommended that women should venture into other agro-entrepreneurship activities apart from farming for improved livelihood. Also, incentives and other resources should be provided for women in order to boost their interest in agro entrepreneurship. Lastly, government should make provisions for infrastructures that will assist women in the study area.

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USAGE OF CLIMATE-SMART PRACTICES AMONG ARABLE CROP GROWERS IN KOGI STATE, NIGERIA

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ABSTRACT

Climate change is one of the major contributors to food insecurity among arable growers and Sub-Saharan Africa as a whole. This study examined usage of climate-smart practices among arable crop growers in Kogi State, Nigeria. Information was gathered on the socio-economic characteristics of arable crop growers, types of arable crops grown by growers, climate smart practices used, and constraints to climate-smart usage. Three-stage sampling technique was used to sample 213 arable crop farmers. A structured questionnaire complimented by the interview scheduled, was used for data collection. The data collected were analysed using frequency, percentages, and the mean. Findings showed that 69.5% of the arable crop farmers were male, with a mean age of 42.6 years. Cassava (92.9%) and maize (89.7%) were the most produced arable crops in the study area. Mixed cropping systems (88.3%) and afforestation (77.3%) were the most climate-smart practiced by arable crop farmers. Inadequate finance ($\bar{X}$ =2.69), and inadequate awareness on climate smart practices ($\bar{X}$ =2.64) were the most severe constraints facing the adoption of climate-smart practices in Kogi State. It is recommended that the government at all levels provide adequate support to enhance climate-smart practices.

Keywords: Climate-smart practices, Arable crop grower

INTRODUCTION

Agriculture is the major sustenance of livelihood to a larger percentage of Nigeria populace (Udemezie, 2019). Arable crop farmers are agriculturalists that cultivate and manage land to produce crops such as fruits, vegetables, grains, and legumes. The numbers of arable crop farmers in full or part-time farming in Nigeria have increased drastically due to the increase in youth's unemployment and low attitude of government in entrepreneurship development (Pelemo *et al.,* 2019). Despite the number of workers in the agricultural sector, Food insecurity and poverty persist in Nigeria because of climate change. One of the major solutions to the reduction of climate change is the application of climate-smart agriculture. Climate-smart agricultural practices imply the application of smart practices to reduce the effect of climate change. The aim of climate-smart practices is to build a resilient farming system that would reduce climate change and increase productivity and wellbeing for farmers.

Climate-smart agricultural practices include the application of cover crops, planting of trees, erosion control, avoidance of grazing, mixed cropping systems, adoption of irrigation farming systems, crop diversification, changing planting dates, timely planting, and harvesting. The objectives of this study were to: describe the socio-economic characteristics of arable crop growers in the study area; identify the arable crops grown; identify the climate-smart practices by arable crops growers; and examine the constraints to climate-smart practices.

METHODOLOGY

The study was done in Kogi State Nigeria. The State is located between latitude $6^0 33^1$ and $8^0 44^1$ N and longitude $5^0 22^1$ and $7^0 49^1$E, with a population of 3,278,487 people and land area of about 30,354.74 square kilometres (Kogi State Ministry of Information, 2016). The major food crops grown in the State are yam, cassava, maize, sorghum, rice, millet, cowpea, and sweet potato. Three-stages sampling technique was employed for this study. The first stage involved random selection of one (1) from the four (4) agricultural zones in the State. The second (2) stage involved a random selection of three (3) villages each from the selected LGAs making a total of twelve (12) villages. The third stage involved the use of proportionate sampling to select 10% of arable crop farmers from the sample population of 2134 in the State, which gave a total of 213 arable growers. Primary employees were employed for this study. The study objectives were achieved using descriptive statistics (frequency, percentages and mean). Constraints to the adoption of climate practices were measured using a 3-point Likert type scale of very severe 3, severe 2 and not severe 1. The overall constraint was classified into severe ≥2 and not severe <2

RESULTS AND DISCUSSION

Socioeconomic characteristic

Table 1 indicated that 69.5% of the arable crop grower's male while 30.5% were female. Larger proportion of male might be attributed to the difficult and tasking activities involved in climate-smart practices that could be better handled by men. Table 1 revealed that the mean age of arable crop farmers in the study area was 42.6 years. This

indicates an active age where new practices like that of climate-smart is fully adopted in order to address climate problems in the study area. This finding is line with that of Ekpa e*t al.* (2021) that young farmers adopted more of climate-smart practices in drought prone area of North West Nigeria. Table 1 indicated that the mean farm size of the arable crop farmers was 2.82 hectares.

Table 1: Socio-economic characteristics of arable crop farmers (n=213)

Variables	Frequency	Percentage	Mean
Sex			
Male	148	69.5	
Female	65	30.5	
Age			
<30	12	5.6	
31-40	56	26.3	42.6
41-50	101	47.4	
>50	44	20.7	
Household size			
1-5	23	9.9	12
6-10	129	60.6	
11-15	45	21.1	
16-20	12	5.6	
>20	4	1.9	
Farming experience			
<10	15	7.0	16.4
11-20	134	62.9	
21-30	55	25.8	
>30	9	4.2	
Farm size			
<1	22	10.3	2.82
1.1-2.0	34	15.9	
2.1-3.0	67	31.4	
>3.0	90	42.3	

Sources: Field survey, 2023

Arable crops produced by rural households

Table 2 showed that 92.9% and 89.7% produced cassava and maize. This implies that a larger proportion of rural households produce maize in the study area. This is not surprising as these two crops were the most highly produced stable crops in Kogi State of Nigeria. Also, 82.2% produced yam while 58.2%, 54.5% and 52.1% produced yam, beans, millet and melon respectively.

Table 2: Distribution of rural households according to crops produced (n=213)

Variables	Frequency	Percentage	Ranking
Cassava	198	92.9	1st
Maize	191	89.7	2nd
Yam	175	82.2	3rd
Bean	124	58.2	4th
Millet	116	54.5	5th
Tomatoes	97	45.5	6th
Vegetables	88	41.3	7th
Guinea corn	73	34.3	8th

Sources: Field survey, 2023

Climate-smart practices used by arable crops growers

Tables 3 indicated that mixed cropping system (88.3%), planting of trees (77.3%), changing plant date (79.8%), crop diversification (75.6%), application of organic (73.7%), planting of drought resistant (70.9%), early harvesting (64.8%) and planting of cover crop (61.9%). This finding is in consonance with that of Adebayo and Ojogu (2019) that application of organic manure was one of the climate-smart practices adopted in Ogun State of Nigeria.

Table 3: Distribution of respondents according to climate-smart practices (n=213)

Variables	Frequency	Percentage	Ranking
Mixed cropping system	188	88.3	1st
Planting of trees	166	77.9	2nd
Changing in planting date	170	79.8	3rd
Crop diversification	161	75.6	4th
Application of organic fertilizer	157	73.7	5th
Planting of drought resistant crops	151	70.9	6th
Early harvesting	138	64.8	7th
Planting cover crop	132	61.9	8th
Erosion control	123	57.8	9th

Sources: Field survey, 2023

Constraints to adoption of climate-smart practices

Table 4 indicated that high cost of input ($\bar{X}$ =2.78), lack of finance ($\bar{X}$ =2.69), lack of government support ($\bar{X}$ =2.68), inadequate training on climate-smart practices ($\bar{X}$ =2.74) were the most severe constraints to adoption of climate-smart practices. This finding is in tandem with that of Ekpa *et al.* (2021) who reported that high cost of inputs is serious problem facing the adoption of climate-smart practices in Nigeria. However, land tenure ($\bar{X}$ =1.46) is not a severe constraint to adoption of climate-smart practices in the study area.

Table 4: Constraints to adoption of climate-smart practices (n=213)

Constraints	Very severe	Severe	Not severe	Sum	Mean	Decision
High cost of inputs	151 (70.9)	67 (31.4)	5 (2.3)	592	2.78	Severe
Inadequate training on CSAP	182 (85.4)	6 (2.8)	25 (11.7)	583	2.74	Severe
Lack of finance	157 (73.7)	47 (22.1)	9 (4.2)	574	2.69	Severe
Lack of government support	154 (72.3)	50 (23.7)	9 (4.2)	571	2.68	Severe
Lack of awareness	137 (64.3)	75 (35.2)	1 (0.4)	562	2.64	Severe
Cost expensive	143 (67.1)	52 (24.4)	18 (8.5)	551	2.59	Severe
Inadequate knowledge	130 (61.0)	62 (29.1)	21 (9.9)	535	2.51	Severe
Lack of technical know how	62 (29.1)	150 (70.4)	4 (1.9)	490	2.30	Severe
Lack of access high quality breed	60 (28.2)	120 (56.3)	33 (15.5)	453	2.13	Severe
Land tenure system	34 (15.9)	29 (13.6)	150 (70.4)	310	1.46	Not severe

Sources: Field survey, 2023

CONCLUSION AND RECOMMENDATIONS

It can be concluded that most of the arable crop farmers were male in their active age with high literacy level. Mixed cropping system, planting of trees and changing planting date were the most climate-smart practices. The most constraints to climate-smart practices were high cost of inputs, inadequate training on CSAP and lack of finance. It is recommended that the government should provide necessary inputs that will reduce the effect of climate change in the study area. Training should be organized for arable crop farmers that will equip their knowledge on climate friendly practices.

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FARMERS' PROPENSITY TO USE REALITY TELEVISION SHOW FOR INFORMATION ON CLIMATE-SMART AGRICULTURE STRATEGIES IN SOUTHWESTERN NIGERIA

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ABSTRACT
This study examined farmers' propensity to use RTS for information on CSA strategies in southwestern Nigeria. A multi-stage sampling procedure was used to select 121 farmers for this study. Using interview schedule, data were collected on farmers' socioeconomic characteristics, awareness of RTS, perceived constraints and propensity of its use for information on climate-smart agriculture strategies. Data were analysed using descriptive (frequencies, percentages, means). Farmers were mostly male (55.4%) and smallholders (1.6±1.3ha). None (0.0%) were aware of any Nigerian RTS used to promote agriculture. The most severe perceived constraints to the use of RTS were poor network reception ($\bar{x}$=161.2) and unstable power supply ($\bar{x}$=160.3). Majority of the farmers (69.4%) had a high propensity to use RTS for information on CSA. Agricultural development communicators should focus on utilizing this EE format in promoting climate-smart agriculture.
Keywords: Reality television show, Entertainment education, Climate-smart agriculture, Farmers

INTRODUCTION

The impact of climate change is increasing all over the world, and agriculture remains one of the most vulnerable sectors to its effects. Africa's vulnerability to climate change, the resultant low food production and hike in food prices demand a comprehensive, sustainable approach that will mitigate the effects of climate change while supporting agricultural productivity. Studies have reported a low awareness of the principles of climate-smart agriculture among farmers in Nigeria (Chinedum, Tambi and Bangali (2015)) and this necessitates the development of knowledge platforms that will support information and technology sharing with relation to climate-smart agriculture. Narrative storytelling, which is at the core of entertainment education (EE), has long been used to effectively disseminate social messages to target audiences. Through the infusion of educational contents with a good dose of entertainment, the EE genre has been used to inspire and spur audiences to action on specific issues. Various studies (Perlman *et al*, 2013; Singhal, Wang and Rogers, 2013, Onuekwe, 2015) have documented the use of EE to address health, agricultural, political and environmental issues. An emerging variant of EE is the Reality Television Show, Reality television show is being used to disseminate messages on agricultural technologies and agribusiness in diverse parts of the world [*Farmers Apprentice* (UK), *Kwanda* (South Africa), *Don't lose the plot* (Kenya), *Shamba Shape Up* (Kenya, Tanzania and Uganda)]. However, the use of reality television show for targeted messages especially in relation to climate action and climate-smart agriculture strategies is yet to be explored in Nigeria. Therefore, this study investigated farmers' propensity to use reality television show for information on climate-smart agriculture in southwestern Nigeria. Specifically, the study:
1. identified the socioeconomic characteristics of farmers.
2. ascertained farmers' awareness of the use of Reality Television Show for agricultural development.
3. ascertained farmers' perceived constraints to the use of Reality Television Show for information on climate-smart agriculture.
4. established farmers' propensity to use Reality Television Show for information on climate-smart agriculture.

METHODOLOGY

The study was carried out in the southwestern agro-ecological zone of Nigeria, which lies between longitudes 2º 31' and 6º 00' E and latitudes 6 º 21' and 8 º 37' N. A multistage sampling procedure was used to select farmers through the Agricultural Development Programme (ADP) structure. In all 121 farmers were sampled for the study. Farmers' propensity to use reality television show was measured with 20-item statements to obtain a quantitative measure of farmers' propensity, respondents were provided with response options of 'Very willing,' 'Partially willing,' and 'Not willing' assigned scores of 2, 1, and 0 respectively. The maximum score obtainable was 40, while the minimum score was 0. Afterwards, an index of scores was generated and mean score (29.5±10.9) was used to categorise the respondents as having either high or low propensity to use reality television show for information on climate-smart agriculture strategies. Data were analysed using both descriptive (mean, percentages) and inferential statistics (Pearson's Product Moment Correlation analysis).

RESULTS AND DISCUSSION
Farmers' socioeconomic characteristics

Results presented in Table 1 show that a greater percentage of the farmers were male (55.4%) and married (83.5%) with a mean age of 44.9±12.7 years, suggesting that farming is still quite male dominated. There was an even distribution of farmers having primary education (33.1%) and secondary education (33.1%), with just a few having tertiary education (15.7%). In addition, 93.4% of the farmers travelled outside their home and community. Most of the farmers (62.0%) cultivated crops on less than 2 hectares of land with an average

farming experience of 21.1±14.5 years. This is an indication that the farmers are smallholder farmers, as specified by FAO (2010) but have appreciable farming experience.

Table 1. Distribution of farmers by their socioeconomic characteristics

Characteristics	Category	Frequency	Percentage	Mean
Age	Less than 25 years	5	4.1	44.9±12.7
	25-35 years	26	21.5	
	36-45 years	32	26.4	
	46-55 years	36	29.8	
	Greater than 55 years	22	18.2	
Sex	Male	67	55.4	
	Female	54	44.6	
Level of education	No Formal Education	22	18.2	
	Primary Education	40	33.1	
	Secondary Education	40	33.1	
	Tertiary Education	19	15.7	
Farm size	Less than 2 hectares	75	62.0	1.6±1.3 ha
	2-4 hectares	40	33.1	
	More than 4 hectares	6	5.0	
Years of farming experience	Less than 15 years	40	33.1	21.1±14.5 years
	15-25 years	44	36.4	
	Greater than 25 years	37	30.6	
	Total	**121**	**100.0**	

Farmers' awareness of the use of reality television shows for agricultural development

From the information in Table 2, most farmers were not aware of reality Television Show and its use for promoting agriculture, as 69.4% had never heard of reality television show. A greater percentage (73.6%) had never watched any Nigerian reality television show, and none (100.0%) knew of any Nigerian reality show used to promote agriculture.

Table 2. Distribution of farmers by awareness of the use of reality television shows for agricultural development

Variables	Category	Frequency	Percentage
Have you heard of reality television show?	No	84	69.4
	Yes	37	30.6
Have you ever watched a Nigerian reality television show?	No	89	73.6
	Yes	32	26.4
How often do you watch reality television show?	Never	89	73.6
	Rarely	12	9.9
	Sometimes	16	13.2
	Always	4	3.3
	Total	**121**	**100.0**

*Multiple responses (n=121)

Farmers' perceived constraints to the use of reality television shows for information on climate-smart agriculture

As shown in Table 3, poor network reception ($\bar{x}$=161.2), unstable power supply ($\bar{x}$=160.3), lack of sponsorship ($\bar{x}$=156.2) and sustainability of the show ($\bar{x}$=154.6), and language barrier ($\bar{x}$=147.1) were regarded as severe constraints to the use of reality television show for sourcing information on climate-smart agriculture. Olajide and Oresanya, 2016) have identified these constraints in a previous study.

Table 3. Distribution of farmers by perceived constraints to the use of reality television shows for climate-smart agriculture

Constraint	Not a constraint	Mild constraint	Severe Constraint	Weighted score
Poor network reception	10.7	17.4	71.9	161.2
Unstable power supply	15.7	8.3	76.0	160.3
Lack of sponsorship	15.7	12.4	71.9	156.2
Lack of sustainability of the show	13.2	19.0	67.8	154.6
Language barrier	15.7	21.5	62.8	147.1

Weighted mean score =139.9

Farmers' propensity to use reality television show for information on climate-smart agriculture

Results in Table 4a show that more than two-thirds of the farmers (69.4%) had a high propensity to use reality television shows for sourcing information on climate-smart agriculture. As shown in Table 4b, most of the farmers were very willing to watch reality television shows to source information on climate-smart practices such as rainwater harvesting and supplemental irrigation of dry land crops (66.1%) and improved scheduling and application of small-scale irrigation water (52.1%). The respondents were still willing to watch reality television shows even if they do not have a personal television (66.1%).

Table 4a Farmers' level of propensity to use reality television shows for information on climate-smart agriculture strategies

Propensity category	Frequency	Percentage	Mean ± SD	Index
Low	37	30.6	29.5±10.9	0-29.4
High	84	69.4		29.5-58
Total	**121**	**100.0**		

Table 4b Distribution of farmers by their propensity to use reality television shows for information on climate-smart agriculture strategies

Statements	Not willing	Partially willing	Very willing
How willing are you:			
To watch reality TV shows on climate-smart agriculture with other farmers if you don't have a personal television?	21(17.4)	20(16.5)	80(66.1)
To watch reality TV series focused on addressing both climate-smart agriculture and non-farm issues affecting you?	15(12.4)	23(19)	83(68.6)
To watch reality TV shows on climate-smart agriculture if it is humorous?	19(15.7)	46(38)	56(46.3)
To watch reality TV shows for information on improved scheduling and application of small-scale irrigation water?	15(12.4)	43(35.5)	63(52.1)
To watch reality TV shows for information on how to effectively manage soil fertility?	16(13.2)	39(32.2)	66(54.5)

CONCLUSION

Based on the findings of this study, farmers in southwestern Nigeria are eager to use reality television shows for information on climate-smart agriculture despite their low awareness of its use agricultural development.

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ASSESSING THE EFFECTIVENESS OF COPING STRATEGIES OF SMALL-SCALE POULTRY FARMERS WITH HIGH COST OF FEED IN EKITI STATE, NIGERIA

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ABSTRACT

This study assessed the coping strategies of poultry farmers with high cost of feed ingredients in Ekiti State. Multistage sampling procedure was used to select 120 respondents. Primary data were collected on socio economic characteristics, causes of price increase, effect of high cost, coping strategies adopted by poultry farmers on high cost of feed in Ekiti State. Data was collected with the aid of questionnaires and analysed using frequency, percentage and mean. The result showed that the mean age of the respondents was 48 years, 58.3% were married with a mean monthly income of N61, 400. The causes of price increase of poultry feed ingredient were high demand for feed ingredients by humans and animals ($\bar{x}$=4.47), low production of feed ingredients ($\bar{x}$=4.27), high cost of transporting feed ($\bar{x}$=4.25). Coping strategies adopted by poultry farmers were using local feed (89.2%), feed formulation (78.3%), while the least coping strategies was reduction in the numbers of birds (68.2%). The study concludes that there is resilience and determination of small-scale poultry farmers to sustain their businesses in the face of economic challenges and recommends that policymakers should consider implementing measures to stabilize feed costs, such as subsidies or incentives for poultry farmers.

Key words: Effect, Coping Strategies, Cost, Feed Ingredients.

INTRODUCTION

Livestock production sustains the livelihoods of 1.3 billion people globally and provides 34% of the world's protein supply. Contributing significantly to agricultural output, it accounts for 40% in industrialized countries and 20% in developing ones (FAO, 2022). While large-scale livestock production meets growing global demand, small-scale producers rely heavily on livestock for survival. Livestock serves not only as a food source but also holds substantial economic, social, and cultural value, making it integral to agro ecosystems (Soussana et al., 2017). Poultry, including chickens, ducks, and turkeys, has led growth in livestock production, with Nigeria housing Africa's second-largest chicken population. Poultry production in Nigeria contributes food, employment, income, and organic fertilizer, benefiting rural households (Bello et al., 2022). Recently, however, poultry farmers have faced increasing challenges due to rising feed costs. Climate change, ingredient shortages, and market fluctuations have driven up the prices of maize and soybean, essential poultry feed ingredients also in demand for human consumption and export (Sowole, 2021). The COVID-19 pandemic exacerbated these issues globally, disrupting supply chains and intensifying feed shortages. In Nigeria, the high feed costs have led many poultry farmers to reduce flock sizes, exit the industry, or adopt cost-saving strategies, such as producing their own feed, using crop waste, or changing feeding routines (Ekot, 2022). Integrated farming systems have also emerged as a strategy for coping with these challenges. Effective adaptation measures are essential for farmers to navigate feed price volatility while sustaining productivity.

The rising demand for eggs, a vital protein source, driven by population growth, emphasizes the need to increase poultry production. Yet, escalating feed prices, compounded by import restrictions on key feed ingredients like maize and soybeans, have decreased profitability, forcing some farmers, particularly in Ekiti State, to close their farms. This study assesses the effectiveness of coping strategies with high cost of feed among small scale poultry farmers in Ekiti State

The specific objectives were to: describe the socio-economic characteristics of poultry farmers in Ekiti State, identify the causes of price increase, identify the effect of high cost of poultry feed on poultry farmers, assess the coping strategies adopted by poultry farmers with high cost of feed and examine the effect of the coping strategies adopted by poultry farmers on poultries in Ekiti State.

METHODOLOGY

The study was carried out in Ekiti State, Nigeria. A multi-stage sampling procedure was used for the study. The first stage involved selection of four (4) Local Government Areas (LGAs) which are Ado, Ikole, Oye and Ido-Osi Local Government Areas, the second stage involved a random selection of two communities from each LGA, at the third stage involved a random selection of fifteen (15) poultry farmers from each community. A total of 120 respondents were selected and used for the study. Primary data was collected using a structured questionnaire, this was used to elicit responses from the respondents in the study area. Data collected was analysed using descriptive statistics such as frequency, percentage and mean.

RESULTS AND DISCUSSION

Table 1 reveals that 57.5% of poultry farmers in the study area are male, likely due to the physical demands of the job, aligning with findings that gender impacts farming roles (Onasanya and Akerele, 2018). Most farmers (51.7%) are aged 41-50, with a mean age of 48, suggesting they are in productive years, favourable for adopting new

technologies (John et al., 2022). About 40.8% have tertiary education, contributing to effective risk management and farm success. Monthly income varies, with 61.8% earning N10,000–N50,000, and a mean of N61,400. Poultry ownership averages 435 broilers, though most (65%) own 1-200. Households are typically small (1-5 members, 74%), while 86.7% of farmers have 1-5 years of experience. Cooperative membership is low (48.3%), and only 35.8% access extension services, limiting exposure to essential innovations (Opeyemi et al., 2021).

Table 3: Socioeconomic characteristics of Poultry Farmers in Ekiti State

Variables	Responses	Frequency (%)	Mean/Mode
Gender	Male	69 (57.5)	Male
	Female	20 (42.5	
Age	20-30 years	11 (9.2)	
	31-40 years	38(31.6)	48
	41-50 years	62 (51.7)	
	>51	9 (7.5)	
Marital Status	Single	50 (41.7)	Married
	Married	70 (58.3)	
Education Background	No formal education	22 (18.3)	Tertiary
	Primary	16 (12.5)	
	Secondary	34 (28.3)	
	Tertiary	49 (40.8)	
Monthly Income	10,000-50,000	74 (61.7)	
	50,001-100,000	42 (34.2)	N61,400
	>100,000	5 (4.2)	
Number of Broilers	1-200	78 (65.0)	
	201-400	6 (5.0)	435
	401-600	12 (10.0)	
	>601	26 (20.0)	
Household Size	1-5	89 (74.2)	4
	6-10	31 (25.8)	
Poultry Experience	1-5 years	104 (86.7)	3 years
	6-10 years	16 (13.3)	
Membership of Cooperative Society	Yes	58 (48.3)	No
	No	62 (51.7)	
Extension Services	Yes	43 (35.8)	No
	No	77 (64.2)	

Causes of price increase of poultry feed ingredient in Ekiti State

Table 2 outlines the main factors driving up poultry feed prices. The top cause is the high demand from both humans and animals, with a mean score of 4.47. The second factor is low production levels (4.27), followed closely by high transportation costs (4.25), as noted by Abdulrahman (2022). Climate change affects ingredient growth (4.25), while traders' practices of hoarding for inflated sales rank fifth (4.23), in line with Aremu's (2022) findings.

Table 2: Descriptive analysis showing the Causes of Price increase of Poultry Feeds

Items	SA	A	U	D	SD	Mean
Low production of feed ingredients led to an increase in price	45 (37.5%)	69 (57.5%)	-	6 (5.0%)	-	4.27
High demand for feed ingredients by humans and animals causes a rise in feed's price	56 (46.7%)	64 (53.3%)	-	-	-	4.47
Buying and hoarding feed ingredients by traders causes the price to go up	48 (40.0%)	59 (49.2)	6 (5.0%)	7 (5.8%)	-	4.23
Farmers sticking to a particular feed brand cause an increase in the price of the brand	38 (31.7%)	62 (51.7%)	13 (10.8%)	7 (5.8%)	-	4.09
High cost of transporting feed results in high price of feed	51 (42.5%)	55 (45.8%)	7 (5.8%)	7 (5.8%)	-	4.25
Climate Change affect the growth of feed ingredient which result to increase in feed price	55 (45.8%)	44 (36.7%)	14 (11.7%)	7 (5.8%)	-	4.25

Effect of high cost of poultry feed on poultry farm

Table 3 highlights the major impacts of rising poultry feed costs on farms. The primary consequence is the steady increase in poultry product prices, with a mean score of 4.45. This is followed by a decline in feed quality and efficiency (4.27), resulting in reduced productivity when farmers cannot afford adequate feed (Ekot, 2022). Other effects include a decrease in the number of broilers raised (4.08) and low-quality poultry products (4.05).

Table 3: Descriptive analysis of the Effect of high cost of poultry feed on poultry farmers

Items	SA	A	U	D	SD	Mean
High cost causes a decrease in the number of broilers	33 (27.5%)	75 (62.5%)	12 (10.0%)	-	-	4.08
High cost of feed causes reduction in feed quality and feed efficiency	32 (26.7%)	88 (73.3%)	-	-	-	4.27
High cost of feed leads to constant increase in price of poultry products	54 (45.0%)	66 (55.0%)	-	-	-	4.45
High cost of feed can lead to outright closure of poultry farm	42 (35.0%)	45 (37.5%)	27 (22.5%)	6 (5.0%)	-	3.75
It led to loss of weight in broilers	44 (36.7%)	43 (35.8%)	6 (5.0%)	27 (22.5%)	-	3.87
High cost of poultry feed causes low quality of poultry products	48 (40.0%)	51 (42.5%)	21 (17.5%)	-	-	4.05
High cost of poultry feed causes low profit for broiler poultry farmers	48 (40.0%)	48 (38.3%)	6 (5.0%)	20 (16.7%)	-	4.02

Coping strategies adopted by poultry farmers on the high cost of feed ingredients

Table 4 outlines various strategies poultry farmers use to cope with rising feed ingredient costs. A notable 78.3% of respondents employ feed formulation, while 68.2% engage in bulk buying of poultry feed. Additionally, 89.2% utilize alternative feed sources based on cost and availability.

Table 4 Coping strategies adopted by poultry farmers on the high cost of feed ingredients

Items	Yes (%)
Feed formulation	78.3
Bulk buying poultry feed	68.3
Growing of feed	38.3
Use of alternative feed sources based on its availability and cost	89.2
Change in feeding routine of your broilers so as to cut cost	88.3
Reduction in the size of your poultry farm due to high cost of feed	72.5
Use of crop waste as feed source due to the cost of feed	82.5
Source for fund through cooperative societies	82.5
Government intervention to cushion the high cost of feed	70.0

Effect of coping strategies adopted on poultry farms

Table 6 highlights the coping strategies poultry farmers adopt to sustain their operations. The most important strategy is that these approaches help farmers stay in business ($\bar{x}$=4.25), corroborating John et al. (2022), who noted that the absence of such strategies can lead to high bird mortality and business failure. Forming cooperative societies ranks second ($\bar{x}$=4.24) while the least is coping reduces birds' mortality ($\bar{x}$=3.33).

Table 5: Effects of coping strategies adopted on poultry farms

Items	SA	A	U	D	SD	Mean
Coping strategies reduce the cost of poultry feed	13 (10.8%)	88b (73.3%)	19 (15.8%)	-	-	3.79
Coping strategies help poultry farmers maintain profit margin	25 (20.8%)	88 (73.3%)	-	7 (5.8%)	-	4.09
Coping strategies help produce high quality poultry product	19 (15.8%)	87 (72.5%)	7 (5.8%)	7 (5.8%)	-	3.98
Coping strategies reduce bird mortality	19 (15.8%)	45 (37.5%)	13 (10.8%)	43 (35.8%)	-	3.33
Coping strategies help poultry farmers to stay in business	44 (37.7%)	69 (57.5%)	7 (5.8%)	-	-	4.25

Items	SA	A	U	D	SD	Mean
Coping strategies encourage the recycling and reuse of organic waste	32 (26.7%)	60 (50.0%)		28 (23.3%)	-	3.80
Coping strategies lead to pooling collaborative efforts by forming cooperative societies	55 (45.8%)	52 (43.3%)	-	13 (10.8%)	-	4.24
Coping strategies helps increase the food security status	32 (26.7%)	81 (67.5%)		7 (5.8%)	-	4.15

CONCLUSION

The study shows that poultry farming is male dominated, with most farmers in their productive years and having tertiary education. Many rely on personal savings for funding, while limited access to extension services restricts their exposure to new techniques. Rising feed prices, driven by demand, low production, transport costs, and climate change, threaten profitability and farm sustainability. The study recommends better extension services, policies to stabilize feed prices, and support for cooperatives to help farmers sustain operations and enhance food security.

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ANALYSIS OF CONSERVATION PRACTICES AMONG VEGETABLE FARMERS IN EJIGBO LOCAL GOVERNMENT AREA OF OSUN STATE, NIGERIA

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ABSTRACT
This study analysed the conservation practices among vegetable farmers in Ejigbo Local Government Area, Osun State, Nigeria. The study described the socioeconomic characteristics, identified the awareness level of types of conservation practices, assessed the level of utilization, and investigated the perception of practicing conservation agricultural practices among vegetable farmers. Random sampling procedure was used to select 120 vegetable farmers. Descriptive statistics such as frequency distribution, percentages, and mean values were used to analyze the data. The study revealed that the mean age of the respondent is 45 years, and the majority (67.5%) are members of farmers association. Further findings show that conservation practices engaged by the respondents are mulching (95.8%), crop rotation (83.3%), and cover cropping (66.6%). The majority (89.6%) have a favourable perception of practicing conservation agriculture. In conclusion, vegetable farmers practice various conservation techniques, such as mulching, crop rotation, and cover cropping. Based on the findings, vegetable farmers through their association should increase educational programs and training workshops to improve farmers' knowledge of conservation practices to enhance their positive perception and effective utilization of these practices.
Keywords: Conservation Practice, Mulching, Vegetable Farmer

INTRODUCTION

Agriculture is regarded as the backbone of Nigeria's economy, sustaining the livelihood of the majority of the population with the sector contributing 22.4% to the country's Gross Domestic Product (GDP) (Food and Agriculture Organization, 2022). To achieve self-sufficiency and meet the food demand of Nigeria's large population, increasing crop productivity through intensive farming has been prioritized (Akteruzzaman et al., 2012). The emergence of the 'Green Revolution' in the 1980s helped boost crop yields in a short period, but the continuous use of synthetic fertilizers and pesticides adversely affected soil properties, leading to reduced soil fertility (Kafiluddin and Islam, 2008).

Conservation agriculture, a resource-preserving technique, promotes minimal tillage, soil coverage, crop residue management, and crop rotation, which support sustainable productivity and economic profitability (FAO, 2023). However, practices like deep plowing and mono-cropping contribute to soil degradation, reducing organic matter and increasing erosion and nutrient leaching (Belete and Yadete, 2023). Conservation Agricultural Practices (CAPs) are vital for vegetable farmers to maintain sustainable farming. These practices enhance soil fertility, improve water retention, and reduce erosion, thereby supporting long-term productivity and profitability (FAO, 2023). Engaging in vegetable production by rural households can significantly alleviate poverty, enhance nutrition, and improve livelihoods (Mukaila et al., 2022). Some key vegetables planted are tomatoes, pepper (Capsicum), okra, amaranth (green leafy vegetable), spinach, celosia (soko), pumpkin leaves (ugu), bitter leaf, and jute mallow (ewedu).

METHODOLOGY

The study was carried out in Ejigbo LGA of Osun State. The region is known for its agricultural activities, with a variety of crops, including vegetables. Random sampling procedure was used to select 120 vegetable farmers. Primary data were collected with the aid of questionnaire. The socioeconomic characteristics, measured by age, farming experience (in years), farm size (in hectares), and membership in farmers' associations (yes or no). This data will be analysed using frequency distribution, percentages, and mean values. The second variable, awareness of types of conservation practices adopted, is assessed through multiple responses, with the analysis also relying on frequency distribution and percentages. The third variable measures the level of utilization of conservation practices, using a scoring system where "always use" equals 3, "occasionally use" equals 2, and "very rarely use" equals 1; the results will be analysed using mean ranking. Lastly, the perception of practicing conservation agriculture among vegetable farmers is measured using a Likert-type scale, with values assigned as follows: "strongly agree" equals 5, "agree" equals 4, "undecided" equals 3, "disagree" equals 2, and "strongly disagree" equals 1, with a grand mean of 3.84 calculated for analysis.

RESULTS AND DISCUSSION
Socioeconomic characteristics

Table 1 reveal a mean age of 44.7 years, 33.3% are female, while 66.7% are male. The average household size is 6 members. Average (55.0%) have completed 1-10 years of schooling, with an overall mean of 12.5 years of schooling. The average farm size is 1.14 hectares. Regarding the source of labour, 37.5% rely on self-labour and the farming experience of respondents varies, with 40.8% with

over 15 years. Additionally, 67.5% of respondents are members of an association.

Table 1: Socio-economic characteristics

Characteristics	Freq(%)	Mean
Age (years)		44.7
Sex		
Female	40(33.3)	
Male	80(66.7)	
Household size		6
Year of schooling		12.5
1-10	66(55.0)	
11-20	50(41.7)	
>20	4(3.3)	
Farm size (ha)		1.14ha
Source of Labour		
Self	45(37.5)	
Hired labour	62(51.7)	
Mechanized	13(10.8)	
Farming Experience		
1-5	9(7.5)	
6-10	27(22.5)	
11-15	35(29.2)	
>15	49(40.8)	
Member of association		
Yes	81(67.5)	
No	39(32.5)	

Awareness of types of conservation agriculture

Results in Table 2 indicate that a significant majority of respondents are aware of mulching (95.8%), crop rotation (83.3%), cover cropping (66.6%), while 58.3% are aware of water conservation and harvesting techniques. In contrast, contour farming has a lower awareness level (30.0%). Lastly, minimum tillage or no tillage practices are the least recognized, with only 5.0% of participants expressing awareness.

Table 2: Awareness of Types of conservation agriculture

Conservation practices	Frequency	Percentage (%)
Mulching	115	95.8
Crop Rotation	100	83.3
Cover cropping	80	66.6
Water conservation/harvesting	70	58.3
Integrated pest management	68	56.6
Agroforestry	65	54.1
Contour farming	36	30.0
Minimum tillage/No tillage	6	5.0

Utilisation of conservation agriculture

Mulching (mean = 2.34) and water conservation/harvesting (mean = 2.33) are the most frequently employed methods, indicating farmers' priorities. However, practices like integrated pest management and agroforestry rank lower, highlighting areas for increased education and support.

Table 3: Utilisation of conservation agriculture

Conservation Practices	Mean	Rank
Mulching	2.34	1st
water conservation /harvesting	2.33	2nd
cover cropping	2.19	3rd
Crop rotation	2.14	4th
Integrated Pest Management	2.13	5th
Agroforestry	1.95	6th
Contour farming	1.95	7th
No Tillage	1.93	8th

Perception regarding the practice of conservation agriculture

The summary of perceptions regarding the practice of conservation agricultural methods among vegetable farmers indicates a strong preference for these approaches. A significant 89.6% of farmers hold a favourable view, suggesting that they recognize the benefits of conservation agriculture.

Table 3: Perception summary

Perception	Percentage
Favourable	89.6%
Unfavourable	10.4%

CONCLUSION AND RECOMMENDATION

In conclusion, vegetable farmers practice various conservation techniques, such as mulching, crop rotation, and cover cropping, however, they have limited adoption of not till or minimum tillage practices. Based on the findings, vegetable farmers through their association should increase educational programs and training workshops to improve farmers' knowledge of conservation practices to enhance their positive perception and effective utilization of these practices.

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ENHANCING CONFLICT PREVENTION: COMMUNITY-BASED EARLY WARNING SYSTEMS IN NIGERIA

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ABSTRACT

This paper explores the various aspects of community-based early warning systems that can be adopted for conflict prevention in Nigeria. The purpose of the paper is to: examine some community-based approaches and their implementation at the local level; investigate the use of technology to support these efforts, and examine the challenges faced in establishing effective community-based monitoring systems for conflict prevention. This study focused on publications explicitly addressing the community-based early warning systems. Only recent publications were included to ensure coverage of the most recent trends and developments. The major drivers of conflicts include political power struggles, environmental factors, poverty, unemployment and indigeneity issues. The existing early warning mechanisms implemented in response to these challenges are UNDP's early warning and early response system, digital base system, capacity building initiatives and youth engagement. Some community-based approaches adopted at the local level include engaging local stakeholders, building trust and ownership, participatory decision-making, use of local conflict mediators and investing in development of local expertise. The study identified technologies used to support these efforts such as deploying mobile and web-based platforms, GIS and mapping tools and social media monitoring. The challenges faced in establishing effective community-based monitoring systems for conflict prevention were examined in this study. In conclusion, there is need for increased government investment, stronger political commitment and strategies to ensure long-term sustainability of early warning systems and restoration of peace in Nigeria communities.

Keywords: Early Warning Systems, Conflicts, Community Based Approaches, Prevention, Technology

INTRODUCTION

Community-based early warning systems in Nigeria are crucial for preventing conflicts and enhancing local security. These systems involve local actors in risk assessment and threat detection, improving community resilience and fostering collaboration. These systems are particularly beneficial in Nigeria's diverse ethnic and religious makeup, where communal conflicts are a longstanding issue (Heman., Olusanya and Jimoh, 2024).

Community-based early warning systems (CBEWS) offer contextual information about at-risk communities and groups, structuring responses based on behaviours during different vulnerability and need phases. Their goal is to enable effective crisis response by providing accurate information, using local conditions knowledge, and identifying effective response options (Ude, Ezeodili, and Eneh 2024).

The National security faces significant challenges, including communal conflicts. Communities need protection to engage in livelihood activities and preserve their social values. However, well-structured communities face serious threats. Several emergencies and disasters have prompted the development of early warning and conflict prevention systems and strategies. This article therefore explores the various aspects of community-based early warning systems in Nigeria.

The theoretical framework for this article is modelled after the theory of risk communication. The purpose of an early warning system is to keep threats from becoming disasters. However, an early warning system can only ensure protection if the warning is received on time, its meaning is understood, and necessary actions are executed. Thus, risk communication is fundamental in an early warning system. Two key components of the early warning system in risk communication are dissemination and notification, as well as community capacity. Dissemination relates to the actual method of delivering the message, whereas notification refers to how the communication is received and interpreted. A strong information dissemination system is required to ensure that messages do not change as they pass through the various layers and that they arrive on time to the community members at risk. The risk communication framework places a strong emphasis on community engagement.

Insufficient engagement by providers or users can lead to community members misunderstanding risk. Effective risk communication relies on comprehensive assessments, good governance, and risk perception, awareness, and interpretation. Without these elements, early warning may fail, putting the entire community at risk (Fakhruddin *et al.,* 2020).

METHODOLOGY

This study focused on publications explicitly addressing the community-based early warning systems. Only recent publications were included to ensure coverage of the most recent trends and developments in the area of community based early warning systems.

The literature search was conducted using various databases, including Google Scholar, Scopus, Web of Science, PubMed, ScienceDirect,

and DOAJ, using specific keywords related to Community-Based Early Warning Systems in Nigeria for a targeted and relevant collection.

RESULT DISCUSSION
Components of effective community-based early warning systems

Effective Community-based Early Warning Systems consist of several key components:

Data Collection: CBEWS utilizes a combination of quantitative and qualitative data sources to assess conflict risk, including administrative data, media reports, open and closed sources, and audio-visual inputs (Muggah and Whitlock, 2022).

Risk Assessment: The Global Conflict Risk Index uses human security-based structural indicators to predict and measure violent conflict probability and intensity over up to four years.

Analysis: The use of both qualitative and quantitative analytical methods in issuing official warnings for conflict events enhances decision-makers' anticipatory abilities through prediction and explanation (Sweijs and Teer, 2022).

Communication: EWS generate a set of products based on their analysis, which are then communicated to decision-makers (Defontaine, 2019).

Response Mechanisms: The systems are designed to facilitate Early Action (EA) aimed at preventing conflict events, mitigating their impact, or preparing for their consequences (Sweijs and Teer, 2022).

Community-based early warning approaches: importance of local knowledge

Community-based approaches in Nigeria aim to prevent and address communal conflicts, promote peacebuilding, and reconcile different groups, preventing loss of lives, property destruction and displacement and they include the following.

i. Establishment of peace committees at the grassroots level. This approach employs a community-based approach to peace, involving grassroots peace committees composed of community and religious leaders, women and youth representatives. These committees identify conflict threats and mediate disputes before violence, fostering trust, dialogue, and understanding among different groups (Mohammed, 2023).

ii. Another effective approach is the use of local conflict mediators or peacebuilders. Mediators are trained to facilitate dialogue, resolve disputes, and promote reconciliation within communities. They build relationships, address grievances, and prevent escalating conflicts, promoting peaceful coexistence among conflicting parties.

iii. Furthermore, community-based early warning systems often involve the use of technology and data collection tools Mobile phones, social media, and online platforms are used to gather real-time information about potential conflicts, enabling early warning systems to detect emerging tensions and take proactive measures to prevent violence, thereby maintaining peace (International Telecommunication Union, 2023).

iv. Moreover, community engagement and participation are key components of successful early warning systems in Nigeria. Community involvement in conflict prevention strategies is crucial for their effectiveness and sustainability. This approach encourages residents to report suspicious activities, share threats, and participate in peacebuilding initiatives, fostering a sense of collective responsibility for safety (International Red Cross and Red Crescent, 2020).

v. In addition, capacity building and training programs are essential for building the skills and knowledge of community members involved in early warning systems. Workshops, seminars, and simulations equip individuals with conflict resolution skills, mediation techniques, and communication strategies, enhancing communities' ability to respond to conflicts, promote peace, and prevent violence (Gladfelter, 2018).

Community-based approaches enhance social cohesion, trust, and peace maintenance by recognizing local communities' high stakes in preventing conflicts. Effective solutions must start with them, promoting shared responsibility and peace (International Organization for Peacebuilding, 2021).

Challenges and limitations

Community-based early warning systems (CBEWS) in Nigeria have potential benefits, but their sustainable implementation faces challenges such as insufficient funding, lack of political will and sustainability Concerns.

Inadequate funding hinders the creation and maintenance of early warning infrastructure, impacting the capacity to invest in state-of-the-art equipment and technologies for efficient disaster risk management. Additionally, there is a lack of qualified staff and technical know-how needed for proper operation and maintenance of CBEWS (Oke, Amarnath and Cofie, 2023).

The absence of strong political commitment poses a significant challenge to the implementation of CBEWS. It leads to inefficiency in responding to conflict threat issues, lack of clear priorities in national strategies, and limited community participation in disaster risk management plans.

These issues hinder the effective implementation of conflict prevention and disaster management policies, limiting the integration of empirical knowledge and regular feedback from communities. (Pham, Thieken and Bubeck, 2024).

CBEWS' long-term sustainability faces challenges due to maintenance issues, unstable power supply, and lack of community awareness about disaster intensity, risk, and potential damage. Despite improvements, delays in preparing and responding to events persist. (Pham, Thieken and Bubeck, 2024).

CONCLUSION AND RECOMMENDATIONS

Community-based early warning systems in Nigeria have shown promise in enhancing conflict prevention and disaster management. These initiatives empower local communities to detect potential threats, collect data, and respond swiftly to emerging crises. By involving grassroots stakeholders and leveraging technology, these systems have helped improve community resilience and foster collaboration among various actors. However, challenges such as resource constraints, limited political will, and sustainability concerns continue to pose obstacles to their effective implementation. This calls for increased investment in resources, stronger political commitment, and strategies to ensure long-term sustainability. By overcoming these hurdles, Nigeria can further enhance its ability to prevent conflicts, manage disasters, and protect its citizens, ultimately contributing to a more stable and resilient society.

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ASSESSMENT OF RICE FARMERS' KNOWLEDGE ON ADAPTATION STRATEGIES TO CLIMATE CHANGE IN NORTHWEST NIGERIA

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ABSTRACT

The study assessed rice farmers' knowledge on adaptation strategies to climate change in Northwest, Nigeria. Multi-stage sampling procedure was used to select 441 respondents in the study area. Data were collected using structured questionnaire. Descriptive and inferential statistics were used to analyse the data. The results on respondents' knowledge on adaptation strategies to climate Change showed that majority (59.4%) of the respondents had high knowledge level while 9.3% and 31.3% had moderate and low knowledge level on adaptation strategies to climate change respectively. The t-test statistics revealed that there was a significant difference (t=-8.946. $p \leq 0.01$) in respondents' knowledge on adaptation strategies to climate change between the two States. The Tobit regression analysis revealed that age ($p \leq 0.01$), sex ($p \leq 0.01$), household size ($p \leq 0.05$), education ($p \leq 0.01$), years of farming experience ($p \leq 0.05$), extension contact ($p \leq 0.01$), and access to credit ($p \leq 0.05$) significantly influenced respondents' knowledge on adaptation strategies to climate change. The study concluded that a moderate proportion of the respondents had high knowledge on adaptation strategies to climate change in the study area. The study therefore recommended among others that ministry of agriculture through the ADPs and other relevant stakeholders should fashion out ways to improve farmers' knowledge on climate change adaptation strategies.

Keywords: Climate change challenges., innovation uptake, Adaptation strategies., knowledge transition.

INTRODUCTION

In a bid to address climate change issues and its associated problems, the Nigerian government developed a National Adaptation Strategy and Plan of Action on Climate Change for Nigeria to check climate change challenges (BNRCC, 2011). The decisions, therefore, on what strategies to adopt to effectively adapt to climate change, depend on the depth of awareness about climate change challenges on the one hand and the knowledge that will guide the applicability of adaptation strategies to climate change on the other hand by farmers who are at the centre of agricultural production.

Knowledge is a key ingredient to forming perception, attitude and the ultimate adoption of agricultural innovation. The essence of all extension communication is to bring farmer to that point where their capacities and potentials to operate farm businesses are optimal and such points are defined by how well farmers can demystify production challenges and applying appropriate innovation to adequately address such challenges. Innovation uptake creates an initial knowledge gap between what is termed as current knowledge and knowledge required for using the innovation effectively (Badilescu-Buga, 2013). This suggests that farmers who are so challenged by climate change anomalies require a wholesome, positive knowledge transition on adaptation strategies to cope in the study area. Knowledge is therefore deemed a necessary component of innovation adoption process without which it becomes difficult for an effective adoption decision to be made by farmers.

The Northwest region of Nigeria has been regarded as the new hubs for rice production in the Sahel region of Nigeria. However, climate change is impeding it production in this area (Orifah et al.,

2024). The dearth in information on rice farmers' Knowledge on adaptation strategies to climate change necessitated this study. The study assessed rice farmers' knowledge on adaptation strategies to climate change in Northwest, Nigeria while the specific objectives were to:

i.   ascertain the respondents' knowledge level on adaptation strategies to climate change.
ii.   determine respondents' knowledge level differential on adaptation strategies to climate change in the study area.
iii. determine the factors influencing respondents' Knowledge on adaptation strategies to climate change in the study area.

METHODOLOGY

The Northwest region is one of the six geopolitical entity that makes up Nigeria; it is largely a semi-arid zone with rainfall duration of up to 4 months. The vegetation cover is relatively sparse. It is located between latitude 10^0 N and 15^0 N, and longitude 2^0E and 12^0.30E and is comprises of seven States namely: Katsina, Kano, Kaduna, Jigawa, Zamfara, Sokoto and Kebbi. The region has a projected population of 60 million people (City population, 2023).

For this study, a multi-stage sampling procedure was employed. Stage one involved a purposive selection of Jigawa and Kebbi State out of the seven States in the region owing to their production capacity. In stage two, four L.G. As (Local Government Areas) each from Jigawa (Auyo, Miga, Ringim, and Kazaure) and Kebbi (Argungu, Bunza, Yauri, and Zuru) States respectively were selected, because of their dominance in the production of rice. In stage three one foremost rice-producing community was

selected from each of the selected Local Government Areas in the two States. In Jigawa State, the communities were Miga, Suntuluma, Ayan and Madarawa in Miga, Ringim, Auyo and Kazaure L. G. As respectively while in Kebbi State, the communities were Arugungu, Bunza, Zuru and Yauri in Arugungu, Bunza, Zuru and Yauri L.G. As respectively. The fourth stage involved a simple random sampling of a representative proportion from each community to give a total of 441 respondents.

Primary data were used for the study and data were obtained using well-structured questionnaire. To measure knowledge on adaptation strategies to climate change, respondents were presented with knowledge test questions to ascertain knowledge on adaptation strategies to climate change. Score of 1 was assigned to all correct responses and score of 0 to all wrong responses. The maximum achievable score was 43 and minimum score was 0. Scores were cumulated as a percentage of the maximum achievable score. An index was computed and used to categorise respondents' knowledge level following the procedure adopted by Luangduangsitthideth et al. (2018).

Data were analysed using Stata software version 12. Both descriptive (frequencies, percentages and means) and inferential (Tobit regression and t-test) statistics were used to analyse the data.

RESULTS AND DISCUSSION

The result in Table 1 shows that correct responses were highest for "Pest invasion can be controlled using pesticide" (98.2%), this was followed by "Cover crop improve soil nutrient" (97.3%) and "Crop rotation replenish the soil nutrients" (96.6%). However, the least correct responses were recorded for agricultural insurance is effective to protect against loss of or damage to crops or livestock (26.3%).

The result on the Categorisation of respondents' knowledge level in Table 2 indicates that more than half of the respondents (59.4%) had high knowledge level, 9.3% had medium knowledge while 31% had low knowledge level. It can be implied that a good proportion of rice farmers in the study area had high knowledge on adaptation strategies to climate change. It can also be implied from the result that sizeable proportion of the rice farmers still lack the requisite knowledge on adaptation strategies to climate change and may impact on farmers' decision-making capacity. This assertion is in line with the findings of Hothongcum et al., 2014) who averred that the decision to use a strategy depends on having the right knowledge about the adaptation options, the ability to make the right choice as well as the capacity to use these strategies.

Table 1: **Respondents' knowledge on adaptation strategies to climate change**

S/N	Knowledge statements	Correct
1.	Pest invasion can be controlled using pesticide	433(98.2)
2.	Cover crops improve soil nutrient	429(97.3)
3.	Crop rotation replenish the soil nutrients	426(96.6)
4.	Cover crop control soil erosion	423(95.9)
5.	Improved crop variety produce greater yield	423(95.9)
6.	Increase in family labour reduces cost of labour	422(95.7)
7.	Cover crops enhance water availability	422(95.7)
8.	Manure from mixed farming improves soil nutrient status	420(95.2)
9.	Forest trees help improve environmental air	420(95.2)
10.	Crop diversifications cushion the effects of total failure of primary crop	420(95.2)
11.	Improved crop variety can be a pest-resistant variety	419(95.0)
12.	Irrigation helps to increase resilience to water stress in drought prone areas	419(95.0)
13.	Mulching prevents the water evaporation in the soil	419(95)
14.	Improved crop variety can be a disease-resistant to variety	418(94.8)
15.	Improved crop variety can be a salinity-tolerate Salinity	417(94.6)
16.	Mulch act as a canopy in rainy season to reduce soil erosion	417(94.6)
17.	Improved crop variety can be a drought-tolerant variety	415(94.1)
18.	Draught animals in mixed farming allow larger areas to be cultivated	414(93.9)
19.	Crop rotation suppresses pest and diseases	413(93.7)
20.	Contour ploughing reduces runoff that carries away seeds and topsoil	413(93.7)
21.	Increase in family labour translate to increase agricultural output	412(93.4)
22.	Cover crop is used to suppress weed	412(93.4)
23.	organic mulch provide nutrient to the soil after they decompose	412(93.4)
24.	Chemical fertilizers can improve soil quality and yield from climate depleted soils	411(93.2)
25.	Increase in the number of productive member support better technological adaptation	410(93.0)
26.	Changing planting and harvesting date supports crop maturity	410(93.0)
27.	Mixed farming diversifies income sources	410(93.0)
28.	Changing planting and harvesting date help to circumvent pest invasion	409(92.7)

S/N	Knowledge statements	Correct
29.	Changing planting and harvesting date help to circumvent diseases	408(92.5)
30.	Mixed farming serves as buffer in the event of crop failure	406(92.1)
31.	Mulching suppresses weed	402(91.2)
32.	Engagement in diverse livelihood options guarantee diverse streams of income in the face of crop failure	392(88.9)
33.	Changing planting and harvesting date help to circumvent water stress	392(88.9)
34.	Harvested water can be used to supplement during water stress for agricultural purposes	392(88.9)
35.	Chemical fertilizers are not environmentally friendly	381(86.4)
36.	Decayed leaves from droppings fertilizes the soil and improve soil status	372(84.4)
37.	Trees help to reduce the concentration of carbon in the atmosphere	334(75.7)
38.	Chemical pesticides are environmentally friendly	335(75.9)
39.	Fungi can be used to inoculate degraded forest	220(49.9)
40.	Fungi suppresses diseases and pest infection	201(45.6)
41.	Fungi help transport water and mineral nutrient to the plant	192(43.5)
42.	Biofuel alternatives are environmentally friendly than inorganic options	146(33.1)
43.	Agricultural insurance is effective to protect against loss of or damage to crops or livestock	116(26.3)

Note: Figures in parentheses are percentages
Source: Field Survey, 2019

Table 2: Categorisation of respondents based on knowledge level on adaptation strategies to climate change

Knowledge Level	Freq	%	Min. score	Max. score	Mean
Low	138	31.3			
Moderate	41	9.3	13.0	59.0	52.0
High	262	59.4			

Source: Field Survey, 2019

Furthermore, Jabbar (2003) reiterated that the belief derived from knowledge and perception that is formed about technology influences the decisions to adopt, reject or differ adoption decision at any point. The result agrees with the findings of Onyegbula and Oladeji (2017) who reported high knowledge level on climate change adaptation strategies for that more than half of the farmers in their study. The authors further reported that farmers' knowledge was highest for strategies such as adjustment of rice planting calendar based on onset of rainfall, use of mulch materials to conserve soil moisture and appropriate use of fertilizer.

Determination of respondents' knowledge differential on adaptation strategies to climate change between the selected states

The independent test analysis result in Table 3 shows that there was a significant difference (t = -8.946, P= 0.000) in knowledge on adaptation strategies to climate change between the two States. The mean knowledge scores shows that Kebbi State had higher knowledge score than Jigawa State. The magnitude of the difference in mean as revealed by the eta squared value (0.154) indicated a strong effect size. Thus, it can be inferred that there is a strong difference in knowledge on adaptation strategies to climate change that is due to locational difference. The result on respondents' knowledge differential also suggests that Kebbi State is ahead and apart in terms of upscaling rice farmers' knowledge with respect to adaptation strategies to climate change.

Table 3: Test of difference in knowledge on adaptation strategies to climate change among   selected states

Variable	State	N	Mean	Std. Error Mean	df	Mean difference	t-ratio	p-value
Knowledge score	Jigawa	203	48.926	0.500	439	-5.217	-8.946	0.000***
	Kebbi	238	54.143	0.300				

N=Number of observations, df= Degree of freedom. Eta Squared= 0.154.
Source: Field Survey, 2019

Factors influencing knowledge on adaptation strategies to climate change
Table 4 reveals that the LR Chi-square (11) =60.85 is significant at 1% a significant improvement in fit of the model as against an intercept or a null only model. The results further revealed that age (β=

0.003; p=0.000), sex (β=0.059; p=0.009) and extension contact (β=0.015; p=0.002) were significant at 1% and influenced knowledge on adaptation strategies to climate change.
Similarly, household size (β=0.003; p=0.051), annual income (β=5.89E-08; p=0.046), years of

farming experience (β=0.002; p=0.030), level of education (β= -0.011; p=0.022), and access to credit (β= 0.020; p=0.012) were significant at 5%.

The results from this study corroborate some of the findings of Kimambo *et al.* (2018) who in a knowledge related established that gender, years of farming experience, age, household size and farm size significantly influenced vegetable farmers' nutritional knowledge.

Table 4: Socio-economic factors influencing rice farmers' knowledge on adaptation strategies to climate change

Variables	Coef.	Std. Err	t	P>|t|
Age	-0.0030037	0.0007843	-3.83	0.000***
Sex	0.0592702	0.0226073	2.62	0.009***
Marital status	-0.0034655	0.0127105	-0.27	0.785
Household size	0.0019984	0.0010221	1.96	0.051**
Level of education	-0.0112102	0.0048835	-2.3	0.022**
Annual income	5.89E-08	2.95E-08	2.00	0.046**
Years Farming experience	0.0016748	0.0007693	2.18	0.030**
Farm size	0.0065368	0.0101197	0.65	0.519
Membership of cooperatives	-0.0081448	0.0118338	-0.69	0.492
Extension contacts	0.0153669	0.0048156	3.19	0.002***
Access to credit	-0.0286129	0.0113772	-2.51	0.012**
Constant	0.8526732	0.0403402	21.14	0.000***
Sigma	0.1004171	0.0033884	0.0937572	0.107
Log-likelihood	384.6049			
LR Chi^2(11)	60.85			0.000***
Pseudo R^2	-0.0859			

Note: ***significant at 1%; **significant at 5%; *significant at 10%
Source: Field Survey, 2019

CONCLUSION AND RECOMMENDATIONS

The study concluded that a moderate proportion of the respondents had high Knowledge on Adaptation Strategies to Climate Change in the study area. There was significant difference in Knowledge between Jigawa and Kebbi. Age, sex, household size, education, years of farming experience, extension contacts, and access to credit significantly influenced respondents' knowledge on adaptation strategies to climate change.

The study recommends that intervention programmes to improve farmers' knowledge with respect to adaptation strategies should be considered as it will influence their adoption of these strategies and in turn help curtail the losses that may result from climate change events.

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ADOPTION OF PESTICIDE SAFETY RULES BY COWPEA FARMERS IN SABON ZARIA LOCAL GOVERNMENT AREA OF KADUNA STATE, NIGERIA

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ABSTRACT
The study assessed the adoption of pesticide safety rules among cowpea farmers in Sabon Zaria Local Government Area of Kaduna State. Its specific objectives included describing farmers' socio-economic characteristics, identifying sources of information on pesticide usage, evaluating awareness and adoption of safety rules, and identifying constraints to adoption. Findings revealed that the average age of respondents was 44 years, with a majority being male (55%). Key sources of information included fellow farmers (34.7%), agricultural extension services (26.3%), and local input suppliers (12.6%). Awareness levels regarding safety rules were moderate, with mean scores indicating practices such as wearing protective clothing ($\bar{x}$=3.6) and reading labels ($\bar{x}$=3.0). However, farmers faced several constraints: financial limitations in purchasing effective pesticides ($\bar{x}$=3.2), lack of government support ($\bar{x}$=3.0), insufficient knowledge of safety rules ($\bar{x}$=2.9), and inadequate training ($\bar{x}$=2.6). The study recommends establishing realistic credit policies for farmers and enhancing supervision from agricultural agencies to promote safe pesticide use and improve production outcomes.
Keywords: Pesticide safety rules, technology adoption, cowpea farming

INTRODUCTION

Adopting pesticide safety rules is crucial for protecting the health of farmers, consumers, and the environment. While pesticides help control pests and diseases, leading to increased crop yields and improved food security (Kumar and Reddy, 2024), improper handling can harm human health, contaminate the environment, and lower crop quality (Onyeaka et al., 2024). This issue is particularly pressing in Nigeria, where agriculture is a primary livelihood for many rural communities.

In Sabon Gari Local Government Area of Kaduna State, Nigeria, pesticides are integral to agriculture, especially for crops like cowpea, maize, and millet (Khan et al., 2023). However, the need to boost crop productivity has resulted in increased reliance on chemical pesticides, raising concerns about safe usage and potential health and environmental impacts (Adedibu, 2023). Smallholder farmers often lack access to proper training on pesticide application, leading to risks of over-application, exposure, and improper handling. Compounding this issue is the limited availability of protective gear and the prevalence of substandard pesticide products in the market (Omoigui et al., 2020).

This study investigates pesticide use patterns in Sabon Zaria, focusing on factors influencing farmers' application decisions, their safety awareness, and the effectiveness of regulatory measures. Key objectives include identifying cowpea farmers' socio-economic characteristics, sources of pesticide information, awareness of safety rules, adoption of these practices, and barriers to adoption of safety rule adoption. The study aims to provide recommendations to improve pesticide management and promote sustainable, safe agricultural practices in Kaduna. By addressing knowledge gaps and enhancing safety awareness, it hopes to reduce the risks associated with pesticide use while supporting agricultural productivity.

METHODOLOGY

The study was conducted in Sabon Gari LGA, Kaduna State, Nigeria, within the Sudan savannah, an agricultural zone with open grasslands. The local economy is primarily agricultural, focusing on crops like maize, millet, and cowpea, and livestock. The urban sector relies on trade and small industries. The study targeted registered cowpea farmers across six areas. From 2,135 farmers, a sample of 640 was chosen through multi-stage sampling for participation.

Table 4: Sample Distribution of respondents

Farmer's group	Population	Sample size (30%)
Bassawa	379	115
Samaru	735	220
Bomo	451	135
Chikaji	97	29
Dogarawa	272	81
Jushinwaje	201	60
Total	**2135**	**640**

Data was collected using a structured questionnaire and validated through a pilot test. Frequency counts, percentages, and descriptive statistics were applied for analysis. A four-point scale measured agreement levels, with a composite index as a benchmark for awareness and adoption. Scores below this index indicated low awareness and adoption.

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 2 presents the socio-economic characteristics of cowpea farmers in the study area. The average age of respondents was 44 years, indicating that most farmers are in a productive age range, which supports openness to innovation and risk-taking. A majority (55%) of respondents were male, reflecting that cowpea farming is male-dominated, likely due to men's greater access to family land inheritance (Issa and Kagbu, 2016). Educationally, 30.15% of respondents had primary schooling, suggesting potential for greater adoption of agricultural innovations through increased access to information (Issa and Kagbu, 2017). The average farm size was 5 hectares, showing that most farmers had small holdings, consistent with findings that

available land determines farm cultivation size (Issa, 2016). Household size averaged 9, indicating sufficient family labour for labour-intensive farming tasks, vital for resource-poor smallholders (Brownson et al., 2023). Farmers' annual income averaged ₦85,862.07, while only 54.37% had access to credit. With an average of 18.7 years of farming experience, respondents were shown to possess valuable expertise that likely enhances their farm management skills (Ani, 2018). This socio-economic profile underscores the farmers' readiness to engage in innovative practices and maintain productivity within the constraints of their resources.

Table 2: Socio-economic characteristics of cowpea farmers

Variables	Frequency	Percentage	Mean
Age			44
20-30	141	22.03	
31-40	207	32.34	
41-50	146	22.81	
Above 50	145	22.65	
Gender			
Male	352	55.00	
Female	287	44.84	
Education background			
Informal	144	22.50	
Primary	193	30.15	
Secondary	156	24.37	
Tertiary	146	22.81	
Farm size(Ha)			5.00
1-3	196	30.62	
4-6	154	24.06	
7-9	148	23.12	
10 and above	141	22.03	
Household size			9
1-5	166	25.93	
6-10	184	28.75	
11-15	151	23.59	
Above 15	138	21.56	
Annual farm income (₦)			85,862.07
60,000-80,000	232	36.25	
80,000-100,000	206	32.18	
Above 100,000	200	31.25	
Access to credit			
Had access	291	45.46	
Had no access	348	54.37	
Years of farming experience			18.7
1-10	146	22.81	
11-20	206	32.18	
21-30	145	22.65	
Above 30	142	22.18	

Source: Field Survey; 2023

Sources of information about pesticide usage by cowpea farmers

Table 3 shows cowpea farmers' primary information sources for pesticide use: fellow farmers (17.18%), extension services (15.93%), and

both local suppliers and radio programs (13.90%). This highlights the importance of peer interactions, accessible media, and proximity in delivering timely guidance on safe pesticide practices.

Table 3: Sources of information about pesticide usage by cowpea farmers

Sources	Frequency	Percentage (%)
Agricultural extension services	102	15.93
Local agricultural input suppliers	89	13.90
Fellow farmers	110	17.18
Internet and social media	82	12.81
Print media (newspapers, magazines)	83	12.96
Radio programs	89	13.90
Journals	79	12.34

Source: Field Survey; 2023

Awareness of safety rules of adoption of pesticides among cowpea farmers

Table 4 shows high awareness among cowpea farmers about pesticide safety, particularly in wearing protective clothing ($\bar{x}$ = 3.6), cleaning equipment ($\bar{x}$ = 3.2), and using noise guards and gloves ($\bar{x}$ = 3.2). This reflects farmers' understanding of personal protection's role in reducing health risks (Lari et al., 2023).

Table 4: Awareness of safety rules of adoption of pesticides among cowpea farmers

Safety rules	Mean	Criteria
Reading of label	3.0	Low
Wearing of protective clothing	3.6	High
Cleaning equipment after use	3.2	High
Disposing of container properly	3.0	Low
Keeping children and pets away	2.8	Low
Avoid drinking/drinking/smoking during spraying	3.1	Neutral
Washing hands thoroughly after application	3.0	Low
Wearing of noise guard and hand gloves	3.2	High

Source: Field Survey; 2023.   **Note: Composite index = 3.1**

Adoption of safety rules in the use of pesticides

Table 5 shows cowpea farmers' adoption of pesticide safety practices. High adoption rates were noted for wearing protective clothing ($\bar{x}$ = 3.2), cleaning equipment ($\bar{x}$ = 3.1), and keeping children and pets away during application ($\bar{x}$ = 3.1). These results suggest farmers prioritize practices that enhance safety and pesticide effectiveness (Madaki et al,2024).

Table 5 Adoption of safety rules in the use of pesticides

Safety rules	Mean	Criteria
Reading label can serve as a guideline for pesticide usage for cowpea farmers	2.8	Low
Wearing protective Clothing will lower the risk of drifting of chemicals	3.2	High
Cleaning of equipment will improve the performance of chemicals	3.1	High
Disposing of container properly will lower the risk of contact with chemicals	2.7	Low
Keeping children and pets away during application	3.1	High
Avoid spraying in wind direction	2.5	Low
Avoid eating/drinking/smoking during spraying	2.9	Neutral

Source: Field Survey; 2023.   **Note: Composite index = 2.9**

Constraints to the adoption of safety rules of pesticides among cowpea farmers

Table 6 highlights key constraints to adopting pesticide safety rules among cowpea farmers, including financial limitations ($\bar{x}$ = 3.2), insufficient government support ($\bar{x}$ = 3.0), limited safety knowledge causing health risks ($\bar{x}$ = 2.9), and restricted access to information ($\bar{x}$ = 2.9). Enhanced support and information access are essential.

Table 6: Constraints to the adoption of safety rules of pesticides among cowpea farmers

Constraints	Mean	criteria
Lack of knowledge about safety rules leads to sickness among farmers	2.9	High
Limited access to information on safety practices	2.9	High
Financial constraints discourage farmers from buying effective pesticides	3.2	High
Unavailability and unaffordability of safer alternatives	2.2	Low
Lack of proper training on pesticide safety leads to severe hazard	2.6	Low
Inadequate protective equipment causes injury to skin during application	2.7	Neutral
Lack of government support/regulation leads to adulteration of pesticides	3.0	High

Source: Field Survey; 2023

Note: Composite index = 2.7

CONCLUSION AND RECOMMENDATIONS

This study concludes that most cowpea farmers are middle-aged and moderately literate, enabling potential awareness of pesticide safety rules. However, they rely on peer networks for information, which can be unreliable. Constraints such as financial limitations and lack of support hinder the adoption of safe practices, posing health risks.

To enhance pesticide safety among farmers, the study recommends establishing peer education groups for knowledge sharing, launching awareness campaigns on safe practices, providing financial support through subsidies or low-interest credit for safer pesticides, and strengthening government regulations to ensure adherence to safety standards and sustain farmers' engagement.

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VARIETAL PREFERENCE FOR PLANTAIN AND BANANA IN ILESHA, OSUN STATE, NIGERIA

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ABSTRACT
Adoption rates of introduced banana/plantain cultivars are often low compared to their economic importance. This study investigated banana/plantain varietal preference among farmers in Ilesha, Osun State, Nigeria. A total of 150 banana/plantain farmers were sampled with interview schedule. Data collected were analyzed with both descriptive and inferential statistics. Findings showed that majority of the respondents cultivated Alabameji (82.7%), Agbagba ohun (82.7%) and PITA 17 (63.3%). PITA 17 (mean=2.09±0.78) ranked first as improved variety cultivated while Ijeshaloba and Asogba (mean=2.39±0.623) ranked first as local varieties cultivated. The aggregated score showed that local varieties (mean=2.22) were most preferred by farmers. Findings on farmers' preference criteria showed that high market value (mean=3.75±0.48) ranked first, bunch length (mean=3.74±0.47) ranked second and results on constraints facing the banana/plantain plantation of preferred varieties indicated that incidence of pest and diseases ($\bar{x}$=3.74±0.47) ranked first. Hypothesis testing showed that age (r=-0.213) of the respondents showed a negative significant influence on the preference for banana/plantain varieties while years of farming experience showed a positive significant relationship (r= 0.803, p<0.01). The study concluded the farmers in the study area had higher preference for local varieties of banana/plantain due to high market value and bunch length. Varieties mainly preferred were Ijeshaloba, Asogba, Agbagba ohun and PITA 17. Thus, agricultural research institutions concerned with genetic breeding should focus on developing varieties with higher attributes for bunch length, and number of fingers per bunch to boost farmers' prospect for high market value for banana/plantain produce.

Keywords: Cultivation, improved, local, preferred, varieties

INTRODUCTION

The family Musaceae includes plantains and bananas. Plantains are often taller and produce fewer, larger, and looser fruits than bananas. Plantains are available in a variety of sizes, shapes, and numbers of fruits per bunch. Plantains and bananas are essential food crops in Sub-Saharan Africa's humid forest and mid-latitude zone, accounting for more than 25% of carbohydrate and 10% of calorie consumption for around 70 million people (Olumba and Onunka, 2020; Mignouna *et al.,* 2020).

The economic value of plantains and bananas makes the crops highly valuable tree crops in a country like Nigeria, where health, nutrition, and dietary implications of foods are top priorities in most debates. In addition to being a staple food for rural and urban residents, it is a source of revenue for smallholder farmers who grow it in compounds or income gardens (Mogaji and Mogaji, 2020). Plantains, like the majority of horticulture crops, are relatively valuable products. Their yearly output value in Sub-Saharan Africa exceeds that of several other food crops, including maize, rice, cassava, and sweet potatoes (Kindt *et al.,* 2023).

Adoption rates of introduced banana and plantain cultivars are frequently low compared to their economic importance and are lower than for other staple crops (Marimo *et al.*, 2020; Walker and Alwang, 2015). Furthermore, research is scarce on the adoption rates of new banana cultivars in SSA. The adoption of local cultivars has failed to match the increasing demand for the commodity, resulting in a decline in banana production in Nigeria during the last two decades (Ebewore, 2016).

The general objective of the study was to examine the farmers' varietal preference for plantain and banana in Ilesha, Osun State, Nigeria and the specific objectives were to;

i. describe the socioeconomic characteristics of banana and plantain farmers;
ii. identify the banana and plantain varieties grown by the farmers;
iii. assess the preferred banana/plantain varieties by the farmers;
iv. assess the preference criteria for banana/plantain varieties by the farmers; and
v. investigate the constraints facing the plantation of preferred banana/plantain varieties

METHODOLOGY

The study was conducted in Ilesha, Osun State. Osun State is located in South-Western Nigeria and lies within latitudes 6° and 9° N of the equator and approximately between longitudes 2° and 7° E of the Greenwich meridian (Fadipe and Oladepo, 2020).

There was no existing registered list of all banana and plantain farmers in Ilesha. Therefore, this study used snowball sampling to generate and compile the list of banana and plantain farmers in Ilesha, where about 192 farmers were generated.

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

Where:
n= sample size
N = target population = 520
e = 0.05

$$n = \frac{240}{1 + 240(0.05)^2}$$

n = 150 respondents

Therefore, a simple random selection of 150 farmers was generated from the list generated.

RESULTS AND DISCUSSION
Socioeconomic characteristics

The results in Table 1 showed that the respondents had an average age of 41.8 years. This implies that the banana and plantain farmers in the study area were still young. Furthermore, nearly half (48.0%) of respondents had 6–10 people living in their households, while 13.3% had 11 or more, with an average household size of 6 people. The result shows the availability of family labor for banana/plantain agricultural activities in the study area.

Table 1 also showed that some (40.0%) of respondents cultivated 1-10 acres of banana/plantains, with only 2.7% cultivating 31 acres or more. This implies that the banana and plantain farmers in the study area were smallholders. The average years of banana/plantain farming experience was 12.7 years. This shows that farmers with many years of farming experience are familiar with the limitations, which increases their adoption of innovations as a means of alleviating productivity constraints (Kainga *et al.,* 2019).

Table 1: Socio-economic characteristics of the respondents

Variables	Frequency	Percentage	Mean (SD)
Age (years)			
≤ 30	40	26.7	
31 – 40	46	30.7	41.8(16.19)
41 – 50	34	22.7	
51 and above	30	20.0	
Household size (persons)			
1 – 5	58	38.7	
6 – 10	72	48.0	6.0(2.77)
11 and above	20	13.3	
Banana/plantain farm size (Acres)			
1 – 10	60	40.0	
11 – 20	53	35.3	15.1(8.15)
21 – 30	33	22.0	
31 and above	4	2.7	
Years of Banana/plantain farming experience			
1 – 10	75	50.0	
11 – 20	46	30.7	12.7(8.00)
21 – 30	27	18.0	
31 and above	2	1.3	

Source: Field Survey, 2024

Banana and Plantain Varieties Grown by Farmers

Table 2 showed that most respondents cultivated Agbagba ohun (82.7%), Alabameji (82.7%), Ifenla (79.3%), and Agbagba erin. Only a few farmers cultivated BITA 3 (32.0%) and Cardaba (24.0%). The limited plantation of improved varieties, frequently associated with inferior fruit quality attributes, shows the importance of incorporating consumption qualities early in the breeding process (Marimo *et al.,* 2020; Tenkouano *et al.,* 2019).

Table 2: Types banana/plantain varieties cultivated by respondents

Banana/plantain varieties	Frequency	Percentage
Improved varieties		
BITA 3	48	32.0
PITA 17	95	63.3
FHIA 21	84	56.0
Cardaba	36	24.0
Local varieties		
Ijeshaloba	110	73.3
Ifenla	119	79.3
Agbagba ohun (False horn type)	124	82.7
Agbagba erin (Elephant type)	119	79.3
Koloko (alabameta)	111	74.0
Asogba (olomoyoyo)	96	64.0
Alabameji (twin)	124	82.7

Source: Field Survey, 2024

Farmers Preference on Banana and Plantain Varieties

Table 3 showed that respondents ranked Cardaba (mean=2.10) first, PITA 17 (mean=2.09) second, FHIA 21 (mean=1.95) third, and BITA 3 (mean=1.64) fourth. This indicates that respondents preferred to plant Cardaba and PITA 17 in the improved banana/plantain variety category, which is consistent with the findings of Weltzien *et al.* (2019). The results of local varieties in Table 2 also revealed that both Ijeshaloba and Asogba (mean = 2.39) were ranked first by respondents, Agbagba ohun (mean = 2.30) was ranked third, and Alabameji (mean = 2.05) was the least cultivated local variety indicated by respondents. The aggregated score of improved and local varieties revealed that farmers in the study area preferred local varieties (mean = 2.22) over improved varieties (mean = 1.95).

Table 3: Farmers' Preferred banana/plantain varieties by respondents

Banana/plantain Varieties	Highly Preferred	Preferred	Not Proffered	Mean±SD	Rank
Improved varieties					
BITA 3	18(12.0)	60(40.0)	72(48.0)	1.64±0.68	4th
PITA 17	53(35.3)	58(38.7)	39(26.0)	2.09±0.78	2nd
FHIA 21	33(22.0)	76(50.7)	41(27.3)	1.95±0.70	3rd
Cardaba	54(36.0)	57(38.0)	39(26.0)	2.10±0.78	1st
Average score				**1.95**	
Local varieties					
Ijeshaloba	70(46.7)	69(46.0)	11(7.3)	2.39±0.63	1st
Ifenla	68(45.3)	53(35.3)	29(19.3)	2.26±0.76	4th
Agbagba ohun (False horn type)	71(47.3)	53(35.3)	26(17.3)	2.30±0.74	3rd
Agbagba erin (Elephant type)	54(36.0)	57(38.0)	39(26.0)	2.10±0.78	5th
Koloko (alabameta)	52(34.7)	58(38.7)	40(26.7)	2.08±0.78	6th
Asogba (olomoyoyo)	70(46.7)	69(46.0)	11(7.3)	2.39±0.63	1st
Alabameji (twin)	47(31.3)	60(40.0)	43(28.7)	2.05±0.81	7th
Average score				**2.22**	

Source: Field Survey, 2024

Farmers' Preference Criteria of Banana and Plantain varieties

Table 4 showed the results of farmers' preferences criteria for bananas and plantains in Ilesha. According to the findings, respondents ranked high market value (mean = 3.75) first, bunch length (mean = 3.74) second, number of fingers per bunch (mean = 3.52), and good post-harvest storage (mean = 2.94) as the least preferred criteria for banana and plantain plantations. This result suggests that high market value, bunch length, and number of fingers per bunch were the primary selection criteria for banana and plantain plantation varieties in the study area, which is consistent with the findings of Robertson *et al.* (2024).

Table 4: Farmers' preference criteria of Banana and plantain varieties

Reasons	SA	A	D	SD	Mean	Rank
High market value	115(76.7)	32(21.3)	3(2.0)	0	3.75±0.48	1st
Bunch length	113(75.3)	35(23.3)	2(1.3)	0	3.74±0.47	2nd
High productivity	78(52.0)	60(40.0)	10(6.7)	2(1.3)	3.43±0.67	5th
Number of finger per bunch	92(61.3)	44(29.3)	14(9.3)	0	3.52±0.66	3rd
Taste and Sweetness	66(44.0)	63(42.0)	19(12.7)	2(1.3)	3.29±0.73	6th
Finger length	71(47.3)	76(50.7)	3(2.0)	0	3.45±0.53	4th
High nutritive value	56(37.3)	56(37.3)	36(24.0)	2(1.3)	3.11±0.81	9th
Tolerance to drought	66(44.0)	41(27.3)	38(25.3)	5(3.3)	3.12±0.90	8th
Resistance to pest and diseases	67(44.7)	53(35.3)	28(18.7)	2(1.3)	3.23±0.79	7th
Good post-harvest storage	32(21.3)	83(55.3)	29(19.3)	6(4.0)	2.94±0.75	10th

Source: Field Survey, 2024; SA=Strongly Agree, A= Agree, SD=Strongly Disagree and D=Disagree

Constraints to Plantation of Preferred Banana/Plantain Varieties

Table 5 showed that the most common constraints in banana/plantain production were pests and diseases ($\bar{x}$=3.74), low soil fertility ($\bar{x}$=3.34), insufficient extension delivery to farmers ($\bar{x}$=3.28), and farmers' access to markets ($\bar{x}$=2.63). This finding shows that the occurrence of pests and diseases, low soil fertility, and insufficient extension delivery systems to farmers were the primary obstacles faced by banana/plantains farmers in cultivating preferred varieties of banana/plantains in the study area.

Table 4.5: Constraints facing the cultivation of preferred banana and plantain varieties

Constraints	Highly severe	Severe	Less severe	Not a constraint	Mean±SD	Rank
Incidence of pests and diseases	113(75.3)	35(23.3)	2(1.3)	0	3.74±0.47	1st
Low soil fertility	86(57.3)	39(26.0)	15(10.0)	10(6.7)	3.34±0.91	2nd
Inadequate extension delivery system to farmers	82(54.7)	36(24.0)	24(16.0)	8(5.3)	3.28±0.92	3rd
Post-harvest deterioration of roots	68(45.3)	45(30.0)	33(22.0)	4(2.7)	3.18±0.85	4th
Illiteracy of farmer	67(44.7)	46(30.7)	24(16.0)	13(8.7)	3.11±0.97	5th
Shortage of good/quality planting material	32(21.3)	83(55.3)	29(19.3)	6(4.0)	2.94±0.79	6th
Low awareness on available varieties	50(33.3)	47(31.3)	36(24.0)	17(11.3)	2.87±1.08	7th
Lack of agricultural inputs	50(33.3)	45(30.0)	38(25.3)	17(11.3)	2.85±1.01	8th
Unavailability of planting materials during planting season	37(24.7)	53(35.3)	48(32.0)	12(8.0)	2.77±0.91	9th
Access to market	32(21.3)	53(35.3)	42(28.0)	23(15.3)	2.63±0.98	10th

Source: Field Survey, 2024; SA=Strongly Agree, A= Agree, SD=Strongly Disagree and D=Disagree

The study found a significant negative correlation (r = -0.213, p<0.05) between age and preference for banana/plantain varieties among the respondents. Years of farming experience also had a significant positive relationship (r = 0.803, p < 0.01).

Table 6: Test of significant relationship between socioeconomic characteristics and preference for banana/plantain varieties

Preference for banana/plantain varieties	Pearson Correlation (r)	Sig. (p-value)
Age (years)	-0.213*	0.020
Household size (persons)	-0.059	0.560
Banana/plantain farm size (Acres)	0.168	0.067
Banana/plantain farming experience (years)	0.803*	0.000

*Significant at p<0.05 level

CONCLUSION AND RECOMMENDATIONS

The study therefore concluded that the banana/plantain preferred to grow local varieties of banana/plantain due to high market value, bunch length, and number of fingers per bunch. Although the incidences of pests and diseases, low soil fertility and inadequate extension delivery system to farmers posed severe challenges to the farmers for commercial cultivation of the preferred varieties. To increase the preference for banana/plantain varieties in the study area at high level, agricultural research institutions concerned with genetic breeding of improve banana and plantain varieties should focus on developing varieties with higher attributes for attribute for bunch length, and number of fingers per bunch to boost farmers' prospect for high market value for banana/plantain produce.

COMPARATIVE ASSESSMENT OF TRADITIONAL AND MODERN HEALTHCARE FACILITIES USE AMONG RURAL NURSING MOTHERS IN IKORODU LGA, LAGOS STATE, NIGERIA

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ABSTRACT

Sound health is crucial for a balanced life, particularly for women who manage household activities, as poor health can lead to significant hardships, reduced labor capacity, and adverse effects on child development. Nigeria operates a dualistic health care structures with the traditional healthcare facilities (THF) and modern healthcare facilities (MHF) coexisting side by side. The question here is whether there are differences in the use of healthcare facilities by the respondents, hence the need for a comparative assessment. This study aimed to determine the level of patronage of THF and MHF, identified the THF and MHF services accessed, identified the constraints faced in accessing them and evaluated the respondents' perceptions of these facilities, Three-stage sampling procedure was used to select 105 respondents using a questionnaire. Data were analyzed using descriptive statistics and t-tests. The result showed that 65.7% of rural nursing mothers patronized MHF, while 34.3% patronized THF during their last illness. The service most accessed at THF was treatment and prevention of diseases (43.8%) while for MHF was vaccination/immunization (61.9%). Low quality of services was the main constraint for MHF users ($\overline{x}= 2.04$), while inadequate drugs for THF users ($\overline{x}= 2.80$). Cost was perceived to be important in the utilization, with 57.2% of users choosing THF for its affordability. There are significant differences ($p<0.05$) in age ($t= -0.533$), income ($t= 2.399$), payment of respondent's healthcare ($t= -1.774$) and distance to healthcare facilities ($t= -2.580$) between THF and MHF. The study recommends that the cost of healthcare at MHF and THF should be significantly subsidized, as it is seen as a key factor affecting the utilization of these facilities.

Keywords: Modern Healthcare, Traditional healthcare, Nursing mothers, Rural

INTRODUCTION

Health is a vital metric for assessing a country's success, and access to quality healthcare is crucial in a country like Nigeria, where diseases such as malaria are prevalent, especially in rural areas. Rural communities face distinct healthcare challenges, as affordable and accessible services are often limited, impacting the health of individuals and families. For women, especially, poor health can hinder work capacity, thereby affecting household welfare and children's development (Asenso-Okyere et al., 2011). The health status of women in rural Nigeria is essential not only for agricultural productivity but also for the broader socio-economic development of these communities.

Over the years, both traditional and modern healthcare systems have played roles in the healthcare landscape of Nigeria. Traditional medicine, rooted in indigenous knowledge, has been utilized for generations and remains widely used in rural communities. According to the World Health Organization (WHO, 2013), traditional medicine consists of various practices based on local beliefs and experiences. Notably, in sub-Saharan Africa, including Nigeria, up to 80% of the rural population relies on traditional healthcare, as they are more accessible and culturally resonant (WHO, 2021). However, the influence of civilization and scientific advancement has led to a rise in orthodox medicine which is now the primary choice in Nigeria's formal healthcare system (Osemene et al., 2011).

Primary Health Care facilities are the closest modern healthcare providers available to rural Nigerians, representing the foundational layer of the national healthcare structure (National Primary Health Care Development Agency, 2019). Ideally, nursing mothers would rely predominantly on modern healthcare facilities (MHF), given their scientifically validated treatments. Yet, traditional health facilities (THF) remain popular among rural dwellers, highlighting the dual healthcare system that exists in Nigeria. The question here is if there are differences in the use of these healthcare facilities by rural nursing mothers in Ikorodu LGA, Lagos State. Besides, information available has not been able to give a tangible record to compare nursing mother's patronage of modern healthcare facilities and traditional healthcare facilities in rural areas especially in Ikorodu LGA, Lagos state. It is against this backdrop that this study was carried out. The main objective is to do a comparative assessment of traditional and modern healthcare facilities used by rural nursing mothers in Lagos state.

The specific objectives are to
1. determine the level of patronage of THF and MHF in the study area
2. identify the traditional and modern healthcare services accessible to the respondents
3. identify the constraints faced by the respondents in accessing the traditional and modern healthcare facilities
4. evaluate the respondents' perceptions of the THF and MHF in the study area.

Hypothesis of the study was stated that there are no significant differences between the personal characteristics of those that patronizes traditional healthcare facilities and modern healthcare facilities

METHODOLOGY

The study was carried out in Ikorodu Local Government Area of Lagos state. Three stage sampling was used. First, three rural LCDAs (Imota, Ijede, and Ikorodu North) within Ikorodu LGA were purposively selected due to their rural characteristics. In the second stage, three Traditional Healthcare Facilities (THFs) were chosen through snowball sampling due to a lack of a definitive list, while simple random sampling was used to select one-third of the Modern Healthcare Facilities (MHFs). Finally, 105 rural nursing mothers were selected through simple random sampling from lists provided by both THFs and MHFs, ensuring an equal chance of selection among respondents. Data for the study were collected using structured questionnaire. Data were analysed using descriptive statistics and t-test. Institutional ethical clearance was obtained from the Ethical Committee of Lagos State Ministry of Health, Lagos, Nigeria.

RESULTS AND DISCUSSION

Level of respondents' patronage of the healthcare facilities

The study found that 65.7% of respondents visited MHF during their last illness, while 34.3% visited THF, indicating a preference for MHF among the majority (about two-thirds) of respondents (Table 1). Table 1 also shows that 21% of the respondents reported using MHF only when THF failed, and 25.7% used THF only when MHF failed, showing a pattern of alternating between healthcare options when one does not meet their needs. This finding is consistent with that of Olatunji (2013) where majority of the respondents that patronizes THF when ill approaches MHF if their condition does not change.

The frequency of usage of these healthcare facilities by respondents is presented in Table 1. Among THF users, 41% had no specific visitation schedule, while 21% visited once every three months, and 13.3% indicated once in two weeks and once in a month. For MHF users, 38.1% reported no specific schedule, 14.3% visited once every three months, 25.7% visited monthly, and 12.4% visited bi-weekly. These patterns are similar to that of Suellen et al. (2020) findings in Ibadan, where traditional healthcare usage among adult women was less frequent, often occurring as little as once per week.

Table 1: Respondents' Level of Patronage of Healthcare Facilities

Statement	MHF		THF		
Which healthcare facility did you attend the last time you were sick?	69(65.7)		36(34.3)		
	Not true at all		**I am not sure**		**Very true**
I patronize MHF only when THF fails	78(74.3)		7(6.7)		20(21.0)
I patronize THF only when MHF fails	66(62.9)		12(11.4)		27(25.7)
Frequency	**Once a week**	**Once in 2 weeks**	**Once a month**	**Once in 3 months**	**No specific schedule**
Frequency of attendance of THF	12(11.4)	14(13.3)	14(13.3)	22(21.0)	43(41.0)
Frequency of attendance of MHF	10(9.5)	13(12.4)	27(25.7)	15(14.3)	40(38.1)

Source: Field survey 2023. Value in parenthesis are in percentages

Traditional and modern healthcare services provided by the facilities

The study shows that respondents use THF mainly for disease treatment, herbal concoctions (43.8%), maternal and health care services (40.0%), and nutrition education (38.1%) as seen in table 2. In contrast, MHF are primarily utilized for vaccination/immunization (61.9%), health education (61.0%), medical tests (60.0%) nutrition education (59.0%), and family planning (51.4%). This suggests that MHF is valued for preventive and diagnostic services, while THF is preferred for traditional remedies. These findings align with previous research by Odefadehan and Adereti (2021), where immunization was the top service offered to rural women by MHF.

Table 2: Distribution of the types of Modern and Traditional Healthcare Service

Health service	Yes	No
Traditional healthcare services		
Prevention of disease	43(41.0)	62(59.0)
Treatment of diseases	46(43.8)	59(56.2)
Maternal and health care services	42(40.0)	63(60.0)
Family planning	32(30.5)	73(69.5)
Pharmacy/dispensary	13(12.4)	92(87.6)
Counselling	39(37.1)	66(62.9)
Herb concoction	46(43.8)	59(56.2)
Health education	26(24.8)	79(75.2)
Routine check- up, vital signs and general health	40(38.1)	65(61.9)
Normal delivery service	40(38.1)	65(61.9)
Nutrition education	40(38.1)	65(61.9)
Modern healthcare service		
Vaccination/Immunization	65(61.9)	40(38.1)
Prevention of diseases	62(59.0)	43(41.0)
Treatment of diseases	65(61.9)	40(38.1)
Maternal and health care services	65(61.9)	40(38.1)
Family planning	54(51.4)	51(48.6)
Pharmacy/dispensary	59(56.2)	46(43.8)
Laboratories	63(60.0)	42(40.0)
Counselling	56(53.3)	49(46.7)
Routine check- up, vital signs and general health	65(61.9)	40(38.1)
Nutrition education	62(59.0)	43(41.0)
Health education	64(61.0)	41(39.0)
Normal delivery service	63(60.0)	42(40.0)

Source: Field survey 2023. Value in parenthesis are in percentages

Constraints faced by respondents in the use of traditional and modern healthcare facilities

Results in Table 3 indicates that the most common constraints for rural nursing mothers using THF are absence of standardized measurement of drugs ($\bar{x}$=2.80), poor economic status ($\bar{x}$=2.15), and insufficient healthcare personnel ($\bar{x}$=2.07). For MHF, the main constraints include low quality of services provided ($\bar{x}$=2.04), lack of belief in healthcare personnel ($\bar{x}$=2.03), distance to health facilities ($\bar{x}$=2.01), and poor economic status ($\bar{x}$=2.00). These findings align with Utoo (2022), who noted that healthcare facilities in developing countries often lack essential supplies, and Oyewole (2018) found that insufficient personnel can discourage facility usage.

Table 3: Distribution of Respondents based on Constraints faced in using MHF and THF

Constraints	THF		MHF	
	Mean	Rank	Mean	Rank
Inadequate healthcare personnel	2.07	3rd	1.95	7th
Distance to health facilities	1.94	5th	2.01	3rd
High cost of accessing traditional/ modern healthcare facilities	1.90	6th	1.99	5th
Attitude of health workers	1.97	4th	1.89	9th
Poor economic status of most rural mothers	2.15	2nd	2.00	4th
Inadequate drugs	1.81	9th	2.04	1st
Time wastage in accessing treatment	1.84	8th	1.91	8th
Lack of belief in healthcare personnels	1.80	10th	2.03	2nd
Absence of standardized measurement of drugs	2.80	1st	1.91	8th
Low quality of services provided	1.80	10th	2.04	1st
Dirty and unhygienic environment	1.21	11th	1.80	11th
Influence of friends and family members on patronage	1.87	7th	1.86	10th
Inadequate security	1.84	8th	1.96	6th

Source: Field survey 2023

Perception of respondents on the cost and risk associated with the use of MHF and THF

Analyses were conducted on the perception of THF and MHF along two categories (level of risk and cost implication). The level of risk was ranked into low, medium and high as shown in Figure 1. About half (45.7%) of the respondents patronizing THF had medium risk, compared to 37.8% from MHF who had low risk. This implies that the respondents perceived that the level of risk involved

in THF was higher than that of MHF. This aligned with Akpabio (2014) findings that women who preferred modern health care practitioners are more knowledgeable of the risk involved in patronizing traditional birth attendant. On cost implication, the results in Figure 2 shows that 57.2% respondents that utilizes THF did so because of the low cost while 58.1% of the nursing mothers believed that cost is high. This implies that respondents perceive MHF to be cost more than THF.
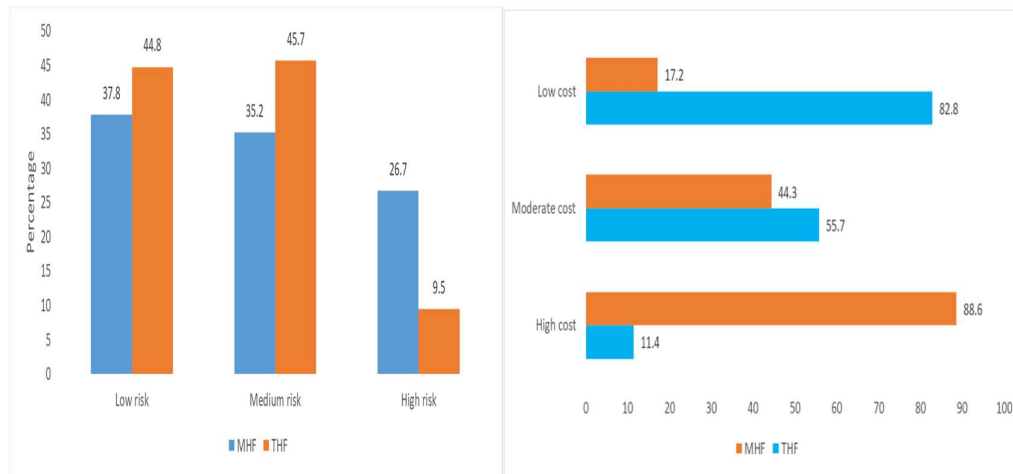
Figure 1: Perception of respondents on the cost implication Figure 2: Perception of respondents on the level of risk
Source: Field survey, 2023

Test of Hypothesis

The results in Table 4.6 shows that there are significant (p<0.05) differences in age (t= -0.533), religion (t= -2.441), income (t= 2.399), payment of respondent's healthcare (t= -1.774) and distance to healthcare facilities (t= -2.580) between THF and MHF. This supports Habtom, (2018) on "Perceptions and attitudes of modern and traditional medical practitioners about traditional medical practice in Eritrea" findings that there is significant difference in age between modern and traditional medical practitioners.

Difference between personal characteristics and THF and MHF (t-test)

Variables	t-value	p-value	Decisions
Age	-0.533	0.004	S
Ethnicity	0.811	0.177	NS
Marital status	-0.143	0.403	NS
Religion	-2.441	0.000	S
Income	2.399	0.000	S
Educational level	1.839	0.761	NS
Number of living children	0.477	0.973	NS
Occupation of respondents	-2.427	0.086	NS
Occupation of husband	-1.616	0.328	NS
Payment for respondent's healthcare	-1.774	0.000	S
Distance to healthcare	-2.580	0.000	S
Source of information	-1.544	0.172	NS

Source: Field survey, 2023

CONCLUSION AND RECOMMENDATIONS

Approximately two-thirds of the respondents reported visiting MHF during their last illness, though about one-third do not follow a specific schedule for healthcare visits. Respondents primarily use THF for treating diseases and obtaining herbal concoctions, while they rely on MHF for vaccination, immunization, and health education. Key constraints include the absence of standardized drug measurements in THF and perceived low-quality service in MHF.

Additionally, respondents consider THF to carry higher health risks than MHF, though many continue to use THF due to its lower cost. The study recommends fostering collaboration between MHF and THF to enhance overall healthcare delivery in the community. It is also suggested that healthcare costs at both MHF and THF be significantly subsidized, as affordability is a key factor in facility utilization. Furthermore, regular training programs should be organized for health workers in both

sectors to improve service quality and effectiveness in meeting patient.

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ASSESSMENT OF FOOD SECURITY STATUS OF ENTREPRENEURS INVOLVED IN ADIRE VALUE CHAIN IN OGUN STATE, NIGERIA

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ABSTRACT

This study assessed the food security status of entrepreneurs involved in adire value chain in Ogun state, Nigeria. Simple random sampling was used to select 72 producers and 90 marketers for a total sample size of 162 respondents. Data was collected using interview schedule and analysed with percentages, mean, chi-square and T-test. The results showed that most adire producers (59.8%) fell within the low-income range of between N10,000 and N30,000 monthly with mean monthly income of N37,846.22 while the marketers (30.0%) realized less than N25,000 in a month. Majority of the producers (77.8%) and marketers (75.6%) were food-secured. Significant relationship (p<0.05) existed between marketers' monthly income (r=0.52); monthly production (r=0.55); expenditure (r=0.21) and their food security status. Also, there existed a significant difference (p<0.05) in the food security status of adire producers and marketers (t=1.83). The study concluded that entrepreneurs involved in adire value chain had low monthly income which affected their food security status. It was therefore recommended that adire entrepreneurs should make use of digital tools or mobile apps to connect with a broader market.

Keywords: Food security status, Entrepreneurs, adire producers and adire marketers

INTRODUCTION

Adire is a resist dyed cloth produced and worn by the Yoruba people of southwestern Nigeria in West Africa. The Yoruba label adire, which means "tyed and dyed" was first applied to indigo-dyed cloth decorated with resist patterns around the turn of the twentieth century (Encyclopaedia of Clothing and Fashion). Recently, the business of adire textile production is like other entrepreneurship which is a dynamic process of creating incremental wealth by individuals using hand resources (Muhammed, 2006). Onyekezini (2004) opines that the practice of textile art is about the second oldest profession since the creation of man, only to agriculture. The textile art ministers to man's second most basic need which is clothing. It thus ranks as one of the most cherished needs of humans. As a distinctive textile type, adire first emerged in the city of Abeokuta, a centre for cotton production, weaving, and indigo dyeing in the nineteenth century. The prototype was tie-dyed kijipa, a handwoven cloth dyed with indigo for use as wrappers and covering cloths. Female specialists dyed yarns and cloth and also refurbished faded clothing by re-dyeing the cloth with tie-dye patterns. In the early decades, a vast trade network for adire spread across West Africa, particularly Ghana, Congo and Senegal (Byfield, 2002).

In Nigeria, a lot of households especially those in the informal sector struggle to regularly obtain enough food that is both sufficient and nourishing, making food security a serious problem. The food security of agricultural households has been the subject of extensive research but less is known about how non-agricultural entrepreneurs especially those operating in the cultural and creative industries, such as the Adire value chain are impacted by food insecurity. Many entrepreneurs, from fabric makers and designers to traders, make their living from the Adire textile sector in Ogun State, Nigeria.

However, because they frequently work in the unofficial sector, these business owners run the danger of experiencing food poverty due to erratic income fluctuations and unstable markets. Adire is significant to Ogun State's culture and economy, but little is known about the level of food security for individuals who produce and trade it. These entrepreneurs' erratic revenue, sporadic employment, and restricted access to official financial institutions can make them more susceptible to food poverty. Furthermore, larger economic and environmental issues like inflation, unstable markets, and climate change are likely to make these people's struggles even more difficult to deal with since they may have an indirect impact on their access to food and purchasing power. When evaluating food security, most of the material already written has concentrated on agricultural households and rural communities. Nevertheless, research on non-agricultural entrepreneurs is lacking, especially in cultural sectors like Adire manufacturing. The lack of research restricts the ability to understand how these entrepreneurs deal with issues related to food security and impedes the creation of focused interventions that promote their well-being.

Therefore, this study assessed the contributions of production of tie and dye to increasing food security status of the entrepreneurs involved in the adire value chain. Specifically, the study described the enterprise characteristics of adire entrepreneurs and determined the food security status of adire entrepreneurs in the study area. It further determined the relationship between the enterprise characteristics of respondents and food security status. It also determined the difference in the food security status of adire producers and marketers in the study area.

METHODOLOGY

The study was conducted in Ogun state in South-western Nigeria. The two adire markets available in Abeokuta were purposively selected, which are Itoku International Adire/Kampala market and Asero International Adire/Kampala market both situated in Abeokuta South Local Government Area of Ogun state. In Itoku international market, there were 70 registered adire producers and 500 registered adire marketers in the association while in Asero International Market, there were 20 adire producers and 102 adire marketers. Simple random sampling was used to select 80% producers and 15% marketers from the list of registered producers and marketers in the two markets. A total of 162 respondents were selected comprising 72 producers and 90 marketers were selected for the study.

Measurement of variables

The research variables of the study were measured as follows:

Estimated monthly income from adire production and marketing: this was measured at interval level as amount made from adire production and marketing in a month

Estimated monthly income from other sources - This was measured at interval level as amount made from other livelihood activities in a month.

Estimated expenditure per production: this was measured at interval level as amount spent on production in a month

Sources of finance: this was measured at nominal level as personal (1), family/friends (2) cooperative society or association (3), microfinance banks (4) and commercial banks (5)

Areas of specialization in adire production: was measured at nominal level as producers (1) and marketers (2)

Food security status of adire producers and marketers - This was measured using the adapted FANTA scale, which consists of 15 occurring questions and frequently asked questions, each of the questions in each table was asked with a recall period of four weeks (30 days). The respondents were asked an occurrence question that is whether the condition in the question happened at all in the past four weeks (yes or no). If the respondent answered "yes" to an occurrence question, a frequency-of-occurrence question was asked to determine whether the condition happened rarely (once or twice), sometimes (three to ten times) or often (more than ten times) in the past four weeks. The maximum score for a household is 27 i.e. the household response to all nine frequency-of-occurrence questions was "often", coded with a response code of 3, the minimum score is 0 i.e. the household responded "no" to all occurrence questions, frequency-of-occurrence questions were skipped by the interviewer, and subsequently coded as 0. The higher the score, the more food insecurity (access) the household experienced. The lower the score, the less food insecurity (access) a household experienced.

RESULTS AND DISCUSSION

The enterprise characteristics of respondents are shown in Table 2. Most of the producers (59.8%) fell within the low-income range of between N10,000 and N30,000 in a month. The mean income for producers was N37,846.22 monthly. This finding is not surprising since most producers were small-scale and medium scale adire producers with poor capital base and outputs. A few (5.5%) of the producers do not have a monthly income which suggests that they were in apprenticeship or industrial training students learning production and marketing of adire. The monthly income of the marketers - shows that 30.0% of the marketers realized less than N25,000 in a month and 31.1% fell within the income range of between N25,000 to N50,000 monthly. Only 20.0% of the marketers had monthly income above N100,000 with a mean monthly income of N117,233.33 which indicates that marketers of adire earn more money monthly than producers of adire. The distribution of producers based on their monthly income from other sources indicates that most producers (59.7%) do not have income from other sources indicating that they are mainly adire producers without an alternate source of income, while 37.5% realized less than N50,0000 in a month as income from other sources. Only 2.8% had above N50,000 as income from other sources in a month. The average income from other sources for producers was N16,933.33 monthly. Most marketers (70.0%) had income from other sources was less than N100,000 in a month, while only 12.2% had income from other sources to be between N100,001- N200,000. However, the result implies that respondents engage in other forms of livelihood activities to minimize shock and risks that could arise as a result of changes in the demand and supply of their products from their major occupation.

The data in Table 2 also shows the expenditure per production of producers and marketers. The table reveals that majority (69.1%) of the producers spent more than N3,000 per production of adire with a mean expenditure of N10,637.50± N21,022.87, that is, in purchasing dyes, chemicals and, starch, while 26.5% of the producers spent between N2,501 and N3,000 per production. Only a few (4.3%) of the producers spent between N2,000 and N2,500 per production and this implies that most of the adire producers produce on a small scale. Furthermore, Table 2. shows the expenditure per production of the marketers. Majority of the marketers (58.0%) spent more than N8,000 per production with mean of N68,134.44± N138,563.553. It is noteworthy that marketers provide the producers with clothes for production and pay them for the services rendered. Most of the guinea brocades used in production of adire are imported materials which makes them

quite expensive. The results also reveal that 35.8% of the marketers spent between N2,000 and N5,000 per production while only 6.2% of the marketers spent between N5,001 and N8,000 per production.

The distribution of respondents by scale of production is indicated in Table 2. Most producers (63.9%) produce on a medium scale, 1.4% produce on a large scale, while 34.7% produce on a small scale. The scale of business of the marketers shows that large proportion of the marketers' business is on a small scale (46.7%), while only 14.4% sell on a large scale. This result might be due to insufficient startup capital for marketers. Most producers (72.2%) and marketers (90.0%) involved in adire enterprise own their personal/ individual businesses. Only 26.4% of producers and 6.7% of marketers indicated that their businesses were owned by family. More of the producers (27.4%) and marketers (44.4%) had between 1 to 2 persons assisting them in their enterprise, while 27.7% and 36.7% of producers and marketers respectively do not have anyone assisting them in their enterprise. The number of apprenticeship assistants for producers and marketers on average was 3.33 and 2.09 persons, respectively.

Most producers (80.6%) and marketers (63.3%) obtained capital from personal savings, only 15.3% of producers and 18.9% of marketers source money from family and friends. Some producers (2.8%) and marketers (17.8%) had access to capital through cooperative societies. The implication of this is that the easiest way for adire producers and marketers to source funds for their business activities is through personal savings or family members. Though microfinance could also be of help as a source of capital, however, access to credit facilities from microfinance banks seems difficult for the people in this sector as the majority of them could not meet the banks' requirements, especially for high interest rates.

The distribution of respondents according to production and marketing experience reveal that 31.9% of producers had between 11 to 15 years of production experience in adire with mean years of experience of 16.83±10.81 years. This implies that adire production is an age-long profession of the respondents in the study area. More than a third (35.6%) of the marketers had over 25 years of marketing experience, while far less than average (21.1%) had 16 to 20 years of marketing experience (Table 1). The marketers' year of experience was 24.2±13.32 years. It is therefore expected that adire producers' and marketers 'years of experience in adire production and marketing will no doubt culminate into higher level of productivity. This is because the producers and marketers can easily change strategies which could translate to trying new ideas that they have seen or heard from other producers and marketers, or even extension agents (Ezebuiro et al., 2008).

Table 1: Distribution of adire entrepreneurs based on their enterprise characteristics

Variables	Producers(n=72)			Marketers (N=90)	
Monthly income	**F**	**%**		**F**	**%**
< N10,000	5	6.9	< N25,000	27	30.0
N10,001- N20,000	22	30.6	N25,001-N50,000	22	24.4
N20,001- N30,000	21	29.2	N50,001-N75,000	6	6.7
N 30,001- N40,000	9	12.5	N75,001-N100,000	14	15.6
> N40,000	11	15.3	> N100,000	18	20.0
Mean±SD	N37,847± N66,042			N117,233± N334,242	
Income from other sources			< N100,000	63	70.0
< N50,000	27	37.5	N100,001-N200,000	11	12.2
> N50,000	2	2.8	> N200,000	5	5.5
None	43	59.7	None	11	12.2
Mean±SD	N16,933± N33,014			N8,164± N25,875	
Expenditure per production					
Producers			Marketers		
N2,000- N2,500	7	4.3	N2,000 N5,000	58	35.8
N 2,501- N3,000	43	26.5	N5,001- N8,000	10	6.2
> N,3000	112	69.1	> N8,000	94	58.0
Mean±SD	N10,638±N21,024			N68,134.44±N138,564	
Scale of production			**Scale of business**		
Small scale	25	34.7	Small scale	42	46.7
Medium scale	46	63.9	Medium scale	35	38.9
Large scale	1	1.4	Large scale	13	14.4
Ownership of business					
Family	19	26.4		6	6.7
Individual/Own	52	72.2		81	90.0
Group	1	1.4		3	3.3
Apprenticeship assistance					
None	20	27.8		33	36.7

Variables	Producers(n=72)				Marketers (N=90)		
1-2	20	27.8			40	44.4	
3-4	19	26.4			11	12.2	
>4	13	18.1			6	6.7	
Mean±SD	3.33±2.09				1.73±1.84		
Source of income							
Personal	58	80.6			57	63.3	
Family/ Friends	11	15.3			17	18.9	
Cooperatives Society	2	2.8			16	17.8	
Microfinance bank	1	1.4					
Years of experience							
1-5	9	12.5			5	5.6	
6-10	13	18.1			14	15.6	
11-15	23	31.9			8	8.9	
16-20	8	11.1			19	21.1	
21-25	7	9.7			12	13.3	
>25	12	16.7			32	35.6	
Mean±SD	17±10.81				24±13.32		

Food security status

Table 2 shows that 20.8% of producers were food insecure, while 77.8% were food secure. Similarly, 75.6% of the marketers were food secure, while 22.2% were not food secure. This implies that most adire entrepreneurs were food secure, probably because they had income from other sources.

Table 2: Distribution of respondents based on their food security status

Food security Status	F	%	Minimum	Maximum	Mean	SD
Producers						
Secured (0.00-3.07)	56	77.8	0.00	30.00	3.08	6.48
Not secured (3.08-30.00)	15	20.8				
Marketers						
Secured (0.00-4.74)	68	75.6	0.00	38.00	4.75	9.60
Not secured (4.75-38)	20	22.2				

Source: Field survey 2018

Relationship between Enterprise Characteristics of Respondents and Food Security Status

The data in Table 3 showed the relationship between the selected enterprise characteristics of the respondents and the food security status of adire producers and marketers. The findings reveal that there were significant relationships between producers' scale of production (χ^2= 14.33, p<0.05), source of finance (χ^2= 10.00, p<0.05) and food security status. This implies that the scale of production determines the food security status of the producers. Marketers' scale of production (χ^2= 23.21, p<0.05) was significantly related to the food security status while the business type (χ^2= 3.27, p>0.05) and source of finance (χ^2= 0.17, p>0.05) were not significantly related to the food security status. This implies that no matter the business type the marketers were engaged in, it does not affect their relationship with their food security status. Also, irrespective of the source of finance of the marketers, the food security status is not influenced.

Table 3: Chi-square analysis of the relationship between respondent's food security status and selected enterprise characteristics

Variables	Producers (n=72)				Marketers (90)			
	χ^2	df	P	Decision	χ^2	df	P	Decision
Scale of production	14.33	2	0.00	S	23.21	2	0.00	S
Business type	3.18	2	0.20	NS	3.27	2	0.20	NS
Source of finance	10.00	3	0.02	S	0.17	2	0.92	NS

Difference between food security status of producers and marketers

The result on Table 4 reveals that there was no significant difference (t=-1.83, p<0.05) in the food security status of producers and marketers. The implication is that both producers and marketers do not differ in their food security status.

Table 4: T- test analysis of difference between adire producers and marketers food security status

Livelihood outcome	Mean	SD	N	t	df	P	Decision
Producers	12.61	2.56	72	1.83	160	0.41	NS
Marketers	13.47	3.23	90				

Source: Field survey 2018

CONCLUSION AND RECOMMENDATIONS:

Adire textile in Nigeria originated from Egbaland as a traditional entrepreneurship, passing from one generation to another. However, innovations have transformed the craft into modern entrepreneurship for knowledge can be acquired through vocational training. Similar to most of the small-scale businesses in developing economies, lack of capital has been a major factor hindering the development of the sector as most of the producers and marketers source funds through family or reliance on personal savings or microfinance banks to some extent. Return on investment is not determined by the size of the investment, but rather by marketing effort. The craft has been a source of employment generation and income to many people including designers, tailors and other low-skilled labourers, and at least provides a source of livelihood to the people of the area. Involvement in the enterprise has not differentiated the producers from marketers with respect to their household food security. It is therefore recommended that adire entrepreneurs should make use of digital tools or mobile apps to connect with a broader market.

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AQUACULTURE FARMERS' INFRASTRUCTURE AND TRAINING NEEDS IN EKITI STATE, NIGERIA

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ABSTRACT
The study examined aquaculture farmers' infrastructure and training needs in Ekiti state, Nigeria. The population of the study included 61 participants that are Agricultural Development Project aquaculture farmers available for focus group discussion. The selection of participants employed a multi-stage sampling procedure. In the first stage, the three ADP zones in Ekiti state were selected, the second stage involves purposive selection ADP blocks based on predominance of aquaculture registered farmers. A block per zone was selected. The third stage involved random selection of ADP cells which are the communities where aquaculture farmers resides. A cell was selected per block. At the fourth stage, random selection of 6 - 12 registered aquaculture farmers were invited for Focus Group Discussions per cell. Focus group discussion was used for data collection while Data collected was analyzed using descriptive statistical tools, such as frequency distribution, mean, standard deviation, percentage and Atlas Ti. The result of the study revealed that the production needs of registered aquaculture farmers in Ekiti State are technical, managerial and infrastructural in nature. It is therefore recommended that for sustainable improved aquaculture production in Ekiti state, farmers should be involved in the project development, implementation, monitoring, and evaluation and learning stages.
Keywords: Aquaculture, Farmers, Infrastructure, Training needs

INTRODUCTION

Aquaculture, the farming of aquatic species, is a vital part of Ekiti State, Nigeria's economy, contributing to food security and employment. The state's water resources and climate make it ideal for aquaculture. However, the sector faces significant challenges, limiting its growth potential. Key issues include limited access to high-quality inputs, like fingerlings and feed, which are essential for fish growth. The lack of local hatcheries and feed mills means farmers rely on distant suppliers, raising costs and reducing profitability.

Financial constraints also hinder aquaculture development. Farmers often lack access to affordable credit, which is essential for investing in infrastructure and quality inputs. Additionally, the limited availability of technical knowledge and training means many farmers struggle with best practices in disease control, water quality, and feeding, further impacting production.

Poor infrastructure compounds these challenges. Unreliable roads, electricity, and storage facilities increase operational costs and result in high post-harvest losses. This infrastructure deficit restricts market access, limiting farmers' ability to reach wider markets and secure fair prices. This paper therefore examined the production needs of registered aquaculture farmers in Ekiti State with the following objectives:

1. Describe the socioeconomic characteristics of respondents in the study area;
2. Examine the fish product preferences and expectation by farmers
3. Evaluate the main actions needed to achieve desired product quality and quantity expectations ;
4. Determine farmers infrastructural and training needs

METHODOLOGY

The study in Ekiti State, Nigeria, used a multi-stage sampling of aquaculture farmers registered with the Agricultural Development Project (ADP). Selection involved three ADP zones, purposively chosen blocks, and randomly selected cells and farmers, totaling 61 participants. Data were analyzed using descriptive statistics, including frequency, mean, and Atlas Ti.

RESULTS AND DISCUSSION
Characteristics of respondents

In the study's agricultural zones, 67.2% of participants were male and 32.8% female. Zone 1 (Aramoko) had 57.1% male and 42.9% female; Zone 2 (Ikere) had 87% male and 13% female; and Zone 3 (Isan Ekiti) had 66.7% male and 33.3% female. Including women is essential for sustainable rural development.

Table 1: Sex distribution

	Zone 1 Aramoko	Zone 2 Ikere	Zone 3 Isan - Ekiti	Overall
Male	57.1%	86.7%	66.7%	67.2%
Female	42.9%	13.3%	33.3%	32.8%

Source: Field study, 2023

The study examined fish farmers' demographics, noting a mean age of 44.57 years, with younger farmers in Zone 3 (mean 37.67 years) and older in Zone 2 (mean 53.87 years). Household heads comprised 72.1% of participants, with the highest in Zone 2 (86.7%). Age significantly influences innovation adoption and sustainability among farmers.

Table 2: Age and household distribution

	Zone 1 Aramoko	Zone 2 Ikere	Zone 3 Isan - Ekiti	Overall
Age	44.04±9.34	53.87±15.39	37.67±8.60	44.57±12.31
Household head	75%	86.7%	55.6%	72.1%

Source: Field study, 2023

Generally, most (73.8%) of the fish farmer's source their stock from the hatchery, 24.6% from grow out farmers and a few 1.6% of respondents combine both hatchery and grow out.

Fish product preferences and expectations by farmers

Preferences for fish products, like smoking size (7.89±1.81) and table size (6.23±1.99), highlight the need to align production with consumer demand.

This aligns with Aregheore et al. (2017), emphasizing market-driven strategies in aquaculture to meet consumer preferences and improve profitability. During one of the FGGs a participants stated the;

"We like to grow our fish to table size, but due to the high cost of feed, we rear them to smoking size, which there is always a market for". Participant 3 Zone 3, Moba block, Ira cell (7-12-2023).

Table 3: Fish product preferences and expectations by farmers and consumers

	Responses	Zone 1 (Aramoko)	Zone 2 (Ikere)	Zone 3 (Isan)	Total State
Catfish products preferences	Clarias	6.96 ± 2.15	5.67 ± 1.99	7.06 ± 2.02	6.66 ±2.12
	Hybrid	7.00 ± 2.26	7.87 ± 0.83	6.69 ± 3.09	7.16±2.23
	Heterobancus	5.50 ± 2.12	5.00 ±0.00	0.00 ± 0.00	5.45±2.02
The sizes of catfish preferred	200g – 700g (smoking size)	7.43 ± 1.97	8.33 ± 1.49	6.78 ± 2.21	7.46±1.99
	1kg above (table size)	5.61 ± 1.97	5.40 ± 1.55	6.72 ± 1.70	5.89±1.86
	700g – 900g (barbecue size)	6.20 ± 1.14	9.00± 0.00	0.00 ± 0.00	6.45±1.37
How long does it take to achieve these different sizes of catfish	3 to 4 months (smoking size)	7.46 ± 1.62	7.87 ± 1.73	6.44 ± 1.72	7.26±1.74
	5-6 months (table size)	5.25 ± 2.30	6.20 ± 1.57	6.72 ±1.41	5.92±1.99
	4-5 months (barbecue size)	5.10 ±1.45	5.00 ±0.00	0.00 ± 0.00	5.09±1.38
Kind of brood fish are desired by the hatchery	Clarias	9.20 ± 1.75	8.00 ±0.00	7.53 ± 2.01	8.19±2.06
	heterobancus	8.50 ± 0.71	7.00 ±0.00	6.13 ± 1.13	6.63±1.36
Kind of fingerlings do grow out farms desire	Clarias	8.10 ± 1.19	6.400 ± 1.35	5.17 ± 1.04	6.28±1.64
	Hybrid	7.60 ±2.26	6.93 ± 1.58	8.06 ± 1.30	7.57±1.81
What fish product do consumers desire in this area	Smoking size	7.86 ± 1.98	8.67 ± 1.18	7.28 ± 1.84	7.89±1.82
	Table size	6.14 ± 2.35	6.47 ± 1.36	6.17 ± 1.89	6.23±1.99
	Barbecue size	5.63 ± 1.06	0.00 ± 0.00	0.00 ± 0.00	5.63±1.06

Actions needed to achieve desired product quality and quantity expectations

The result in table 4 shows the actions the farmers employed in achieving their desired product quality and quantity. Across the three zones, the farmer agreed that feeding their fish well, changing water and sorting them into sizes enhances their expected product quality and quantity. The overall for adequate feeding is mean score (8.61±1.11) which scored the highest, followed by changing of water (8.13±1.12) and lastly sorting into different sizes (6.87±1.74).

For instance, in zone 2, Ise/Orun block, Ise cell. Participant 5 said "at times, we administer tetracycline and bitter leaf water to the fishes to

treat them and when they are not feeding well". (9-12-2023).

Also in zone 1, Efon block, Efon cell, participant 8 state, "we sort the catfish into sizes to prevent bigger catfish from eating the smaller ones". (12-12-2023).

These findings align with previous research on nutrition and water quality's importance in aquaculture (Boyd and Tucker, 2018; Garling, 2019), emphasizing proper feeding and water maintenance to boost catfish growth, reduce waste, and lower disease risks. The findings highlights the significance of adopting holistic and proactive management approaches to enhance the productivity, profitability, and sustainability of fish farming in Ekiti State.

Table 4: Actions needed in achieving desired product quality and quantity

	Zone 1 (Aramoko)	Zone 2 (Ikere)	Zone 3 (Isan)	Total State
Adequate feeding	8.21 ± 1.20	8.87 ± 1.19	9.00 ± 0.69	8.61±1.11
Changing water	7.68 ±1.23	8.47 ± 0.99	8.56 ± 0.78	8.13±1.12
Sorting	6.32±1.70	6.73 ± 1.71	8.30 ± 1.06	6.87±1.74

Source: Field study, 2023

Farmers' infrastructure and training needs

Tables 5 and 6 show Ekiti State farmers' infrastructure and training needs, highlighting storage, power, and processing inadequacies across zones. This aligns with Olaniyi et al. (2020) on infrastructure's role in agriculture. Processing facilities (8.00±1.19) were most inadequate, followed by storage (7.95±1.32) and power (7.13±1.58).

Table 5: Access to adequate infrastructure

		Zone 1 Aramoko	Zone 2 Ikere	Zone 3 Isan	Total
There is a lack of adequate infrastructure	Storage facility	8.15 ± 1.16	0.00 ± 0.00	7.60 ± 1.55	7.95±1.32
	Power supply	8.50 ± 0.93	6.36 ± 1.22	7.10 ± 1.79	7.13±1.58
	Processing facility	8.28 ± 1.18	7.93 ± 0.83	7.78 ± 1.44	8.00±1.19

Source: Field study, 2023

The findings revealed varying interest in improvement programs across zones. Farmers' prioritized pond construction training (8.75±1.58) and feed formulation (8.51±1.37), with notable interest in fish processing (7.83±1.79) for smoking and packaging. Consistent interest in nutrition underscores its role in catfish growth (Riche et al., 2019). Tailored, holistic programs addressing zone-specific needs can promote sustainable catfish farming intensification in Ekiti State.

Table 6: Training needs

	Zone 1 (Aramoko)	Zone 2 (Ikere)	Zone 3 (Isan)	Total State
Pond construction	9.00 ± 2.82	0.00 ± 0.00	0.00 ± 0.00	9.00 ±2.83
Feed composition	8.46 ± 1.86	8.27 ± 1.10	7.89 ± 1.37	8.25±1.56
Hatchery training	7.04 ± 2.69	10.00 ±0.00	7.73 ± 1.49	7.34±2.35
Fish processing	10.00 ± 0.00	7.87 ± 0.83	7.27 ± 2.00	8.28±1.63
Water testing	9.00 ±2.83	0.00 ± 0.00	0.00 ± 0.00	9.00 ±2.83
Fish management	0.00 ± 0.00	8.29 ± 1.07	7.67 ± 0.58	8.18 ±1.01

Source: Field study, 2023

CONCLUSION AND RECOMMENDATIONS

The study concludes that Catfish farmers in Ekiti State face infrastructure challenges (storage, power, processing) that limit growth, investment, and market activities. A skills gap highlights the need for capacity building. Recommendations include infrastructure upgrades, enhanced extension services, and public-private partnerships to improve productivity, with investments in roads, electricity, and water management essential for sustainable growth.

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SMALLHOLDER FARMERS' ATTITUDE TOWARDS UTILIZATION OF RICE INTENSIFICATION PRACTICES IN NORTHWEST, NIGERIA: A PANACEA TO INCREASED LIVELIHOOD

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ABSTRACT

The study examined smallholder farmers' attitude towards utilization of system of rice intensification (SRI) practices in Northwest, Nigeria. The SRI is a climate smart innovation practice for increasing rice productivity via fewer inputs' usage as well as its impact on smallholders' income, livelihood and food-security. Flooded rice is the largest consumer of water, and its sustainability is endangered by water inadequacy. This compelled the development of substitute irrigation innovation, like the SRI. The study specifically described the socio-economic characteristics, examined the attitude of the respondents towards SRI and identified the constraints to implementation of SRI practices. Data was collected using questionnaire and interview schedule administered to 315 randomly selected rice farmers via a 3-stage sampling procedure and analyzed using descriptive statistics. Majority (91.7%) were males, married (75.0%), with secondary education (66.7%) and no extension contact (91.7%). Average age of 32 years, farming experience of 11 years, monthly income of N30, 637.51k, farm-size of 7.0 hectares and household-size of 5 persons. The respondents had favorable attitude towards SRI innovation practices ($\bar{x}$=1.54±1.23). The Categorisation of attitude shows that majority (58.7%) of the respondents had favorable attitude towards SRI practices. There were several severe constraints to utilization of SRI practices (Index $\bar{x}$=3.21±1.47). It was concluded that the respondents have favorable attitude towards SRI practices. It was recommended that periodic advisory services to further improve the attitude of clienteles more, their understanding and knowledge on the significance of SRI components as well as its utilization for food security enhancement.

Keywords: Farmers, Intensification, Smallholder, Attitude, Rice.

INTRODUCTION

Rice (*Oryza sativa L.*) is one of the utmost significant food crops for over 50% of the global population and it production meaningfully effects food security potentials of most countries (Ara, *et al.,* 2017). Over 160 million hectares was estimated to be covered by rice production worldwide with an approximate annual production of around 500 million metric tons. Hence, the demand for irrigation water has exceeded the amount of available water for rice production in Nigeria. Therefore, alternative practices that reduce water use need to be put in place to enhance sustainable rice production for the nearest future. Numerous procedures have been used to reduce input usage in production of rice previously. It is against this background, that the System of Rice Intensification (SRI) has evolved as a smart technique for rice cultivation, providing a combination of modern agronomic practices and traditional wisdom. In principle, SRI highlights the optimization of rice development via water management strategies, seeds and agro-input usage, soil health improvement and innovative agronomic techniques. Compared to the previous practices mostly dependent on severe chemical inputs and continuous irrigation, SRI focuses on enhancing the inherent potential of rice plants through ecological principles (Chittimothu, 2024). SRI encourages healthier plant growth, promotes robust root proliferation, enhances nutrient and water uptake efficiency. Hence, wider-spacing amid plants reducing competition among plants, permits better light penetration and promoting stronger tillering. Distinguishing quality is the water management approach, instead of uninterrupted flooding, it indorses "alternate wetting and drying or intermittent irrigation practices". SRI not only preserves water but encourages aerobic environments, nurturing desirable microbial activity and lessing green methane gas emissions.

SRI promotes usage of organic fertilizers, natural pest management methods, lessening dependence on synthetic chemicals and mitigating ecofriendly dangers thereby aligning with the principles of promoting biodiversity, agroecology and reducing the ecological footprint of rice production. It empowers farmers with innovation, skills as well as knowledge livelihoods food security and climate resilience possibility. Also, its adaptive and participatory approach fosters farmer-led techniques and knowledge transfer, promoting social cohesion and community resilience. As the global agricultural community grapples with the dual challenges of feeding a growing population and mitigating climate change, SRI offers a beacon of hope. The SRI is an innovative methodology aimed at increasing the productivity of rice cultivation while using fewer resources such as water, seeds, and chemicals. Flexibility in utilizing SRI practices

is crucial for farmers to fit the innovation to suit their specific local conditions, preferences and resources. It at this premise that the study was poised to provide answers to the following objectives. The general objective of the study is to examine the smallholder farmers' attitude towards the SRI practices in North-west, Nigeria. The specific objectives are to:

1. Describe the socio-economic characteristics of the rice farmers.
2. Examine the respondents' attitude towards the SRI innovation practices.
3. Identify the constraints to implementation of the SRI innovation practices.

METHODOLOGY

The study was conducted in Jigawa and Kano states in North-West Nigeria where the pilot SRI project was conducted. Jigawa is located between Latitude 11^0 00'00" N and 13^0 00' N with Longitude 8^0 00' E and $10^0$15' E. The area occupies a land mass of 216,065 Sq Km. According to National Population Census (2006), the study area has a population of 26,231,987 with a growth rate of 2.83% and 2.94% in Jigawa and Kano states respective. Jigawa State has a total of 27 Local Government Areas (LGAs) divided into Agricultural zones,

Kano State has a total of 44 Local Government Areas (LGAs) with about 13,076,900 people with an annual growth rate of 2.94%. Based on this growth rate, the projected present population of the state to about 19,296,109 (NPC, 2006). It lies between latitude $11^0$33' North and $12^0$37' North of the equator and Longitude $8^0$34'East and $9^0$29' East and covers a land area of about 20760km2 square. The state is administratively divided into three agricultural zones by Kano State agricultural rural development authority.

A 3-stage sampling procedure was used. The first stage was a purposive selection of Jigawa and Kano states. The second stage was a judgmental selection of three Local Government Areas from each state where rice is mostly produced and where SRI farmers probably abound to obtain a total of six (6) local government areas. In the third stage, Taro Yamane's formula was used at 5% probability level to obtain a sample size of 315 respondents for the study. This implies that a total of 97 respondents were used in Jigawa State and 218 respondents were used in Kano State to give a total of 315 respondents for the study.

RESULTS AND DISCUSSION
Socioeconomic characteristics

From the Table 1, it shows that the mean age of the respondents is 32 years. Majority were males (91.7%), married (75.0%), with secondary education (66.7%). This implies that majority of the respondents were moderately literate and hence stands the chance of understanding the accruing benefits of improved innovations in rice farming practices and this would assist their information seeking habits. The marital status is in line with the submission of Ahien et.al., (2017) that marriage confers responsibility. Mean farming experience of 11 years, monthly income of N30, 637.51k and farm size of 7.0 hectares respectively. This corroborates the ascertain of Bello, et al., (2017). They have average household size of 5 persons and no presence of extension services (91.7%).

Table 1: Distribution of the respondents based on socio-economic characteristics

Variables	Frequency	Percentage	$\bar{x}\pm \delta$
Age (Years.)			
0-20	1	0.8	32.4±1.95
21-30	37	30.8	
31-40	80	66.7	
≥ 41	2	1.7	
Sex			
Male	110	91.7	
Female	10	8.3	
Marital Status			
Single	27	22.5	
Married	90	75.0	
Widowed	2	1.7	
Divorced	1	0.8	
Farming experience (Years)			
1-5	3	2.5	10.88±2.27
6-10	53	44.2	
11-15	57	47.5	
16-20	6	5.0	
≥ 21	1	0.8	
Educational Qualifications			
No Formal Education	1	0.8	
Primary Education	20	16.7	

Variables	Frequency	Percentage	$\bar{x} \pm \delta$
Secondary Education	80	66.7	
Tertiary Education	6	5.0	
Islamic Education	13	10.8	
Average Monthly Income (N)			
1-10,000	2	1.7	30,637.51±3,689.84
10,001-20,000	1	0.8	
20,001-30,000	60	50.0	
30,001-40,000	48	40.0	
40,001-50,000	8	6.7	
≥ 50,001	1	0.8	
Farm Size (ha)			
1-5	40	33.3	7.0±1.2
6-10	66	55.0	
11-15	12	10.0	
≥ 15	2	1.7	
Household Size (No)			
1-5	89	74.2	4.5±1.5
6-10	27	22.5	
11-15	3	2.5	
≥ 15	1	0.8	
Presence of Extension Services			
Yes	10	8.3	
No	110	91.7	

Source: Field Survey, 2022.　　$\bar{x} \pm \delta$=Mean ± Standard Deviation

Respondents' attitude towards SRI innovation practices

The respondents agreed with all the attitudinal statement on SRI innovation practices except the following in Table 2; SRI practices is easy to apply on any rice farm ($\bar{x}$=1.29±1.11), SRI innovation styles can only for educated farmers ($\bar{x}$=0.89±0.91), there is ease of land preparation and transplanting ($\bar{x}$=1.44±1.20), and it does not requires too much high cost in application ($\bar{x}$=1.34±1.14). This is in congruent with the submission of Aromolaran et al. (2017). From the attitudinal index value

($\sum\bar{x}$=1.54±1.23). It shows that the respondents have favorable attitude to the SRI innovation practices. The result of the Categorisation of the attitudinal level of respondents on SRI innovation practices is shown in Table 3 where majority (58.7%) of the respondents at pooled level shows favorable attitude towards the SRI innovation practices. in the study area while smaller proportion of about 1/3 (32.1%) shows low attitudinal disposition to the SRI innovation practices. This is in agreement the work of Singh, et al (2018) on the attitude of farmers to the SRI.

Table 2: Categorisation of the attitude of the respondents on SRI innovation practices

	Kano		Jigawa		Pooled	
Attitudinal Level	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Low	70	32.1	31	31.9	101	32.1
Moderate	20	9.2	9	9.3	29	9.2
High	128	58.7	57	58.8	185	58.7
Total	218	100	97	100	315	100

Source: Field Survey, 2022

Constraints to implementation of the SRI innovation practices

Most of the constraints examined were severe constraints in Table 3 except for none availability of organic manure for usage ($\bar{x}$=3.70±1.50), farm input requirement are expensive ($\bar{x}$=3.45±1.60), inadequate funds to practice the SRI method ($\bar{x}$=3.56±1.58) and the equipment are not available or too expensive to practice SRI innovation into

practice ($\bar{x}$=3.53±1.58) that are very severe. Arifin and Hambali's (2020) discovered that expensive input requirement, limited access to inputs and finance, and adherence to traditional farming practices among others are main barriers to adoption of SRI innovation practices. The mean index value of the constraints shows that SRI innovation practices has a severe constraints ($\bar{x}$=3.21±1.47) militating against its adoption/implementation among the rice farmers in the study area.

Table 3: Distribution of the respondents based on constraints to implementation of SRI innovation practices

Variables	Mean ($\bar{x}$)	SD (δ)	R
No availability of organic manure for usage	3.70	1.50	Very Severe
The Farm inputs requirements are expensive	3.45	1.60	Very Severe
Inadequate funds to practice the SRI method	3.56	1.58	Very Severe
Equipment is not available/expensive to practice SRI innovation into practice	3.53	1.58	Very Severe
Mean Index Value of Constraints	**3.21**	**1.47**	Severe

Source: Field Survey, 2022

It was concluded that respondents have favorable attitude towards SRI practices ($\bar{x}$=1.54±1.23). Periodic advisory services be provided to increase the attitude of the clienteles and adoption of SRI was recommended.

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SANITATION AND HYGIENE BEHAVIOURS AMONG SECONDARY SCHOOL STUDENTS IN RURAL AND URBAN, EKITI STATE, NIGERIA

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ABSTRACT

Many secondary schools in Nigeria face challenges with inadequate sanitation and water supply, which hinders students' access to clean toilets. This study examined sanitary behaviour among secondary school students in rural and urban areas of Ekiti State, Nigeria. A multi-stage sampling technique was used to select 211 respondents from two Local Government Areas (LGAs), Efon-Alaaye and Erinjiyan. Data was collected through questionnaires and analysed using descriptive statistics (frequency, percentages and mean) and inferential statistics (t-test). The average respondents were aged 13.98±1.91 years old, predominantly female (54.0%), Christian (92.9%), and indigenous (66.8%). Most respondents (80.1%) had a high level of knowledge about water, sanitation, and hygiene (WASH). Nearly all schools had a primary water source (93.8%) and separate toilets for boys and girls (91.9%), though only 48.3% had hygiene promotion posters. A favourable attitude towards WASH was seen in 57.3% of respondents, with common practices including covering drinking water storage (2.89±0.40) and washing hands after using the toilet (2.84±0.42). Major barriers to WASH included limited time (2.02±0.95) and resources like soap and buckets (1.86±0.96). A significant gender difference was found in sanitary behaviour (t=0.016, p<0.05). There was no significant difference in the sanitary behaviour between the rural and urban secondary schools. The study recommends addressing time and resource constraints, regular hygiene education, and increasing posters promoting hygiene practices.

Keywords: Sanitation, Hygiene practices, Secondary school

INTRODUCTION

Water, sanitation, and hygiene (WASH) are critical to public health, preventing waterborne diseases like hepatitis B, typhoid, cholera, and diarrhoea. In Nigeria, diarrhoea alone causes over 121,800 deaths annually, primarily due to poor access to clean water and sanitation (World Bank, 2012). Access to safe drinking water is essential for national development, nutrition, and health (Shahid et al., 2018). In 2018, Nigeria declared its WASH sector in a state of emergency, highlighting the urgent need for improved facilities. Secondary schools in Nigeria face significant WASH challenges, with inadequate sanitation, limited water access, and unhygienic facilities. Many students lack clean toilets and drinking water, hindering proper hygiene practices. This situation reflects a broader gap in understanding the state of WASH practices and the barriers students face in maintaining them. To address this, school-based WASH programs can promote better hygiene behaviours and infrastructure improvements, with students acting as ambassadors to spread WASH awareness within their communities (Winter et al., 2021). However, WASH progress remains slow in Nigeria and other parts of Africa, and more comprehensive efforts are needed to tackle these issues effectively. The program indeed takes students as good ambassadors that are supposed to massively relate the good WASH policies to the larger society at home (Winter *et al*., 2021).

The main objective of this study was to assess water sanitation and hygiene behaviours among secondary school students in Efon- Alaaye and Erinjiyan, Ekiti State, Nigeria. The specific objectives were to:

i. examine the students' knowledge level on the best practices in maintaining sanitation and hygiene,
ii. determine the attitude of the students to appropriate sanitation and hygiene practices in schools,
iii. examine the sanitary practices among students in secondary schools,
iv. identify the constraints faced by students in maintaining proper wash behaviours.

The hypotheses of the study:

i There is no significant difference in the sanitation and hygiene behaviours between male and female students in secondary schools.
ii. There is no significant difference in the hygiene behaviours of Efon- Alaaye secondary schools and Erinjiyan-Ekiti secondary schools.

METHODOLOGY

The study was conducted in Efon-Alaaye and Erinjiyan in Ekiti State, Nigeria, which is located in the southwestern region. Ekiti was created in 1996 and has 16 Local Government Areas. Efon-Alaaye lies between latitudes 7°6' N and 7°15' N, and longitudes 4°8' E and 4°52' E, in a valley with numerous rivers and streams. Erinjiyan, also known as the Golden City, is situated between latitudes 7°30' N and 7°45' N, and longitudes 4°23' E and 5°5' E, approximately 30 km from Ado-Ekiti, the state capital. The majority of the population in both areas is involved in farming. The study was conducted in secondary schools in Efon-Alaaye (urban) and Erinjiyan-Ekiti (rural) in Ekiti state.

A multistage sampling procedure was used in this study. The purposive sampling technique selected two local government areas in Ekiti State (Efon-Alaaye and Erinjiyan-Ekiti representing urban and rural areas). Seven public secondary

schools in Efon-Alaaye were enumerated, and 30% were randomly selected, yielding two schools (Christ Apostolic Church Grammar School and Apostle Babalola Memorial Grammar School). Similarly, 30% of the five private schools in the area were randomly chosen, providing two schools for the study. In Erinjiyan-Ekiti, 30% of the two public schools (Erin-Ayonigba High School and Erinjiyan Community High School) were selected, resulting in one school. Additionally, 30% of the two private schools (Olive Royal Academy and Bazzallel Excellent College) were selected, yielding one school. In the final stage, the total student population in each selected school was obtained from the vice principal's office, and 20% of students were randomly selected for the study. A total of 211 respondents participated. Primary data were collected using a questionnaire, which was used to solicit information from the respondents. Data were analysed using descriptive statistics (frequencies,

percentages, and means) and inferential statistics (T-test) for hypothesis testing.

RESULTS AND DISCUSSION
Characteristics of the respondents

Table 1 shows that 82% of respondents were under 15 years, with a mean age of 13.98±1.91 years, indicating they are in a vulnerable age group at high risk for infections and diseases if proper WASH practices are not followed. Egbinola and Amanambu (2015) note that children aged 5-14 are more prone to such risks, which can impact their academic performance, physical growth, and cognitive development. Most respondents (54%) were female, reflecting the greater need for WASH resources among women. The majority (92.9%) were Christian, with 7.1% identifying as Muslim, suggesting Christianity as the dominant religion. Vanderweele (2017) suggests that religious beliefs influence health and hygiene attitudes.

Table1: Respondents' personal characteristics

Variables	Responses	F	%
Age (years)	< 15	173	82.0
(13.98±1.91)	>15	38	18.0
Sex	Male	97	46.0
	Female	114	54.0
Religion	Christianity	196	92.9
	Islam	15	7.1

Source: Field survey, 2023

Categorisation of respondents' knowledge level on WASH practices

Table 2 shows that the majority (80.1%) of the respondents had a high level of knowledge on WASH while 19.9% had a low level of knowledge. This implies that most of the respondents have good knowledge of water, sanitation and hygiene practices. This could be as a result of educational exposure of the respondents. This result agrees with the findings of Alula Seyum et al. (2018), which

revealed that reasonable percentage above half understands water and sanitation practices for healthy lifestyle through school programs. Majority of the respondents exhibiting a high level of knowledge suggests a favorable starting point for implementing interventions aimed at fostering improved WASH behaviours. Majority (57.3%) of the respondents had favourable perception towards wash practices while 42.7% had unfavourable attitude.

Table 2: Categorisation of the respondents based on Knowledge level on the best practices of students' in maintaining sanitation and hygiene

Knowledge level	F	%	Statistics
Low	42	19.9	
High	169	80.1	

Min =8, Max =15, Mean =13.37, SD =1.25

Categorisation of sanitary practices among the students

Table 3 shows that the majority (68.7%) of the respondents had high compliance to sanitary practices while 31.3% of the respondents had low compliance to sanitary practices. This implies that

most of the respondents are knowledgeable about sanitary practices and also comply with the practices. This agrees with the findings of Rawan *et al.*, (2018), which stated that compliance with sanitary practices by the respondent was very high due to their high-level of awareness.

Table 3: Categorisation of the respondents based on their sanitary practices

Sanitary practices	F	%	Statistics
Low	66	31.3	Min =28, Max = 48
High	145	68.7	Mean =41.27, SD =3.84

Source: Field survey, 2023

Categorisation of Sanitary behaviour of the respondents

Table 4 shows that 54.5% of the respondents had positive sanitary behaviour, while 45.5% had negative behaviour. This implies that knowledge, attitude and practices of sanitation and hygiene among students in Ekiti state is marginally high. This may be attributed to high knowledge of WASH practices (80.1%), favourable attitude to WASH (57.3%), and High sanitary practices (68.7%) among the respondents. This aligns with the importance of knowledge as a precursor to positive behaviour change in sanitation and hygiene practices. Otto et al. (2022) found that, alongside accessible basic WASH resources (e.g., water, soap, toilets), sufficient understanding of WASH is essential for effective practice.

Table 4: Sanitary behaviour

Sanitary behaviour	F	%	Statistics
Negative	96	45.5	
Positive	115	54.5	

Min =71, Max =108, Mean =95.05, SD =8.27
Source: Field survey, 2023

Constraints faced by students in maintaining proper water sanitation and hygiene practices

Table 5 highlights student constraints to WASH. The major constraint is limited time due to school activities (2.02), followed by inadequate resources (soap, bowls, buckets) at 1.86. This supports Otto et al. (2022), who emphasized that WASH practices require essential resources. A lack of school programs promoting sanitation and hygiene (1.73) ranks 5th, consistent with Olukanmi (2013), who found minimal hygiene initiatives and insufficient support for menstrual hygiene. This aligns with Adam et al. (2009), who noted inadequate hygiene education and facilities in Nigerian public secondary schools.

Table 5: Constraints faced by students in maintaining proper water sanitation and hygiene practices

Constraints	Not a constraint F (%)	Mild constraint F (%)	Severe constraint F (%)	Mean	Rank
Inadequate toilet facilities	139 (65.9)	10 (4.7)	62 (29.4)	1.64	5
Dirty toilet facilities	166 (78.7)	15 (7.1)	30 (14.2)	1.36	7
Limited knowledge of the importance of water, sanitation and hygiene behaviours	114 (54.0)	16 (7.6)	81 (38.4)	1.84	3
Limited time due to school activities	93 (44.1)	20 (9.5)	98 (46.4)	2.02	1
Limited resources such as soap, bowls and buckets	113 (53.6)	15 (7.1)	83 (39.3)	1.86	2
Lack of school programs or activities that focus on promoting good sanitation and hygiene behaviours	124 (58.8)	19 (9.0)	68 (32.2)	1.73	4
Lack of parental involvement in teaching and enforcing hygiene practices at home	143 (67.8)	11 (5.2)	57 (27.0)	1.59	6

Source: Field survey, 2023

Hypothesis Testing

The result of the hypotheses on sanitary behaviours of male and female students revealed that there was a significant difference (t=0.016, p<0.05) in the sanitary behaviour of male and female students. Possible reasons for this discrepancy could indicate variations in socialization patterns, with traditional gender roles influencing attitude towards cleanliness. There was no significant difference in the sanitary behaviour between the rural and urban secondary schools. This could be that the common educational curriculum, government policies and interventions, access to information, educational initiatives and infrastructure development may have been the same and have influenced sanitary behaviour in a consistent manner and implemented uniformly across different school settings.

Table 6: Difference in the sanitary behaviour of male and female students

Variable	N	Mean	SD	SE	t-value	Df	p-value
Male	97	95.06	7.58	0.77	0.016	209	0.026*
Female	114	95.04	8.85	0.83			

Table 7: Difference in the sanitary behaviour between rural and urban secondary schools

Variable	N	Mean	SD	SE	t-value	Df	p-value
Rural	53	99.49	7.97	1.09	4.74	209	0.504
Urban	158	93.56	7.85	0.62			

Source: Field survey, 2023

CONCLUSION AND RECOMMENDATION

From the findings, it can be concluded that most respondents were young, female, and Christians. Respondents had high knowledge level and favourable perception towards wash practices. The most important constraints faced by the respondents was limited time due to school activities and limited resources such as soap, bowls and buckets respectively. Respondents' sanitary behaviour (knowledge, attitude and practices of WASH) was positive. There was a difference in the sanitary behaviour of male and female students while there was no difference in the sanitary behaviour of rural and urban secondary schools.

Based on the conclusions of the study, the following recommendation are made;

1. Respondents favourable attitudinal disposition towards WASH practices should be sustained through regular sensitization by teachers, government, WHO, World Bank and NGOs, building a resilient commitment to hygiene within the school community.

2. Effort should be made in alleviating all the constraints most importantly limited time due to school activities and limited resources such as soap, bowls and buckets.

3. Educational programmes that promote hygiene and sanitation should be regularly organized for the students and also sufficient posters or signs should be near the toilet facilities and in the school environment to serve as constant reminders, reforcing resilience and WASH practices among students.

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DETERMINANTS OF HEALTH INSURANCE SCHEMES' USAGE AMONG ENROLLEES IN RURAL COMMUNITIES IN OYO STATE, NIGERIA

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ABSTRACT

The study assessed the determinants of health insurance scheme usage among rural enrolees in Oyo State, Nigeria. It addressed financial constraints due to rising healthcare costs and evaluated the effectiveness of the health insurance scheme in providing affordable healthcare access. A multi-stage sampling method selected 144 enrolees, with data gathered through interview schedules (questionnaire) and secondary sources. Data were collected on the respondents' knowledge of health insurance scheme enrolment and use conditions including the challenges faced. The analysis involved descriptive (frequency, percentages) and inferential statistics like Chi-square, Pearson Product Moment Correlation, and regression analyses. The respondents were aged 49.2±11.1 years, with a household size of 4.8±1.4 members. Most were female (53.5%), married (89.6%), Christian (63.9%), had tertiary education (79.9%) and were civil servants (34.7%). Majority (66.0%) had a high knowledge of health insurance but only 52.1% utilised it actively. The main challenge was minimal drug cost coverage (1.92±0.87). Enrolees occupation ($\beta=0.188$), benefits derived ($\beta=0.712$) and challenges faced ($\beta=-0.129$) significantly influenced utilisation of health insurance. Usage of health insurance scheme was poor but could be enhanced by increasing the benefits of the scheme such as drugs and treatment received and by enrolling more non-formal sector actors in the scheme.

Keywords: Health insurance, Enrolees, Oyo State Health Insurance Agency, Economic development

INTRODUCTION

Good quality health care is both a human right and a means of combating poverty and injustice. Universal Health Coverage (UHC) is a simple yet impactful concept that has become a top priority in global health and it has been recognized as one of the World Health Organization's three key strategic goals for 2019-2023 underscoring its status as a global health imperative (Nyandekwe et.al 2020). Health insurance as a means of health inclusion has a significant relationship with economic development in Nigeria and socio-economic productivity of the people (Agum, 2020). However, in 2018, 76.6% of healthcare expenditure in Nigeria was made from out-of-pocket which ranked the country as the third country with highest out-of-pocket spending (Dataphyte, 2021). To expand health insurance coverage in Nigeria, the Oyo State Health Insurance Agency (OYSHIA) was founded on August 18, 2015, and legally mandated on December 1, 2016, to offer affordable, comprehensive healthcare and financial protection to all residents, including vulnerable groups. As of 2023, 184,757 people have enrolled, with 103,444 from the formal sector and 81,313 from the informal sector. However, there is no profound data on rural utilisation of the scheme (OYSHIA, 2023).

The main objective of this study is to evaluate the determinants of health insurance scheme usage among enrolees in rural communities in Oyo State, Nigeria. The specific objectives of the study were to:
i. describe the socio-economic characteristics of the enrolees.
ii. ascertain the challenges faced by the enrolees in using health insurance scheme.
The hypotheses of the study:

i. There is no significant relationship between the challenges enrolees faced in the use of health insurance and their level of usage.
ii. There is no significant contribution of the independent variable (age, sex, education, occupation, knowledge, benefits, challenges) to the dependent variable.

METHODOLOGY

The study focuses on Oyo State, Nigeria, known as the "Pace Setter." This predominantly Yoruba state has a largely agrarian population. The main ethnic groups are the Oyos, Ogbomosos, Oke-Oguns, Ibadans, and Ibarapas. Oyo State has 33 Local Government Areas (LGAs) and 29 Local Council Development Areas (LCDAs). The state offers affordable healthcare scheme through the Oyo State Health Insurance Agency (OYSHIA), with accredited facilities (government and private hospitals and PHC) across all LGAs. This study's population is comprised of OYSHIA enrolees in selected communities in Oyo State.

Multistage sampling procedure was used. The first stage involved a simple random selection of three (Afijio, Ibarapa central, Ido) out of the thirty-three LGAs in Oyo State and two out of the 10 wards from each LGAs. The second stage was the random selection of three communities from each of the wards: Afijio (Ilora, Jobele, Akinmorin), Ibarapa central (Oke-seni, Igbole, Isale-oba), Ido (Omi Adio, Jiboye, Aba-Oke) and 50% of the accredited OYSHIA facilities in the communities were selected. The final stage was the proportionate sampling to size of total number of enrolees in the selected facilities in the communities to give a total of 144 respondents.

Primary and secondary data sources of information were used to collect data. Primary data was collected through the use of interview schedule.

Secondary data was collected from Oyo State Health Insurance Agency state office, secretariat, Agodi, Ibadan.

The dependent variable of this study is health insurance scheme usage of rural enrolees. They were asked to select the health care conditions/treatment received from their service providers. This was measured as Always, Occasionally and Never and Scores of 3, 2 and 1 were assigned respectively. The mean score was computed and used to categorise into high and low level of usage. Also, challenges was measured using three point rating scale of severe, mild and not a challenge and scores of 3, 2, 1 was assigned respectively. The mean score of each statement was computed and ranked. The data collected were appropriately statistically analyzed using descriptive (frequency distribution, mean and percentage) and linear regression analyses.

RESULTS AND DISCUSSION
Socioeconomic characteristics

Result in Table 1 shows that 34% of respondents were aged 51-60, while 33.3% were 41-50, with a mean age of 49.2±11.1 years, indicating that most were adults likely to use health insurance. This aligns with Adewole et al. (2020) findings on NHIS users in Ibadan. Also, females comprised 53.5% of respondents, suggesting higher usage than males. Most respondents (79.9%) had tertiary education, enabling them to understand the health insurance packages under OYSHIA. Occupationally, 34.7% were civil servants, 30.6% were teachers, and others were traders, retirees, farmers, or in small trades, reflecting OYSHIA's mandate for all residents to register under the scheme. This enrolment is expected to promote health and quality of life in the state.

Table1: Socioeconomic characteristics of the respondents

Variables	Response Options	F (%)
Age (years)		
49.2±11.1	≤30	6 (4.2)
	31-40	25 (17.4)
	41-50	48 (33.3)
	51-60	49(34.0)
	61-70	10 (6.9)
	>70	6 (4.2)
Sex	Male	67 (46.5)
	Female	77 (53.5)
Educational status	Primary	2 (1.4)
	Secondary	27 (18.8)
	Tertiary	115 (79.9)
Occupation	Farming	7 (4.9)
	Civil servant	50 (34.7)
	Trading	21 (14.6)
	Artisans	3 (2.1)
	Teaching	44 (30.6)
	Retiree	14 (9.7)
	others	5 (3.5)

Source: Field survey (2023) Figures in parentheses are percentages

Table 2: Categorization of the enrolees based on knowledge of health insurance scheme and use conditions (OYSHIA)

Knowledge level	Frequency	Percentage	Min.	Max.	Mean	SD
Low <19	49	34.0	8.00	26.00	19.33	3.67
High 19 and above	95	66.0				
Total	144	100.0				

Source: Field survey, 2023.

Table 3: Categorization of benefits enrolees derived from the use of health insurance (OYSHIA)

Benefit category	Frequency	Percentage	Min.	Max.	Mean	SD
Low <16	51	35.4	7.00	21.00	16.56	5.05
High 16 and above	93	64.6				
Total	144	100.0				

Source: Field survey, 2023.

Challenges faced in using health insurance scheme (OYSHIA)

Health insurance enrolees encounter different constraints in the use of the scheme. Table 4 shows that the major constraint faced by enrolees in the

study area was low cost covered on drugs by the scheme ($\bar{x}$=1.92) which was ranked 1st. This was followed by high cost of health insurance premiums ($\bar{x}$=1.47) which ranked 2nd and poor delivery of treatment and care ($\bar{x}$=1.46) which was ranked 3rd. This implies that drugs given to rural enrolees whenever they visit health facilities were not sufficient which led to an out-of-pocket mechanism for the purchase of drugs despite the cost/deductions of health premiums and this could lead to a loss of interest and low usage of the health insurance scheme (OYSHIA).

Table 4: Challenges faced in using health insurance scheme (OYSHIA)

Statements	Severe challenge	Mild challenge	Not a challenge	Mean	Rank
Long distance to the health facilities	24 (16.7)	16 (11.1)	104 (72.2)	1.44	4th
High cost of health insurance premium	15 (10.4)	38 (26.4)	91 (63.2)	1.47	2nd
Poor facility	10 (6.9)	27 (18.8)	107 (74.3)	1.32	5th
Poor delivery of treatment and care	25 (17.4)	16 (11.1)	103 (71.5)	1.46	3rd
Bad road network from residents to health facilities	10 (6.9)	11 (7.6)	123 (85.4)	1.21	6th
Drug cost covered is minimal	49 (34.0)	35 (24.3)	60 (41.7)	1.92	1st
Health facility is imposed	13 (9.0)	21 (14.6)	110 (76.4)	1.32	5th

Source: Field survey 2023, Figures in parentheses are percentages

Categorisation of the enrolees based on utilisation of health insurance scheme (OYSHIA)

Table 5 shows that majority (52.1%) of the respondents had low utilisation of health insurance scheme while 47.9% of them had high utilisation. This implies that the respondents in the study area had low level of utilisation despite their high level of knowledge. Some enrolees especially civil servant forgot their assigned health facilities since they were automatically enrolled and has never utilised the scheme, while some complained that their package does not cover their family and they see no reason to utilise the scheme. This goes against the study of Adetona and Kio (2020) that reported high (65.9%) utilisation of health insurance among household heads in rural communities of Ogun state.

Table 5: Categorization of the enrolees based on utilisation of health insurance (OYSHIA)

Level of utilisation	Frequency	Percentage	Min.	Max.	Mean	SD
Low <63	75	52.1	58.00	77.00	63.45	3.90
High 63 and above	69	47.9				
Total	144	100.0				

Source: Field survey, 2023.

Contribution of the independent variables to the level of usage of health insurance scheme

Regression was conducted on the contribution of the independent variables to the level of usage of health insurance scheme in the study area. The results of the regression analysis revealed R^2 value of 0.667. This indicated that the independent variables explain 66.7% of the level of utilisation of health insurance scheme among OYSHIA enrolees in rural communities of Oyo State. Table 6 reveals that occupation (β = 0.188, $p < 0.05$), benefits (β = 0.712, $p < 0.05$) and challenges (β = -0.129, $p < 0.05$) significantly determined level of utilisation of health insurance scheme (OYSHIA). This implies that occupation, benefits derived, and challenges faced had a direct influence on the utilisation of health insurance scheme. This implies that civil servant has a higher tendency to engage in insurance scheme as presented in Table1 because of their automatic enrolment as government staff. Benefits respondents derive from the use of the scheme determine the level at which the scheme is being utilised especially in terms of financial protection and improved health outcomes. Also, challenges like minimal drug cost covered, high cost of insurance premiums and poor delivery of treatment and care as shown in Table 4 reduce enrolees engagement and use of the scheme in the study area. The majority of the enrolees complained about insufficient drugs while most of them complained that they were given cheap drugs while the costly ones were purchased out-of-pocket. These reduce the confidence and engagement of the respondents in the scheme.

Table 6: Factors influencing the utilisation of health insurance scheme

Variables	Standardized coefficients (β)	t-value	p-value
Age	-0.094	-1.363	0.175
Sex	0.068	1.262	0.209
Education	-0.076	-1.450	0.149
Occupation	0.188	3.204	0.002*
Knowledge	0.035	0.600	0.549
Benefits	0.712	10.241	0.000*
Challenges	-0.129	-1.984	0.049*

Source: Field survey (2023) R=0.816, R^2=0.667, Adjusted R^2= 0.630, Standard error=2.37, $\alpha_{0.05}$, *p$\leq$0.05

CONCLUSION AND RECOMMENDATIONS

The study concluded that enrolees had high knowledge, derived high benefits, low utilisation and majority of them were civil servant. Minimum drug cost covered, high cost of health insurance premium and poor delivery of treatment and care were the most severe challenges faced in the use of health insurance scheme OYSHIA. Enrolees' occupation, challenges faced, and benefits significantly influenced level of utilisation of health insurance scheme. It is concluded from the study that in order to build resilience and increase the level of utilisation of health insurance among enrolees in rural communities of Oyo state, occupation, challenges faced, and benefits must be put into consideration. It was therefore recommended that;

1. Considering the occupation, flexible payment plans, like monthly or quarterly premiums, can help individuals with irregular incomes, particularly in the informal sector, access insurance more easily. This approach will enhance financial resilience and promotes consistent enrolment and usage of insurance services

2. Expanding drug and treatment coverage in health insurance can reduce enrollees' financial burdens, making the scheme more appealing and sustainable. This improvement addresses key challenges and enhances enrollees' resilience to rising healthcare costs.

3. Involving community leaders, associations, and cooperatives can effectively promote the insurance scheme in rural and non-formal sectors. This bottom-up approach fosters trust, encourages participation, and broadens the scheme's reach.

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EFFECT OF KWARA STATE SOCIAL INVESTMENT PROGRAMME (KWASSIP) ON RURAL WOMEN IN AGRICULTURAL PRODUCTIVITY IN EKITI LOCAL GOVERNMENT AREA, KWARA STATE NIGERIA

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ABSTRACT
Stereotypes against women in agriculture are highly detrimental to the agricultural productivity in Ekiti LGA of Kwara State. To resolve the inequality gap, this study seeks to determine the effect of KWASSIP on rural women in agricultural productivity in Ekiti Local Government Area. Eighty (80) women farmers were interviewed. Data were collected with a well-structured interview schedule and analysed using descriptive statistics. The findings revealed that, most (75%) respondents acquired land through leasing, renting, and community land. Land unavailability (X=2.97) was the most limiting constraint next was gender discrimination (X=2.53) was the most severe constraint limiting the respondents. The study concludes that the KWASSIP program has influenced the output of the respondents greatly and has brought tremendous improvement in their yields. Therefore, it is recommended that more awareness should be created about the project and, more female extensionists should be mobilized to the rural areas to make women farmers aware of how can improve their farm productivity.
Keywords: KWASSIP program, Rural Women and Agricultural productivity

INTRODUCTION

Nigeria's agriculture sector remains the country's largest employer of labour in 2023, with over 25 million people who engaged in agricultural activities representing about 30.1% of the total workforce according to the National Bureau of Statistics (NBS, 2023). Other sectors have significant growth and development, but agriculture continues to be the backbone of the Nigerian workforce. Available data revealed that 25 million people are actively employed in the agricultural sector, far surpassing other industries. Meaning that agriculture is a critical means of livelihood for rural dwellers and a key pathway out of poverty. Agriculture has been identified as a weapon to fight against impending household food insecurity (Adewumi, 2024).

According to Okunade (2018) who affirmed that many women in developing countries face numerous challenges, that is lingering their involvement in agricultural activities i.e. constrained by a lack of access to inputs, political discrimination, and poor access to government intervention programs, and services. They also often lack incentives to invest given the greater vulnerability and proportionately greater exposure to risk that resulted from having fewer assets.

Despite discrimination, inequality, and stereotypes against women in agriculture, Women remain active key players in agriculture and allied fields. Rural women play a key role by working with full passion in the production of crops right from the soil preparation to the post-harvest stage (Ologbenla et al., 2019). It was estimated that women are responsible for 70 percent of actual farm work. Currently women make up to 49.6% of the world's population, this translates to roughly 3.9 billion women compared to 4 billion men, resulting in a global surplus of about 57 million men (NBS, 2023). With this population advantage no much recognition is given to them as an important contributor to agricultural productivity they remain invisible

workers (Okunade et al., 2018). Affirmed that women must be given a full chance to participate in decision-making as they are actively engaged in home and farm activities. Women make up a substantial majority of the agricultural workforce and produce most of the food that is consumed in sub-Saharan Africa an engine of economic development.

The productivity and economic empowerment of women is therefore a logical priority of agricultural programs and policies that seek to promote agricultural development. The priority is warranted both in terms of the importance of women's agricultural production as a source of economic growth and as a source of rural livelihoods and policy reduction.

Agriculture remains a very important sector of the Nigerian economy. It contributes significantly to food and fibre production for feeding the ever-increasing population, and employment generation. Central Bank of Nigeria (CBN, 2023) noted that if Nigeria is to meet food requirements and generate the financial resources needed for its overall development program, it must improve its agricultural performance. Agricultural productivity is low despite all efforts especially when the actual yield of the staple food is compared with the potential yield (Okunade et al.,2018). The implication is that there is a need for the government to extend agricultural scope for value additional which will lead to an increase in output from existing hectares that are properly targeted to be harnessed due to the introduction of various programs to overcome these shortcomings, among such programs are; National Agriculture Technology and Innovation Policy (NATIP, 2021-2025), Agricultural Promotion Policy (APP, 2016), National Food Security program, Kwara State Social Investment program (KWASSIP, 2019). Kwara State Social Investment Program (KWASSIP) is one of the agricultural development programs established by the Kwara State

Government to increase productivity in agriculture. KWASSIP is a rural-based agricultural outfit established to stimulate efficient agricultural production through the dissemination of hybrid seeds. The main goal of KWASSIP is to alleviate poverty and enhance financial inclusion. The program is projected to lift 500,000 people out of poverty. Focuses on empowering rural people and promoting economic growth by supporting women in agriculture (KWASSIP Annual Report, 2023).

In spite that, many of women activities are not well defined as "economically active. This article sought to provide answer to these following research questions. What are the various farm activities in which women farmers have been involved? What are the problems confronting women farmers in the study areas?

The specific objectives of the study are to;
1. determine the various farm activities in which farmers have been involved.
2. identify the problem confronting women farmers in the study areas.

METHODOLOGY
The study was carried out in Ekiti Local Government Area of Kwara state. 40 out of 200 farmers were selected for the study. Two respondents were randomly selected from each of the chosen groups giving a total of 80 respondents. Two women farmers were chosen from each of the

groups that were selected for the study to give a sample size of 80 women farmers. A well-structured and validated interview schedule was used to collect information from the respondents.

The dependent variable is the effect of KWASSIP on women's agricultural productivity. The effect of KWASSIP on women's agricultural productivity was measured by:
1. Identified various farm activities in which women farmers involved
2. Identify problems confronting respondents in the study area.

RESULT AND DISCUSSION
Farming activities involved by the respondents and their awareness
The result in Table 1 revealed that sowing ranked 1st WMS=1.7 in women's farming activities, Next is inter-cultural practices, weeding and harvesting ranked 2nd (WMS=1.5), followed by pricking ranked 3rd (WMS=0.8), while land clearing ranked 4th (WMS=0.5). This implies that the majority of the women are more engaged in sowing as part of their farming activity. Also, the finding from Table 2 shows that 66.2% of the respondents were aware of KWASSIP while 33.8% did not know anything about KWASSIP. This indicates that the majority of the women are aware of KWASSIP and this has been of help to them in participating in agricultural activities.

Table 1: Distribution of respondent based on their farming activities

Farm activities	Highly Involved	Involved	Not involved	WMS	Rank
Land clearing	11(13.8)	17(21.3)	52(65.0)	0.5	5th
Land preparation	22(27.5)	20(25.0)	38(47.5)	0.8	4th
Sowing	54(67.5)	24(30.0)	2(2.5)	1.7	1th
Intercultural practices	43(53.8)	32(40.0)	5(6.3)	1.5	2th
Weeding	48(60.0)	24(30.0)	8(10.0)	1.5	2th
Harvesting	46(57.5)	27(38.8)	7(8.8)	1.5	2th
Picking	38(45.0)	24 (30.0)	20(25.0)	1.3	3th
Cleaning of grains	25(31.3)	14(17.5)	41(51.2)	0.8	4th
Drying of grains	25(31.3)	15(18.8)	40(50.0)	0.8	4th

Source: Field survey, 2023

Effects of KWASSIP on agricultural activities.
Table 2 shows the effects noticed on the farm. Higher yield ranked 1st (WMS=0.5), better livestock production ranked 2nd (WMS=0.3), rapid germination, low use of farm labour, easy control of

pest and disease, and early maturity of crops ranked 3rd (WMS=0.1), while better conversation of products into snacks and increase income ranked 4th (WMS=0.0). This implies that the women experienced higher yield in their productivity.

Table 2: Respondents based on the effects of their agricultural activities

Effects noticed on farm	Yes	No	WMS	Rank
Higher yield	43(53.8)	7(46.3)	0.5	1st
Better livestock production	24(30.0)	56(70.0)	0.3	2nd
Rapid germination	5(6.3)	75(93.8)	0.1	3rd
Low use of farm labour	8(10.0)	72(90.0)	0.1	3rd
Better conversion of produce into a product	1(1.3)	79(98.8)	0.0	4th
Increase income	3(3.8)	77(96.3)	0.0	4th
Easy control of pests and disease	7(8.8)	73(91.3)	0.1	3rd
Early maturity of crops	7(8.8)	73(91.3)	0.1	3rd

Source: Field survey, 2023

Problem encountered by women farmers

Table 3 further shows that lack of credit accessibility ranked 1st (WMS=3.8), inadequate female extensionist ranked 2nd (WMS=2.8), restricted availability of land ranked 3rd (WMS=2.2), division of labour ranked 4th (WMS=1.9), lack of farm input and decision-making ranked 5th (WMS=1.2). All these call for urgent intervention from the government to improve their productivity. This shows that the major problem facing the women is lack of credit accessibility in the government should intervene in the situation.

Table 3: Distribution of respondents based on the problem encountered

Constraints	Strongly agreed	Agreed	Undecided	Disagreed	Strongly disagreed	WMS	Rank
Lack of farm input	10 (12.6)	11 (13.8)	-	20 (25.0)	39 (48.5)	1.2	5th
Division of labour	22 (27.5)	6 (7.5)	10 (12.5)	25 (31.5)	17 (31.5)	1.9	4th
Restricted availability of land	31 (38.8)	7 (8.8)	2 (2.5)	24 (30.0)	16 (20.0)	2.2	2nd
Decision making	7 (8.8)	4 (5.0)	16 (20.0)	24 (30.0)	29 (36.3)	1.2	5th
Inadequate female extensionist	51 (63.7)	5 (6.3)	-	4 (5.0)	20 (25.0)	2.8	3rd
Lack of credit accessibility	72 (90.0)	4 (5.0)	-	3 (3.8)	1 (1.3)	3.8	1st

Source: Field survey, 2023

CONCLUSION AND RECOMMENDATIONS

The following conclusions are made based on the findings:

1. That women farmers are putting their best into agricultural activities such as crop production.
2. That KWASSIP is valid, and effective and should not cease to exist.

Based on the findings of the study, it is therefore recommended that rural women's potential in Agricultural activities should be recognized and tapped to boast Agricultural production. These women should be exposed to capacity building training to harness their hidden potential to optimum capacity for effective performance in Agricultural production. Emphasis should be that:

1. The government should provide credit societies to assist women farmers in increasing their farm productivity.
2. More female extensionists should be mobilized to the rural areas to make women farmers aware of how can improve their farm productivity.
3. The government should provide adequate storage facilities to reduce the amount of losses in foodstuffs, especially more perishable ones.

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EFFECTS OF FARMER-HERDER CONFLICT ON MAIZE FARMERS' PRODUCTIVITY AND LIVELIHOOD IN KAFUR LOCAL GOVERNMENT AREA OF KATSINA STATE, NIGERIA

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ABSTRACT
The study assessed the effect of farmer-herder conflict on farmers' productivity and livelihood in Kafur Local Government Area of Katsina State. The study was guided by four specific objectives and adopted a descriptive survey design. A total of 147 respondents comprising 114 crop farmers and 33 herders were randomly selected for the study. A structured interview schedule was used to collect data which was analyzed using simple percentages and mean scores. The result showed that distortion of marital kinship ($\bar{x}$=4.3), and rural-urban migration ($\bar{x}$=4.3) were the major effects of conflicts on the livelihood of maize crop farmers. Indiscriminate bush burning ($\bar{x}$=4.3) and the growth of ethnic profiling and hate speeches ($\bar{x}$4.2) were the two major causes of conflicts. Also, the result showed traditional rulers ($\bar{x}$=4.0) were more influential in resolution. The study concludes that farmers' livelihood was disrupted by farmer-herder clashes/conflicts. The study recommended that the government should promote enhanced public information and education on the need to respect the laws on restricted areas such as grazing and forest reserves, as well as involve indigenous resource user groups in policies relating to natural resource management and utilization.
Keywords: Farmer-herder conflict, farm productivity, farmers' livelihood

INTRODUCTION

The farmer-herder conflict in Nigeria has become a significant challenge, severely affecting agricultural productivity and rural livelihoods (Achimugu and Alexander, 2024). This conflict arises from competition for vital resources like land and water, leading to violence, displacement, and economic disruption (Safari and Wambua, 2024). Historically prevalent, these tensions have intensified due to population growth and climate change, directly threatening food security and the sustainability of agricultural production (Ifedayo, 2023).

Despite the mutual benefits derived from their relationship—crop farmers providing feed for herders and herders supplying manure—conflicts frequently erupt over grazing land and cattle routes (Audu and Audu, 2023). These disputes typically escalate during the early rainy season and as harvest time approaches, resulting in crop damage and confrontations (Mbih, 2020). Efforts by traditional rulers and stakeholders to mitigate these conflicts have yet to produce lasting solutions, leading to widespread disruptions in socio-economic, religious, and educational activities. The ongoing violence not only affects individual households but also poses serious threats to Nigeria's national unity and political stability (Ebonyi, 2023).

The primary objective of this study was to evaluate the causes of conflict and the resolution strategies between maize farmers and herders in the Kafur Local Government area of Katsina State. Specifically, the study identified the underlying causes of conflict between maize farmers and herders in the Kafur Local Government area; assessed the impact of these conflicts on the livelihoods of maize farmers and explored potential resolution strategies that could be implemented to mitigate conflicts between maize farmers and herders in the Kafur Local Government area.

METHODOLOGY

The study in Kafur Local Government, Katsina State, involved registered maize farmers and herders. Multistage sampling procedure selected 147 respondents using purposive and proportionate sampling. Data were collected through interviews with open-ended and Likert-type scales, then analysed for means, counts, and significance based on the grand mean.

Table 1: Sample Distribution of Respondents

S/N	Wards	Farmers	Herders	
1	Unguwar Gyara	17	3	
2	Unguwar Nuhu	30	5	
3	Unguwar Maina	25	2	
4	Unguwar Mato	20	3	
5	Unguwar Gwaza	15	2	
6	Rugar Namadu	1	4	
7	Rugar Jare	3	5	
8	Rugar Shanu	2	7	
9	Rugar Jali	1	2	
	Total	114	33	147

RESULTS AND DISCUSSION

Causes of conflict between crop farmers and herders in Kafur local government

Indiscriminate bush burning ($\bar{x}$ = 4.3) is the primary conflict factor between maize farmers and herders, as it destroys forage. Other significant contributors include ethnic profiling (4.2), land tenure issues, migratory grazing practices (4.1) as shown in Table 2, and resource access challenges (4.0), which heighten tensions and hinder coexistence (Olamide, 2024).

Table 2: Causes of conflict between the maize crop farmers and herders

Causes of conflict	SA	A	U	D	SD	Sum	$\bar{x}$	Sig
Indiscriminate bush burning	54	37	3	3	2	2.92	4.3	S
Growth of ethnic profiling and hate speeches	50	38	3	6	2	2.89	4.2	S
Land tenure system	40	48	4	8	3	2.87	4.1	S
Migratory grazing	30	61	1	5	3	2.78	4.1	S
High number of herders to cattle ratio	44	33	5	10	4	2.65	4.1	S
Inadequate natural grazing reserves	31	54	6	4	5	2.73	4.0	N
Lack of access to water point	38	44	4	7	7	2.71	4.0	N
Disregard for local rules and regulation	42	44	4	1	9	2.61	4.0	N
Limited or decline in natural resources	40	41	7	10	2	2.62	4.0	N
Farming on the cattle route	42	37	6	9	6	2.72	3.9	NS
Climate change (flood/Drought)	35	42	5	12	5	2.63	3.8	NS
Theft	31	45	1	13	10	2.54	3.7	NS
Bush burning	40	28	3	14	15	2.47	3.6	NS

Source: Field survey 2023   GM=4.0

Effect of conflict on agricultural production

The study reveals that farmers perceive the loss of soil fertility as the most significant impact of conflict with herders, scoring 4.2, followed by low crop output at 4.1, (Table 3). Factors like overgrazing and soil compaction degrade soil quality, leading to reduced crop yields and increased food insecurity in rural communities (Ogunbode et al., 2023: Tadesse and Hailu, 2024). For herders, inadequate milk production, also rated at 4.1, stems from limited access to grazing land and water, worsened by stress during migration (Tüfekci and Sejian, 2023). This decline in milk yield represents a substantial economic loss (Getaneh *et al*., 2023; Adams *et al*. 2023). Overall, both farmers and herders face critical challenges due to conflict, impacting agricultural productivity and livelihoods.

Table 3: Effect of conflict on Agricultural Production in Kafur Local Government

Effects of conflict	SA	A	U	D	SD	Sum	X	Sig
Los of soil fertility	38	44	4	7	7	2.71	4.2	S
Low crop output	44	37	4	9	6	2.65	4.1	S
Inadequate milk production	55	37	3	3	2	2.99	4.1	S
Poor income	31	52	6	4	7	2.62	3.8	NS
Low quality output	38	48	4	8	2	2.80	3.8	NS
Reduction in meat production	36	42	5	12	5	2.66	3.7	NS

Source: Field survey 2023   GM= 4.0

Effects of the conflicts on the livelihood of maize crop farmers in Kafur Local Government.

The findings in Table 4 highlight the significant impact of conflicts on maize farmers' livelihoods, with a grand mean of 4.0. Disruption of marital kinship and rural-urban migration are the most severe effects ($\bar{x}$ = 4.3), as families relocate to urban areas for safety, leading to rural depopulation and labour shortages. Threats to food security rank next ($\bar{x}$ = 4.2), as conflicts hinder planting and harvesting, reducing crop output, raising food prices, and increasing insecurity (Sani et al., 2021). Lastly, displacement and refugee crises ($\bar{x}$ = 4.1) deepen poverty, with many smallholder farmers losing homes, income, and economic stability (Hebbar, 2023).

Table 4: Effect of the conflicts on livelihood of maize crop farmers in the study area?

Items	SA	A	U	D	SD	Sum	x̄	Sig
Distortion of marital kinship	50	36	2	8	4	2.85	4.3	S
Rural-urban migration	50	42	3	3	2	2.72	4.3	S
Threat to food security	52	33	1	12	2	2.63	4.2	S
Causes generational enmity	42	43	1	7	7	2.76	4.0	N
Loss of homes	43	39	2	7	9	2.72	4.0	N
Loss of peace of mind	37	48	4	9	3	2.46	4.0	N
Displacement of persons/refugees	49	36	2	5	8	2.80	4.1	S
Loss of income	48	40	2	9	2	2.62	4.1	S
Loss of life	40	39	3	14	4	2.70	3.9	NS
Threat to national security	40	37	2	2	19	2.56	3.7	NS

Source: Field survey 2023   **GM= 4.0**

Possible conflict resolution strategies between crop farmers and herders in Kafur Local Government

Table 5 results, with a grand mean of 3.9, emphasize sustainable strategies to resolve conflicts between maize farmers and herders. Encouraging communication and dialogue, alongside payback of Naira-equivalent resources, ranks as the top approach ($\bar{x}$ = 4.0). Open dialogue fosters mutual understanding, allowing grievances to be addressed and resources shared effectively. According to Zhyvko (2024), open communication builds trust, clarifies intentions, and reduces the risk of conflict escalation, supporting long-term peace and cooperation between both groups.

Table 5: Possible resolution strategies between maize crop farmers and herders

Resolution strategies	SA	A	U	D	SD	Sum	X	Sig
Encouraging communication and dialogue	39	43	4	9	5	2.73	4.0	S
Payback of Naira equivalent of the damage	40	45	4	6	5	2.78	4.0	S
Establishing clear property right	42	37	3	11	7	2.69	3.9	N
Orientation and educating herders and farmers	38	42	3	10	7	2.68	3.9	N
Designation of grazing field for the nomads	36	46	3	8	7	2.69	3.9	N
Promoting integrated resource management	3 1	43	2	16	8	2.54	3.7	NS

Source: Field survey 2023   **GM= 3.9**

Institutions measure mostly adopted by farmers/herders in resolving conflicts.

Table 6 reveals that traditional rulers are the preferred conflict mediators among farmers and herders, scoring 4.0, due to their accessibility and understanding of local customs (Adebayo and Olufemi, 2019; Tokawa and Maharazu,2024). Courts, though a formal option with a 3.7 score, are less favoured due to costs, distance, and perceived impartiality, making them a secondary choice (Nassef *et al.*, 2023)

Table 6: Institutions mostly adopted by farmers/herders in resolving conflicts?

Institution	SA	A	U	D	SD	Sum	x̄	Sig
Traditional ruler	40	36	16	5	3	2.64	4.0	S
Courts	31	27	31	8	3	2.55	3.7	S
Security institutions	24	42	18	8	8	2.48	3.6	N
Executive intermediation	30	29	27	9	5	2.51	3.6	N
Farmers Associations	29	30	22	16	3	2.49	3.6	N
Miyetti Allah herders Association	13	50	25	1	11	2.40	3.5	NS
Other local Elders	12	47	22	12	7	2.34	3.4	NS

Source: Field survey 2023   **GM=3.6**

CONCLUSION AND RECOMMENDATIONS

This study concludes that Farmer-herder conflicts arise from crop damage and land encroachment by herders, and farmers expanding into grazing areas. These conflicts reduce soil fertility and crop yields for farmers and hinder milk production for herders. They also disrupt maize farmers' livelihoods, causing family separation and prompting rural-urban migration.

The study also recommends open communication, dialogue, and a compensation mechanism to resolve farmer-herder conflicts. Community forums and mediation platforms, involving local leaders, can facilitate fair discussions on resource-sharing. A transparent compensation system and training in sustainable practices will promote mutual understanding and peaceful coexistence between maize farmers and herders.

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BEHAVIOUR OF RURAL DWELLERS TOWARDS NON-TIMBER FOREST PRODUCTS UTILISATION IN NORTH CENTRAL NIGERIA

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ABSTRACT

The study examined the behaviour of rural dwellers towards Non-Timber Forest Products utilisation in North Central Nigeria. Data were gathered through the administration of questionnaire to 251 proportionally selected rural dwellers from 9 purposively selected communities in the 3 Local Government Areas of the 2 States that represented the North Central. The data were analysed using mean score and binomial logit. The study showed that the rural dwellers had very high knowledge (≥ 2.1), favourable attitude and positive perception of NTFPs utilisation. The result of the binomial logit regression revealed that age, income, household size, utilisation experience, knowledge of use and NTFPs cost significantly influenced the utilisation of NTFPs. Sustainable cultivation, harvesting, processing and utilisation of NTFPs through enlightenment campaigns by government at all levels, domestication of NTFPs farming such as mushroom production, snailery, apiculture, rabbitry and grass cutter production, and value addition to NTFPs by the users for enhanced income generation was recommended among others.

Keywords: Knowledge, attitude, perception, utilisation and NTFPs.

INTRODUCTION

Non-Timber Forest Products (NTFPs) referred to as all the resources or products that may be extracted from forest ecosystem and are utilised within the household or are marketed or have social, cultural or religious significance (Mahonya *et al.*, 2019). They include fruits and nuts, vegetables, medicinal plants, gum and resins, essences, bamboo, rattans and palms, fibres and flosses, grasses, leaves, seeds, mushrooms, honey and lac. Adeniran and Adebayo (2022) included wild and managed game, reptiles, fish and insects to these examples by defining NTFPs as all tropical forest products (plants and animals or parts) other than industrial timber, which are (or can be) harvested for human use at the level of self-support or for commercial purposes.

The use of non-timber forest products (NTFPs) is as old as human existence. Hitherto, high degree of NTFPs value addition via processing that will ascertain sustainable utilisation in perpetuity has not been achieved because the agelong traditional utilisation abound in most of the communities that depend on NTFPs for livelihood. The knowledge, attitude and perception of users influence how, when and what quantity of the products will be utilised. This has created a wide gap in the demand for NTFPs by users and its corresponding supply by producers. It was in view of this that the study hypothesized that there was no significant relationship between the socio-economic and psychological factors and the level of utilisation of NTFPs.

METHODOLOGY

The study was carried out in North Central, Nigeria. As a result of the extensive nature of the study area, two (2) states viz: Kwara and Niger, were purposively selected to represent the North Central geo-political zone of Nigeria. This is due to the availability and extensive use of NTFPs and the presence of Kainji Lake National Park observed in these 2 states. Kwara State comprised of sixteen Local Government Areas. Based on an annual growth rate of 2.8% (Ganiyu *et al*., 2023a), the estimated population of the State by 2024 is 3,499,406 million persons. Niger State on the other hand had twenty-five Local Government Areas with a land area of 74,244 square kilometres. The projected population based on 2.8% growth rate in 2024 is 5,941,175 persons.

A multi-stage sampling technique was employed in selecting the respondents. In stage 1, three (3) LGAs were Purposively selected from each State, based on the availability, harvesting and utilisation of NTFPs. These included: Kaiama, Baruten and Ekiti in Kwara State; Borgu, Mokwa and Lapai in Niger State. This gave a total of six LGAs for the two States. In the second stage, three communities were purposively selected from each LGA based on the prominence of NTFPs utilisation. In Kwara State, the communities included Kugiji, Gwaria and Kanikoko from Kaiama LG; Okuta, Ilesha and Gwanara from Baruten; and Osi, Epe Opin and Isare Opin from Ekiti LG. In Niger State, the communities were: Babana, Wawa and Sabon Pegi from Borgu; Mokwa, Kpaki, and Bokani from Mokwa and Adagba, Baban Gwari and Lapai from Lapai LG.

Analytical techniques: Both descriptive and inferential statistics were used in this study.

Binomial Logit model: The model involves cases where the observed outcome can have only two possible values (Ganiyu, 2023). The outcome is coded as '0' and "1" where the target group (referred to as a case) is coded '1' and the reference group (referred to as a non-case) is coded '0'. This statistic was used to estimate the relationship between the level of utilisation of NTFPs (Y_U) and socio-economic, institutional and cultural and psychological characteristics (X) of the users of NTFPs. The conceptual model was specified as:

$P_i = E(Y_U = 1/X_i) = e (\beta_0 + \beta_1X_1 + \beta_2X_2 .... \beta_iX_i$

Where: P_i = the probability that dependent variable Y_u = (1= high users; 0= low users); Y_U = level of utilization of NTFPs (1= high; 0= low); β_0 = the intercept which is constant; $\beta_1... \beta_i$ = coefficient of determinants of utilisation of NTFPs; X_i = set of independent variables which was specified as:
X_1 = level of education (years spent in school); X_2= age of users (in years); X_3= sex of users (male= 1; female= 0); X_4= income of users (₦); X_5 = marital status (1= married; 0 = others); X_6 = size of household (number of persons living and feeding together); X_7 = cooperative membership (member =1; non-member =0); X_8= experience in use of NTFPs (years); X_9 = extension contact (number of extensions visit in the last one year); X_{10} = credit accessibility (amount accessed (₦); X_{11} = social customs (1 = yes; 0 = otherwise); X_{12} = language (number of languages spoken by users); X_{13} = religion (1 = Traditional; 2 = Islam; 3 = Christianity); X_{14} = knowledge of NTFPs by user (1= high; 0= low); X_{15} = attitude of user (1= favourable; 0 = otherwise); X_{16} = perception of user on NTFPs (1= positive 0= otherwise)

RESULTS AND DISCUSSION
Behaviour of NTFPs users

The behaviour of NTFPs utilisation in the study area showed that the rural dwellers had very high knowledge of use of fruits/ vegetables (2.7), locust bean (2.6), charcoal (2.6), fish (2.5), fuelwood (2.4), honey (2.2), bushmeat (2.1), shea oil (2.1), chewing stick (2.3) and kolanut (2.1). This is in line with the findings of Olagunju et al. (2020), where it was observed that rural women level of knowledge in agroforestry practices was high. However, there was low knowledge in the use of bitter cola (1.8), moringa (1.5), snail (1.5), tamarind (1.5) and mushroom (1.4). The implication of this is that the users will be more dispose to the use of NTFPs which they have high knowledge of utilisation due to their accessibility. On the other hand, they are indisposed to the use of NTFPs with low knowledge probably because the products are not readily

accessible in the area. This is in tandem with the finding by Amusa et al. (2017), that market knowledge of NTFPs were significantly positively correlated to socio economic characteristics of traders.

The attitudes towards the utilisation of NTFPs can vary among rural dwellers. Their attitude towards the utilisation of NTFPs shows a high mean score with respect to fruits/vegetables (2.7), locust bean (2.6), fish (2.6), charcoal (2.5), fuelwood (2.5), chewing stick (2.2), kola nut (2.2) and honey (2.1), implying that the users showed favourable attitude towards their use. This is in line with the findings of Akinnagbe and Oluwasola (2017), where it was reported that majority of the local communities in southwestern Nigeria had positive attitudes towards NTFPs, recognizing their economic and cultural importance. However, the users' attitude towards the utilisation of shea oil (2.0), bitter kola (1.8), bush meat (1.7), tamarind (1.6), moringa (1.5), mushroom (1.5) and snail (1.4) was unfavourable. This conforms with the submission by Ige, et al. (2019), who revealed that while some stakeholders had positive attitudes towards NTFP utilization, others do not. Moreover, there is prohibition in hunting of wildlife in areas occupied by the Kainji Lake National Park, thereby leading to scarcity of bush meat and consequently, unfavourable attitude towards its utilisation.

The rural dwellers practices towards NTFPs utilisation indicated a high mean score for the use of fruits/ vegetables (2.8), locust bean (2.8), fish (2.8), honey (2.3), charcoal (2.1), fuelwood (2.1), chewing stick (2.1) and kola nut (2.1). This implied that users have positive practice towards their utilisation in the study areas. This submission agrees with that of perceptions of forest dependent communities towards NTFPs utilisation and its contribution to their livelihoods by Adekunle et al. (2020). However, the users showed negative practices towards the utilisation of shea oil (2.0), bush meat (1.8), bitter kola (1.8), moringa (1.7), mushroom (1.7), snail (1.6) and tamarind (1.6). This in a way, informs their low utilisation in the study areas.

Table 1: Mean response of rural dwellers behaviour towards NTFPs utilisation

NTFPs	Mean score	(N=251)			KAP	Decision
	K	A	P			
Bushmeat	2.1	1.7	1.8	H	UF	N
Shea oil	2.1	2.0	2.0	H	UF	N
Honey	2.2	2.1	2.3	H	F	P
Fruits and vegetables	2.7	2.7	2.8	H	F	P
Locust bean	2.6	2.6	2.8	H	F	P
Moringa	1.5	1.5	1.7	L	UF	N
Fish	2.5	2.6	2.8	H	F	P
Mushroom	1.4	1.5	1.7	L	UF	N
Snail	1.5	1.4	1.6	L	UF	N
Charcoal	2.6	2.5	2.1	H	F	P
Fuelwood	2.4	2.5	2.1	H	F	P
Chewing stick	2.3	2.2	2.1	H	F	P
Kola nut	2.1	2.2	2.1	H	F	P

NTFPs	Mean score	(N=251)			KAP	Decision
	K	A	P			
Bitter kola	1.8	1.8	1.8	L	UF	N
Tamarind	1.5	1.6	1.6	L	UF	N
Aggregate mean score	2.1	2.1	2.1	H	F	P

≥2.1 = High, <2.1 = Low; ≥2.1 = Favourable (F), <2.1 = Unfavourable (UF); ≥2.1 = Positive (P), <2.1 = Negative (N)

Socioeconomic, cultural and psychological factors affecting Utilisation of NTFPs

Binomial Logit regression analysis was used to analyse the factors affecting NTFPs utilisation. The results of the analysis showed that age (0.279, P ≤0.1), income (0.026, P ≤0.05), household size (0.003, P ≤0.01), utilisation experience (0.076, P ≤0.1) and cost of NTFPs (0.000, P ≤0.01) were the socioeconomic factors that significantly affected the level of utilisation of NTFPs. The implication of this is that a unit increase in age of users will lead to a proportionate increase in NTFPs utilisation by the users. This conforms with *a priori* expectation since aged users tend to adopt utilisation of natural resources from the forest than their younger counterparts. This is in tandem with the submission by Faleke *et al.* (2023), that farmers age had positive and significant relationship with fish output. Also, as the income of the user increases, the utilisation of NTFPs decreases, same way utilisation increase with a unit decrease in costs. This is in consonance with Ganiyu *et al.* (2023a), where income of household head significantly influenced utilisation of NTFPs among users in Kwara State. Furthermore,

a unit increase in the number of households will lead to a proportionate increase in the utilisation of NTFPs. Also, the more the years of experience of NTFPs user, the more is the utilisation of NTFPs.

In like manner, only the knowledge of utilisation of NTFPs had positive and significant influence with utilisation at 5% among the psychological factors. This implied that a unit increase in the knowledge of users on NTFPs utilisation will lead to a proportionate increase in its utilisation because of the advantage of getting information of the various uses to which NTFPs could be put by the household through the internets, literatures and other avenue. This supports the submission by Ganiyu *et al.* (2023b), where knowledge of use of NTFPs positively influenced rural household food security in Kajuru LGA, Kaduna State. The R^2 of 0.681 shows that 68.1% of the variation in the level of utilisation of NTFPs was explained by the variation of independent variables in the model. The null hypothesis was rejected since there is significant relationship between the socio-economic factors and the level of use of NTFPs by the users.

Table 5: Binomial Logit Model Analysis of factors affecting NTFPs Utilisation

Variables	Exp(B)	S.E.	P-Value
Education	1.583	0.884	0.603
Age	1.322*	0.154	0.07
Gender	0.001	17306.84	0.999
Income	0.611**	0.221	0.026
Marital Status	0.001	47332.33	1.000
Household Size	1.276***	20393.4	0.003
Occupation	0. 000	38125.56	0.999
Cooperative Membership	0.001	6822.6	0.998
Utilisation Experience	1.785*	284.344	0.076
Extension Contact	137.163	10047.59	1.000
Credit Accessibility	0.001	117287.3	0.999
NTFPs Cultural Value	0.001	20052.52	0.999
Language	11857.369	7063.469	0.999
Religion	0.339	0.75	0.149
Knowledge of Use	2.042**	3734.09	0.04
Attitude to Use	0.811	0.603	0.728
Practices of Use	1.534	1.307	0.744
NTFPs cost	-7.925***	4218.608	0.000
Constant	2.68E+126	176673.7	0.999

Pseudo R^2 = 0.681   *= 10%; ** = 5%; *** = 1%

CONCLUSION

The study revealed that the users of NTFPs had high knowledge, favourable attitude and positive practices towards the utilisation of NTFPs in the study area. The study further concluded that the

utilisation of NTFPs was affected by age, income, household size, utilisation experience, knowledge of use, and NTFPs cost.

RECOMMENDATION

Since the cost of NTFPs significantly had inverse relationship with utilisation, sustainable cultivation, collection, processing and trading of NTFPs should be harnessed by the National Park Services so as to make the products affordable to users, while not undermining the internally generated revenue objective of government. Also, domestication of NTFPs farming such as mushroom production, snailery, apiculture, rabbitry and grass cutter production, and value addition to NTFPs by the users for enhanced income generation should be embraced.

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SHOCKS AND COPING STRATEGIES AMONG HOUSEHOLDS IN NIGERIA: A QUALITATIVE REVIEW

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ABSTRACT

Households in developing countries are often vulnerable to shocks. The frequency and severity of various shocks pose significant challenges to such households. The specific objectives of this study are to review the types of shocks faced by households in Nigeria and identify the coping strategies employed to mitigate them. A comprehensive search using Google Scholar was conducted, focusing on papers indexed in Scopus, ScienceDirect, and Elsevier. The inclusion criteria required the presence of keywords such as "shocks," "coping strategies," and "Nigeria," resulting in the selection of 36 studies published between 2011 and 2024. Only original research papers with empirical findings were included, ensuring the quality of the studies reviewed. The review of shocks and coping strategies among Nigerian households revealed a diverse range of responses. Agricultural shocks significantly impacted food security, leading to asset liquidation and borrowing. Food insecurity resulted in households adopting strategies such as reducing meal frequency and quality, selling assets, and seeking external assistance. Economic and health shocks compelled households to adjust consumption, deplete assets, and seek informal financial support. Conflict-related shocks prompted relocation, reliance on social networks, and adopting alternative livelihoods. The review underscores the need for policies enhancing access to credit, affordable education, and healthcare to bolster household resilience. Strengthening social support networks and providing targeted economic support can mitigate the adverse impacts of these shocks. Policymakers should focus on comprehensive interventions that address the diverse nature of household vulnerabilities in Nigeria.

Keywords: Shocks, Risks, Coping strategies, Households, Resilience, Policy

INTRODUCTION

Households face various risks, with significant dangers present daily in Sub-Saharan Africa, often associated with factors such as climatic changes, price fluctuations, and mortality of household heads (Nikoloski, et al., 2017). The type of shocks varies by country, with food insecurity identified as a major shock in developing countries between 2008 and 2011, along with climatic shocks and political instability (Heltberg et al., 2012). Shocks are categorized by their nature, origin, scope, occurrence level, severity, and frequency. Fafschamps (1999) and the World Bank (2001) categorize shocks into micro, meso, and macro levels. Deaton (1991) classifies shocks by severity and frequency into catastrophic and minor. They are also categorized into idiosyncratic and covariate shocks based on scope (World Bank, 2001; Dercon, 2002; Onu, 2003; Azam et al., 2012). According to Heitzmann et al. (2002) and the World Bank (2001), shocks originate from economic, environmental, health, life-cycle, natural, political, and social factors. The dynamics of poverty are often linked to the incidence of risks, shocks, and vulnerabilities of individuals and households.

Coping strategies are the responses used by households to prevent, mitigate, adapt to, or minimize the effects of shocks. Snel and Staring (2001) define coping strategies as deliberate actions taken by low-income households to limit spending or generate additional income, enabling them to meet basic needs and avoid significant declines in welfare. Households frequently resort to asset sales, informal transfers, and reductions in household spending when faced with shocks. The choice of coping strategies depends on factors such as household characteristics (assets, income diversity and stability, education of the household head), the

local economy, infrastructure, and past experiences with similar shocks (World Bank, 2000; Rashid, 2006). These strategies are often sequenced, following an order of adoption (World Bank, 2000).

The effects of shocks on households and on their ability to cope with such crises have been a topic of increasing concern, and there has been debate about helping the affected households manage the consequences of the shocks (Olawuyi et al., 2011). Thus, there is a need to understand the type of shocks faced by Nigerians in recent times and the coping strategies used to mitigate these varying shocks to develop a robust mitigation plan for subsequent occurrences.

The study hopes to contribute to the on-going debate in development literatures on resilience and vulnerability assessment to help policy makers in designing policies and programs implemented to improve the resilience of citizens.

Hence, these specific objectives of the study are to:

1. identify the types of shocks experienced by Nigerian households over the years.
2. examine the coping strategies used by Nigerian households to mitigate these shocks.

METHODOLOGY

The review was conducted using a structured and comprehensive approach, ensuring the inclusion of high-quality and relevant studies.

The literature search was conducted primarily through Google Scholar, with additional sources obtained from Scopus, ScienceDirect, and Elsevier. The search focused on studies that included the keywords "shocks," "coping strategies," and "Nigeria."

Inclusion and exclusion criteria

To ensure the relevance and quality of the studies included, specific inclusion and exclusion criteria were established. The review included original research papers published between 2011 and 2024, although the year of publication was not a strict criterion. Only studies that focused on Nigerian households were considered, and these studies employed either qualitative, quantitative, or mixed methods for data collection and analysis. Importantly, the review excluded any papers that were reviews or did not draw conclusions based on original findings. The included studies were all in English.

Study selection and data collection

A total of 36 studies were included in the final analysis. The selection process involved an initial screening of titles and abstracts by two independent reviewers. Given that the inclusion criteria were well-defined, there were no disagreements between the reviewers. Data collection was performed manually, with a detailed examination of the abstracts, methodologies, and findings related to shocks and coping strategies.

Data synthesis

The findings from the included studies were synthesized using narrative synthesis. This approach was chosen due to the diversity of the study designs and the variety of outcomes reported, which made statistical meta-analysis unsuitable.

This systematic review adhered to rigorous methodological standards to provide a comprehensive understanding of the shocks and coping strategies among Nigerian households.

Shocks and coping strategies among households in Nigeria

The review of compounding shocks faced by households in Nigeria reveals significant impacts. For instance, pest invasions, flooding, insufficient rainfall, rising input prices, and declining output prices severely affect food security among farming households. Around 17.90% of households resorted to selling assets, while an alarming 62.50% did not adopt any coping strategy, indicating a severe gap in resilience (Obi-Egbedi and Owosho, 2023). Moreover, agricultural shocks in Africa, including Nigeria, are categorized into weather risks, crop and livestock diseases, and price fluctuations. Households often responded by dissaving, borrowing, increasing work hours, selling productive assets, and relying on assistance from friends, family, and NGOs or reducing overall consumption (Nikoloski, Christiaensen, and Hill, 2017). In Ogo-Oluwa, Oyo State, rural households faced land degradation, drought, livestock diseases, and income loss, coping through remittances, borrowing, distress sales, migration, and significant adjustments in food intake, even interrupting education (Olawuyi et al., 2011).

In addition to agricultural shocks, food insecurity remains a persistent issue. Studies found that 63.3% of rice farmers in Kebbi State were food insecure, with households coping by buying food from the market, eating less preferred foods, selling livestock and assets, mothers limiting their food intake to feed children, scavenging, child labor, and begging (Danmaigoro and Gona, 2022). Similarly, rice farming households in Ekiti State coped with food insecurity by limiting portion sizes and consuming less expensive or preferred food (Ojo, 2024). In Abeokuta, Ogun State, 84.4% of households were food insecure, with strategies including taking loans, selling livestock, reducing meal frequency, and lowering food quality. These findings reveal the high prevalence of food insecurity and its potential negative impact on nutritional status, with significant associations between food insecurity status and access to resources like land, paved roads, and markets (Akinbule et al., 2020).

The impacts of COVID-19 policies on livelihoods and food security were substantial. Movement restrictions and market closures severely impacted the livelihoods of smallholder farmers, with primary coping strategies including food reduction and dissaving (Balana et al., 2020). Differences in coping mechanisms were observed among female-headed households during the COVID-19 lockdown in rural Anambra State, highlighting food system innovations and improved food preparation methods (Okoli, 2021). Similarly, economic shocks from fossil fuel subsidy reforms led to significant price increases for fuel, escalating living costs, and exacerbating poverty, especially in vulnerable regions (Rentschler, 2016). Moreover, fuel subsidy removal affected rural households in Ile-ogbo and Imini communities, with coping strategies including meal reduction and child labour. In extreme cases, individuals resorted to praying, begging, stealing, and even prostitution (Adewole, 2024).

Health shocks also present significant challenges for Nigerian households. Regular hospitalizations, domestic accidents, and work-related injuries were common in Enugu State, with households primarily coping by borrowing money or selling assets (Urama et al., 2019). In North Central Nigeria, prevalent illnesses like malaria, typhoid, and respiratory infections particularly affected female-headed households, leading to out-of-pocket payments, reduced food consumption, and income loss (Adegboye et al., 2022). Coping strategies for health-related shock include asset depletion and borrowing. Also, many households resorted to borrowing from friends and family and selling assets to manage the financial strain caused by health crises (Onisanwa, 2018).

Weather-related shocks significantly affect Nigerian households. Smallholder rice farmers in Ogun State faced floods and droughts, adopting coping mechanisms like changing crop species, sustainable land management, rainwater harvesting, constructing flood dykes, distress migration, and

livelihood diversification (Sanusi and Dries, 2024). In a related study, gender-specific livelihood strategies in response to climate change-induced food insecurity in Southeast Nigeria were explored. Men focused on growing staple crops, while women predominantly engaged in marketing agricultural produce, suggesting that investments in sustainable agricultural practices and disaster management infrastructure are crucial to mitigating these shocks (Anugwa et al., 2020).

Conflicts, both resource-based and violent, also pose significant challenges. Resource conflicts in Nigerian Savannah tourism communities revealed patterns of intra-user group conflicts, inter-user group conflicts, and conflicts between user groups and authorities. Coping strategies included changing the situation, adjusting expectations, devaluation, avoidance, and symptom reduction through stress relief measures (Adisa, 2011). Farmers and herders in post-conflict situations in the Kainji Dam Area relied on problem-oriented strategies like purchasing food and leveraging past farming experience, alongside emotion-oriented strategies such as praying for peace and accepting fate (Umar et al., 2013). Displaced farming communities due to farmer-herder conflicts in North Central Nigeria primarily relied on support from friends and family. Other coping strategies included job switching, relocating to safer areas, forming vigilance groups, and faith-based mechanisms. This emphasizes the need for empowering displaced populations with skills to better manage displacement challenges (Yikwab and Tade, 2022).

In a different study, findings by Anozie and Agbelayi (2024) reveals economic policies such as the naira redesign have caused significant financial disruptions. Rural households in Sapele Local Government Area adapted by reducing spending habits and increasing their interest in accepting digital forms of payment, indicating a potential area for policy development to promote digital financial literacy and infrastructure (Anozie and Agbelayi, 2024). Economic shocks caused by price increases for agricultural inputs forced households to adopt coping mechanisms like borrowing, adjusting food intake, selling goods, and even removing children from school (Shehu and Sidique, 2015). Elderly individuals faced significant challenges during economic recessions, coping through subsistence farming, petty trading, reliance on remittances and religious organizations, working for others, and begging (Eboiyehi and Muoghalu, 2019).

CONCLUSION AND RECOMMENDATIONS

The review of shocks and coping strategies among Nigerian households highlights the diverse and severe impacts of agricultural, economic, health, weather-related, and conflict-induced shocks. The findings reveal significant vulnerabilities, especially among farming and low-income households, which often resort to measures such as asset liquidation, borrowing, reducing food intake, and relying on social networks. These coping mechanisms, while varied and resourceful, underscore the need for targeted interventions to enhance resilience and reduce vulnerability. The study recommends enhancing access to credit and financial services, particularly in rural areas, to provide sustainable means for households to manage and recover from shocks. Stabilizing food prices through targeted policies can mitigate food insecurity and help maintain nutritional status among vulnerable populations. Promoting sustainable agricultural practices and investing in disaster management infrastructure, such as crop diversification and flood control measures, can significantly reduce the impacts of agricultural shocks. Strengthening social safety nets, including cash compensation programs and targeted social protection measures, is essential to cushion the impact of economic shocks and health crises, especially for households headed by women. Finally, the study emphasizes the importance of conflict resolution policies and support for displaced populations, empowering individuals with skills and providing safe relocation options to better manage displacement challenges.

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ADAPTION STRATEGIES OF POULTRY FARMERS TO CLIMATE CHANGE IN ODOGBOLU LOCAL GOVERNMENT AREA OF OGUN STATE, NIGERIA.

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ABSTRACT

Poultry production is one of the most important agriculture enterprises vulnerable to climate change. The study therefore examines poultry farmers adaptation strategies to climate change in Odogbolu local government area of Ogun state. A total of sixty (60) farmers were selected through a multistage sampling procedure and data were collected using a well-structured interview schedule. Frequency counts, percentages and logit regression model were used to analyse the collected data. Results revealed that majority (60.0%) of the poultry farmers were within the age range of 30-40 years. Majority (72%) of the respondents were male and literate (74.0%). About 37% of the respondents had household size of between 1 to 5 persons with (50%) having farming experience above 6 years. The most common adaptation strategies among the farmers are building pen house against the wind (40%), Construction of wind break (22%) and increase in water intake (22%) given to the birds during dry season. The Logit regression model analysis results revealed that the significant and positive variables are education ($p < 0.05$), extension contacts ($p<0.05$) and farming experience ($p<0.01$). However, the level of adaption strategies among poultry farmers in the study area was low; suggesting that farmers in the study area are not well abreast of climate change information. The study recommended that Government and NGO agencies should provide adequate information on climate change at the rural farm level extension education, media awareness and public awareness campaign

Keywords: Climate Change, Adaptation Strategies, Farmer, Poultry farmers

INTRODUCTION

Climatic change is a change in the statistical distribution of weather over a period of time, that ranges from decades to millions of years or to a change in the state of the climate that can be identified by the change that persist for an extended period, usually decade or longer (IPCC, 2007)

Many believe agriculture is the most susceptible sector to climate changes and this is attributed to the fact that climate change affects the two most important direct agricultural production inputs, precipitation, and temperature (Deschenes and Cireenstone (2006). Climate change also indirectly affects agriculture by influencing the emergence and distribution of livestock diseases, exacerbating the frequency and distribution of adverse weather conditions, reducing water supplies, irrigation and enhancing severity of soil erosion.

Climate change has direct and indirect effects on poultry productivity through reduction in feed intake and increase mortality, increased in cost of feed, water scarcity. Climatic change will also affect nomadic and transhumant livestock keepers. Presently in Odogbolu Local Government area of Ogun state season that were formally predictable are no longer predictable, season is now erratic.

Today, farm animals are suffering from suspected heat related stress. Over 30 years ago, farmers faced problems of climate change such as temperature, excess rainfall, flooding etc. Climate change as it continues each day possesses a threat to the world at large. Its effects are said to be felt mainly in the developing countries due to their inability to cope adequately with these changes. And this has implication for future availability of animals as habitat of species would be lost which would affect the animal. The intensity of the sun will destroy animals, late rains will delay early maturity of animals, some may even be died by drought.

According to UNDP (2004), adaptation is a process by which strategies to moderate and cope with the consequence of climate change can be enhanced, developed and implemented. This research work is embarked upon to investigate the poultry farmers' perception of climate change, identify the choice of adaptation strategies being employed and determine the factors influencing the climate change perception. This will not only deepen our understanding of resilience in agriculture but also inform policies and interventions suited to the local context.

The research objectives are.

1. To examine the socio-economic characteristics of poultry farmers.
2. To identify, if farmers are aware of climatic change.
3. To identify adaptation strategies employed by poultry farmers to mitigate the effects of
4. climatic change.
5. To identify the constraint to adaptation to climatic change by poultry farmers
6. To determine the factors that influenced poultry farmers adaptation to climate change

METHODOLOGY

This study was carried out in Odogbolu Local government Area of Ogun state, Nigeria. The Local government Area is located between latitude 6.9333^0 N, longitude 3.7833^0 E, Odogbolu LGA share boundaries with Ijebu ode, Ijebu north and Ogun waterside in Ogun state. The area is characterized by tropical savannah climate with undulating terrain and scattered hills. The population of the study were the poultry farmers. A

multistage sampling procedure was used to select the respondents for the study.

The first stage was a random sampling of four rural livestock farming communities from the list obtained from the block extension officer in Odogbolu LGA of the Ijebu zonal office, ADP.

The second stage involved a selection of fifteen poultry farmers from each of the four communities selected. Thus, a total of sixty (60) poultry farmers were selected and used for the study.

Data for the study were collected from primary sources through a questionnaire administered in the study area. Data collected were analysed using frequency, percentage, and logit regression model Model specification

Logistical regression model was adapted and used to analyse the determinants of the poultry farmers perception of climate change.
The regression logistic model is specified as

$$Y = \frac{1}{1 + \exp^2}$$

Where Y = responses of respondent, which is either 1 for yes, and 0 for No
1 = Notice changes in rainfall /temperature
0 = did not notice changes in rainfall/temperature
$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \ldots \ldots \ldots \ldots \beta_8 X_8$
X_1 = Age (years)
X_2 = Gender (male = 1, otherwise = 0)
X_3 = Educational level (no of years spent in school)
X_4 = Household size (number of persons living together)
X_5 = Received extension advice (Yes = 1, No = 0)
X_6 = Farming experience (years)
X_7 = Type of farm
The pseudo-R square and the chi-square were used to measure the goodness of fit of the model and the significance of the model.

RESULTS AND DISCUSSION
Socioeconomic characteristics
Table 1 showed that majority of the respondents were within the age bracket of less than 30 years to 40 years (60%), 25% are within the age of 41 – 50 years. This result depicts that livestock farming are mostly dominated by people within the age bracket of 30 – 50 years and this people are capable of noticing change in weather, since climate change takes some time to be notice, only the aged could notice the change. This result supports the finding of Ume et al, 2018. 72% of the respondents were male and 17% were females. This result implies livestock farming is largely dominated by the male, but there is still significant female participation. This agreed with the finding of lenis et al, 2019. The results further showed that half of the of the respondents (52%) were married, which implies that more labour will be available to carry out activities involved in poultry production,

Table 1: Results of socioeconomic characteristics of respondents

Variables	Frequency	Percentage
Age		
Less than 30 years	21	35
31 – 40 years	15	25
41 – 50 years	14	23
51 – 60 years	4	7
60 year and above	6	10
Gender		
Female	17	28
Male	43	72
Marital status		
Single	19	32
Married	31	52
Divorced	6	10
Widow	4	6
Educational level		
Primary school	6	10
Secondary school	14	24
Higher school	24	40
Not educated at all	3	5
Other specify	13	21
Total	**60**	**100**

Source: Field survey, 2024

Table 2 present the climatic change perception of the poultry farmers in the study areas. Result shows that 40% of the respondents perceived increases in temperature, while about 23%, 14% and 23% perceived a decrease, no change and do not know respectively. This result agrees with the findings of Adeoti et al (2016) who reported that majority (40%) of the respondents perceived an increase in temperature. With respect to rainfall (39%) of the respondents interviewed perceived a

decrease in rainfall, while 22%, 22% and 17% respectively perceived increase in rainfall, change in timing of rainfall and no change in rainfall

respectively. The result of this finding is in line with the finding of Bewuketu (2017) who reported that farmers perceived a decrease in rainfall overtime

Table 2: Distribution of Respondents' perception of climatic change indicators

Variables	Frequency	Percentage
Temperature trend level		
Increase temperature	24	40
Decrease temperature	14	23
No change	8	14
Don't know	14	23
Precipitation changes		
Increase precipitation / extended rain system	13	22
Decrease precipitation / shorter rainy season	24	39
Change in timing of rains / earlier	13	22
No change	10	17
Total	**60**	**100.00**

Perceived effects of climate change on poultry birds

Table 3 presents the farmers perceived effect of climate change indicator on poultry birds in the study area. Results indicate that 73% of the respondents notice rainfall change and with 40% of the respondents noticing the worsen effect on animal health condition, 22% increase mortality and 20%

diseases outbreak. With respect to temperature change 53% of the respondents notice temperature change and the effect of temperature on the birds were 70% heat stress, 20% delay in egg production and 10% decrease in egg production and this effect indicated by the respondents are caused by increased in sunlight 67% and increase in sun intensity 33%.

Table 3: Distribution of respondents by perceived effect of climate change indicators on poultry birds

Variables	Frequency	Percentage
Notice rainfall		
Yes	44	73
No	16	27
Notice temperature		
Yes	32	53
No	28	47
Effect of rainfall		
Disease outbreak	12	20
Increase in mortality	13	22
Animals' health condition worsen	24	40
Animal health condition Improve	3	5
No adverse effect.	8	13
Effect of temperature		
Heat stress	42	70
Delay in egg	12	20
Decrease in egg	6	10
Production		
Cause of temperature increase		
Increase in sunlight	40	67
Increase in sun intensity	20	33
Observes climatic factors by respondent		
Observe temperature		
Yes	32	53
No	28	47
Observed precipitation		
Yes	34	56
No	26	44
Total	**60**	**100.00**

Table 4 shows the various adaptation strategies employed by poultry farmers to cope with the effect of climate change in the study area. This strategy is

building of pen house against the wind (40%), this is to prevent high turbulent wind or wind of high speed and to allow good cross ventilation of air in

the pen house and also to help in evacuation of smell that emanate from animal waste (Lensis et al 2019). Furthermore, 22% of the respondents adopted an increase in water intake to animal as a strategy for climate change and this water is necessary to prevent heat stress and also help in body

metabolism. Provision of supplementary feed takes (22%) by the respondents are preferred during the period of high heat and humidity (Ume et al 2018). The use of cooling materials for birds enable better internal thermoregulations.

Table 4: Adaptation strategies employed by respondents to cope with effect of climatic change

Variables	Frequency	Percentage
Adaptation strategies		
Construction of wind break	13	22
Building of pen house against wind	24	40
Installation of cooling material	10	16
Increase in water given to the animal	13	22
Total	**60**	**100.00**

Table 5 shows some constraints to adaptation to climate change by the respondents. Poultry farmers faced some constraint to practice sustainable adaptation strategies and this constraints are lack of knowledge of appropriate adaptations practices to apply in their livestock activities (36%), Lack of information about short term climate variation

(17%), Lack of credit (18%), this is in tandem with (Gbetebouo, 2009) in the Limpopo river basin in South Africa where more than 53% of the farmers cited lack of credit as a barrier to adaptation to climate change, no access to water (12%) is also a significant barriers to adaptation to climate change.

Table 5: Distribution of respondent by constraints to climatic change

Variables	Frequency	Percentage
Constraints		
Lack of information about short term climatic variation	10	17
Lack of knowledge of appropriate adaptation	22	36
Lack of creditor saving	11	18
No access to water	7	12
Other constrains	8	13
No barriers to adaptation	2	4
Total	**60**	**100.00**

Determinants of Poultry farmers' Adaptation to climate change

Table 6 presents the result of the determinants of adaptation to climate change among poultry farmers in the study area. Pseudo R^2 show that 46.52% of the variation in farmers' likelihood to adapt to climate change were explained by the explainable variables included in the model. The likelihood function of the logit model was significant (Wald $\chi2 = 47.95$, p< 0.000) suggesting the strong explanatory power of the model. Result shows that the significant variables are education, extension contacts and farming experience. The marginal effect of education was positive and significant (p< 0.05). This implies that as the year of education of household head increase by a unit the

likelihood of taking up adaptation strategies against climate change will increase by 0.6906 unit. This may be attributed to the literacy level of the sampled farmers that made them to be more receptive to new innovation and information on climate change. This result aligned with the findings of Deresa et al., (2009), Oyebola (2021), Coster and Adeoti (2020). The marginal effect of extension contacts was positive and significant (p<0.05). This indicates that an increase in the number of visits of extension agents to farmers will increase their likelihood of adapting to climate change. This supports the findings of Maddison (2006) and Deresa et al., (2009). The marginal effect of poultry farming experience has positive relationships with farmers'

adapting to climate change. The relationship was significant at 1%. This implies that with the level of experience of the poultry farmers they are expected to have more knowledge and information about climate change and agronomic practices that they can use in response to climate change. The result supports the findings of Maddison (2006) and Nhemachena and Hassan (2007), Coster and Adeoti (2020), who reported in their studies that experience in farming increases the probability of uptake of adaptation measures to climate change.

Table 6. Result of logit regression

Variable	Marginal effect	Standard error	Z
Age	0.3091	0.2596	1.190
Gender	-0.3725	0.6059	0.614
Marital	0.4630	0.4449	1.041
Education	0.6906**	0.3164	2.182
Household size	0.2041	0.3626	0.563
Received extension	0.3897**	0.1719	2.268
Farming experience	0.7107***	0.2216	3.204
Type of farm	-0.111	0.3958	-0.280
LR chi^2	47.95		
Prob>chi^2	0.0000		
Pseudo R^2	0,4652		
Log likelihood	21.49		

Author' computation from computer print-out, 2024
Legend: ***Significant at 1%. **Significant at 5%, *Significant at 1%

CONCLUSION AND RECOMMENDATION

In this study, it was revealed that majority of the poultry farmers in the study area are not well abreast of what climatic change is all about, but they admitted the erratic weather conditions. It can be concluded that effort should be geared up by the necessary authority toward sensitizing the farmers about change in climate and its attendant effect so that effective adaptation strategies can be planned and undertaken at the farm level by the poultry farmers.

The following are recommended:

1. Dissemination of technological information on climatic change and solution provided to specific problems on climatic change to poultry farmers.
2. Information and advice should be disseminated by extension workers for those in rural area and they should be paid by government not by farmers.

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PERCEPTION OF WOMEN HOUSEHOLD FOOD TRADERS ON ITINERANT ENTREPRENEURSHIP IN SOME SELECTED LOCAL GOVERNMENT AREAS IN KWARA STATE, NIGERIA

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ABSTRACT

Women in itinerant trading are often toughened by the risks involved in long-distance travelling especially in Nigeria with bad roads and vehicles. This study examines the perception of women household food traders towards itinerant entrepreneurship in selected local government areas in Kwara State, Nigeria. The objectives of the study were to identify the socioeconomic characteristics of women itinerant traders, determinant of attitude towards itinerant entrepreneurship, determine the factors influencing women household food traders' participation in itinerant entrepreneurship and to identify the constraints faced by women engaging in itinerant entrepreneurship. A multistage sampling procedure was used to select 150 respondents for the study. Data were collected using an interview schedule. Frequency counts, percentages, mean, and regression were used to analyse the data. The study revealed that the respondents have a mean age of 48.1 years, average household size of 7 people, they also have positive attitude towards itinerant entrepreneurship ($\bar{x}=4.45$), the primary motivation for their participation in itinerant entrepreneurship was to increase income for family support ($\bar{x}=3.84$). However, they were faced with limited capital ($\bar{x}=2.84$) and family responsibilities ($\bar{x}=2.17$), challenges. Age ($\beta=0.007$) and proximity to market ($\beta=-0.032$) determined their attitude towards itinerant entrepreneurship. It is therefore recommended that targeted interventions by relevant stakeholders should be designed to support women's economic empowerment and entrepreneurship in rural areas.

Keywords: Perception, Women, traders, Itinerant Entrepreneurship

INTRODUCTION

Since time immemorial, rural women have been the major contributors to household food trading ensuring that families and communities have access to nutritious and diverse food. This often involves navigating local food markets, bargaining for the best price and selecting high quality produce. In many societies, women are the main merchants at local markets. By selling their produce, they do not only contribute to local economies but also ensure food accessibility to a wider audience. Their efforts have enhanced the production of agricultural raw materials and encouraged self-sufficiency in domestic food items.

Despite advances in modern retailing, a greater number of women throughout the world still earn their livelihood partly or exclusively through itinerant trading of goods (Koroma et al., 2017). Itinerant trading of household food such as yam, potatoes, maize, plantain, dried fish, palm oil *e.t.c*, is a common livelihood activity particularly in Nigeria among women who deal with bulk sale of agricultural commodities and that is widely undertaken in urban settings with a significant customer base. The term itinerant entrepreneurship is defined as a type of entrepreneurial activity characterized by frequent changes in business locations or routes (Korsgaard et al., 2020). Itinerant entrepreneurship provides a source of income to women household food traders and can help stimulates the economy. It also allows for cultural exchange as consumers can learn about different foods and traditions the products they purchase. Itinerant entrepreneurship also allows women to be independent, be their own bosses and control their own schedules which can be important for balancing work and family life.

By exploring the perception of women in itinerant trading, valuable insights on how they view itinerant entrepreneurship will be gained. Understanding their perceptions can help identify the challenges they face, as well as the opportunities for empowerment and support. This study therefore analysed the perception of women household good traders on itinerant entrepreneurship in some selected local government areas in Kwara State, Nigeria.

Always willing to take significant risk despite perceived feeling of helplessness, women most times support their families through long-distance trading. Their roles have been considered critical in maintaining food supply both for rural and expanding urban market to maintain sustainable food supply chain. Women in itinerant trading are often toughened by the risks involved in long-distance travelling especially in Nigeria with bad roads and vehicles and their access to information about their destination which may be rumoured. Various challenges faced by these women include limited access to finance, discrimination and social constraints, restriction in decision making, conflict between work and family life, lack of access to male dominated field, family commitment and stigmatization. The general objective of the study is to analyse the perception of women household food traders on itinerant entrepreneurship in selected Local Government Areas in Kwara State. The specific objectives are to:

1. describe the socio-economic characteristics of women household food traders.
2. identify the attitude of women household food traders towards itinerant entrepreneurship.

3. identify the factors influencing women household food traders' participation in itinerant entrepreneurship.
4. identify the constraints faced by women household food traders in engaging in itinerant entrepreneurship in selected Local Government Areas in Kwara State.

The hypothesis is stated as Socioeconomic characteristics of women household food traders does not affect their attitude towards itinerant entrepreneurship

METHODOLOGY

The research was carried out in Ilorin west and Ilorin south local government area of Kwara state. Household food trading is popular among the dwellers of these two Local Government Areas with their main markets attracting thousands of buyers and sellers of various household food items. Kwara State is located in latitude 8.5ºN and longitude 4.5ºE. The important markets include Ogidi market, Kulende markets, Yoruba road market, Gada markets, Oja- Oba, Oja tuntun, Ipata market, Mandate market. Oja Oba, strategically located in the city centre boasts of diverse ethnic groups and visitors from all walks of life selling and buying diverse goods and services. The population of the study comprises the women household food traders purposively selected from two (Ilorin west and Ilorin south) out of the sixteen Local Government Areas in Kwara State. A purposive selection of

markets in the L.G.As was done due to the concentration of women household food traders. Interview schedule was used to obtain data from the 150 rural women randomly selected.

Attitude of Women Household Food Traders towards itinerant entrepreneurship was measured using a five-point Likert type scale. The factors influencing women household food trader participation in itinerant entrepreneurship was measured using a four-point Likert type scale. Constraints faced by women household food traders in itinerant entrepreneurship was measured using a three-point Likert type scale, the mean was computed in each case and adopted as the measure of the objective.

RESULT AND DISCUSSION

Result shows that the average age of respondents was 48.2 years, itinerant entrepreneurship experience was about 11years while the average household size was 7 persons. The age suggests that respondents are within productive ages and thus possess the required energy for itinerant entrepreneurship. The household size indicates that respondents had mouths to feed and as such depend on itinerant trading as a means of livelihood, confirming the position of Uguru (2018), that, typical rural household usually consists of more than five people. The years of experience is expected to influence their attitude towards itinerant entrepreneurship.

Table 1: Distribution of Respondents Based on Socioeconomic Characteristics (n=150)

Variables	Frequency	Percentages	Mean	Std. Dev
Age (years)			48.02	8.67
≤ 30	8	5.3		
31-40	26	17.3		
41-50	58	38.7		
51-60	56	37.3		
>60	2	1.3		
Household size			7	3.00
≤ 4	17	11.3		
5-10	111	74.0		
11-16	21	14.0		
> 16	1	0.7		
Years of itinerant entrepreneurship			10.98	6.27
≤ 5	43	28.7		
6-11	46	30.7		
12-17	31	20.7		
>17	30	20.0		
Annual income (₦)			630,900	219,032
≤ 200,000	3	2.0		
200,001-600,000	76	50.7		
600,001-1,000,000	70	46.7		
>1,000,000	1	0.7		

Source: Field Survey, 2024

Table 2 reveal that respondents agreed with all the attitudinal statements as indicated by the high

mean scores. This suggests a positive attitude to itinerant entrepreneurship.

Table 2: The Attitude of Women Household Food Traders towards Itinerant Entrepreneurship (n=150)

Items	Mean	Items	Mean
Keeps away from boredom.	4.34	It can lead to a more sustainable future.	4.54
I feel a sense of belonging towards itinerating entrepreneurship.	4.52	It can help empower women in our community.	4.53
It can help improve our quality of life.	4.56	It can promote equality and fairness.	4.41
It preserves our traditional way of life.	4.33	It is meaningful and fulfilling.	4.53

Source: Field Survey, 2024

Table 3 indicates that respondents' attitude to itinerant entrepreneurship was positive with a mean score of 4.45. Itinerant entrepreneurship has promoted skills acquisition and entrepreneurial attitude. Aderinoye-Abdulwahab et al. (2015) argued that trading (39.8%) was the major source of funding for agricultural enterprises in their study.

Table 3: Summary of respondents' attitude

Attitude	Frequency	Percentage	Mean ± SD	Remarks
≤ 4.20	29	19.3		
4.21-4.50	72	48.0	4.45±0.24	Positive
≥ 4.51	49	32.7		

Source: Field Survey, 2024

Factors influencing participation in itinerant entrepreneurship

Table 4 reveals the factors influencing participation in itinerant entrepreneurship ranked accordingly. The factors were in two main categories: economic factors and social factors. The desire to generate income ranked first among economic factors that influence participation in itinerant trading. Furthermore, the need to support the family ranked the most influential social factor that drive participation in itinerant trading among women food traders. Uguru (2018) reported that entrepreneurship improved the social well-being of the people, increased wealth creation, provide food, and shelter and create empowerment for the people.

Table 4: The Economic and social factors influencing participation in itinerant entrepreneurship (n=150)

Economic factors	Mean	Rank	Social Factors	Mean	Rank
Generate income.	3.90	1st	Family support.	3.84	1st
Create employment.	3.74	2nd	Cultural norms.	3.72	2nd
Self- sufficiency.	3.65	3rd	Role models.	3.60	3rd
Create a new economy	3.59	4th	Time availability.	3.54	4th
No reliance on government.	3.58	5th	Access to credit.	2.85	5th

Source: Field Survey, 2024

Constraints faced by women household food traders in itinerant entrepreneurship

Table 5 indicated resources and cultural constraints ranked accordingly. Limited capital and family responsibilities ranked first respectively in both categories.

Table 5: Constraints in itinerant entrepreneurship

Resources Constraints	Mean	Rank	Cultural Constraints	Mean	Rank
Limited capital.	2.84	1st	Family responsibility.	2.17	1st
Transportation and market.	2.56	2nd	Decision making.	2.14	2nd
Environment and weather.	2.42	3rd	Spouse dominance.	2.14	2nd
Clients and customers	2.28	4th	Next of kin.	1.86	4th
Business compliance.	2.16	5th	Ownership of property	1.84	5th

Source: Field Survey, 2024

Result of tested hypothesis

Although the R^2 value is low it is opined that studies in fields that attempt to predict human behaviour typically have low R^2 values as humans are harder to predict than physical processes (Martin et al., 2016). According to Martin et al. (2016) if R^2 values are low but there are statistically significant predictors, it is possible to draw important

conclusions about how changes in the predictor values are associated with changes in the response value. As shown in Table 6, age (β=0.007) was the determinant of the attitude of women traders towards itinerant entrepreneurship, the negative influence of proximity to market (β=-0.032)

indicates that, the farer away from their homes the central market is, the more positive attitude women traders exhibit towards itinerant trading since the distance have made it mandatory for them to travel with commodity.

Table 6: Determinants of the Attitude towards Itinerant Entrepreneurship

Predictors	Unstandardized Coefficients			
	B	Std. Error	t	Sig.
(Constant)	4.516	0.174	25.959	0.000
Age	0.007**	0.002	2.903	0.004
Proximity to market	-0.032**	0.008	-3.899	0.000

Source: Field Survey, 2024 **Significant at the .05 level (2-tailed) R Square=0.199

CONCLUSION AND RECOMMENDATIONS

The study concluded that the attitude towards itinerant entrepreneurship was positive and determined by age and proximity to market. Economic and social factors influence women household food traders' participation in itinerant entrepreneurship. It is therefore recommended that targeted interventions by relevant stakeholders should be designed to support women's economic empowerment and entrepreneurship in rural areas.

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EFFECTS OF FUEL SUBSIDY REMOVAL ON THE POULTRY ENTERPRISES IN KOGI STATE, NIGERIA

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ABSTRACT
The aftermath of fuel subsidy removal has resulted in closing a large number of poultry enterprises in Nigeria. This study assessed the effect of fuel subsidy removal on poultry farmers (layers and broilers) in Kogi State, Nigeria. Three-stages sampling procedure was used to select one hundred and sixty-two poultry farmers in the study area. Structured questionnaire complimented with interviews scheduled were used for data collection. Data collected were analysed through frequency, percentages, and mean and Ordinary Least Square. Findings showed that 79.0% of the respondents were male, with a mean age of 45.8 years. Also, 92.6% of poultry farmers had formal education with a mean annual income of ₦175,780.00. The coefficient of cost of veterinary (-0.1313772), cost of water (-0.5497904), and cost of feeds ((-0.0231436) had effect on the income of poultry farmers. The most constraints faced by farmers in post-subsidy removal were increase in cost of production ($\overline{X}$ =2.93), inflation ($\overline{X}$ =2.67) and the high cost of transportation ($\overline{X}$ =2.57). It is recommended that palliatives inform of feed, medication, and free advisory services should be provided for poultry farmers in order to reduce the negative effect of subsidy removal.

Keywords: Fuel Subsidy, Removal, Poultry Enterprises

INTRODUCTION

Animal protein is crucial for human growth and development. Poultry is major source of animal protein in Nigeria. Nigeria hosts close to 50% of the poultry Sub-Sahara Africa (Adefehinti and Adebo, 2021). Poultry serves source of food and income to farmers and the entire populace at large. They play a crucial role in improving food security by providing affordable and accessible sources of animal protein and vital nutrients (Adeyonu et al., 2021). Poultry have contributed amazingly to GDP. According to Statista (2023), reported that the livestock sector (poultry inclusive) contributed 30.57% to the GDP in the first quarter of 2023. The governor of the Central Bank of Nigeria revealed that the poultry sector is Nigeria's most commercialized agriculture sector, with a net worth of N1.6 trillion in 2019 (Awojulugbe, 2019). The opportunities embedded in poultry have been shattered due to declaration made about the removal of fuel subsidy. The poultry enterprises in Nigeria have suffered unprecedented because of fuel subsidy removal. More than 50% of poultry farm in Nigeria have folded up because of fuel subsidy removal. The exorbitant increases in the prices of feeds and drugs have resulted to decline in the stocking capacity of the farmers. It is on this basis that this study tends to determine the effect of fuel subsidy on the income of poultry farmers. The main objective of the study is to determine the effect of fuel subsidy removal on the poultry enterprises (layers and broilers) in Kogi State, Nigeria. The objectives of this study were to: describe the socio-economic characteristics of the respondents;

determine the effect of fuel subsidy removal on the income of poultry farmers; and identify the challenges faced by farmers in post-subsidy removal.

METHODOLOGY

The study was done in Kogi State Nigeria. The State lies between latitude 6^0 33^1 and 8^0 44^1 N and longitude 5^0 22^1 and 7^0 49^1E. Three-stages sampling procedure was employed for this study. The first (1) stage involved random selection of one (1) from the four (4) agricultural zones in the State. The second (2) stage involved the used of snowball sampling techniques to identify poultry farmers in the study area. The third (3) stage involved the use of proportional sampling to select 10% of poultry farmers from the sampling frame which now gave a total of 162 poultry farmers selected for this study. Primary was used for this study. Objectives one and three were achieved using descriptive statistics (frequency, percentages and mean).

Ordinary Least Square was used to achieve objective two that is the effect of fuel subsidy removal on the income of poultry farmers
The model is expressed in implicit form as shown in equation (1):
$Y = f(X_1, X_2, X_3, X_4, X_4, X_5, X_6, X_7U)$ (1)
The functional form is expressed in the implicit forms as:
$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 b_6X_6 b_7X_7 + U$
Where:
Y = Annual income from poultry enterprises (Naira)

X_1 = Cost of transportation (Naira), X_2 = Cost of drugs (Naira), X_3 = Cost of veterinary (Naira) X_4 = Cost of equipment (Naira), X_5 = Water (Naira), X_6 = Labour cost (Naira), X_7 = Cost of feed (Naira), $b_1 – b_7$ = Regression coefficient, a = constant term, $X_1 – X_{17}$ = Independent variables, U= error term

RESULTS AND DISCUSSION
Socioeconomic characteristics

Table 1 showed that 79.0% of the respondents were males while 21.0% were females. This implies that larger proportion of poultry farmers were males. Table 1 revealed that the mean age 45.8 years, implying the farmers are in their active and productive age. Table 1 showed that the mean household size was 7.0 person, indicating large household size. The mean farming experience of farmers in the stud area was 11.6 years.

Table 1: Socio-economic characteristics of poultry farmers (n=162)

Variables		Frequency	Percentage	Mean
Sex	Male	128	79.0	
	Female	34	21.0	
Age	<20	5	3.1	45.8
	21-30	16	9.9	
	31-40	86	53.1	
	>40	55	33.9	
Household size	<5	37	22.8	7.0
	6-10	120	74.1	
	>10	5	3.1	
Experience in poultry enterprise	<5	4	2.5	
	6-10	56	34.6	11.6
	>10	102	63.0	
Annual income	<500000	7	4.3	175,780.00
	501000-1000000	18	11.1	
	>10000000	147	90.7	

Sources: Field survey, 2024

Effect of fuel subsidy removal on the income of poultry farming enterprises

The result of the Ordinary Least Square in Table 2 showed R^2 value of 0.35.6 which implies that 36% variation in the income of poultry farmers was explained by the independent variables included in the model. The cost of veterinary (-0.1313772) was negatively significant at 10% level of probability. This implies that as the cost of veterinary increases, the income of poultry farmers reduces. Cost of water (-0.5497904) was positive

significant at 10% level of probability. This indicates that as cost of water increases income of poultry farmers reduces. Cost of feeds (-0.0231436) was negatively significant at 5% level of probability. This implies that an increase in cost of feed will reduce the income of poultry farmers. This finding agrees with Kolawole *et al.* (2023) who reported that removal of fuel subsidy has resulted to increase in the cost of vaccines and production among poultry farmers in South-western Nigeria.

Table 2: Effect of fuel subsidy removal on the income of poultry farming enterprises (n=162)

Variables	Coefficient	t-value
Cost of transportation	-0.118323	-0.16
Cost medication	0.1204001	0.32
Cost of veterinary	-0.1313772	-1.82*
Cost of equipment	-0.029822	-0.01
Water	-0.5497904	-7.47*
Labour	0.0142138	0.21
Cost of feeds	-0.0231436	-2.11**
Constant	63492.07	8.42***
F-value	12.16***	
R-squared	0.3560	
Adj R-squared	0.3267	

Sources: Field survey, 2024
**=Significant at 5% level of probability, *=Significant at 10% level of probability

Challenges faced by poultry farmers in post-fuel subsidy removal

Table 3 indicated that increase in cost of production ($\bar{X}$ =2.93), inflation ($\bar{X}$ =2.67), increase in transportation cost ($\bar{X}$ =2.57), low patronage ($\bar{X}$

=2.55), and reduction in number of birds ($\bar{X}$ =2.44) were the most severe challenges faced by poultry farmers in post-fuel subsidy removal. This finding aligns with that of Adefehinti and Adebo (2023) who reported that increase in production is a major constraint farmer in Oyo State, Nigeria. However, loss of market ($\bar{X}$ =1.96) was not a severe challenge faced by poultry farmers in the study area.

Table 3: Challenges faced by poultry farmers in post-fuel subsidy removal (n=162)

Variables	Very severe	Severe	Not severe	Sum	Mean	Decision
Increase in transportation cost	102 (62.9)	50 (30.9)	10 (6.1)	416	2.57	Severe
Inflation	117 (72.2)	37 (22.8)	8 (4.9)	433	2.67	Severe
Low patronage	99 (6.1)	53 (32.7)	10 (6.1)	413	2.55	Severe
Reduction in numbers of bird	85 (52.5)	67 (41.4)	7 (4.3)	396	2.44	Severe
Loss of market	34 (20.9)	88 (54.3)	40 (24.7)	318	1.96	Not severe
Increase in production cost	152 (93.8)	8 (4.9)	2 (1.2)	474	2.93	Severe
Decreased profitability	56 (34.5)	81 (50.0)	25 (15.4)	355	2.19	Severe

Sources: Field survey, 2024

CONCLUSION AND RECOMMENDATIONS

It can be concluded that majority of the respondents are males. The cost of veterinary, cost of water, and cost of feed had an effect on the income of poultry farmers. Also, cost of production is the most constraint facing poultry farmers. It is recommended that the government should reverse fuel subsidy back in order to reduce the cost of production. Also, palliatives inform of feed, medication, and free advisory services should be provided for poultry farmers in order to reduce the negative effect of subsidy removal.

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EXPLORING THE PATTERNS AND TRENDS OF COMMUNAL CONFLICTS IN NORTH CENTRAL, NIGERIA

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ABSTRACT

In recent years, incidences of communal conflicts have been increasing in the country. The study therefore examined the patterns and recent trends of communal conflicts in North-central, Nigeria. The specific objectives were to; identify the types of communal conflicts in the study area; determine the season of occurrence of communal conflicts in the study area; determine the category of people mostly affected by communal conflicts; determine the duration of communal conflicts in the study area and determine the period of displacement from communities during communal conflicts. A four staged sampling procedure was used to obtain a sample size of 391 farmers. Information was elicited using questionnaire, interview schedule and focus group discussion and analysed using descriptive statistics such as frequencies, percentages and mean. The major findings showed that the majority (47.05%) of the respondents reported that farmers/herders' conflicts occurred both in the dry and rainy seasons. The mean period of displacement from communities during communal conflicts in the study area was 11.74 months. Relocation to safer places was the most widely adopted coping strategy by respondents to mitigate the effect of communal conflicts. In conclusion, the patterns and recent trends of communal conflict occurrence were examined in the study. The study recommended that extension service providers, government and non-governmental organizations should facilitate farmers' access to productive resources that will improve their well-being and productivity and also aid in mitigating the effects of communal conflicts.

Keywords: Communal Conflicts, Farmers/herders, Occurrence, Frequency, Security

INTRODUCTION

Communal conflicts have become a persistent issue in Nigeria and has plagued the nation for decades. These conflicts, often rooted in ethnic or socioeconomic differences, have led to violence, displacement, and loss of lives. The patterns and trends of communal conflicts in Nigeria is a complex phenomenon with deep-seated historical, political and economic causes (Anierobi, *et al.,* 2024).

Communal conflicts in Nigeria have had a terrible impact, with thousands of people killed. The cycle of violence and revenge has produced an environment of dread and mistrust, impeding efforts toward reconciliation and peacemaking. The humanitarian effects of these wars are equally substantial, with many people displaced from their communities and in need of immediate aid (Ochogwu, 2024). Furthermore, the prevalence of communal conflicts in Nigeria is a complicated issue that demands ongoing commitment and collaboration from all parties. By addressing the core causes of these conflicts and fostering dialogue and reconciliation, Nigeria may advance toward a more peaceful and inclusive society in which all its residents can dwell together (Orhero, 2020).

North-central Nigeria has experienced an array of ethno-communal incidents over the years, with many ending in widespread bloodshed and instability. Additionally, the prevalence of community conflicts is a complicated issue that needs sustained dedication and collaboration from all parties. There is an urgent need to investigate the current patterns and trends of such conflicts in order to propose relevant solutions for curbing them. As a result, this study examines the prevalent narratives of community conflicts in Benue and Nasarawa States to obtain insight into the current state of socio-contextual complications. More specifically, the study seeks to:

i. Determine the season of occurrence of communal conflicts in the study area.
ii. Determine the category of people mostly affected by communal conflicts in the study area.
iii. Determine the period of displacement from communities during communal conflicts in the study area.
iv. Examine the coping strategies adopted by the respondents to mitigate impact of communal conflicts in the study area.

METHODOLOGY

Benue and Nasarawa States, in North-Central Nigeria, were the study's locations. The total land mass of North Central Zone covers an area of 296,898 km^2 which represents approximately 32% of the land mass of the country. Its coordinates are 6° 30' to 11° 20' North by latitude and 2° 30' to 10° 30' East by longitude. More than 77% of the population in the region are largely involved in one type of activity or another (Adzenga, Umar and Onyenkazi, 2024).

The study's population consisted of all farm families in Nigeria's Benue and Nasarawa states, selected through a multistage sampling procedure. Initially, all Local Government Areas (LGAs) where communal conflicts occur often in the two

states were purposively selected using the purposive sampling procedure. Overall, seven (7) LGAs with a high incidence of communal conflict over the years were selected: four (4) out of 23 LGAs in Benue state and three (3) out of 13 in Nasarawa state. In the second stage, eleven (11) extension blocks with a high prevalence of communal conflicts were chosen from the specified LGAs using a purposive sampling technique. That is, eight (8) extension blocks from LGAs in Benue state and three (3) extension blocks from LGAs in Nasarawa state (the significant number of extension blocks affected in Benue state reflects the severity of conflicts in the State. In the third stage, twenty-four (24) extension cells that have suffered repeated communal conflicts were randomly selected (15 extension cells from Benue state and nine (9) extension cells from Nasarawa state) using a simple random sampling method. Finally, 391 farmers (277 from Benue and 114 from Nasarawa) were selected from a list of registered farm families in each cell using the Taro Yamane formula for sample size determination. Primary data were obtained using a structured questionnaire and interview schedule to elicit information from farmers and analysed using

descriptive statistics such as percentages, mean scores, and ranking.

RESULTS AND DISCUSSION
Season of occurrence of communal conflicts

According to Table 1, 41.87% of respondents in conflict-prone areas of Benue State reported that farmers/herders' conflicts occur primarily during the rainy season. This result is congruent with that of Olaiya, Ogungbaro and Olujide (2022), who observed that the majority of resource-based conflicts between farming communities in Nigeria occur during the farming season. Furthermore, majority (85.96%) of the respondents from Nasarawa State reported occurrence of farmer/herder conflicts during the rainy and dry seasons. However, the pooled result revealed that 47.05% of respondents in the study area reported the occurrence of farmers/herders' conflicts during the dry and rainy seasons. This result concurs with the findings of Olayoku (2014) who observed that resource-based conflicts do not end after the rainy season and that violence recurrence of the conflicts was not restricted to specific seasons of the year and occurred during all months.

Table 1. Season of occurrence of communal conflicts in the study area

Type	Season	F	%
Ethnicity/Chieftaincy	Rainy	127	32.48
Land/Boundary/Fishing	Dry	80	20.46
Farmers herders	Rainy and Dry	184	47.05
Total		391	100.0

Source: Field survey, 2019

Period of displacement from communities during communal conflicts

Table 2 showed that the mean period that the respondents were displaced in Benue State was 13 months, while the mean period of displacement in Nasarawa State was 11 months. This shows that farmers in Benue State were displaced from their communities for a longer period than their counterparts in Nasarawa State, most likely due to

the severity of the conflicts in Benue State. The pooled result showed that the average period of displacement from the study area was 11.74 months. Desertion of multiple villages, as well as the interruption of farming and extension efforts in communities affected by communal conflicts, are likely to have an impact on people's income-generating activities.

Table 2. Period of displacement from communities during communal conflicts in the study area

Duration (Months)	Benue n=277		Nasarawa n=114		Pooled n=391	
	F	%	F	%	f	%
1-11	162	58.40	63	55.30	225	57.54
12-23	78	28.20	19	16.70	97	24.81
24-35	28	10.10	26	22.80	54	13.81
36-47	3	1.10	3	2.60	6	1.53
48-59	3	1.10	3	2.60	6	1.53
≥ 60	3	1.10	0	0	3	076
Total	277	100.0	114	100.0	391	100.0
Mean	13.29		11.10		11.74	

Source: Field survey, 2019

Coping strategies adopted by farmers to mitigate the impact of communal conflicts in the study area

Result in Table 3 show that most (82.67%) of the respondents in areas affected by conflicts in Benue State relocated to safer places and worked harder (26.35%) to mitigate the effect of communal

conflicts why majority of the respondents (99.12%) in Nasarawa State also relocated to safer places and reduced production (86.84%) so as to mitigate the effect communal conflicts. The pooled result revealed that relocation to safer places (87.46%) and reduction in production (35.54%) were the most widely adopted strategies by respondents in conflict prone areas of the study area to mitigate the effect of communal conflicts. This result is consistent with the findings of Salihu *et al.* (2024) that Nigerian farmers used a variety of survival strategies during conflict, including enforcing farm security, praying for peace, seeking help from friends and relatives for relocation, reducing labour utilization, switching to less risky jobs, or cultivating new crops because of not hiring labour, among others.

Table 3. Coping strategies adopted to mitigate the impact of communal conflicts

Strategies	Benue %	Nasarawa %	Pooled %
Relocated to a safer place	82.67	99.12	87.46
Reduced production	14.44	86.84	35.54
Worked harder	26.35	23.64	25.57
Borrowed money	5.41	37.71	14.83
Sold all the farm produce	6.49	22.80	11.25
Taking a less risky job	0.72	2.01	2.55

Field survey, 2019   *Multiple response

CONCLUSION AND RECOMMENDATIONS

The findings revealed that communal conflicts in the study area occurred both in the dry and rainy seasons. The mean period of displacement from communities was 11.74 months. Relocation to a safer places and reduction in production were the most widely adopted coping strategies by respondents in conflict prone areas of the study area to mitigate the effect of communal conflicts. Therefore, it is recommended that extension service providers, other government agencies, and non-governmental organizations (NGOs) such as the National Emergency Management Authority (NEMA), Red Cross, and others should assist displaced persons reduce the impact of communal conflicts by delivering extension services to IDPs and allowing them access to information, productive resources which would facilitate their reintegration into their communities.

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ASSESSMENT OF SOIL FERTILITY MANAGEMENT PRACTICES AMONG ARABLE CROP FARMERS IN OYO STATE

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ABSTRACT

Sustaining soil fertility is critical for ensuring food and livelihood security for present and future generations. Inadequate Soil Fertility Management Practices (SFMP) among arable crop farmers have reduced crop yields and it threatens food production and farmers' livelihoods. This study assessed the SFMP among arable crop farmers in Oyo State. A four-stage sampling procedure was used to select 240 farmers and data were collected through questionnaires. Descriptive statistics (mean, charts, and frequency counts) and inferential statistics (Chi square and Pearson Product Moment Correlation) were used for analysis. The results showed that the majority of farmers were male (72.5%), married (83.3%) and Christian (75.3%), with an average age of 52 ± 9.42 years and a mean of 11 ± 5.23 years of education. Over half (51.7%) of respondents reported significant benefits from SFMP use. Utilisation of SFMP was high (50.8%) among farmers, with mulching ($\bar{x}=2.72$), zero tillage ($\bar{x}=2.59$) and crop rotation ($\bar{x}=2.40$) being the most adopted practices. Key benefits include increased crop yield ($\bar{x}=194.9$), higher income ($\bar{x}=194.9$) and reduced crop failure ($\bar{x}=191.7$). The main constraints were inadequate supply of inputs ($\bar{x}=2.84$), limited agricultural land ($\bar{x}=2.79$) and insufficient finance ($\bar{x}=2.68$). Years of farming experience ($r = 0.183$) significantly influenced SFMP use, with farming experience ($\beta = 0.223$) and educational attainment ($\beta = 0.107$) being key predictors of utilisation.

Keywords: Soil Fertility, Management Practices, Arable crops

INTRODUCTION

Effective soil management is essential for sustainable farming. Proper soil management improves land value, prevents degradation, and maintains fertility, which is essential for food security and sustainable land use. In developing countries, agricultural expansion due to population growth drives unsustainable practices, resulting in biodiversity loss and land degradation. Maintaining soil fertility is thus necessary for food and livelihood security (Alemu and Mengistu, 2019). Farmers traditionally used crop rotation, bush fallowing, and shifting cultivation to maintain soil fertility, but reduced land availability limits these methods. Hence, new techniques like organic fertilizers and minimum tillage are becoming critical (Havlin and Heiniger, 2020). Despite Nigeria's large arable land area, productivity is low, necessitating enhanced soil fertility management to meet growing food demands. This study examined the respondents' socio-economic characteristics, assessed benefits derived from SFMP, identified constraints and determined the extent of SFMP use.

The hypothesis tested was: *Ho1* – There is no significant relationship between selected socio-economic characteristics and the extent of soil fertility management practice usage

METHODOLOGY

The study was conducted in Oyo State, southwestern Nigeria, with Ibadan as its capital. The state covers a land area of approximately 28,454 square kilometres, situated between latitude 7°N and 9°N and longitude 3°E and 5°E, and is bordered by Kwara, Osun, Ogun and the Republic of Benin. The state has a tropical climate, and a population heavily involved in farming, making it an ideal site for assessing soil fertility management.

A multi-stage sampling selected three of the four zones, six blocks within those zones, one cell per block, two villages per cell, and 20 farmers per village, totalling 240 respondents. Data were collected via structured questionnaires and analysed using descriptive statistics.

RESULTS AND DISCUSSIONS

Most respondents were aged 50-59 (35%) with an average age of 53±8.7 years, supporting findings that individuals in active age groups are more engaged in farming (Ashimolowo *et al.,* 2023). The majority were male (72.5%), married (83.3%) and had a mean education level of 7.6±4.8 years, indicating moderate literacy levels that could influence SFMP understanding. Farming was the primary occupation (84.2%), with a mean monthly income of ₦55,600±15,527.36. On average, respondents had 24 years of farming experience, reflecting a significant capacity for SFMP adoption.

Table 1: Socioeconomic characteristics of the respondents

Variable	Frequency	Percentage	mean
Age			
30-39	16	6.7	5±8.71
40-49	70	29.2	
50-59	84	35.0	
60-69	68	28.3	
>69	2	0.8	
Sex			
Male	174	72.5	
Female	66	27.5	
Marital Status			
Married	200	83.3	
Single	10	4.2	
Divorce	30	2.5	
Years of formal Educational			
1-6	120	50.0	7.6±4.76
7-12	86	35.8	
>12	34	14.2	
Monthly Income			
30,000-70,000	216	90.0	55,600.00±15527.36
71,000-111,000	10	8.3	
112,000-120,000	2	1.7	
Farming Experience			
1-10	88	36.7	24±11.12
11-20	111	42.2	
>20	41	17.1	

Source: Field Survey, 2020

Benefits derived from the use of soil fertility management practices

The weighted score assessment as shown in Table 2 indicated that the primary benefit of SFMP was an increase in crop yield (194.9), directly translating to higher income and reduced crop failure (191.7), which are critical for food security and economic stability. Other benefits included enhanced family food security (184.9), improved soil health (183.3), and sustainability of farmland (179.2). These results align with research suggesting that SFMPs, such as organic manures and crop rotation, significantly enhance farming productivity (Aghabeygi et al., 2024).

Table 2 Distribution of the respondent based on the benefits derived from the use of SFMP

Benefits derived	Larger extent	Lesser extent	Not at all	Weighted score	Rank
Increase crop yield	95.8	3.3	8.0	194.9	1st
Increase income	95.8	3.3	8.0	194.9	1st
Reduce crop failure	91.7	8.3	0.0	191.7	2nd
Enhance family food security	85.8	13.3	8.0	184.9	3rd
Improve the health of soil	85.0	13.3	10.0	183.3	4th
Promote sustainability of farmland	79.2	20.8	0.0	179.2	5th
Reduce misuse of harmful chemicals on soil	70.8	28.3	8.0	169.9	6th

Source: Field Survey, 2020

Constraints encountered by respondents to the use of soil fertility management practices

Table 3 shows that the primary constraint was inadequate input supply ($\bar{x}$ = 2.84), followed by limited land availability ($\bar{x}$=2.79) and financial constraints ($\bar{x}$ = 2.68). These barriers highlight the need for better resource access to facilitate effective soil management practices. Labor shortages ($\bar{x}$ = 2.56) and high costs ($\bar{x}$ = 2.52) also hinder SFMP adoption, aligning with Ogieriakhi and Woodward (2022), who found resource constraints critical in SFMP uptake.

Table 3 Distribution of respondents based on constraints encountered to the use of soil fertility management practices

Constraints	Mean	Rank
Inadequate supply of necessary inputs	2.84	1st
Inadequate availability of agricultural land	2.79	2nd
Inadequate finance	2.68	3rd
Shortage supply of human labour	2.56	4th
High cost of soil management practices	2.52	5th
Transportation problem of fertility inputs	2.02	6th
Lack of knowledge of SFM utilization	1.58	7th

Source: Field Survey, 2020

The extent of use of soil fertility management practices by the respondent

The extent of SFMP use as shown in Table 4 reveals that mulching was the most frequently employed method, with a mean score of 2.72, followed by zero tillage ($\bar{x} = 2.42$) and crop rotation ($\bar{x} = 2.34$). Mulching is popular due to its ability to retain soil moisture and improve fertility. Crop rotation and zero tillage are also valued for reducing soil depletion and erosion. Over half of the respondents (50.8%) had a high SFMP usage level, while 49.2% had a low usage level, suggesting that adoption could increase with improved resource access.

Table 4 Distribution of respondents by their extent of use of Soil Fertility Management

SFMP	Not at all	Once in two seasons	Every season	Mean	Rank
Mulching	3.3	21.7	75.0	2.72	1st
Zero tillage	10.0	38.3	51.7	2.42	2nd
Crop rotation	1.7	62.5	35.0	2.34	3rd
Ridging	7.5	57.5	35.0	2.28	5th
Mineral fertilizer	5.8	65.0	29.2	2.23	4th
Bush fallowing	1.7	75.0	23.3	2.22	6th
Organic manure	6.7	68.3	25.0	2.18	7th
Use of cover crop	5.8	76.7	17.5	2.12	8th
Planting of leguminous crop	9.2	70.8	20.0	2.11	9th
Organic manure and mineral fertilizer	20.0	50.0	30.0	2.10	10th
Compost	11.7	73.3	15.0	2.03	11th
Level of use of SFMP	**F**	**%**			
Low	118	49.2			
High	122	50.8			
Total	240	100			

Source: Field Survey, 2020

Hypothesis Testing

Test of relationship between respondents' socioeconomic characteristics and extent of use of soil fertility management practices

The analysis of the relationship between selected socio-economic characteristics and the extent of SFMP among respondents reveals some key insights. The chi-square results indicate that only years of farming experience (r = 0.047, p = 0.183) shows a significant positive correlation with the extent of SFMP usage. This implies that farmers with more experience are more likely to employ effective soil fertility management practices, likely due to their accumulated knowledge and practical understanding of the benefits. This supports the findings of Orifah et al., (2018), who found that farmers with more years of farming experience tend to adopt more soil fertility management practice than those with few years of experience. Other variables such as sex ($\chi^2 = 0.828$, p = 0.363), marital status ($\chi^2 = 0.3619$, p = 0.164), religion ($\chi^2 = 2.957$, p = 0.228), Age (r = 0.110, p = 0.147) and educational attainment (r = 0.707, p = 0.35) do not have a significant association with the extent of SFMP usage. This suggests that these demographic factors do not play a crucial role in determining how frequently or extensively farmers adopt soil fertility management techniques.

Table 8 Chi-square and correlation analysis between some selected socio-economic characteristics and the extent of Soil Fertility Management Practices

Variable	Chi-square value	df	p-value	r- value	Remarks
Sex	0.828	1	0.363		Not significant
Marital status	0.361	2	0.164		Not significant
Religion	2.957	2	0.228		Not significant
Age			0.110	0.147	Not significant
Educational attainment			0.707	0.352	Not significant
Years of farming experience			0.047	0.183	Significant
Monthly income			0.457	-0.69	Not significant

Source: Field Survey, 2020.

CONCLUSION AND RECOMMENDATIONS

The study highlights SFMPs as essential for sustainable agriculture, food security, and economic stability. Benefits include increased yield, income, and family food security. However, challenges like input shortages, limited land and insufficient funds hinder full SFMP adoption. Years of farming experience showed a significant positive correlation with the extent of SFMP usage.

The Ministry of Agriculture should enhance input availability, improve land access and promote financial support. Agricultural departments should also invest in educating farmers on SFMPs to maximize sustainable land use.

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EFFECTS OF CLIMATE CHANGE ON AGRICULTURAL CROPS AMONG WOMEN FARMERS IN ILORIN-EAST LGA, KWARA STATE, NIGERIA

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ABSTRACT
Climate change has affected agricultural activities in most countries of the world, thus resulting in food shortage. This study investigated the perceived effects of climate change on agricultural crops among women farmers in Ilorin-East LGA, Kwara State, Nigeria. Specifically, the study assessed the types of crops cultivated, examined the perceived effects of climate change on agricultural crops, investigated the coping strategies to climate change effects, and identified the challenges encountered. A two-stage sampling procedure was used to select 150 respondents. Structured questionnaires were used while both descriptive and inferential statistics were used for data analysis. Findings showed that many (87.3%) respondents grew African spinach and 78.0% were grouped as having high perceived effects on crop production. The main perceived effect of climate change was reduced crop yield ($\bar{x} = 4.60$), while the use of addition of manures and fertilisers ($\bar{x} = 4.57$) was the major coping strategy employed. The main challenge encountered was difficulty in obtaining suitable land for farming ($\bar{x} = 3.66$). Logistic regression on significant relationship between socioeconomic characteristics and perceived effects of climate change showed that marital status ($\beta=2.09$, $p<0.05$) and age ($\beta=0.07$, $p<0.05$) were significant. The study concluded that the women farmers perceived effects of climate change on their crops were high. Thus, agricultural extension programs for women farmers should devise strategies to help in building climate adaptive capacity of the women to increase crop yield and infestation of pests and diseases.
Keywords: Agricultural crops, climate change, coping strategies, perceived effects

INTRODUCTION

Climate change is one of the major environmental threats to humanity especially in agriculture on a global scale. It affects agriculture in a number of ways, one of which is directly related to food production. With its many implications for the environment and human survival, climate change is one of the most significant challenges of the twenty-first century (Jasper et al., 2020).

The productivity of agricultural crops is a major factor in determining rural livelihood, economic growth, and food security. The global food production trajectory has been shaped in recent times by a multitude of factors that have an impact on crop output worldwide. Women are important contributors to the agricultural industry, but in comparison to men, they own fewer assets, have less access to land, inputs, financial and extension services, and are more vulnerable to the negative consequences of a worsening environment (Bello *et al.,* 2021).

The spread of diseases and pests is accelerated by climate change, severely taxing Nigeria's agricultural sector and raising the risk of food shortages and price rises. The four aspects of food—availability, stability, accessibility, and utilization—are affected by these circumstances. This makes it harder for a sizable portion of the populace to physically, socially, and financially have access to enough good and healthy meals. Nigeria is a significant importer of agricultural goods despite having a vast agricultural potential because the majority of its women cultivate food for subsistence (Pawlak and Kołodziejczak, 2020).

The general objective of the study was to examine the perceived effects of climate change on agricultural crops among women farmers in Ilorin East LGA, Kwara State, Nigeria and the specific objectives were to;

i. identify the types of agricultural crops mostly planted in the study area.
ii. examine the perceived effects of the climate change on agricultural crops in the study area.
iii. identify the coping strategies employed by women agricultural crop farmers on climate change effects in the study area.
iv. examine the challenges faced by women farmers in the study area

METHODOLOGY

The study was carried out in Ilorin East Local Government Area (LGA) of Kwara State. Ilorin East is located between latitude 8° 5'N and longitude 4° 5'E.

A two-stage sampling procedure was used in selecting respondents for this study. Stage 1 was a purposive selection of five villages from Ilorin East LGA because of the predominance of women in agricultural activities, and Stage 2 was a random selection of 30 women agricultural crop farmers in each of the selected five villages. In all, a total of one hundred and fifty respondents were sampled to provide data for this study.

RESULTS AND DISCUSSIONS

Types of agricultural crops cultivated

Table 1 displayed the results of crops that the respondents grew. Most respondents planted African spinach (Efo tete) (87.3%) and maize (80.7%), with some (53.3%) planting sorghum. These findings revealed that women farmers cultivated a variety of food crops, implying that women in the study area are a large labour force in

agriculture, playing critical roles in food crop production and household food security (Antriyandarti *et al.,* 2024). This study supports the assumption that women in Africa account for the majority of agricultural crop producers and processors (Perelli *et al.,* 2024).

Table 1: Types of agricultural crops cultivated by women

Agricultural Crops	Frequency	Percentage
African Spinach (Efo tete)	131	87.3
Fruits	97	64.7
Maize	121	80.7
Sweet potatoes	102	68.0
Millet	85	56.7
Sorghum	80	53.3
Cassava	84	56.0
Tomatoes	104	69.3
Pepper	110	73.3
Yam	85	56.7
Others	110	73.3

Source: Field Survey, 2024

Perceived effects of climate change on crops of women farmers

Table 2 showed that climatic change affected crop yield the most (mean = 4.60), while increasing floods was the least affected (mean = 4.34). This means that climate change reduced crop productivity significantly due to pests and disease infestations, as well as shifted crop growing seasons for farmers. Climate change has also been shown in studies to reduce smallholder farmers' crop production (Belay *et al.,* 2022; Tajudeen *et al.,* 2022; Wing *et al.,* 2021).

Table 2: Perceived effects of climate change on crop production

Perceived Effects	SA	A	U	D	SD	Mean	SD	Rank
Reduced crop yields	94(62.7)	52(34.7)	4(2.7)	0	0	4.60	0.54	1st
Infestation of pest and diseases	77(51.3)	70(46.7)	3(2.0)	0	0	4.49	0.54	2nd
Shift in crop growing season	73(48.7)	75(50.0)	1(0.7)	1(0.7)	0	4.47	0.55	3rd
Disruption to pollination	72(48.0)	73(48.7)	3(2.0)	1(0.7)	1(0.7)	4.43	0.64	4th
Water scarcity and irrigation challenges	69(46.0)	77(51.3)	4(2.7)	0	0	4.43	0.55	5th
Soil quality degradation	70(46.7)	73(48.7)	7(4.7)	0	0	4.42	0.58	6th
Increased temperature	71(47.3)	73(48.7)	4(2.7)	1(0.7)	1(0.7)	4.41	0.65	7th
Increased heat stress	67(44.7)	77(51.3)	5(3.3)	1(0.7)	0	4.40	0.59	8th
More frequent drought	63(42.0)	81(54.0)	3(2.0)	2(1.3)	1(0.7)	4.35	0.66	9th
Increased flooding	61(40.7)	81(54.0)	6(4.0)	2(1.3)	0	4.34	0.62	10th

Source: Field Survey, 2024; Keys; SA-Strongly Agree, A-Agree, U- Undecided, D- Disagree, SD-Strongly Disagree

The aggregate level of individual respondents' perceived effects of climate change on crop farming is presented in Table 3. Findings showed that most (78.0%) of the respondents were grouped as having high perceived effects on crop production, while few (22.0%) respondents were grouped as having low perceived effects. This implies that most women farmers in the study area have a high perception that climate change phenomena adversely affect their crop production activities. This finding agrees with many studies that earlier found that climate change manifestation poses negative effects on rural livelihood activities of women (Duru *et al.,* 2022; Dibakoane *et al.,* 2022).

Table 3: Level of effect of climate change on crop farming of women farmers

Obtained score	Level of effects	Frequency	Percentage
10 – 30	Low	33	22.0
31 – 50	High	117	78.0
Total		150	100.0

Source: Field Survey, 2024; Possible score range = 10 – 50

Coping Strategies to climate change used by women farmers

Table 4 showed the result of climate change coping strategies adopted by the women farmers. The table showed that the addition of manures and fertilizers (mean=4.57) ranked first, the adoption of cultural practices (mean=4.51) ranked second, and mulching (mean=4.32) was listed as the least

common coping strategy. This means that adding manures and fertilizers, as well as using cultural practices, were the primary coping methods utilized by women farmers to adjust to the consequences of

climate change in the study area which also corroborates with the findings of Balasha *et al.* (2023).

Table 4: Coping Strategies to Climate Change Used by Women Farmers

Coping strategies	SA	A	U	D	SD	Mean	SD	Rank
Addition of manures and fertilizers	86(57.3)	63(42.0)	1(0.7)		0	4.57	0.51	1st
Use of cultural practices	76(50.7)	74(49.3)		0	0	4.51	0.50	2nd
Managing crop yields	80(53.3)	66(44.0)	3(2.0)	0	1(0.7)	4.49	0.61	3rd
Planting at any convenient time	79(52.7)	68(45.3)	2(1.3)	0	1(0.7)	4.49	0.60	4th
Fetching of water from the rivers or streams	70(46.7)	76(50.7)	4(2.7)		0	4.44	0.55	5th
Reliance on wind pollination	73(48.3)	71(47.3)	4(2.7)	1(0.7)	1(0.7)	4.43	0.65	6th
Planting of drought tolerant crops	71(47.3)	72(48.0)	3(2.0)	3(2.0)	1(0.7)	4.39	0.69	7th
Wetting the crops early in the morning and in the evening	69(46.0)	74(49.3)	5(3.3)	1(0.7)	1(0.7)	4.39	0.65	8th
Planting on highland	67(44.7)	72(48.0)	7(4.7)	3(2.0)	1(0.7)	4.34	0.72	9th
Mulching	58(38.7)	86(57.3)	4(2.7)	2(1.3)	0	4.32	0.66	10th

Source: Field Survey, 2024; KEYS; SA-Strongly Agree, A-Agree, U-Undecided, D- Disagree, SD-Strongly Disagree

Challenges faced by women in agricultural crops farming

Challenges to crop farming by women farmers were presented in Table 5. Findings showed that difficulty in obtaining suitable land for farming (mean=3.66) ranked first, limited access to resources (mean=3.55) ranked second, and balancing farm responsibilities with household duties (mean=3.37) ranked the least constraint. This

implies that difficulty in obtaining suitable land for farming, and limited access to resources were the major constraints facing rural women farmers in applying coping strategies to climate change effects on crop production in the study area. This finding agrees with the studies of Kehinde *et al.* (2021) and Nnaji *et al.* (2021) who found that difficulty in assessing suitable lands for farming was a major problem facing women farmers in Nigeria.

Table 5: Challenges faced by women in agricultural crop farming

Challenges Faced	VS	S	NS	NC	Mean	SD	Rank
Difficulty in obtaining suitable land for farming	104(69.3)	43(28.7)	1(0.7)	2(1.3)	3.66	0.57	1st
Limited access to resources	82(54.7)	68(45.3)	0	0	3.55	0.50	2nd
Difficulty in obtaining loan	83(55.3)	65(43.3)	2(1.3)	0	3.54	0.53	3rd
Unpredictable weather patterns	77(51.3)	70(46.7)	1(0.7)	2(1.3)	3.48	0.59	4th
Inadequate infrastructure	73(48.7)	76(50.7)	0	1(0.7)	3.47	0.54	5th
Pests and diseases	66(44.0)	84(56.0)	0	0	3.44	0.50	6th
Difficulty in accessing markets	67(44.7)	80(53.3)	2(1.3)	1(0.7)	3.42	0.56	7th
Limited access to education and training opportunities	65(43.3)	82(54.7)	2(1.3)	1(0.7)	3.41	0.56	8th
Gender based discrimination	68(45.3)	77(51.3)	2(1.3)	3(2.0)	3.40	0.62	9th
Balancing farm responsibilities with household duties	62(41.3)	83(55.3)	3(2.0)	2(1.3)	3.37	0.60	10th

Source: Field Survey, 2024; KEYS; VS-Very Severe, S-Severe, NS-Not Severe, NC-Not a Challenge

Test of hypotheses results

Hypothesis one (H0₁): There is no significant relationship between some selected socio-economic characteristics and perceived effects of climate change on agricultural crops among women farmers

Table 6 showed that marital status (B = 2.09, p<0.05) and age (B = 0.07, p<0.05) had significant

and positive relationships with the perceived effects of climate change on women's crop farming. This means that an increase in age could worsen the negative effects of climate change on crop farming in the study area. Farmers in their advanced years are predicted to be hesitant to accept innovations that can help avert the disastrous consequences of

climate change on agricultural production (Grigorieva, 2023).

Table 6: Result of logistic regression showing the determinants of women farmers' perceived effects of climate change on their crop farming

Variables in the Equation	B	S.E.	Wald	Sig.	Exp(B)
Age	0.07*	0.03	4.60	0.03	1.07
Marital status	2.09*	0.66	2.73	0.01	2.97
Education	-0.69	0.47	2.12	0.15	0.50
Annual income	0.00	0.00	0.05	0.82	1.00
Number of dependents	-0.10	0.09	1.34	0.25	0.90
Model Summary					
Step -2 Log likelihood	Cox and Snell R Square		Nagelkerke R Square		
1 144.398a	0.087		0.134		

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than 0.001.
Source: Field Survey, 2024

Hypothesis two (H0$_2$): There is no significant relationship between coping strategies employed and perceived effects of climate change on crop farming

The results of PPMC presented in Table 7 showed that coping strategies employed by women farmers had a significant negative relationship with the effects of climate change at the $p<0.01$ level.

This implies that an increased application of the coping strategies would lessen the effects of climate change experienced by the women farmers. This further implies that coping strategies employed by the women farmers are significantly effective in mitigating the adverse effects of climate change on farms (Malhi *et al.,* 2021).

Table 7: PPMC Correlation between coping strategies employed and perceived effects of climate change on crop farming

		Coping strategies	Effects of climate change
Coping strategies	Pearson Correlation	1	-0.645**
	Sig. (2-tailed)		0.000
	N	150	150
Effects of climate change	Pearson Correlation	-0.645**	1
	Sig. (2-tailed)	0.000	
	N	150	150

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Field Survey, 2024

CONCLUSION AND RECOMMENDATIONS

The study concluded that women farmers perceived that the effects of climate change on their crops were high. The application of manures, fertilizers, cultural methods, and fetching of water from rivers or streams were the most common coping strategies adopted by women farmers to adjust to the effects of climate change. The study recommends that the government and other agriculturally related agencies should establish ways to assist women farmers in developing climate adaptive capacities that will boost crop yields, reduce pest and disease infestations, and alter crop growing seasons.

RETHINKING RURAL DEVELOPMENT APPROACHES: AN OVERVIEW OF THE OUTCOMES OF THE RAYUWA PROJECT IN KATSINA STATE, NIGERIA

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ABSTRACT

Rural areas are the agricultural centres, food baskets, and economic base of the nation. However, they face numerous challenges including high rate of poverty, low literacy levels, lack of infrastructure, insecurity and absence of public and private institutions to support socio - economic development. Various strategies and programmes such as the Green Revolution, Operation Feed the Nation (OFN), MAMSER, DFRRI, River Basin Development Scheme, FADAMA I, II and III, Poverty Alleviation Programme and the Agricultural Transformation Agenda have been implemented without achieving the desired outcomes. This suggests the need to rethink and improve rural development strategies and programmes. Rural development is the process of improving the quality of life and livelihood of people living in rural areas. The Rayuwa project is an intervention aimed at improving the livelihood of smallholder rural farmers and their households in Kafur LGA Katsina State. The project objectives are to: increase agricultural productivity and farmers' resilience (ability to cope with challenges/stresses); commercialize the farm; reduce drudgery on the farm; and cultivate the next generation of farmers. In 2022, the project team formed 122 Village Savings and Loans Associations (VSLAs) in the 11 pilot areas and N34,169,900 ($82,794) was received as savings and N28,672,250 ($69,472) was issued as loans to members. In 2022, 115 new businesses were started, and 35 existing ones were improved or expanded. In the 2023 learning assessment, the number of students scoring zero in numeracy fell (53% to 46%), science and technology (41% to 40%) across 6 pilot in pilot.

INTRODUCTION

The concept of rural, ruralness or rurality has many definitions. In Nigeria, the National Bureau of Statistics (NBS) defines a community with less than 20,000 people as rural. Igbebe (2021) defines it based on occupation, housing, and extent of community planning etc. Rural dwellers are resource poor and characterized by subsistence living. According to Mondal (2022) the ten essential characteristics of the rural community are as follows: Size; population density; agriculture is the main occupation; close contact with nature; homogeneity of population; social stratification; close social interaction; social solidarity; and joint family.

Improvement in the quality of life and economic well-being of people living in rural areas (Ekong, 2010). To Chidi (2003) it is the development of the rural people in a sustainable manner enabling them use skills, capacities and resources to improve their socio – economic outcomes.

Importance of rural areas

Rural areas are a key sector in every nation's economy. In Nigeria they produce the food consumed in both and urban areas. Also, export products such as ginger, hide and skin, cocoa, rubber, and palm produce which bring in foreign exchange are produced in rural areas.

Challenges faced by rural communities in Nigeria

According to Macaver (1999) rural poverty is a major problem among rural dwellers. Poverty may be roughly defined as the failure to achieve certain minimum standards of living. It is a welfare concept that describes a condition of insufficiency of income relative to basic needs. Rural areas face low literacy, climate change, lack of credit. Also, due overuse, most farms in rural areas have low fertility. They have low access to markets and bargaining power and lack infrastructure and skills to diversify income sources.

Rural development strategies in Nigeria

To promote rural development programmes such as Operation Feed the Nation, Green Revolution, Directorate of Foods Roads and Rural Infrastructure, Mass Mobilization for Socio - economic Development and Reconstruction (MAMSER), Better Life for Rural Women, Family Support Programme, Poverty Alleviation Programme and Agricultural Transformation Agenda have been implemented in Nigeria.

Designing and implementing effective strategies for rural development in Nigeria

Rural development strategies in Nigeria since independence have not achieved the objective of developing rural areas (Folorunsho, 2015). It has been argued that the use of top – down non-participatory methods is a major factor in their failure (Wiggins and Proctor, 2001). Participatory methods ensure high level of buy – in, participation and co – ownership for sustainability (Abdulai, Bahadur and Fraser, 2022). Also, a sustainable graduation plan should be planned and implemented at the end of the project (Madu and Umebali, 2017).

The Rayuwa model and its outcomes

The Rayuwa project commenced in Kafur Local Government Area of Katsina State with 11 pilot communities in 2019 and in 2021 it expanded into 21 more communities in the first expansion phase. The Rayuwa project hinges its activities on the philosophy that, the rapid growth of small

commercial farmers dominated agriculture accelerates economic transformation and rapid decline in rural poverty (Pyxera Global, 2023). The Rayuwa model utilized participatory methods to design a holistic approach to rural household empowerment and resilience, hence its different components and integrated nature. The Rayuwa project has three components: agriculture, education and income generation.

Achievements of Rayuwa project on livelihood improvement of smallholder farmers

1. **Farmer aggregation and formalization**
   In 2022, the Rayuwa team facilitated the formation and formalization of 167 farmer cooperatives and 3 new Farmer's Unions in the new villages in Katsina State. The Rayuwa team conducted 10 separate trainings on leadership and group dynamics for leaders of farmer cooperative groups and members. All cooperative leaders and 4634 cooperative members participated in the training.

2. **Access to Finance and Production Inputs**
   In 2021 the project accessed a loan of N84 million ($202,409) for 740 farmers for maize and rice production in the rainy season. The 96% repayment of the loan by farmers encouraged the team to increase the number of farmers to 1,200. From 2023-25, Rayuwa will track the distribution of loans to ensure that at least 5,000 of its 12,764 (39%) project participants access loans at least once.

3. **Village Savings and Loan Association (VSLA)**
   VSLA is a self-formed, self-managed, and self-capitalized financial group that functions like a micro-bank in rural communities. In 2022, the project team formed 122 new groups in the 11 pilot villages and the 49 new villages in Katsina State. In the same period, N34,169,900 ($82,794) was received as savings and N28,672,250 ($69,472) was issued as loans to members. Since project inception, a total of 214 VSLA groups have been formed - 199 female, 14 male groups, and 1 gender-mixed group – with a total of 5,324 members. Cumulatively, N52,142,500 ($126,341) was saved and N56,041,980 ($135,789) was disbursed as loans. In 2023, Rayuwa formed six Village Savings and Loans Federations (VSLFs) and providing the VSLFs with 10 million Naira as seed capital to support VSLAs.

4. **Household income diversification (HHID)**
   The initiative targets women who support their household's farming operations but are usually not entitled to the incomes thereof. In 2022, 27 new businesses were started in the 11 pilot villages, and 60 existing businesses were improved or expanded. In the new villages, 115 new businesses were started, and 35 existing ones were improved or expanded. Rayuwa project in collaboration with the Ahmadu Bello

University's National Agricultural Extension and Research Liaison Services (NAERLS) trained 103 women. Also, over 200 women have been trained and empowered with items and tools such as grinding machines, knitting kits, bags of soybeans and groundnuts for food processing, animal feed production among others.

5. **V. Reduced drudgery on the farm**
   In 2019, Rayuwa facilitated the formation of the Rayuwa Youth Mechanization groups to own and hire micro mechanization equipment. The Rayuwa team started the 'smart subsidy scheme's cost-sharing purchase plan. Rayuwa provides 70% and the farmer 30% of the cost. In 2022 and 2023, 300.farmers benefited from mechanization equipment, including the rolling injector seed planter, the power tiller, and grain threshers.

Cultivate (Raise) the next generation of farmers

Rayuwa works with key stakeholders of the local school system to ensure high-quality education is accessible and remains accessible beyond the lifetime of the project. Key achievements from 2022:

i. Improvements in numeracy (11% to 17%), agriculture (18% to 23%) science and technology in 6 pilot communities as revealed by 2023 learning assessment.

ii. Reduction in scores of zero in numeracy (53% to 46%), Agriculture (39% to32%), science and technology (41% to 40%) across.

iii. Improvement scores of 80% and above in Agriculture from 12% to 18%.

iv. Reducing number scoring zero from 32% to 30% in literacy, 53% to 52% in numeracy, 46% to 40% in Agriculture and 51% to 48% in science and technology in 21 new Katsina communities.

v. From the homeschooling clusters, 166 learners (72 boys and 94 girls) are being prepared for enrollment into mainstream schooling from September 2022.

vi. Formation of debate, quiz, farming and reading clubs across 27 Rayuwa schools.

vii. Also, 4 Rayuwa schools were supported to plant 100 economic trees each under a cost –sharing arrangement.

Rayuwa model lessons for sustainable rural development

The following strategies of the Rayuwa project if adopted can speed up rural transformation through improved policy measures, project design and implementation strategies.

1. Use of Participatory system i.e., rapid rural appraisal prior for design and during implementation to promote community buy – in and ownership.

2. Design with sustainability in mind. Sustainability factors such as use of community members as Volunteer Extension Agents

(VEAs), Field Agents (FAs) and Community Education Workers (CEWs) who remain in the communities at the end of the project.
3. Sustainable graduation strategies put in place to transform volunteers into fee for service providers at the end of the project.
4. Emphasis on trainings and capacity building.
5. Integrated and cross – programmatic nature of project design with agriculture, education, and income generation working together to improve farmers capacity, and diversify household income.
6. Utilization of monitoring and evaluation tools to monitor and improve project implementation and management to maximize resource use efficiency and benefits to target group.
7. Consideration of a minimum length of time for sufficient impact i.e., 5 years in Nigeria and 9 years in India.
8. Constant engagement with stakeholders using quarterly townhall meetings.
9. Adoption of a culture of learning, creativity and innovation to improve project management and maximize benefits to target group.
10. Provision of necessary tools and resources to manage farming as a business and diversify household income.

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DETERMINANTS FOR THE ADOPTION OF VALUE ENHANCING GINGER PROCESSING PRACTICES FOR EXPORT AMONG LOCAL PROCESSORS IN KADUNA STATE, NIGERIA

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ABSTRACT
The study determined the factors influencing the adoption of recommended practices for ginger processing to meet export standards among local processors in Kaduna State. Multiple-stage sampling method was used to select 215 respondents for the study. Descriptive statistics and multiple linear regression analysis were utilized to achieve the objectives of the study. The study found that a majority of the ginger processors were males (61%), married (78%) and 30 % of the respondents had secondary education while the mean age of the processors was 45 years. Also, 31% of the processors had experience of between 16 – 25 years with 16 years being the mean and the dominant family size was 6 – 10 persons (29%) with 9 being the mean. Additionally, 59.1% obtained credit while the mean credit was ₦84,000 and only 41% had extension visits. Furthermore, the mean output was 480kg while the majority earned between ₦100,001 – 200,000 and the mean was ₦191,000. The determinants of adoption with their respective coefficients were sex (-0.592), membership (0.619), complexity (0.329) and cost (-0.129) significant at 1 percent while marital status (0.266), educational level (0.235), and processing experience (0.254) were significant at 5 percent. However, credit received (-0.073) was significant at 10 percent. The study recommends that facilitating factors of adoption such as education/training, credit and extension services should be emphasized while the benefits of adoption should be publicized to encourage mass adoption by local processors.

INTRODUCTION

Ginger production and export has become an important activity internationally. For the fourth year in a row, the *global ginger* market sales value increased by 5% to $6.6B in *2023 (Index box, 2024)*. Nigeria is the largest producer of ginger in Africa and second largest in the World. However, despite its large production, Nigeria is a small contributor to global ginger exports, at just 3.5% with a production volume of 734,295 MT, 86% of the total production in the whole of Africa. Nigeria's ginger export was worth $10.8 million in 2023 (Bamigboye, 2023).

Nigeria is unable to fully tap into increased opportunities in ginger production and export because locally processed ginger is usually contaminated with aflatoxin and low essential oils/spice content (Agro Nigeria, 2016). At present. most studies on ginger tend to focus on adoption of improved agronomic practices to increase yield among others. There has been less emphasis on how to improve the quality of ginger to meet export requirements/standards. This study is therefore aimed at achieving the following objectives: (i) to describe the socio-economic characteristics of ginger processors in Kachia and Kagarko LGAs of Kaduna State; and (ii) to determine the factors influencing adoption of recommended practices for ginger processing for export among ginger processors.

METHODOLOGY

The study was carried out in Kachia and Kagarko Local Government Areas (LGAs) of Kaduna State which are in the Southern part of Kaduna State, Nigeria. Majority of the people are farmers but in addition to farm production they process ginger to improve the marketability, preservation and storage of ginger (Agro Nigeria, 2016).

A multi-stage sampling technique was used to select 215 ginger processors for the study. Finally, using Slovin's formula, the sample size was determined.

Table 1: Sampling Technique and Sample Size

LGA	District	No. of ginger processors	No. of ginger processors selected (45.4% of sampling frame)
Kachia	Gumel	53	24
	Kachia Urban	43	20
	GidanJibrin	45	20
	SabonSarki	52	24
	GidanMana	44	20
Kagarko	Aribi	55	25
	KurminJibrin	40	18
	Kagarko North	47	21
	Kagarko South	43	20
	Jere South	51	23
Total		**473**	**215**

Source: Field Survey, 2023

A structured questionnaire was utilized for data collection. The questions were designed to meet the objectives of the study.

Descriptive statistics to achieve objectives (i) while the multiple regression analysis was used to achieve objective (ii). The Multiple regression equation is expressed as follows:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 ... \beta_{12} X_{12} + U$. Where:

Y = Adoption of ginger processing practices (number of practices adopted)

X_1 - X_{12} are independent variables

U = error term

α = Constant.

RESULTS AND DISCUSSION
Socioeconomic characteristics

The results in Table 2 reveals that the youthful, highly energetic and age bracket of 20 – 50 (70.6 percent) constituted an overwhelming majority of ginger processors while the mean age of the respondents was 45 years. This agrees with the study of Dutse (2017) who reported a mean age of 45 years for most farmers. Table 2 also, shows that most of the ginger processors were males (131) while females were 84 representing 60.9 and 39.1 percent of the respondents respectively. As confirmed by the United Nations Development Programme [UNDP] (2017). The mean household size of the respondents was 9. Ibukun (2009) reported the same average family size. The mean quantity of ginger processed was 480kg. The mean income was ₦191,000.

Table 2: Distribution of respondents according to their socio-economic characteristics

Variable	Frequency (n = 215)	Percentage (%)
Age (years)		
20 – 34	33	15.3
35 – 40	65	30.2
41 – 50	54	25.1
51 – 60	31	14.4
61 – 70	32	15.0
Mean	*45*	
Sex		
Male	131	60.9
Female	84	39.1
Marital status		
Married	167	77.7
Single	48	22.3
Household size (Number of persons)		
One (1)	25	11.6
2 – 5	43	20.0
6 – 10	62	28.8
11 – 15	37	17.2
16 – 25	42	15.5
Mean	*9*	
Level of education (Years of schooling)		
No formal education	47	21.9
Koranic education	21	9.8
Adult education	15	7.0
Primary education	50	23.3
Secondary education	64	29.8
Tertiary education	29	13.5
Processing experience (years)		
1 – 5	22	10.2
6 – 10	32	14.9
11 – 15	40	18.6
16 – 25	67	3.2
26 – 35	35	31.2
36 – 40	20	9.3
Mean	*16*	

Source: Author's Field Survey, 2023

Table 3 also shows that the major sources of credit for the 127 ginger processors that obtained credit were: banks - 36 (28.3 percent), cooperatives - 25 (19.7 percent), and dealers - 21 (16.5 percent), respectively. The mean credit obtained by processors was ₦84,000. Table 3 indicates that 137 (63.7 percent) of the respondents belong to a group while 78 (36.3 percent) of the respondents do not

belong to any group. Results also show that a majority 127 (59.1 percent) of the respondents had no visits from extension agents throughout the year while 52 (24.2 percent) were visited once. These findings are corroborated by Ibukun (2009) and Dutse (2017). who found that a majority of farmers had no contact with extension agents.

Table 3: Distribution of respondents according to their institutional variables

Institutional factors	Frequency, n = 215	Percentage
Membership of group		
Yes	137	63.7
No	78	36.3
How many groups do you belong to?		
None	78	36.3
One (1)	91	42.3
Two and above	46	21.4
No of extension visits per year		
Not visited	127	59.1
Once (1)	52	24.2
Twice (2)	14	6.5
Thrice (3)	13	6.0
Four Times (4)	5	2.3
Five (5) and above	4	1.9
Visit to extension agents per year		
Did Not visit	152	70.7
Once (1)	33	15.3
Twice (2)	20	9.3
Thrice (3)	4	1.9
Four (4)	4	1.9
Five (5) and above	2	1.0
Are you Satisfied with extension visits?		
Yes	75	34.9
No	140	65.1
Did you obtain credit?		
Yes	127	59.1
No	88	39.9
Total	**215**	**100**

Source: Author's Field Survey, 2023

Determinants of adoption of recommended practices for ginger processing for export among ginger processors

Table 4 shows that sex (- 0.592), membership (0,619): and experience (0.254), complexity, (0.329) and cost of adoption (- 0.129) was significant to adoption at 1 percent statistical level of significance. This agrees with the findings of Augustine (2015) who found a significant relationship between sex, membership, experience and adoption. Findings also show that marital status (0.266) and educational level (0.235) had a significant relationship with adoption at 5 percent statistical level of significance. This is in line with the *apriori* expectation that the higher the educational attainment of a person the more likely he or she is receptive to changes including the willingness to adopt recommended practices. Credit had a negative coefficient (- 0.073) and a significant relationship with adoption at 10 percent statistical level of significance. This implies that the more credit processors receive the less their likelihood of adoption.

Table 4: Socioeconomic, institutional and technological determinants of adoption

Variables	Regression coefficient	Standard error	t-value
Constant	1.855	0.715	2.594
Sex (X_1)	- 0.592	0.214	-2.770*
Age (X_2)	- 0.016	0.013	- 1.282
Marital status (X_3)	0.266	0.109	2.437**
Education level (X_4)	0.235	0.110	2.140**
Household size (X_5)	0.118	0.125	0.944
Credit received (X_6)	- 0.073	0.043	-1.728***
Membership of association (X_7)	0.619	0.045	13.766*

Variables	Regression coefficient	Standard error	t-value
Processing experience(X_8)	0.254	0.124	-2.047**
Extension visits (X_9)	0.090	0.077	1.167
Compatibility (X_{10})	- 0.290	0.193	- 1.506
Complexity (X_{11})	0.329	0.049	6.669*
Cost of adoption (X_{12})	- 0.129	0.460	-2.821*
R= 0.877			
R^2 = 0.769			
Adjusted R^2 = 0.750			
n = 215			
F = 55.714			

***Coefficient statistically significant at 10% **Coefficient statistically significant at 5%
*Coefficient statistically significant at 1% NS = not significant

CONCLUSION AND RECOMMENDATIONS

The study established that ginger processing was an important source of income and provided for the needs of many households. It was also found that socio-economic and institutional variables have a significant effect on adoption. In line with this, it is important to maximize the value of processed ginger through increased awareness and adoption of recommended practices.

The study made the following recommendations:

i. To meet export standards, it is recommended that extension services should design programmes and interventions that empower ginger processors with adequate extension visits, inputs, market access and credit.

ii. Factors which were found to determine adoption should be encouraged, supported and provided by extension services and NGOs to enable adoption.

iii. Constraints that affect adoption such as low information dissemination, low awareness and adoption should be tackled using increased extension visits and the use of preferred channels.

iv. High cost of processing, insufficient capital, insufficient inputs and low production capacity should be tackled by government.

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GENDER DISPARITIES IN LIVESTOCK PRODUCTION AMONG RURAL HOUSEHOLDS IN ASA LOCAL GOVERNMENT AREA, KWARA STATE, NIGERIA.

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ABSTRACT

In livestock production both genders play vital roles in the production. However, past policies overlooked the importance of human resources as key aspect of economic development. The study assessed gender disparities in livestock production among rural households. A two-stage sampling procedure was used to select the respondents. Data for the study were obtained using structured questionnaire from 120 (60 males; 60 females) livestock farmers. Data collected were analysed using descriptive and inferential statistics. The results showed that, both genders had different key roles they perform on their livestock farms. The results revealed that, both male and female had positive attitude towards livestock production with percentage of 98.3% and 96.7% respectively. However, their productions are faced with challenges such as, inadequate infrastructures, limited access to veterinary services and animal healthcare. T-test result showed a mean difference of 1.73. The study concludes that both genders had positive attitude towards livestock production and that they actively participate in the production. It is recommended that, government policies that promotes equal involvement of both genders in decision makings, financial management should be designed and implemented for sustainability of livestock production.

Keywords: Gender disparities, livestock, production, role, rural

INTRODUCTION

The term livestock is sometimes used to refer solely to animals that are raised for consumption, and sometimes used to refer solely to farmed ruminants, such as cattle, sheep, goats, and pigs (Uzonwanne *et al.,* 2023), In rural areas, livestock production is a key component of small-scale farming system and is an important source of income, food, and nutrition for rural households. The livestock sector is the largest source of animal protein including dairy and poultry products (FAO, 2019).

Gender is the socially constructed roles, behaviour and activities that a given society consider appropriate for a society (WHO, 2017). Gender plays an important role in agriculture since both male and female are important factors in the agrarian world. They both influences the division of labour, access to resources, decision-making, and outcomes for men and women in the sector. Gender roles are considered as the social definition of women and men in a society. So, these roles can vary among different societies regarding religion, culture, classes, values, and beliefs. According to the sustainable Development Goals (SDGs); efforts should be made to promote gender equality in agriculture and providing women with equal access to resources and services, empowering women to participate in decision-making, and addressing cultural and social norms that limit women's opportunities. In many developing countries, Nigeria inclusive, past policies for agricultural development were often narrowly aimed at production growth, overlooking the importance of human resources as well as the social and welfare aspects of development. This study therefore considered gender disparities in livestock production in Asa Local Government area of Kwara state. This study therefore considered gender role in livestock production in Asa Local Government area of Kwara state. Specifically, it described the socioeconomic factors responsible for gender role in livestock, ascertain the roles of male and female livestock farmers, describe the attitude on gender roles in livestock production and identified the constraints that affect the roles to livestock production in the study area

Hypothesis of the study was stated as there is no significant difference between the roles performed in livestock production among male and female livestock farmers.

METHODOLOGY

This research was conducted in Asa local government Area of Kwara State, Nigeria. The population of the study comprised all male and female livestock farmers in Asa local government area of Kwara state, Nigeria. A two-stage sampling method was used to select the respondents for the study. The first stage involved the random selection of five (5) villages in Asa local government area of Kwara state. The second stage was the random selection of 60 males and 60 females livestock farmers across the five (5) villages. This made up the sample size of 120 respondents for the study. A structured questionnaire administered via personal interview was used to collect responses from the farmers. Descriptive (frequency count, percentages mean and standard deviation) and inferential statistics such T-test were used to analyse the hypothesis.

A structured questionnaire administered via personal interview was used to collect responses from the farmers. Data collection was carried out with the use of structured interview schedule. The instrument was divided into six sections based on the objective of the study. The section A dealt with the socio-economic characteristics of the

respondent. Section B examined the roles of both male and females in livestock production. Section C described the attitude of male and female farmers in livestock production while Section D identified the constraints militating against livestock production in the study area. Descriptive (frequency count, percentages mean and standard deviation) and inferential statistics such as multiple regression was used for analysed the hypothesis. The dependent variable of the study is the level of participation in livestock production on gender basis. This was measured on a three-point Likert scale. A list of the activities was drawn, and the farmers were required to indicate their extent of participation of each activity on a scale of one to four as follows; never participate (1), rarely participate (2), often participate (3) and always participate (4). These scores were aggregated and converted to means for individual respondents. The mean scores were adopted as a measure of the respondent extent of participation in livestock production on bender

basis. For ease of discussion, a benchmark was introduced to categorize the respondents' level of participation. 2.5 was derived as the mean score, any activity below the 2.5 was categorized as low participation and any activity above 2.5 was categorized as high participation.

RESULTS AND DISCUSSION

Results illustrated in Table 1 showed that the average age of male and female respondents in the study area was approximately 41 years and 39 years respectively which agrees with Kayode et al (2023), Age determines the availability of able-bodied people for agricultural production. Male respondents have 7 years of average years of schooling while female farmers have 8 years of average years of schooling. The average years spent by both male and female respondents in livestock farming is 12 years. 12 years shows that the respondents were experienced in their livestock businesses.

Table 1: Socioeconomic characteristics of the respondents

Socioeconomic characteristics	Frequency	Male Percentage (%)	Mean	Frequency	Female Percentage (%)	Mean
Age (years)						
21-30	13	21.7	40.8 years	12	20.0	38.8 years
31-40	15	25.0		25	41.7	
41-50	19	31.6		14	23.3	
≥ 51	13	21.7		9	15.0	
Years of schooling						
1-6	18	30.0	7.2 years	24	40.0	8.2years
7-12	21	35.0		25	41.6	
≥ 12	11	18.3		11	18.3	
Household size						
1-5	44	73.3	5 persons	58	96.7	3 persons
6-10	15	25.0		2	3.3	
11-15	1	1.7		-	-	
Rearing experience (years)						
1-10	25	41.7	12.1 years	45	75.0	
11-20	24	40.0		9	15.0	
21-30	11	18.3		6	10.0	
Extension contacts						
Yes	25	41.7		18	30.0	

Source: Field survey, 2023

Table 2: Distribution of Male and Female Respondents by their Roles in Livestock Production.

Results on Table 2 shows the roles of male farmers in livestock production. The roles of male and female livestock farmers were ranked according to their mean scores in which for the male livestock farmers, vaccination of livestock was ranked first with a mean score of 4.40; decision making on the farm was ranked second with a mean score of 2.87,

financial management ranked third with a mean score of 2.75 while for the female livestock farmers, sales of livestock farm produce with a mean score of 2.74 was ranked first, financial management with mean score of 2.68 was ranked second, reproduction management with a mean score of 2.57 was ranked third. It implies that, these are the major roles always performed by the male and female livestock farmers on their farms.

Table 2: Distribution of male and female respondents by their roles in livestock production

Roles	Male		Female	
	Mean Score	Rank	Mean Score	Rank
Vaccination of livestock	4.40	1st	2.02	8th
Decision making on the farm	2.87	2nd	2.47	4th
Financial management	2.75	3rd	2.68	2nd
Sales of livestock farm produce	2.56	4th	2.74	1st
Tedious work in livestock production	2.50	5th	2.47	4th
Livestock record keeping	2.45	6th	2.20	6th
Infrastructure and equipment maintenance	2.45	6th	2.10	7th
Reproduction management	2.40	8th	2.57	3rd

Source: Field survey, 2023

Categorisation of male and female respondents by their attitude towards livestock production

Table 3 shows results of the distribution of male and female respondents by categorization of their attitude towards livestock production. It shows that majority of both male and female respondents have a positive attitude towards livestock production with 98.3% and 96.7% respectively. The positive attitude could be as a result of the benefits and opportunities associated with livestock production. The positive attitude can contribute to the success and growth of the livestock industry in the community

Table 3: Categorisation of male and female respondents by their attitude towards livestock production

Categorization	Male		Female	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Positive	59	98.3	58	96.7
Negative	1	1.7	2	3.3
Total	60	100	60	100

Source: Field survey, 2023

Constraints to livestock production in the study area

Results in Table 4 shows the response was ranked according to the mean score; in which, among the male respondents' inadequate infrastructures such as roads and transportation, limited access to capital, inadequate access to veterinary medicine, limited access to extension services and climatic change and its impact on livestock production were ranked first and second as the major constraints faced by the male farmers in livestock production while for the female livestock farmers, limited access to capital and limited access to extension services were ranked first and second as the major constraints faced by the female livestock farmers in livestock production in the study area

Table 4: Constraints to livestock production in the study area

Constraints	Male		Female	
	Mean score	Rank	Mean score	Rank
Inadequate infrastructures such as roads and transportation	2.33	1st	1.30	10th
Limited access to capital or financing	2.30	2nd	2.51	1st
Inadequate access to veterinary service and animal healthcare	2.15	3rd	1.92	4th
Limited access to extension services and technical support	2.15	3rd	2.15	2nd
Climatic change and its impact on livestock productions	2.15	3rd	1.82	6th

Source: Field survey, 2023

Test of hypothesis

Result on table 5, shows a mean difference of 1.73, which implies significant difference between the roles performed in livestock production among male and female livestock farmers.

Table 5: Result of T-test Analysis showing the Mean Difference between the Roles Performed in Livestock Production among Male and Female Livestock Farmers.

Sex	N	Mean	Std. Deviation	Mean Difference	t	Sig.(2-tailed)	Decision
Male	57	14.49	5.552	1.73	0.357	0.728	Significant
Female	63	16.22	8.924				

Source: Field Survey, 2022

CONCLUSION AND RECOMMENDATIONS

The study concludes that both male and female livestock farmers had positive attitude towards livestock production in the study area. The study thereby recommends that policies that ensure gender inclusion in livestock production activities and empowering both men and women should be designed and implemented for sustainability of livestock production.

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PERCEPTION OF CROP FARMERS AND PROCESSORS TOWARDS UTILIZATION OF MODERN DRYING AND DEHYDRATING TECHNOLOGIES IN NIGERIA

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ABSTRACT

The study examined the perception of crop farmers and processors towards utilization of drying and dehydrating technology in Nigeria. It described the characteristics of drying and dehydrating technologies (DDTs), ascertained the awareness and usage of DDTs, determined their perception and examined the benefits of using DDTs. A total of 236 processors and 659 farmers were selected across the three geo-political zones in Nigeria through a multistage procedure. Two sets of different interview schedules were employed to gather information from farmers and processors. Percentage, mean, standard deviation and independent t-test were adopted for analysis of data collected. The findings showed that processors' and farmers' mean years of experience were 12.69±9.77 and 15.20 ±10.0, respectively. Most crop processors and farmers (94.5% and 90.9%) were married respectively. Also, most (96.7% and 84.5%) of processors and farmers indicated that DDTs were compatible with their existing method. The majority (65.3%) of processors and 51.5% of farmers had a positive perception towards DDTs usage. Also, the effectiveness of DDTs ($\bar{x}$ =2.85, $\bar{x}$ =2.66) was seen as the most important benefit respondents derived from using DDTs. The study revealed a significant difference in the perceptions of processors and farmers on the use of DDTs (t = 22.030; p >0.01). The study concluded that although both processors and crop farmers had positive perceptions towards utilization of DDTs, processors were better off. The study suggests that more awareness creation, capacity building and the development of affordable dryers for both processors and farmers.

Keywords: Drying and dehydrating technologies, processors, crop farmers, dryers

INTRODUCTION

Nigeria faces serious challenges of galloping population that is outpacing GDP growth and food productivity, signalling impending food security problem that could impede the attainment of sustainable development goals (SDGs) 1 and 2 (AfDB, 2018). Low agricultural productivity experienced especially by peasant smallholder farmers and processors is compounded by the colossal losses (up to 40%) of the meagre harvest through spoilage and wastage due to the inadequacy of preservation, handling, and processing technologies (IFAD, 2018). To raise the output in terms of gains from the agricultural sector, there is the need for most processes within the sector to be driven by technology, to which farmers and processors can have access.

In developing countries, people try to make the best use of the food produced, however, a significant amount of produce is lost in postharvest operations due to a lack of knowledge, inadequate technology and/or poor storage infrastructure (Kumar and Kalita, 2017). These losses were because of several factors, prominent among them most crop produce have high water content which makes them susceptible to attack by biological agents which include bacterial, mould, fungi, and other pathogens, leading to food losses caused by spoilage and decomposition. Hence, reducing post-harvest losses would help reduce wastage and ensure increased productivity and food security.

Drying is one of the most widely used post-harvest processes for preserving agricultural products or foods, with the main purpose of reducing the water content in food products to minimise microbial spoilage and deterioration reactions during storage. Drying implies moisture removal to take produce or products from moisture levels below 50% to safe storage levels of about 8-13%, depending on the type of crop and intended storage condition and use. Smallholder farmers in Nigeria mostly still rely on traditional open-air sun drying methods for indigenous food products (Faborode, 2016) like cocoa, rice, maize, plantain, cowpea, and cassava among others. Most farmers and processors still employ the sun-drying method for agricultural produce on the roadsides and many other unhygienic platforms. This method of food dehydration has led to several undesirable results such as poor quality of dried products, losses of food produce during the drying process and attendant food contamination which could lead to some associated health hazards. IFAD had observed that roadside drying of food produce can cause Lassa fever and appendicitis (The Nation, July 5, 2020). However, this traditional method leads to severe post-harvest losses and quality defects, especially for highly perishable agricultural products.

Realising the critical nature of drying/dehydration in mitigating the problems, scientists, engineers and researchers in universities/research institutes have come up with lots of research works and developed several proven modern drying and dehydration technologies. Prominent among these technologies are solar dryers, rotary dryers, cabinet dryers, dehydrators, freeze dryers and tray dryers and bed dryers These technologies are developed to prevent post-harvest losses. maintain the nutritional value of products, improve the shelf-life of products and increase market values of agricultural products. Although a lot of significant progress has been recorded in the area of developing several drying and dehydrating technologies to prevent postharvest losses, maintain nutritional and market values and enhance food security. there is still limited use of these technologies among farmers and processors,

as farmers and processors are still faced with a lot of post-harvest wastages and products development. This could be trace to farmers' and processors' dispositions towards their utilization of DDTs in Nigeria (Sonka et al., 2023). Hence, this study was conceived to identify the characteristics of drying and dehydrating technology (DDT) between crop farmers and processors in Southwest Nigeria, determine the crop farmers and processors perception and examine the benefits derived from using DDT in the study area.

METHODOLOGY

The study was carried out three out of the six geo-political zones of Nigeria. They are North West, South West and North Central. The respondents for the study were processors and crop farmers involved in drying and dehydrating of agricultural produce. At the first stage, Kaduna (North West), Osun and Oyo (South West), and Kwara States (North Central) were purposively selected based on their closeness to participating institutions where drying and dehydration research outputs and technologies (NRF-DDT projects) are carried. The participating institutions are OAU in Osun State, Niji Group in Oyo State, NAERLs in Kaduna State and NCAM in Kwara State. The second stage involves a purposive selection of 6 local government areas (LGAs) from Kaduna State, 7 LGAs from Osun, 8 from Oyo and 5 from Kwara State. Finally, a proportional sampling technique was employed to pick six hundred and fifty-nine farmers and two hundred and thirty processors across the study area. Perception about utilization of drying and dehydrating technology captured using a five-point Likert scale, the respondents were asked to rate their agreement with 17 perception statements: ranging them from 1to 5 from Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree. The total score of each respondent was calculated based on their perception. Using the mean score, this was then divided into three categories. This was done by asking the participants to name the qualities of DDT

that were employed from a list of ten attributes that were supplied.

RESULTS AND DISCUSSION
Socioeconomic characteristics

The results in Table 1 show that more than half of the processors (54.7%) were male, and majority of the crop farmers (78.5%) were male too. This implies that the utilisation of drying and dehydration technology was dominated by male processors and crop farmers; this could be as a result labour's difficulty and stress associated with the works which exclude women most times. The mean age of processors was 50.9± 20.9 which was slightly higher than that of crop farmers 47.15±11.35. It implies that both respondents were still productive, energetic and active have ability to carry out processing enterprise. More processors (94.5%) than crop farmers (90.9%) were married. The implication is that marriage might play a crucial role in engaging individuals in crop processing and farming activities. They also have access to additional labour resources and support from their families. Processors (59.7%) and farmers (51.6%) had at most 10 years of experience in their respective works with a mean year of experience of 12.7±9.8 for processors and 15.20 ±10.0 for crop farmers. Majority (68.7%) of the processors were aware of dryers/dehydrators (DDTs) for drying agricultural produces while less than half (48%) of farmers were aware of dryers for drying agricultural produces. This implies many of the farmers and few of the processors were not aware of the innovative technologies which supposed to enhance their processing business. Only more than one-third (37.7%) of processors and very few (13.5%) of farmers were using DDTs for drying their products, majority. Besides majority (622.3%, 86.5%) of the processors and farmers still depend on using traditional method of sun-drying for drying agricultural products which is characterised with weather dependence, low quality of product and prone to contamination, labour-intensive and low efficiency.

Table 1: Respondents' socioeconomic characteristic

Variable	Processor (236)		Farmer (659)	
	Freq.	Percent	Freq.	Percent
Sex				
Male	129	54.7	517	78.8
Female	107	45.3	142	21.5
Age				
≤30	27	11.4	2	.3
31 – 45	89	37.7	194	29.4
46 – 60	87	36.9	392	59.5
61+	33	14.0	71	10.8
Mean± SD	50.9 ±20.9		47.15±11.35	
Marital Status				
Single	11	4.7	28	4.2
Married	223	94.5	599	90.9
Widow/widower	2	0 .8	23	3.5

Variable	Processor (236)		Farmer (659)	
	Freq.	Percent	Freq.	Percent
Separated	0	0	5	0.8
Household size				
≤ 5	129	54.7	0	0
6 – 10	97	41.1	573	86.9
11-15	10	4.2	74	11.2
15+	0	0	12	1.8
Mean	12 ±4.8		7.1±4	
Years of experience				
≤10	141	59.7	340	51.6
11 – 30	81	34.3	277	42.0
31-50	14	5.9	42	6.4
Mean± SD	12.7±9.8		23.2±12.0	
Awareness of DDTs				
Aware	162	68.6	316	48
Unaware	74	31.7	343	52
Methods of Drying				
Using Dryers (DDT)	89	37.7	97	13.5
Manual drying (Sun drying)	147	62.3	562	86.4

Source: Field survey, 2023

Characteristics of DDTs

Evidence from Table 2 shows that about almost all of the processors and farmers mostly indicated that DDTs used for processing their agricultural products were cultural and social compatibility to the existing previous practices (98.7%, 84.3%), which means dryers available to them are compatible and favourable with the existing norms, traditions, experience, practices and needs of both farmers which would enhance adoption and utilization of any technology; This is in line with Adesoji et al. (2020) that affirmed that farmers who perceive the technology being consistent with their needs and compatible to their environment are likely to use since they find it as a positive investment. Majority (95.6%, 97.5%) of processors and farmers also identified the DDTs used for drying had relative advantage over the traditional methods of sun-drying in terms of high efficiency, high scalability, high quality of products, non-weather dependence, less labour usage and free from contamination among others. In the same vein, vast majority of the processors (94.3%) and (91.0%) agreed that DDTs were durable and easy to operate whereas majority (79.4% and 71.3%) of the farmers agreed that DDTs used for processing were durable and easy to operate for them. This is in line with Mignouna et al. (2011) report that characteristics of any technology play a critical role in users' decision to use that technology. Therefore, cultural variations have a significant impact on how technology is used since some technologies may be accepted in certain community but rejected in another community.

Table 2: Characteristics of DDT by the respondents

Characteristics of DDT used	Processors (n=89)		Farmers (n= 97)	
	Frequency	Percentage	Frequency	Percentage
Cultural compatibility	86	96.7	80	84.5
Relative advantage	85	95.6	97	97.9
Durability	84	94.3	77	79.4
Easy to operate	81	91.0	77	75.3
Easy to Maintain	80	89.9	66	68.0
Availability of spare parts	70	78.6	71	73.1
Easy to repair	66	74.1	64	66.0
Gender sensitivity	58	61.7	50	51.5
Affordability	35	39.3	19	19.6

Source: Field survey, 2023

Respondents' perception about utilisation of DDTs

Further information in Figure 1 shows that just above majority (65.3%) of processors and majority (51.5%) of farmers had positive perception towards DDTs usage for drying/dehydrating agricultural produce while 34.7% and 48.5% of processors and farmers respectively had negative perception about utilization of DDTs. This implies that both processors and crop farmers had favourable deposition to utilization of DDTs, processors were better off. This finding agrees with the finding of

Alabi *et al.* (2018) and Adisa *et al.* (2020) that reported favourable disposition of both processors and farmers towards adoption of processing technologies. This might be due to advantages derivable from using DDTs over the traditional methods of drying which is characterised with low efficiency, contamination of dried products, and low shelf lives of products among others. The fact that many of processors and farmer had positive perception towards the use of DDTs may not

translate into the decision to use these technologies despite their numerous advantages over traditional techniques, this is because of low awareness of the technologies, the cost, availability and accessibility of the technologies. Therefore, there is an urgent need by government and other relevant stakeholders to create enabling environment and provision of empowerment and capacity building for processors and farmers to enhance utilization of DDTs for drying of crops.
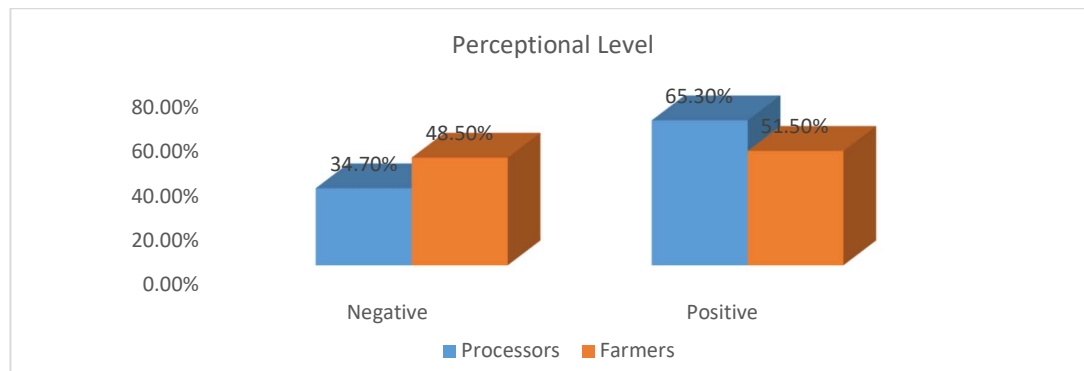

Figure 1: level of perception of farmers and processors

Difference in the perception of utilization of DDTs between processors and farmers

The results in Table 3 show that there was significant difference between farmers and processors perception of the utilization of DDTs for drying agricultural products (t = 22.030; p >0.01). This result implies that processors had better perception of using DDTs for their agricultural

produce than farmers based on their perception mean score of 47.834 for famers and the mean score of 58.4825 for the processors. This result also suggests that since more farmers had negative disposition towards using DDTs efforts should be geared towards creating more awareness and motivating farmers using these technologies for sustainable food production.

Table 3: T-test on perception of farmers' and processors towards utilization of DDTs

	Farmers (n=659)		Processors (n=236)				
Variable	Mean	St dev.	Mean	Std. dev.	Mean diff.	t-value	p-value
Perception about utilisation of DDTs	47.8347	5.10426	58.4825	6.76667	-10.6478	22.030**	0.009

** Significant at p≤0.01, Source: Field survey, 2023

CONCLUSION

Most of the processors were aware of dryers/dehydrators (DDTs) for drying agricultural produces while many of farmers were not aware of dryers for drying agricultural produces. Many of the processors and very few farmers used modern DDTs for drying their products while majority of farmers still depend on using traditional method of sun-drying for drying agricultural products. The study concluded more processors had favourable disposition towards utilization of DDTs, implying that there is high potential derivable for using DDTs over the traditional methods of drying. Provided the government could provide adequate enabling environment and capacity building in form of training for farmers and processors couple with more awareness creation and the development of affordable dryers, both farmers and processors will be motivated to adopt and utilize DDTs for

processing of agricultural produce for enhanced food security.

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PERCEIVED BENEFITS OF POST-HARVEST TECHNOLOGIES AMONG MAIZE FARMERS IN KOGI STATE, NIGERIA

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ABSTRACT

Post-harvest farm losses have contributed significant to food insecurity in Nigeria. The problem is attributed to inadequate post-harvest technologies available for farmers. The study examined the perceived benefits of post-harvest technologies among the maize farmers. A four-stages sampling procedure was used to select one hundred (100) maize farmers. Information was gathered on socio-economic characteristics of maize farmers, perceived benefits of post-harvest technologies, and constraints to post-harvest technologies. A structured questionnaire complimented by the interview scheduled was used for data collection. The data collected were analyzed using frequency, percentages, and the mean. Findings revealed that most (76.0%) of the maize farmers were male with mean age of 37 years. The mean years spent in school and mean farming experience were 9 years and 8 years respectively. The most perceived benefits of post-harvest technologies were good for meeting farmers' need/scarcity ($\bar{X}$=3.0), and increase farmers' standard of living ($\bar{X}$=2.69). The most constraints associated with post-harvest technologies among maize farmers were inadequate market information ($\bar{X}$=2.93), inadequate technical knowledge ($\bar{X}$=2.93) and inadequate finance ($\bar{X}$=2.92). It can be concluded that farmers agree that post-harvest technologies are good in meeting their needs. Inadequate market information is the most constraint faced by the farmer. It is recommended that farmers should be equipped with updated market information and proper knowledge of post-harvest handling. Farmers should be supported financially to seamlessly adopt post-harvest technologies.

Keywords: Perceived benefits, Post-harvest, Technologies, Maize farmers

INTRODUCTION

Global efforts in the fight against hunger to raise farmers' income and improve food security, especially in the world's poorest countries, should give priority to the issue of crop losses (FAO, 2017). This is due to the adverse effects of crop losses on food quality, environment and generally on economic development. Crop losses indicate a waste of productive agricultural resources such as land, water, labour, managerial skills and other inputs that could have been channeled into more ends that are viable. Roughly, about one-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tons per year (FAO, 2017). Post-harvest technologies are agricultural tools or techniques/equipment used to preserve, conserve, store, add value, control quality, process and reduce loss of agricultural commodities. Post-harvest can be defined as the stage of crop production immediately after harvesting. It involves stages such as drying, shelling, cleaning, sorting and packing. Losses during the post-harvest handling, storage, processing, packaging, distribution and marketing of agricultural commodities are considered unacceptably high in Sub-Saharan Africa. These losses occur majorly after the efforts and expenses of production and harvesting have been made and as such reduce the worth and effort of the producer's work. The losses most times force farmers always force farmers to sell at reduce prices (Pelemo *et al.*, 2018). The objectives of the study are to: describe the socioeconomic characteristics of maize farmers in the study area; identify the perceived benefits of post-harvest technologies among the maize farmers;

and identify the constraints associated with post-harvest technologies among the farmers.

METHODOLOGY

This study was conducted in Kogi state, Nigeria. Kogi State is in the middle belt part of Nigeria and lies between longitude 7° 11˙ and 14.86' East of the Greenwich meridian and latitude 7° 28˙ and 51.39' north of the equator 4-stage sampling technique was used for this study (Kogi State Ministry of Information working document, 2016). The state is divided into four agricultural zones (A, B, C and D zones). The first stage involved a random section of Agricultural Zone A. The second stage involved random selection of three Local Government Areas (Yagba West, Kaba Bunu and Ijumu) out of the five (5) LGAs in the zone. The third stage, two communities where randomly selected from each of the three LGAs earlier selected to give a total of six (6) communities. The fourth stage involved the use of proportional sampling to select 100 of maize farmers. Primary data was used employed for this study. The data was collected by the researcher assisted by trained enumerators. Objectives of the study were achieved using descriptive statistics (frequency, percentages and mean).

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 1 showed that the average age of the farmers is 37 years, which implies that the farmers were still in their active productive age. This result is in line with the result of Twilumba *et al.* (2020) who reveal that majority (52.2%) of the farmers were between the ages of 31-40 years. Table 1 also revealed that majority (76.0%) of the maize farmers

were male while female farmers accounted for only few percent. This implies that male farmers dominated the maize production. Table 1 showed the mean household size of the sampled farmers was four (4) persons. This implies a relatively medium size of household among the maize farmers in the study area. Table 1 showed that the average number of years spent in school to be 9 years while only very few had non-formal types of education.

Table 1: Socioeconomic characteristics of respondents (n=100)

Variable	Frequency	Percentage	Mean
Age			
30 years and below	43	43.0	37 years
31-40 years	26	26.0	
41-50 years	13	13.0	
Above 50 years	18	18.0	
Gender			
Male	76	76.0	
Female	24	24.0	
Household size			
1-4 persons	78	78.0	4 members
5-8	17	17.0	
Above 8	5	5.0	
Level of education			
Non-formal education	15	15.0	9 years
Primary education	32	32.0	
Secondary education	42	42.0	
Tertiary education	11	11.0	
Farming experience			
10 years and below	76	76.0	8 years
11-20 years	19	19.0	
Above 20 years	5	5.0	

Source: Field Survey, 2023

Perceived benefit of post-harvest technology among maize farmers

Table 2 indicates that maize farmers agreed that post-harvest technology is good for meeting farmers needs/scarcity ($\bar{X}$=3.00), increase farmers' standard of living ($\bar{X}$=2.79), help to increase farmers' income ($\bar{X}$=2.62) and exposes farmers to new ways of handling farm produce ($\bar{X}$=2.55) ranked 1st, 2nd, 3rd and 4th respectively. This implies that with the use of post-harvest technologies farmers were able to meet their needs during scarcity and incurred minimal post-harvest losses after harvesting of their farm produce. Also, post-harvest technologies increase farmers standard of living through increase in the income of the farmers at the end of the farming season. The least perceived benefits Compatible with farmers indigenous preservation ($\bar{X}$=1.58), not too difficult to finance ($\bar{X}$=1.29), and Compatible with farmers environment ($\bar{X}$=1.24)

Table 2: Perceived benefits of post-harvest technology among maize farmers (n=100)

Variables	SA (%)	A (%)	D (%)	WM	Rank
Good for meeting farmers need/scarcity	100(100.0)	0(0)	0(0)	3.00	1st
Increase farmers' standard of living	79(79.0)	21(21.0)	0(0)	2.79	2nd
Help to increase farmers income	62(62.0)	38(38.0)	0(0)	2.62	3rd
Expose farmers to new ways of handling produce	55(55.0)	45(45.0)	0(0)	2.55	4th
Grant farmers more market opportunity	62(62.0)	30(30.0)	8(8.0)	2.54	5th
Help farmers improve produce shelf-life	59(59.0)	33(33.0)	8(8.0)	2.51	6th
They are cost effective	30(30.0)	70(70.0)	0(0)	2.30	7th
Help meet farmers daily need	16(16.0)	77(77.0)	7(7.0)	2.09	8th
Compatible with farmers indigenous preservation	25(25.0)	8(8.0)	67(67.0)	1.58	9th
Not too difficult to finance	0(0)	29(29.0)	71(71.0)	1.29	10th
Compatible with farmers environment	8(8.0)	8(8.0)	84(84.0)	1.24	11th

Note: SA=strongly agree, A=agree and D=disagree, Source: Field survey, 2023

Constraints to post-harvest technology among maize farmers

Table 3 revealed that inadequate market information ($\bar{X}$=2.93), inadequate technical knowledge ($\bar{X}$=2.93), inadequate finance ($\bar{X}$=2.92), high cost of post-harvest materials ($\bar{X}$=2.79) and problem of bad roads/transportation ($\bar{X}$=2.78) were the serious constraints to post-harvest technology.

This implies inadequate market information and technical knowledge are serious constraints to post-harvest technology. However, price fluctuation ($\bar{X}$=1.14), problem of adulterated agrochemicals ($\bar{X}$=1.14) and problem of theft ($\bar{X}$=1.07), were the least constraints to post-harvest technologies among the maize farmers.

Table 3: Constraints associated with post-harvest technology among maize farmers (n=100)

Variables	SC (%)	NSC (%)	NC (%)	WM	Rank
Inadequate market information	93(93.0)	7(7.0)	0(0)	2.93	1st
Inadequate technical knowledge	93(93.0)	7(7.0)	0(0)	2.93	1st
Inadequate finance	92(92.0)	8(8.0)	0(0)	2.92	3rd
High cost of post-harvest materials	86(86.0)	7(7.0)	7(7.0)	2.79	4th
Problem of bad road/transportation	85(85.0)	8(8.0)	7(7.0)	2.78	5th
Inadequate training on PH technologies	85(85.0)	8(8.0)	7(7.0)	2.78	5th
Inadequate money lending facility	60(60.0)	33(33.0)	7(7.0)	2.53	7th
Inadequate infrastructure	37(37.0)	48(48.0)	15(15.0)	2.22	8th
Change in taste	0(0)	14(14.0)	86(86.0)	1.14	9th
Problem of price fluctuation	7(7.0)	0(0)	93(93.0)	1.14	10th
Problem of adulterated agrochemicals	7(7.0)	0(0)	93(93.0)	1.14	11th
Problem of theft	0(0)	7(7.0)	93(93.0)	1.07	12th

Note: SC=severe constraint, NSC=not severe constraint and NC=not a constraint

CONCLUSION AND RECOMMENDATIONS

It can be concluded that the most prominent benefit of post-harvest technologies on maize production was good for meeting farmers needs/scarcity, increase farmers standard of living and help to increase farmers income, Inadequate market information, inadequate technical knowledge, and inadequate finance were the most predominant constraint faced by the maize farmers in the study area. It is recommended that more women should be empowered to embark on maize production. Farmers should be equipped with updated market information and proper knowledge of post-harvest handling. Farmers should be supported financially to seamlessly adopt post-harvest technologies.

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ASSESSMENT OF COPING STRATEGIES USED BY POULTRY FARMERS DURING COVID-19 PANDEMIC IN ONDO STATE

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ABSTRACT
The rapid spread of COVID-19 pandemic and the total lockdown had serious damaging effects on poultry production in Nigeria. So, this study investigated the effects of coping strategies utilized by poultry farmers in Ondo State during the pandemic. Using interview schedule, a two-stage sampling procedure was employed to obtain information from 110 poultry farmers. The obtained information on poultry farmers' perception of the pandemic, the effects of the pandemic on poultry enterprise and coping strategies used were analysed using percentages, mean and weighted mean. Findings revealed that the respondents held positive perceptions on symptoms (x=4.15) and economic impact of COVID-19 (x=3.79). More so, the pandemic had serious effects on poultry enterprises leading to increased production costs (x=2.98) and reduced profit (x=2.55). The study recommends grassroots stakeholders should embark on intensive sensitisation to enhance the knowledge the respondents about shocks such as pandemics and ways to build enterprise resilience.
Keywords: Disaster losses, Poultry production, Resilience building

INTRODUCTION

Poultry is a profitable enterprise and the most commercialized livestock sub-sector that provides employment for about 14 million Nigerians and contributes about 25% of the nation's agricultural Gross Domestic Products (GDP). However, the emergence of COVID-19 resulted in the fall of total value of production in 2020. The pandemic had terrible impact on poultry sub-sector, and this resulted in significant hardships and economic losses to households, particularly smallholder farmers who are less resilient and more vulnerable to shocks and disturbance within the production system. Thus, requiring urgent coping strategies for the sustainable production of poultry products (Olutunmise *et al*, 2023; Bamidele and Amole, 2021; Babatunde *et al*, 2022).

To prevent the spread of the virus, strategies such as lockdowns were implemented by governments and people were forced to stay at home. Though, the agricultural sector was exempted from these restrictions and lockdowns, only commercial large and medium farm-holders benefited from the exemption (Sawadogo and Ouoba, 2023). Given the disruptions occasioned by the pandemic, there was a need to assess the resultant effects of coping strategies used by the farmers to weather the public heath storm of COVID-19 on their poultry enterprise.

METHODOLOGY

The study was carried out in Ondo state. Multistage sampling which consisted of two stages was used to select respondents for the study with the aid of questionnaire. The first stage involved the purposive selection of Akure South LGA based on the population and high concentration of the poultry farmers in the LGA. The second stage involved the selection of 110 farmers through random sampling from the list of poultry farmers obtained from the secretariat Poultry Farmers Association of Nigeria. Primary data were collected from the respondents using structured interview schedules that contained open and close-ended questions.

Data were collected from respondents to attain study objectives by, 5-point likert type scales was used to measure their perception of the pandemic. The coping strategies used, was determined by the indicating either 'yes' or 'no' from the list of likely strategies provided. Their assessment of the effects of the pandemic, and the effects of the coping measures used was measured on a 4-point likert type scale of 'very high', 'high', 'moderate' and 'not an effect'.

RESULTS AND DISCUSSIONS

Poultry farmers' attitude about Covid 19 pandemic

Results in Table 1 revealed that the respondents held varying perceptions on COVID-19. Affirmation by most of the respondents that the pandemic was an imported disease from China had the highest weighted mean score of 4.83. Also, majority of the respondents indicated that the symptoms of COVID-19 included fever, cough etc. Just as many indicated that COVID-19 disease was a political means of embezzling public funds. This corroborates the findings of Olagoke, Oyelakin and Omotosho (2023) that majority believed it was propaganda.

Table 1: Poultry farmers' attitude about Covid 19 pandemic

Perception statements	Mean	Std. Dev
COVID-19 disease is an imported disease from China	4.83*	0.19
The symptoms of COVID-19 include fever, cough etc.	4.15*	0.13
COVID-19 disease is a political means of embezzling public funds	3.79*	0.32
The older you are, the greater the risks of contacting COVID-19	3.77*	0.51
COVID-19 only affects the rich people	3.66*	0.38
People who have chronic health issues are at greater risks	3.55*	0.10
Use of face mask, maintaining social distance and hand washing can prevent COVID-19	3.22	0.18
It does not affect people that drink alcohol	3.17	0.42

Source: Field survey, 2023. *Mean> 3.5

Effects of COVID-19 pandemic on poultry enterprise

Table 2 established that the pandemic resulted in high cost of transportation, drugs, supplements and vaccines. Also, majority of the respondents indicated that the pandemic increased cost of feeds and decreased poultry output (x=2.61), just as many indicated the pandemic resulted in lack of training/capacity building (x=2.59). This implied that COVID-19 pandemic had serious effects on poultry production, and it agrees with Adeniyi et al (2021) and Esiegwu and Ejike (2021).

Table 2: Effects of COVID-19 pandemic on poultry enterprise

Effects of Covid-19	Mean	Std. Dev.
Unavailability and high cost of drugs, supplements and vaccines	2.66*	0.37
High cost of transportation	2.66*	0.31
No access to loan/credit and extension services	2.55*	0.11
Increase in feeding cost	2.61*	0.12
Decrease in poultry output	2.61*	0.18
Lack of training/capacity building on poultry management	2.59	0.29
Consumption of farm produce meant for selling	2.58	0.27
Reduction in farm income	2.22	0.51
Increased ill health and sicknesses among farmers	1.25	0.26
Security of poultry farms	1.22	0.15

Source: Field survey, 2023.   *Mean> 2.0 = High effects

Coping strategies used by poultry farmers

Table 3 revealed that substituting less quality and cheaper feeds to the birds (85,5%), house to house direct sales of eggs (84.5%), strict adherence to covid 19 protocol (70%) were the most used coping strategies in the study area. This result is consistent with the findings of Adeloye, Toromiro and Olufemi (2023) and Adebiyi et al (2021). The absence of insurance patronage among poultry farmers is glaring with the results showing that none had put in place this very advantageous risk aversion measure before the pandemic incidence.

Table 3: Coping strategies used by poultry farmers

Coping strategies	Freq	Percentage (n=110)
Substituting less quality and cheaper feeds to the birds	94	85.5
House to house sales of eggs	93	84.5
Strict adherence to covid 19 protocol	77	70.0
I use my personal vehicle as a mobile market for sales of farm produce	66	60.0
I increased incentives for farm workers during the lock down.	13	11.8
I adopted several home preservation methods of poultry products during COVID-19 lockdown.	13	11.8
My social network put me in a vantage position for adequate coping support	2	1.8
I have livestock insurance policy in order to cushion negative effect of the pandemic/natural disaster	0	0.0

Source: Field survey 2023

Effects of coping strategies on poultry enterprise

Results presented in Table 4 established that the coping strategies used resulted in increased cost of production (x=2.98). Also, the strategies increased their cost of marketing (x=2.69) and reduced their profit margin (x=2.55). This agrees with Adebiyi et al (2021) which revealed that the coping strategies used affected poultry enterprise.

Table 4: Effects of coping strategies on poultry enterprise

Effects of coping strategies	Mean	Std. Dev
Increase in cost of production	*2.98	0.31
Increase in cost of marketing	*2.69	0.21
Increase in profit through other businesses/non-farming activities	*2.63	0.37
Decrease poultry enterprise profits	*2.55	0.17
Inability to pay salaries due to reduction in profits leading to lay-off of workers	*2.54	0.11
Decrease in scale of production	*2.51	0.53
Increase in sales due to the new marketing strategies employed	*2.51	0.38
Increase in number of workers	1.59	0.11
Decrease in cost of production	1.43	0.37

Source: Field survey, 2023.   *Mean> 2.5 = High effects

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings we conclude that emergency coping measures adopted by farmers to survive the COVID -19 pandemic had negative effects on their business profit margin, operating cost and eventually its sustainability. Many of the coping strategies utilized were emergency measures and no farmer had a preexisting risk aversion mechanism in place to help them cope with such shocks.

The study therefore recommends increased awareness through extension education on shock and risk management in poultry enterprise management. Insurance companies need to design and promote products and services that are poultry farmer friendly to increase their patronage. The Federal Ministry of Livestock Development should facilitate disaster recovery mechanisms with palliative measures for the poultry subsector in order to build resilience.

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IMPACT OF THE ROAD INFRASTRUCTURE ON TOMATO MARKETING IN SURULERE LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

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ABSTRACT
Developing a road transportation network is crucial for enhancing Tomato's productivity. The road transportation infrastructure for Tomato marketing in Surulere Local Government Area of Oyo State, Nigeria was examined, using a multistage sampling procedure to select 120 respondents. Data on respondents' socioeconomic characteristics, conditions of the road infrastructure, and impact of the road infrastructure on the marketing of tomatoes were collected using an interview schedule; and analysed using percentages, frequency, weighted mean score, Pearson Moment Correlation, and Chi-square at $\alpha_{0.05}$. The results showed that respondents were male (82.5%), with a mean years of marketing experience of 17.0 years. The most prevailing conditions of the road infrastructure were portholes (100%) and dustiness (96.7%), while the greatest impact of the road transportation infrastructure was high cost (WMS=4.36) which was high for 76.9% of the respondents. A significant relationship existed between respondents' years of marketing experience (r=0.450), Farm size (r=0.120), and utilisation of the transportation infrastructure but not significant with Primary occupation ($\chi2$=0.079). The road transportation infrastructure reduced the respondent's income. Hence, community development work should be encouraged to fill the portholes for hitch-free sustainable marketing of Tomatoes.
Keywords: Road transportation network, sustainable Tomato marketing

INTRODUCTION
Tomatoes are one of the vegetable crops that contribute to nutrition security and economic growth at all levels (local, national, and global) due to their numerous universal constituents and potentials such as poverty alleviation (Afolabi, 2019). The daily consumption of Tomatoes by households makes Vitamin C readily available they are eaten fresh as a salad, pressed into pastes or purees for soups or stews, and in the producing fruit drinks in Nigeria. Also, Tomato contains higher amounts of lycopene, a type of carotenoid with antioxidant properties.

In developing nations like Nigeria, harvesting, packaging, storage, handling techniques, and transportation are practically poor with perishable crops like Tomatoes; and this allows for considerable losses of produce (Wudad *et al.,* 2021). Thus, as more fresh fruits are needed to supply the growing population in developing countries, more produce is transported to non-producing areas; thereby requiring a reliable efficient, effective, and adequate road transportation network which is critically important to the productivity and marketing of Tomatoes.

However, among various means (Rail, water, and road) by which tomatoes could be transported, in sub-Saharan Africa; the most dominant, affordable and accessible is the road system as more than 80% of the tomatoes are transported via the route. This implies that tomatoes cannot be brought in sufficient quantity to those needing them without an adequate road transportation infrastructure (Wudad *et al.,* 2021). Hence, the current nature of the road infrastructures (portholes, poor drainage, dustiness) has led to increased transportation costs, quick dilapidation of vehicles, reduced marketers' income through the farmgate, and discouraged

many farmers from expanding their production scope among others (Nwafor andOnya (2019).

Based on the background, the study determined the effect of the road transportation infrastructure on tomato marketing in Surulere Local Government Area of Oyo State, described the socio-economic characteristics of the respondents, and identified the various conditions/nature of the road infrastructure. The study hypothesised a significant relationship between the selected variables and the effect of the road transportation infrastructure on tomato marketing.

METHODOLOGY
The study was carried out in Surulere Local Government Area (LGA) of Oyo State. A three-stage sampling procedure was employed to select 120 respondents using an interview schedule. The study population was all the registered Tomato Marketers in the study area. In the first stage the simple random sampling of 75% of the four Districts in the LGA (Gambari/Baya; Iresadu/Arolu; Iwofin). In the second stage, the simple random sampling of two Villages/settlements in the selected districts given 6 villages/settlements (Gambari/Baya; Gambari and Jabata); Iresadu/Arolu (Alagbede and Baasa); Iwofin (Araoye and Olorombo). Thirdly, the systematic random sampling of 20 Tomatoes marketers was done using their association register. Giving 120 respondents for the study. Data were analysed with descriptive and Inferential statistics (Chi-square, PPMC at α 0.05)

RESULT AND DISCUSSION
Socioeconomic characteristics
The result in Table 1 shows that most of the respondents were male (82.5%); and were farmers (88.3%) by occupation with mean farm size and years of marketing being 1.50 acres and a mean

years of marketing experience of 17.0 years. The result of respondents' sex implies that male respondents dominated tomato marketing as men were more involved than women. This is in line with the study of Aina *et al.,* (2021) in which most of the tomato marketers were male. The result on the respondents' occupation implies that farming is a widely accepted livelihood among tomato marketers; while the result on marketing experience predisposes the tomato marketers to better marketing practices which will increase their marketing efficiency (Aina *et al.,* 2021). The result on the area of land cultivated implies that the tomato marketers operate on a subsistence level of production.

Table 1: Socioeconomic characteristic, n = 120

Socio-economic characteristics	Frequency	Percentage	Mean
Sex			
Male	99	82.5	
Female	21	17.5	
Primary occupation			
Farming	106	88.3	
Trading	13	10.0	
Artisans	01	1.3	
Years of marketing experience (years)			
≤ 10	22	33.7	17.0
11 – 20	73	60.0	
> 20	25	6.3	
Tomato Farm size (hectares)			
≤ 2	109	90.9	1.5
> 2	11	9.1	

Source: Field survey, 2023

Condition/nature of road Infrastructures

The result in Table 2 reveals that all the tomato marketers had portholes in their respective roads which were closely followed by dusty (96.7%) and untarred (84.2%) conditions. The result indicated that all the tomato marketers had bad road conditions which could resulted in reduced marketing efficiency of the tomato marketers in the study area (Wudad *et al.,* 2021).

Table 2: Nature of the Road Infrastructure

Conditions of the road infrastructure	Frequency*	Percentage
Portholes	120	100.0
Dusty	116	96.7
Untarred	101	84.2
Rough and slippery	90	75.0
Tarred	20	16.7

Source: Field survey, 2023
*Multiple responses

Impact of the road infrastructure on tomato marketing

The result in Table 5 shows that increased transport cost ranked first (WMS=4.36) among the effects of the road infrastructure on Tomato marketing. This was closely followed by the respondents' inadequate accessibility to other infrastructural amenities (WMS=4.28) with reduced marketers' income being the 3rd (WMS= 4.06). The result implies that poor road transportation infrastructure had an inverse effect on tomato marketing efficiency in the study area (Wudad *et al.,*2021). This impact on the road infrastructure was high for 79.6% of the respondents.

Table 3: Impact of the Road Transportation Infrastructure on tomato marketing

Effect of the road transportation Infrastructure on tomato marketing	Large extent	Lesser extent	Least extent	No extent	WMS	Rank
Increased transport cost	35.8	64.2	0.0	0.0	4.36	1st
Inadequate accessibility to other infrastructural amenities	28.3	71.7	0.0	0.0	4.28	2nd
Reduces marketers' income through sales at farm-gate	25.8	57.5	15.0	1.7	4.06	3rd
Reduce productivity	0. 0	0.0	35.8	64.2	1.53	14th
Level of Road Infrastructure					%	
High					79.6	
Low					24.1	

Source: Field survey, 2023

Relationship between selected variables and utilisation of road transportation infrastructure

The result revealed marketing experience (r = 0.450), and farm size (r = 0.120) respectively exhibited a significant relationship with the use of road transportation infrastructure, while the respondents' occupation is not significant ($\chi2$=0.079).

Table 4: Relationship between selected Variables and utilisation of Road transportation (n=120).

Variable	r- value
Farm size	0.120*
Years of Marketing experience	0.450*
Variables	**$\chi2$ –value**
Primary occupation	0.079

Sources: Field Survey, 2023   *$P \leq 0.05$

CONCLUSION

The study concludes that most of the tomato growers were experienced marketers who operated on the subsistence level. Also, the unfavourable nature of the road infrastructure drastically reduced the marketing efficiency of Tomatoes. However, the utilisation of road transportation infrastructure hinges on respondents' years of marketing experience and farm size. The study recommends that community development work should be encouraged to fill the portholes for hitch-free and sustainable marketing of Tomatoes. Also, all the stakeholders involved in road rehabilitation should help fix the road infrastructural problems for higher efficiency of Tomatoes marketing and better revenue

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SHEA COLLECTORS' INVOLVEMENT IN SHEA TREE CONSERVATION IN BARUTEN LOCAL GOVERNMENT AREA, KWARA STATE, NIGERIA

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ABSTRACTS
The study investigated the involvement of shea collectors in forest conservation in Baruten Local Government Area of Kwara State, Nigeria. Snowball sampling technique was used to identify 150 shea collectors. Data were analysed using frequency, percentages, mean score, standard deviation and Pearson Product Moment Correlation. Findings showed that the mean age of shea collectors was 36 years, which were dominated by women (88.0%). Most of the women were married (55.3%) with average household size of 6 persons. Establishing protected areas (x = 4.38), forest fire management (x = 3.15) and controlled bush burning (x = 3.14) were the top ranked conservation practice used for the study. Fire outbreak (x = 3.19), indiscriminate logging (x = 3.11) were the topmost constraints. The study concluded that shea collectors demonstrated substantial knowledge of forest conservation practices, particularly reforestation and establishing protected areas. The study recommended that more extension service be provided to improve the forest conservation practices of the shea collectors. Also organising programs to integrate conservation efforts with economic benefit such as eco-friendly shea processing techniques could also enhance involvement.
Keywords: Shea collectors, Conservation Practices, Conservation knowledge.

INTRODUCTION

The shea tree (*Vitellaria paradoxa*) is a wild indigenous tree exclusive to Africa and is increasingly being managed in farmlands while found also in the savannah parklands. The shea tree exists in the wild hence, there is need for forest and community conservation. Shea tree densities in natural stands are declining as the remaining tree ages and natural regeneration remains low. This is due to different natural and human driven factors, including climate variability and change, increasing demographic pressure with the disappearance of fallows and uncontrolled deforestation for firewood and production of charcoal as well as large scale land investment in intensive mechanised agriculture (Lovett and Phillips 2018, Seghieri 2019). The declining rate of the shea tree species and the time-consuming shea collection and processing that generate low return per unit of labour constitute a major setback to the shea development as a tree commodity that can lift local people out of poverty (Catherina Ky-Dembele, 2021)

The complete germination process of shea tree is challenging because the recalcitrant seeds lose their viability quickly. It takes a long time for the shoot to emerge, which is a major challenge for shea to be planted by farmers. The study examines the conservation of the shea tree species by the shea collectors in Baruten local government area, Kwara State Nigeria. This could help avoid the reduction and extinction of the shea tree. The general objective of the study is to investigate shea collectors' involvement in forest conservation in Baruten LGA while the Specific objectives were to:

o   Describe the socio-economic characteristics of the shea collectors
o   Assess shea tree conservation practices among shea collectors
o   Identify the constraints to shea tree conservation amongst shea collectors in the study area

METHODOLOGY

The study was carried out in Baruten LGA of Kwara State, Nigeria. 150 collectors were selected using the snowball method. Primary data was collected through interview schedule. Descriptive, Pearson's Product Moment, Correlation (PPMC) and Multiple Regression analysis were used to analyse data collected.

RESULTS AND DISCUSSION

The result from table 1 above showed that shea collectors in the study area were predominantly young, with 50.7% aged 30 years or younger. . Findings showed that the mean age of shea collectors was 36 years, which were dominated by women (88.0%). Most of the women were married (55.3%) with average household size of 6 persons. The insights from the demographic variables above could inform targeted interventions and support strategies tailored to the needs and characteristics of the community.

Table 1: Distribution of shea collectors by socio-economic characteristics (n = 150)

Variable	Categories	Frequency	Percentage	Mean
Age (years)	Less than 31	37	24.7	36
	31 – 45	76	50.7	
	46 – 60	20	13.3	
	61 and above	17	11.3	
Gender	Female	132	88.0	
	Male	18	12.0	
Marital status	Single	67	44.7	
	Married	83	55.3	
Household size	Less than 4	21	14.0	6
	4 – 6	74	29.6	
	7 – 9	18	65.3	
	10 and above	13	8.7	
Processing Experience	Less than 6	89	59.3	7
	6 – 10	33	22.0	
	11 – 1	16	10.7	
	16 – 20	10	6.7	
	26 and above	2	1.3	
Educational Level	No formal education	30	20.0	
	Primary level	6	4.0	
	Quranic level	32	21.3	
	Secondary level	55	36.7	
	Tertiary level	27	18.0	

Sources: Field Survey 2024.

The result from the table showed that establishing protected areas (x = 4.38), forest fire management (x = 3.15) and controlled bush burning (x = 3.14) were the top ranked conservation practice used for the study. This suggests a strong emphasis on designating and maintaining areas where human activity is restricted to preserve forest ecosystems.

Table 2: Shea tree Conservation Practices Among Shea Collectors (n=150)

Conservation practices	N F (%)	R F (%)	S F (%)	A F (%)	MEAN	Rank
Reforestation	55(36.7)	23(15.3)	20(13.3)	52(34.7)	2.46	6th
Afforestation	33(22.0)	62(41.3)	10(6.7)	45(30.0)	2.45	7th
Avoiding clear cutting	10(6.7)	45(30.0)	27(18.0)	68(45.3)	3.02	4th
Selective logging	16(10.7)	38(25.3)	23(15.3)	73(48.7)	3.02	4th
Forest fire management	12(8.0)	31(20.7)	29(19.3)	78(52.0)	3.15	2nd
Controlled burning	9(6.0)	35(23.3)	32(21.3)	74(49.3)	3.14	3rd
Sustainable logging practices	48(32.0)	53(35.3)	24(16.0)	25(16.7)	2.17	8th
Establishing protected areas	21(14.0)	17(11.3)	20(13.3)	53(35.3)	4.38	1st
Forest restoration projects	93(62.0)	34(22.7)	16(10.7)	7(4.7)	1.58	10th
Agroforestry	79(52.7)	34(22.7)	15(10.0)	22(14.7)	1.87	9th

Field survey, 2024   N- Never, R- Rarely, S- Sometimes, A- Always.

The table revealed that. Fire outbreak (x=3.19), indiscriminate logging (x = 3.11) were the topmost constraints. This indicates that these constraints are perceived as a significant hindrance to forest conservation efforts. The high severity could be due to the destructive nature of wildfires, uncontrolled and unsustainable cutting of trees which can rapidly decimate large forest areas and lead to severe deforestation and degradation of forest ecosystem which in turn makes conservation efforts challenging.

Table 3: The Constraints to Shea tree Conservation practices Amongst Shea Collectors in the Study Area (n=150)

Constraints	Not a constraint	Not severe	Severe	Very severe	Mean	Rank
Fire outbreak	20(13.3)	5(3.3)	51(34.0)	74(49.3)	3.19	1st
Indiscrimate logging	20(13.3)	12(8.0)	50(33.3)	68(45.3)	3.11	2nd
Cost of getting seedlings	84(56.0)	31(20.7)	19(12.7)	16(10.7)	1.78	6th
Lack of training on planting of trees	67(44.7)	38(25.3)	38(25.3)	7(5.7)	1.90	5th
Grazing by fulani	35(23.3)	44(29.3)	56(37.3)	15(10.0)	2.34	3rd
Climate change	64(42.7)	27(18.0)	47(31.3)	12(8.0)	2.05	4th
Distance from home to forest area	88(58.7)	31(20.7)	22(14.7)	9(6.0)	1.68	9th
Fear of insecurity	87(58.0)	26(17.3)	30(20.0)	7(4.7)	1.71	7th

Sources: Field Survey 2024

Hypotheses testing

H_{01}: Shea collectors' socioeconomic characteristics are not related to their level of involvement in conservation of the shea tree.

The table above presented the hypothesis testing revealed that socio-economic characteristics significantly influenced involvement of the collectors in forest conservation. Age, gender, marital status, and household size were key predictors, indicating that majority were female, and they are still within their economically active age, showing higher involvement.

Table 7: the results of a regression analysis investigating the relationship between the socioeconomic characteristics of shea collectors and their level of involvement in the conservation of the shea tree

Variables	Co-eff	Std. Err	t-value	p-value
(Constant)	2.792	0.113	24.802	0.000
age of respondents	.016	0.003	5.841	0.000
gender of respondents	0.292	0.098	2.983	0.003
marital status of respondents	-0.325	0.079	-4.098	0.000
processing experience	-0.011	0.006	-1.706	0.090
household size	-0.051	0.014	-3.618	0.000
$R^2 = 0.24$ F Stat = 0.000 p > 1%, 5%, 10%				

Field survey, 2024

CONCLUSION AND RECOMMENDATION

Based on the findings, the study concluded that, shea collectors demonstrated substantial knowledge of forest conservation practices, particularly reforestation and establishing protected areas. Actual practices showed a preference for protected areas and fire management, while activities like agroforestry and forest restoration were less prioritized. Significant constraints included fire outbreaks, indiscriminate logging, and grazing by Fulani herds. Cost-related issues, lack of training, and climate change also posed notable challenges.

The hypothesis testing revealed that socio-economic characteristics significantly influenced involvement of the collectors in forest conservation. Age, gender, marital status, and household size were key predictors, indicating that majority were female, and they are still within their economically active age, showing higher involvement.

The were recommended:

1. The study recommended that more extension service be provided to improve the forest conservation practices of the shea collectors.

2. Providing affordable and accessible seedlings could mitigate the cost barrier to reforestation and afforestation efforts.

3. Organizing programs to integrate conservation efforts with economic benefit such as eco-friendly shea processing techniques could also enhance involvement.

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ASSESSMENT OF AGGREGATOR'S INFORMATION NEEDS ON POST-HARVEST MANAGEMENT PRACTICES OF CASHEW NUT IN KWARA STATE, NIGERIA

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ABSTRACT
This study assessed cashew nut aggregators' information needs on nuts' post-harvest management practices in Kwara State, Nigeria. A three-stage sampling technique was used in selecting one hundred and thirty respondents for the study. Data were obtained using structured questionnaire. Frequencies, percentages, means and regression analysis were used to analyse the data. The mean age of the respondents was 46.8 years, and they were predominantly males (85.4%) with an average of 13.7 years' experience in cashew nut aggregation. The major post-harvest management activities of the nut aggregators are buying and selling of nuts ($\bar{x}$ =1.80). The respondents had highest information needs in maintaining kernel out-turn ratio of the nuts ($\bar{x}$=1.84). Unfavourable Climate and weather conditions was identified as a major challenge impeding post-harvest practices ($\bar{x}$ = 2.02). The regression analysis reveals that age and years of experience have significant relationship with the information needs of the respondents at 0.05 level of significance. The study concluded that cashew nut aggregators' have moderate information needs and it was recommended that agricultural extension services should be enhanced and tailored to provide aggregators with practical, up-to-date information on best practices for post-harvest management through regular training programs, workshops, and field demonstrations.
Keywords: Aggregators, Cashew Nut, Kernel Out-turn Ratio, Information Needs.

INTRODUCTION

Cashew is an important cash crop, particularly in Nigeria, where it plays a vital role in the economy through both export earnings and job creation. Nigeria ranks among the largest producers of cashew nuts globally, and Kwara State is a significant contributor to this production. Despite the volume of production, most nuts from Nigeria still suffer rejection at the international market. The major cause of this is traceable to poor post-harvest management. Effective post-harvest management practices are critical to maintaining the quality of cashew nuts and ensuring their competitiveness in local and international markets (Agbongiarhuoyi et. al., 2020).

Aggregators, who play a key role in collecting nuts from smallholder farmers for further processing or export, are central to the value chain, yet they are sometimes unaware of advanced post-harvest technologies or practices that can help reduce losses and preserve nut quality (Abraham et al., 2023). Inefficiencies in post-harvest handling not only reduce the financial value of the nuts but also affect the competitiveness of Nigeria's cashew in international markets. To take the leading position, supply of quality nuts is crucial. This is achievable with adequate technical support and capacity upgrade for the nut handlers. Therefore, assessing the information needs of cashew nut aggregators regarding post-harvest management practices is critical for enhancing the overall quality and marketability of cashew nuts. Specifically, the study determined the socioeconomic profile of the respondents, identified the post-harvest management activities of the cashew nut aggregators in the study area, assessed the information needs of cashew nut aggregators on post-harvest management practices and identify the major constraint impeding cashew nut's post-harvest management practices. The null hypothesis stated that there is no significant relationship between selected socioeconomic profile of the respondents and their information needs.

METHODOLOGY

The study was carried out in Kwara State, Nigeria. The state extends from latitude 7° 45`N in its southern end, latitude 2° 45`E to the west and longitude 6° 40`E to south east. It has a total population of 3,192,893 (NBS, 2017). It lies exclusively within a tropical hinterland. The state experiences both the wet and dry seasons each lasting for about 6 months. Cashew mut aggregation and marketing of raw nuts is usually carried out from February to April in Kwara State. The population of the study comprises all cashew nut aggregators in Kwara State. A three-stage sampling procedure was used to select respondents for the study. In the first stage, four Local Government Areas (LGAs) Isin, Asa, Edu and Barutene LGAs were selected from each of the Agricultural Development Zones of the State. In the second stage, four communities were purposively selected from each of the LGAs based on the volume of aggregation activities in the areas and influx of aggregators. Lastly, seventy percent of the total numbers of aggregators in each community were proportionately selected to make a total of one hundred and thirty respondents. A structured interview schedule was used to collect data from the respondents. The socioeconomic profile of the respondents was determined using frequency count and percentages. The post-harvest management activities were identified using a three-point Likert-type scale of highly involved (2), slightly involved (1), and not involved (0). The scale measured as X = Σ x / n Where, X = Likert value, Σ = summation, n = total respondents / sample size was used to form the basis for deciding the involvement in the activities. Thus, the decision rule holds that X= (2+ 1 + 0) / 3 = 1.0 so, activities > 1.0 were considered the ones they are involved in while those < 1.0 were

considered otherwise. The information needs were assessed on a four-point Likert type scale of Highly Needed (3), Moderately Needed (2), Needed (1) and Not Needed (0). The constraint impeding cashew nut's post-harvest management practices were identified using a three-point Likert type scale of very severe (3), mildly severe (2), severe (1), and not a constraint (0). Descriptive statistical tools of frequency distribution, percentages, mean counts and standard deviations were used in achieving the objectives. While multiple regression analysis was used to test the hypothesis at 0.05% level of significance.

RESULTS AND DISCUSSION
Socioeconomic characteristics

The result in Table 1 shows that more males (85.4%) were involved in cashew nuts' aggregation than their female counterparts having 14.6 %. This aligns with broader trends observed in agricultural sectors across Nigeria and other developing countries in which gender disparities in agricultural value chains is often observed, with men frequently occupying major roles (Olakojo, 2017 and Bello et. al., 2021). The average age of the respondents was 46.8 years, with a notable proportion (39.2%) falling between the age bracket 41-50 years. An indication that the respondents are in their middle age and are still agile enough to carry out post-harvest management practices. Majority (83.9%) of the respondents were married while few were single and

divorced/separated. This data highlights the economic stability often associated with marital status in rural settings. A study by Jackson et. al., (2017) shows that married individuals tend to engage more in economically secure and income-generating activities to support family livelihoods. In terms of educational attainment, majority of the respondents (78.5%) had from primary to post-secondary education and only a few (21.5%) had no education. Education increases an individual's ability to comprehend and utilize information capable of improving their practices. Close to half (46.9%) of the respondents identified farming as their primary occupation, followed by artisanship (30.0%). This is consistent with the finding of Iraoya and Isinika (2020) who asserted that rural economies in Nigeria typically exhibit a strong linkage between farming and other supplementary income generating activities. Annually, the respondents earn an average income of about ₦687, 549 from aggregation. This income level highlights the economic potential of cashew aggregation. According to Olukunle (2020), aggregation in high-demand export crops like cashew offers substantial income potential. The mean years of experience of the respondents in nuts' aggregation is 13.7 years. Experience is known to significantly impact efficiency in value chain activities as it tends to improve the proficiency of the individuals concerned (Olabanji et. al., 2021).

Table 1: Distribution of respondents based on the sociodemographic profile

Sociodemographic Variables	Frequencies (N=130)	Percentages (%)	Mean
Sex			
Male	111	85.4	
Female	19	14.6	
Age (in years)			
Below 20	04	3.1	
20-30	19	14.6	
31-40	33	25.4	46.8 years
41-50	51	39.2	
51 and above	23	17.7	
Marital Status			
Married	109	83.9	
Single	19	14.6	
Divorce/separated	02	1.5	
Years of Formal Education			
No Formal Education (0)	28	21.5	
Primary School Certificate (1-6)	36	27.7	
Secondary School Certificate (7-12)	59	45.4	10.9 years
Post-Secondary Education (12-18)	07	5.4	
Primary Occupation			
Trading	27	20.8	
Civil Servant	03	2.3	
Artisanship	39	30.0	
Farming	61	46.9	
Annual income from aggregation (₦)			
≤ 100,000	21	16.2	
100,001 – 500,000	46	35.4	
500,001 – 1,000,000	59	45.3	₦687, 549

Sociodemographic Variables	Frequencies (N=130)	Percentages (%)	Mean
>1,000,000	04	3.1	
Years of Experience in nut's aggregation			
Less than 5	11	8.5	
5-10	48	36.9	13.7 years
11-15	40	30.8	
Above 16	31	23.8	

Source: Field Survey, 2024

Level of involvement in post-harvest management activities

The Data in Table 2 shows that the major post-harvest management activities of the nut aggregators is buying and selling of nuts ranking 1st with a weighted mean score of ($\bar{x}$ =1.80). This was followed by nut testing ($\bar{x}$ =1.72) and quality assessment ($\bar{x}$ =1.50) ranking 2nd and 3rd respectively. This finding aligns with the studies of Abraham (2022) and Agbongiarhuoyi et al. (2020) on the structure of post-harvest management in cashew value chains in Nigeria and other West African countries, where small-scale aggregators are generally more focused on immediate sales and quality checks than on value-added activities such as processing and transportation.

Table 2: Distribution of the respondents based on level of involvement in post-harvest management activities

Post-harvest management activities	Highly Involved	Slightly Involved	Not Involved	WMS	Std. Dev	Rank
Nut testing	96 (73.8)	32 (24.6)	02 (1.5)	1.72	0.786	2nd
Buying and selling of nuts	111 (85.4)	12 (9.2)	0 (0.0)	1.80	1.089	1st
Grading and sorting	46 (35.4)	59 (45.4)	25 (19.2)	1.16	0.991	4th
Quality assessment	77 (59.2)	41 (31.5)	12 (9.2)	1.50	0.862	3rd
Bagging	31 (23.8)	42 (32.3)	57 (43.9)	0.80	1.102	7th
Transportation	21 (16.2)	32 (24.6)	77 (59.2)	0.57	0.920	8th
Loading/off loading	34 (26.2)	41 (31.5)	55 (42.3)	0.84	1.009	6th
Drying	43 (33.1)	56 (43.1)	31 (23.8)	1.09	0.899	5th
Separation of apples from nuts	08 (6.2)	14 (10.7)	108 (83.1)	0.23	0.867	10th
Processing	08 (6.2)	21 (16.2)	101 (77.7)	0.28	1.026	9th

Source: Field Survey, 2024; cut-off point = 1.00; Key HI= Highly Involved, SI =slightly Involved and NI = Not Involved. Multiple Responses

The result in Table 3 shows that the highest information needs are in the areas of quality assessment of cashew nuts. These include determination of kernel output ratio (KOR) $\geq$ 44 and determination of total defects ($\leq$ 10%) having weighted mean scores ($\bar{x}$) 1.84 and 1.76 respectively ranking first and second. This was followed by determination of the percentage of good kernel ($\bar{x}$ =1.75; ranking 3rd), A study by Agbongiarhuoyi et al. (2020) and Castka et al. (2023) underscores the importance of accurate KOR and defect measurements in meeting international buyer standards, which in turn allows aggregators to secure higher prices and better contracts. A lack of information in these areas can affect aggregators' ability to ensure consistency in quality, which could limit market access and pricing.

Table 3: Distribution of the Respondents based on information needs on post-harvest management practices

Post-harvest Management Practices	HN	MN	N	NN	WMS	Std. D
Nut Harvesting						
Determining nuts ready for harvest.	10 (7.6)	14 (10.8)	21 (16.2)	85 (65.4)	0.61	1.011
Nut test						
Assessing raw nut quality through floatation test	08 (6.2)	11 (8.4)	16 (12.3)	95 (73.1)	0.48	0.768
Determination of nut count (nuts per kilogram).	34 (26.1)	37 (28.5)	23 (17.7)	36 (27.7)	1.53	0.896
Determining the percentage of good kernel by opening the nut	37 (28.5)	42 (32.3)	32 (24.6)	19 (14.6)	1.75	1.009
Sorting and grading	24 (18.4)	29 (22.3)	31 (23.8)	46 (35.3)	1.24	0.998
Quality assessment						
Determination of total defects ($\leq$ 10%).	43 (33.1)	31 (23.8)	38 (29.2)	18 (13.8)	1.76	0.909

Post-harvest Management Practices	HN	MN	N	NN	WMS	Std. D
Determination of kernel output ratio (KOR) ≥ 44.	49 (37.7)	32 (24.6)	28 (21.5)	21 (16.2)	1.84	0.896
Proper storage method						
Determination of proper drying method for moisture level (8-10%)	19 (14.6)	21 (16.2)	25 (19.2)	65 (0.50)	0.95	1.087
Insect and disease prevention	09 (6.9)	12 (9.2)	14 (10.8)	95 (73.1)	0.50	0.916

Source: Field Survey, 2024 Cut-off Point = 1.5
keys: HN = Highly Needed; N= Needed; NN =Not Needed

Table 4 reveals that unfavourable climatic and weather conditions was noted as the major constraint impeding cashew nuts' post-harvest management practices having a weighted mean score of 2.02. This was followed by shady practices of mixing of immature nuts with matured nuts on the part of the sellers ($\bar{x}$ =2.00; ranking 2nd) and poor infrastructure and technological deficit ($\bar{x}$ =1.67; ranking 3rd). Strivastava (2019) noted that adverse weather patterns can increase post-harvest losses due to rapid deterioration of harvested produce, affecting quality and reducing shelf life. Climate variability has led to increased unpredictability in cashew production, intensifying the challenges of maintaining quality in post-harvest stages.

Table 4: Distribution of the respondents based on the major constraint impeding cashew nut's post-harvest management practices

Constraints	VS	MS	S	NS	WMS	SD	Rank
Inadequate storage facilities	34 (26.2)	41 (31.5)	20 (15.4)	35 (26.9)	1.57	0.863	6th
Unfavourable Climate and weather conditions	48 (36.9)	51 (39.2)	17 (13.1)	14 (10.8)	2.02	0.991	1st
Limited access to processing technology	20 (15.4)	31 (23.8)	43 (33.1)	36 (27.7)	1.27	1.011	9th
Shady practices of mixing of immature nuts with matured nuts on the part of the sellers.	43 (33.1)	56 (43.1)	19 (14.6)	12 (9.2)	2.00	1.090	2nd
Combination of old and new season nuts	38 (29.2)	29 (22.3)	27 (20.8)	36 (27.7)	1.53	0.910	7th
Limited knowledge and training	31 (23.8)	29 (22.3)	47 (36.2)	23 (17.7)	1.52	1.102	8th
Lack of market	08 (6.1)	11 (8.5)	09 (6.9)	102(78.5)	0.42	0.876	10th
Inadequate skilled labour	33 (25.4)	41 (31.5)	30 (23.7)	26 (20.0)	1.62	0.901	4th
Poor infrastructure and technological deficit	35 (26.9)	46 (35.4)	20 (15.4)	29 (22.3)	1.67	1.012	3rd
Bad quality of nuts	29 (22.3)	43 (33.1)	34 (26.1)	24 (18.5)	1.59	1.006	5th

Source: Field Survey, 2024

Data in Table 5 shows that among the seven characteristics entered the model, two were found to be statistically significant predictors at 5% level of significance. These include years of formal education (B = 0.071) and years of experience (B = -0.108). The coefficient for age is positive and statistically significant ($p < 0.05$) indicating that the older the aggregators the more their information needs. On the other hand, years of experience is negative and statistically significant ($p < 0.05$) indicating that the more the years of the respondents' experience in aggregation of nuts the lesser the information needs. community development projects. This could be because the number of years spent on the field of aggregation can make an individual garner requisite knowledge on handling various issues. With an R^2 of 0.698 and an adjusted R^2 of 0.571, the model suggests that socioeconomic characteristics account for about 57% of the variance in information needs, indicating a substantial explanatory power.

Table 5: Contribution of socioeconomic characteristics to information needs

Variables	Coefficient (B)	SE	t-value
Age	0.087	0.317	0.380*
Sex	0.164	0.245	1.327
Marital Status	0.547	0.087	5.259
Years of formal education	0.071	0.213	0.640
Annual Income	-0.060	0.182	-0.168
Years of experience	-0.108	0.170	-0.567*

R^2= 0.698, Adjusted R^2 = 0.571, F = 19.237, p<0.05
Source: Data Computation, 2024

CONCLUSION AND RECOMMENDATIONS

The study concluded that the respondents have information needs on the determination of quality nuts and the major constraint impeding cashew nut's post-harvest management practices was unfavourable climate and weather conditions. The study therefore recommends that training emphasis should focus on techniques to improve the quality of nuts going to the market. Given the adverse impact of climatic conditions on post-harvest quality, introducing climate-resilient storage and handling methods would be beneficial. This includes training on proper drying techniques and low-cost storage innovations to preserve nut quality during adverse weather.

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ASSESSMENT OF POSTHARVEST LOSS MANAGEMENT AMONG ONION MARKETERS IN OYO STATE, NIGERIA

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ABSTRACT
Seasonality in the availability and affordability of onions has been linked to poor postharvest loss management across the value chain. Therefore, this study assessed postharvest loss management among onion marketers in Oyo State. A simple random sampling technique was used to sample 73 respondents for the study and data were obtained using a well-structured interview schedule. Descriptive statistics using frequency counts, percentages, mean scores and standard deviations were used in analysing the data. Findings from the study showed that most of the marketers (97.2%) solely owned their businesses with an average experience of 23 years. The extent of postharvest loss of onion was 32.8%. The primary causes of postharvest loss were rot, pests, bruising, diseases, high humidity, sprouting and the use of inappropriate storage techniques. Strategies adopted for postharvest management of onions were curing, packaging, sorting, dusting with flour and pest and diseases control. Inadequate storage facilities, poor road network, insecurity and low level of value addition were considered severe constraints to postharvest loss management. The study concluded that regardless of strategies adopted by onion marketers to mitigate postharvest loss a considerable quantity of onion is lost at the marketing stage. The study recommends the development of appropriate storage technologies and the dissemination of such for effective postharvest loss management.
Keywords: Onions, Postharvest, Loss, Marketers, Storage

INTRODUCTION

Onion (Allium cepa L.) an herbaceous biennial plant is grown in over 170 countries of the world. It is a significant agricultural commodity in Nigeria, highly valued for its flavour and nutritional qualities. It is also a source of micro and macro nutrients with numerous medicinal uses (Maharazu, 2023). In many growing regions, it is a major source of income for rural families and a means of livelihood for many urban and peri-urban dwellers. Postharvest loss of onions like every other perishable is quite high, particularly in developing countries with inefficient postharvest management systems (Falola et al., 2023). Consequently, Nigeria the largest producer of onions in West Africa (Ministry of Foreign Affairs, 2021) is faced with seasonality in the availability and affordability of onions.

In Nigeria, about fifty percent of more than 2 million metric tonnes of onion produced annually are lost at the postharvest stage (VON, 2023). Postharvest losses of onions pose a formidable challenge in the onion supply chain, impacting the economy and affecting food availability and livelihoods of farmers, marketers, and consumers in the value chain due to inadequate handling, insufficient storage, and inefficient distribution systems (Muhammad and Yakubu, 2023). Kulwijila (2021) reported a postharvest loss of over 25 percent perishable crops in developing countries because of pest infestations, spoilage, and inappropriate postharvest management along the value chain. These losses are not only an economic burden but also a waste of labour, water, land, and other resources used in production. Hence, efficient management of postharvest losses is essential to reducing waste, improving livelihood, and enhancing the overall sustainability of the onion supply chain.

Over the years, several studies have been carried out on the intensity and management of postharvest losses in onion production and its implications on the farmers, with limited focus on the marketers. Onion marketers play a crucial role in the supply chain, and their ability to manage postharvest losses directly affects their profitability, farmers' livelihood and availability of onions to consumers. Muhammad and Yakubu (2023) observed that marketers frequently experience losses that can be as high as 30-50% of their total produce, affecting profitability and contributing to food insecurity.

Therefore, this study aims to assess postharvest loss management among onion marketers in Oyo State, Nigeria. Specifically, the study describes the socio-economic characteristics of the onion marketers, examines the causes of postharvest loss, identify strategies utilised in postharvest management of onions, ascertain the extent of postharvest loss and identify the constraints to postharvest loss management.

METHODOLOGY

The study was carried out in Ogbomoso, Oyo State. A two-stage sampling procedure was used to select the respondents. First, a purposive selection of three major markets: Odo-oba, Waso, and Arada based on the population of onion marketers. The second stage was a random selection of onion marketers from the markets. The list of onion marketers was obtained from the President of the onion's marketers association in each market and a simple random sampling technique was used to select seventy-three (73) respondents which is equivalent to fifty percent of the population.

Population of registered onion marketers being sixty-seven, forty-four and thirty-five in Odo-oba, Waso and Arada markets respectively. The causes of postharvest loss were measured using a 3-point Likert-type scale of very severe (3), severe (2) and not severe (1). The strategies utilised in postharvest management of onions. The respondents were presented with strategies for postharvest management of onions to identify the most utilized strategy using a 3-point Likert type scale of never (1), rarely (2) and often (3) while constraints to postharvest loss management were measured using a 3- point Likert-type scale graduated as follows: not severe (1), severe (2), and very severe (3). Data were analysed using descriptive statistics.

RESULTS AND DISCUSSION

The result in Table 1 shows that marketers had a mean age of 47 years and males dominated (94.5%). The implies that most of the respondents are of young age, active and productive, and this may have a positive effect on their innovativeness and readiness to adopt technologies for postharvest loss reduction. This corroborates the findings of Muhammad and Yakubu (2023), who observed that actors in the onion value chain fell within the economic active age and thus have a significant implication for the sustainability of the onion enterprise. Cultivation of onions in the northern parts of the country might be responsible for male dominance of onion marketing. This is in line with the findings (Maharazu, 2023). The majority (98.6%) had informal education while less than a quarter (24.7%) had a minimum of primary education which is an indicator of a low level of education among the respondents. More than half (53.4%) of the respondents are primarily involved in onion marketing with a mean year of experience of 31 years. This implies that onion marketers in the study area have considerable experience, which is expected to enhance their efficiency in performing marketing activities.

Table 1: Distribution of the Respondents according to Socio-economic Characteristics (n=73)

Variables	Frequency	Percentages
Sex		
Male	69	94.5
Female	4	5.5
Age		
≤40	16	21.9
41- 50	28	38.4
≥51	29	39.7
Mean	47	
Marital Status		
Married	71	97.3
Widowed	2	2.7
Religion		
Christianity	1	1.4
Islam	72	98.6
Level of Education		
Non formal	72	98.6
Primary	18	24.7
Secondary Occupation		
None	39	53.4
Farming	28	38.3
Artisan	13	17.8
Others	17	23.2
Membership of Association		
Yes	73	100
Years of Experience		
≤10	9	12.3
11 - 20	12	16.4
≥20	52	71.2
Mean	31	
Source of capital		
Personal savings	73	100
Friends and relatives	11	15.1
Cooperative/thrift society	64	87.7
Micro-finance banks	23	31.5
Ownership		
Sole	71	97.3
Joint	2	2.7

Variables	Frequency	Percentages
Income from onion Marketing (₦)		
≤500,000	16	21.9
500,001- 1,000,000	38	52.1
≥1,000,000	19	26.0
Mean	750,000	
Sources of Information		
Friends and colleagues	73	100.0
Radio	5	6.8
Social media	12	16.4

Source: Field survey, 2023

Results as shown in Table 2 on the causes of postharvest loss in onions show that all the listed possible causes were rated as very severe. The first three most severe as indicated by the respondents are rot, poor road network and use of inappropriate storage technology. This corroborates the findings of Falola et al (2023), who affirmed that rot in onion, caused by fungi and bacteria, contribute immensely to postharvest loss in onions. Also, physical damage resulting from poor road networks and the use of inappropriate packaging containers during transportation encourages postharvest losses.

Table 2: Causes of postharvest loss

Causes of Postharvest Loss	Mean
Rot	3.0
Pest infestation	2.6
Rodent Attack	2.5
Diseases	2.8
High humidity	2.7
Use of inappropriate storage technologies	2.9
Poor road Network	2.96

Source: Field survey, 2023

Table 3 shows that majority of the marketers experienced 26% to 50% postharvest loss in onion and an average loss of loss of thirty-eight percent. This is relatively high, and it implies that about one third of onions are lost at the marketing stage of the value chain. This corroborates the findings of Osabohien (2022) who reported a postharvest loss of between 20% to 40% in many African countries.

Table 3: Extent of postharvest loss in onions

Percentage Loss	Frequency	Percentage
< 25%	24	32.8
26% - 50%	38	52.1
>50%	11	15.1
Mean		38

Source: Field survey, 2023

Table 4 shows that the marketers utilized all listed strategies for postharvest management of onions except processing to secondary products through value addition. This suggests that the potential of value addition to onions for effective postharvest management is yet to be fully harnessed.

Table 4: Strategies adopted by marketers for postharvest management of onions

Strategies	Mean
Curing	2.68
Sorting and grading	3.0
dusting with flour	2.56
Fumigants/pesticides	1.95
Value Addition	1.0
Storage	2.97

Source: Field survey, 2023

Table 5 shows the constraints to postharvest management of onions. Insufficient fund ($\bar{x}$ =2.71) was ranked first as one of the major constraints. This was closely followed by poor road network $\bar{x}$ =1.71

and inadequate storage facilities $\bar{x}$=1.19. The lowest levels of addition and low knowledge of ideal postharvest management.

Table 5: Constraints to postharvest loss management

Constraints	Mean
Inadequate storage facilities	2.5
Poor road network	2.6
Insecurity	1.95
Low level of value addition	1.6
Low knowledge of ideal postharvest management	1.97
Insufficient fund	2.71
Lack of government support	2.3

Source: Field survey, 2023   Likert-type Scale: Not severe =1, severe=2, very severe=3 Decision rule: x̄ = ≥ 2.0 (severe constraint) x̄ ≤ 2.0 (less severe constraints)

CONCLUSION AND RECOMMENDATION

The study concluded that regardless of the years of experience and strategies utilised by the onion marketers to prevent postharvest loss (PHL) a considerable quantity of onion is lost at the marketing stage through rot. Insufficient funds, poor road networks and inadequate storage facilities were the major constraints to effective postharvest loss management. Based on these findings, the study recommends training and capacity building by extension personnel and marketers on the prevention and management of rot in onion. Design and development of low-cost storage technologies by relevant research institutes and dissemination to appropriate end-users. The government should make efforts to construct new roads and rehabilitate dilapidated ones to ease transportation.

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ECONOMIC ANALYSIS OF WATERMELON PRODUCTION IN ISE ORUN LOCAL GOVERNMENT AREA OF EKITI STATE, NIGERIA

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ABSTRACT
The study examines the economic analysis of watermelon production in Ise Orun Local Government area of Ekiti state. A two-stage sampling technique was used to randomly select 105 respondents for this study. Well-structured questionnaire was used to obtain information on socio-economic characteristics and other relevant variables. The data were analysed using descriptive statistics, a 5 points Likert type scale and budgetary analysis. The results showed that the mean age is 57 years revealing the presence of young and middle-aged individuals who are known to be active and innovative. Costs and returns for watermelon production was analysed with budgetary techniques and result revealed that for a hectare of watermelon, there was a gross margin of ₦662,493 with a cost benefit ratio of 5.79 implying that for every ₦1.00 invested in watermelon production, there was corresponding profit of ₦5.79Kobo. The study revealed that inadequate capital, cost of labour, theft and flooding with mean scores 1.54, 1.51, 1.49 and 1.43 respectively were the serious constraints faced by farmers during the cause of production. It was recommended that farmers be organised into cooperative groups by facilitators from the Local Government or State department of extension services for easier access to loans. Also, provision of improve seeds that are not susceptible to pest and diseases to the grass-root watermelon farmers, to ensure high yield and returns should be made available to the farmers and the land acquisition system that makes it difficult for farmers to acquire enough agricultural land should be reviewed to allow the farmers to have more access to land for cultivation.
Keywords: watermelon, analysis, production, economic, farmers.

INTRODUCTION

Watermelon, *Citrullus lanatus* is one of the most widely cultivated crops in the world. According to FAO (2011) statistics, China is the world's leading producer of watermelon. Nigeria produced more watermelons in 2011 (139,223 tons) than the leading fresh produce African exporter, Kenya, which produced 66,196 tons, and South Africa that produced 77,993 tons. There are over 1,200 varieties of watermelon worldwide, and quite a number of these varieties are also cultivated in Africa (Zohary and Hopf, 2000). Agriculture in Nigeria is dominated by small-scale farming households who produce about 80 percent of the total food requirements (Adeniyi and Adeyemo, 2014) and they grow different kinds of vegetables and fruits, including watermelon. Nigeria produced 1,936,111 metric tons of watermelon in 2020 (FAO, 2022). It is highly medicinal fruits which have great advantages for the health system. This is because watermelon is known to be low in calories but highly nutritious and thirst quenching. Presently, the largest production of the crop in Nigeria still comes from the northern parts. Its cultivation is confined to the drier savanna region of Nigeria (Anon, 2005). Watermelon production is a profitable economic activity because of the availability of the ready-made market within the vicinity of production areas and across all the states of Nigeria. It has been observed that Nigeria has the potential particularly in terms of land and human resources needed to produce enough food for the country (Ndanitsa, 2005; Mairabo, 2021). To be self-sufficient in food production and self-reliant in the economy, the problem of promoting staple food crops to ensure food security must be tackled (Ndanitsa, 2005; Ndanitsa and Umar, 2007). There is also reported shortfall in watermelon supply with respect to local demand thereby putting pressure on the price of the watermelon during off-peak period. This makes watermelon unaffordable to many households in Nigeria and further decreases the per capita consumption rate. There is little chance of malnutrition occurring where enough vegetables are consumed.

Production of fruit crops such as watermelon has been low despite its nutritional and commercial value. This low production of watermelon calls for a close examination of the profitability of producing the crop, and analysis of the resources used in its production. In this study, the parameters employed to assess the economic analysis of watermelon production in Ise Orun Local Government Area of Ekiti State were as follows; the socio-economic characteristics of the respondents, costs and returns of watermelon production and the constraints associated with watermelon production in the study area.

METHODOLOGY

The study was carried out in Ekiti State, which lies within the tropical zone in the rain forest region of southwestern Nigeria. The study was carried out in Ise Orun Local Government Area of Ekiti State. It is located between longitudes 5.3945° or 5° 23' 40" east and latitudes 7.4453° or 7° 26' 43" north. Ekiti state has 16 local government councils, with a population of about 113,754 (NPC, 2006). The area is peculiar for horticultural crop production, and a large percentage of the inhabitants are farmers. Ise orun Local Government Areas of Ekiti State, namely: Ogbese, Afolu, Obada, kajola, Araromi, Ajebamidele, Temidiri, Aba Egbera. It has a land mass of 432 km² at the 2006 census.

Multistage sampling procedure was used in selecting the respondents. Ise Orun Local Government Area was purposively selected, in the first stage, due to its high watermelon-farming

population. In the second stage, five villages were randomly selected from the eight (8) villages within the Local Government Area. Finally, at the third stage, a proportionate sampling was employed in selecting twenty-one (21) farmers from each of the village's base on the list of the sample frame provided by the ADP officials. In all, 105 farmers were randomly selected as sample frame for the study.

Data were analysed using descriptive statistical techniques and 5 points Likert scale of strongly agree (5), Agree (4), Undecided (3), Disagree (2), strongly disagree (1). Farm budget analysis was constructed to estimate the production costs, revenue and gross margin accruable to the farmers. The equations used in estimating the various parameters are defined below:

GM = TR - TVC ………………… (1)
TC = TFC + TVC ………………… (2)
NP = TR-TC ……………………….. (3)

Where:
TC = total cost, TFC = total fixed cost, TVC= total variable cost
GM = Gross margin, TR = Total revenue, NP = Net profit
Depreciation on tools was calculated by the straight-line method as follows:
Depreciation = (cost of purchase - salvage value)/ useful life.

RESULTS AND DISCUSSION
Socioeconomic characteristics

The result from Table 1 revealed that 61.9% of the respondents were less than 60 years old with mean age 57 years revealing presence of young and middle-aged individuals who are known to be active and innovative. They are also likely to be opened to new ideas. Also implies that majority of the respondents are still within the productive working age, active, agile and can withstand the demands (labour) for watermelon farming. Adesoji and Farinde (2006), Ndanitsa et al. (2021) and Mairabo (2021) found out that age of farmers is very critical in agricultural production, and that farmers below the age of 40 years are engaged in rigorous farm work to accomplish cultural practices such as planting, weeding, and harvesting. Majority of the respondents (81%) were male, this indicates dominance of male folks in watermelon production. Also, this is due to the traditional pattern that the male is dominant in the farming system in that area and because migrant farmers are mostly of male gender. Furthermore, majority of the farmers (89.5%) were married, and are therefore expected to be stable and settled in their chosen vocation, also they can help each other and utilize family labour to enhance watermelon production in the study area. Majority (68.6%) of the respondents had at least primary education, thus indicating a high level of literacy in the study area. This will also ease the problem of training farmers on how to access and effectively utilise agricultural credit obtained (Ndanitsa et al., 2021). This agrees with the findings of Ogah (2011), Akaya (2015), who both in a separate study, stated that the level of education determines the level of available opportunities geared towards improved livelihood, food security enhancement, and poverty reduction. The mean years of watermelon production experience was 27 years, this implies that farmer in the study area have the necessary experience to increase their watermelon production given a considerable level of inputs.

The mean household size was 8 persons; the implication is that the large household size will help the farmers in finding solutions to problems associated with shortage of labour utilization in the study area. Also, may serve as source of cheap and readily available farm labour supply depending on the compaction and very likely increased output (Adesoji and Farinde, 2006).

Table 1: Socioeconomic characteristics of the respondents (n=105)

Variable	Frequency	Percentage	Mean
Age (years)			
Under 30	1	1.0	
31-35	18	17.1	
46-60	46	43.8	57
Above 61	40	38.1	
Sex:			
Female	20	19.0	
Male	85	81.0	
Marital status			
Married	94	89.5	
Divorced	5	4.8	
Widow/widowers	6	5.7	
Educational status			
No formal education	33	31.4	
Primary education	55	52.4	
Secondary education	17	16.2	
Household size			

Variable	Frequency	Percentage	Mean
Under 5	15	14.3	
6-10	74	70.5	8
11-15	13	12.4	
Above 16	3	2.9	

Source: Field survey, 2024

Costs and returns of watermelon production in the study areas

The estimates of the budgetary analysis for watermelon are presented in Table 3. The average total variable cost (TVC) of hired labour, chemical fertilizer, seeds, herbicides/insecticide amounted to N87, 507. From the table, labour accounted for about 3.19% of the total production cost, while analysis of other variables shows that the percentages share of Seeds (18.80%) and other costs are 35.67%, and 42.35%, respectively. While the average total fixed cost (TFC) depreciated for farm implements amounted to N42, 074. Average total cost (TC) amounted to N129, 581. The Costs and returns analysis show gross margin of N662, 493 per ha. This when divided by a year gives a monthly income of N55, 207.75. The Benefit-Cost Ratio shows a figure of 5.79, meaning for every one naira invested in Watermelon farming, an additional N5.79 kobo will be realised.

Table 3: Average costs and returns of watermelon production in the study areas (Naira/hectare)

	Items	Mean value (N)	Percentage of variable cost
A	**Revenue**		
	Average yield 1500@N500	750,000.00	
B	**Variable cost**		
	Cost of hired labour	2,788.00	3.19
	Cost of chemical/fertilizer	31,210.00	35.67
	Cost of seeds	16,447.00	18.80
	Cost of herbicides	37,062.00	42.35
	Total variable cost (TVC)	87,507.00	100
C	**Fixed cost**		
	Depreciation of farm equipment (hoe, cutlass, etc	42,074.00	
	Total cost of production		
	TC=TVC+TFC	129,581.00	
D	**Gross Margin (GM)**		
	GM=TR-TVC	662,493	
E	**Net Farm Income**		
	NFI= TR-TC	620,419	
	Return on Investment		
	Benefit cost ratio =TR/TC	5.79	

Source: Field survey, 2024

Constraints of watermelon production

Table 4 reveals the constraints associated with watermelon production as identified by the respondents in the study area which were ranked according to their severity. 54.3% of the sampled farmers ranked inadequate capital/credit facilities to produce watermelon as the first most pressing problem constraining their increased production with the mean score of 1.54. This agrees with the findings of Adeoye *et al.* (2011) and Ajewole (2015) that inadequate credit is a major constraint to watermelon production in Nigeria. This has a big influence on the increase in production since capital is needed to expand the farm and increase production. 51.4% of the farmers ranked High cost of labour as the second pressing constraint in the study area with the mean score of 1.51. Farmers did not pull their resources together to acquire labour saving devices such as mechanized farm inputs so as to reduce the cost of labour for watermelon production and subsequently increase the profitability. 48.6% of the farmers ranked Theft as the 3rd constraints constraining their production with the mean score of 1.49. 42.9% of the farmers ranked flooding as 4th constraint constraining their increased production with mean score 1.43. This could wash away farm produce thereby, leaving the farmer with little or no yield at all. There should be good tillage facilities and border line so as to prevent flooding. Inadequate storage facilities, Poor market price, Inadequate transportation was ranked 5th with mean score of 1.31. By nature, watermelon fruits are heavy, and if the roads leading to where they are being produced are bad, transporting them to the destination will be a very serious problem. According to the sampled farmers, they said the roads that lead to their different farms are very bad and as a result, it has affected the cost of transportation. It corroborates the findings of Ekerete and Asa (2014) that the most severe constraints to watermelon marketing in Uyo Metropolis, Akwa Ibom State, Nigeria include

losses resulting from fruits spoilage, lack of preservation facilities, high cost of transportation, and lack of credit facilities. Other problems confronting watermelon farmers in the study area but were ranked differently include Lack of improved seeds (mean score =1.26), Inadequate extension contacts (mean score =1.25) and Pest and

diseases (mean score = 1.22). This corroborates the report by Adojutelegan *et al*. (2015) that lack of capital, poor markets, perishable nature of watermelon and lack of technology for large scale production were the serious constraints faced by farmers during the production of watermelon.

Table 4: Constraints faced by watermelon farmers in Production

Constraints	Mean	Rank
Inadequate credit facilities	1.54	1st
High cost of labour	1.51	2nd
Theft	1.49	3rd
Flooding	1.43	4th
Inadequate storage facilities	1.31	5th
Poor market price	1.31	5th
Inadequate transportation	1.31	5th
Lack of improved seeds	1.26	6th
Inadequate extension contacts	1.25	7th
Pest and diseases	1.22	8th

Source: Field survey, 2024

CONCLUSION AND RECOMMENDATIONS

Based on the findings, 61.9% of the respondents were less than 60 years old with mean age of 57 years, 81% of the respondents were male and 89.5% of the respondents are married. Findings showed that watermelon production in the study area is a profitable business. The study therefore examines some of the constraints faced by the farmers of watermelon were inadequate capital, lack of labour in the study area, theft and flooding

Based on the findings of this research work, the following recommendations were made:

i. The land acquisition system that makes it hard for farmers to acquire agricultural land should be reviewed to allow the farmers to have more land to cultivate.

ii. Government grants and loans should be made easy to access as this will reduce the cost incurred on inputs and help provide funds for the production activities.

iii. There was need to find a way of improving labour availability through the provision of tractor hiring services by the cooperative society to ensure adequate labour supply, Labour should be utilized more effectively on the farm, as this would improve the profitability of the enterprise.

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INFORMATION-SEEKING BEHAVIOUR OF HOUSEHOLDS IN IBADAN METROPOLIS TOWARDS ANTHROPOGENIC ACTIVITIES THAT CONTRIBUTE TO CLIMATE CHANGE

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ABSTRACT
Human activities significantly contribute to climate change by releasing large amounts of carbon dioxide and other greenhouse gases into the atmosphere. This study determined the knowledge and attitude of households in Ibadan metropolis towards anthropogenic activities that contribute to climate change. A multistage sampling technique was used to obtain data from 121 respondents using a well-structured interview schedule. Data were gathered on socio-economic characteristics, anthropogenic activities engaged in, knowledge of the implications of anthropogenic activities, attitude towards anthropogenic activities, and the willingness to comply with environmentally friendly activities. Data were analysed using descriptive statistics and t-test analysis. The result showed that the mean age was 36.6 years, majority (59.5%) were females, (50.4%) had tertiary education and 61.2% were self-employed. Majority (57.0%) were more compliant with environmentally friendly activities, (54.5%) had a low knowledge level about the implications of anthropogenic activities on the environment, and (57.0%) had an unfavourable attitude towards anthropogenic activities. The result also shows that more than half (56.3%) were unwilling to comply with environmentally friendly activities. The study recommends that the government and private entities should take the responsibility of enlightening households on the need to dispose of their wastes timely and properly. Also, the educational campaigns should inform people about the implications of anthropogenic activities and to seek attitudinal modification that promotes pro-environmental behaviours.
Keywords: Households anthropogenic activities, attitude, knowledge of environmental implications, attitudes to environmentally friendly activities.

INTRODUCTION

Humans, right from the time of creation, have always involved themselves in activities for survival and to meet their daily needs. This constant activity has increased over the years due to the drastic population growth and increase in the demand to meet their ever-growing needs, putting a strain on the environment, causing pollution and numerous environmental problems with the most prominent being climate change.

Anthropogenic activities emanating from industrialisation, transportation, and farming are noted to be the major sources of greenhouse gas (GHG) emissions contributing to climate change and loss of biodiversity. According to Petteri (2020), climate change has a significant impact on Africa, with extreme weather events such as floods, droughts, and desert locust invasions which have become more frequent and severe. Nigeria, Africa's largest economy and most populous country is also facing several environmental challenges such as rising sea levels, drought, and reduced rainfall (Ebele and Emodi, 2016; Ikumbur and Iornumbe, 2019). These threaten agricultural productivity since agriculture in Nigeria is still rain-fed, leading to food insecurity, heightened vulnerability among farmers and increased hunger and malnutrition among vulnerable populations (Odejimi and Ozor, 2019; Chikezie et al., 2019; Gbenga et al., 2020; Ajadike and Simeon, 2019).

As documented by USAID (2021), the energy sector, deforestation, and land-use change are the main sources of Nigeria's greenhouse gas emissions. Also, Kolawole and Okonkwo (2022) noted that human activities such as the burning of fossil fuels, deforestation, and agriculture are significantly contributing to climate change in the country by releasing large amounts of carbon dioxide and other greenhouse gases into the atmosphere which increase the greenhouse effect and global warming.

While several studies have been carried out on anthropogenic activities, the focus was mainly on the impact of the activities on the environment and their contribution to climate change without considering the knowledge and attitude of individuals engaged in these activities who mainly determine if climate action will be effective. Against this background, this study investigated the knowledge and attitude of households in Ibadan metropolis towards anthropogenic activities contributing to climate change.

METHODOLOGY

The study was carried out in the Ibadan metropolis. A multi-stage sampling procedure was used to sample 121 respondents in the study area. Primary data was collected using a structured questionnaire and interview schedule. Descriptive statistics involving frequency, percentage and mean score were used.

RESULT AND DISCUSSION

The study revealed that 44.6% of the respondents were between 16 – 30 years and the mean age was 36.6 years which implies that most of the respondents were still in their middle, active and productive years. More than half (59.5%) were female, (72.7%) were Christians and 52.9% were married. This implies that more than half of the respondents are married and have family responsibilities thus increasing their involvement in anthropogenic activities. This is in line with the findings of Bukola et al., (2018) that most people in Ibadan are married. Also, 88.4% of respondents'

household sizes ranged between 2 and 7 persons, (50.4%) had tertiary education and (61.2%) were self-employed (trading, Artisan). This corroborates the findings of Adesina (2018) that majority of the people in Ibadan metropolis are self-employed.

Respondents' extent of engagement in anthropogenic activities that impact the environment

The study reveals that majority (85.1%) do not engage in dumping wastes in the drainage during rainfall, 84.3% do not use firewood to cook, (88.4%) use cooking gas and 53% burn their waste. The result also revealed low engagement in anthropogenic activities across categories with 62.0% in the agriculture category, 61.2% in the household energy use category and 52.1% in the

waste disposal category This implies a high level of compliance to environmentally friendly activities under the three categories. Furthermore, the overall result shows that more than half (57.0%) of respondents have low engagement in anthropogenic activities that impact the environment.

Knowledge about the implications of anthropogenic activities on the environment

The result in Table 1 shows that (54.5%) of the respondents have low knowledge while 45.5% have high knowledge about the implications of anthropogenic activities on the environment. This corroborates the findings of Yang *et al* (2018) who examined the associations between knowledge of the causes and perceived impacts of climate change in China.

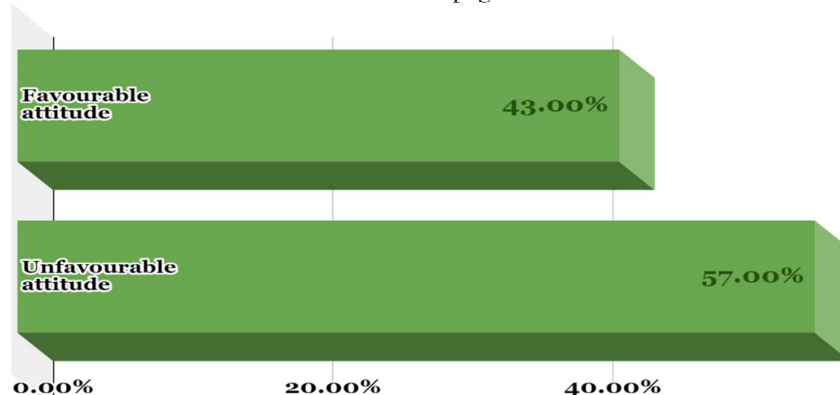**Table 1: Categorisation of respondents' knowledge of the implications of anthropogenic activities**

Knowledge	Frequency	Percentage	Minimum	Maximum	Mean	S.D.
High	55	45.5	55.00	92.00	71.4545	±7.33485
Low	66	54.5				
	121	100				

Source: Field survey, 2023

Attitude of respondents towards anthropogenic activities

The result in Figure 1 shows that 57.0% of the respondents" have an unfavourable attitude towards anthropogenic activities while 43.0% have a favourable attitude towards anthropogenic

activities. This disposition can be due to the respondents' low knowledge level. It conforms to the findings of (Taube, 2021) that the higher the levels of awareness and knowledge the more favourable people's attitudes towards anthropogenic activities.

Figure 1: Categorisation of respondents' attitudes towards anthropogenic activities
n = 121, mean = 48.3, Max = 67; Min = 31
Source: Field survey, 2023

Respondents' willingness to comply with environmentally friendly activities

The result in Table 2 shows that more than half (56.2%) were less willing to comply with environmentally friendly activities while 43.8% of

the respondents were more willing to comply with environmentally friendly activities. These findings support the finding of UNICEF (2022) that households do not regularly practice the activities identified as key to reducing climate change.

Table 2: Categorisation of respondents' willingness to comply with environmentally friendly activities

Willingness	Frequency	Percentage	Minimum	Maximum	Mean	S.D.
More willing	53	43.8	21.00	58.00	42.0661	±5.37546
Less willing	68	56.2				
	121	100				

Source: Field survey, 2023

CONCLUSION AND RECOMMENDATIONS

The study concluded that the respondents are more compliant with environmentally friendly activities. They have low knowledge of the implications of anthropogenic activities on the environment, have an unfavourable attitude towards anthropogenic activities and are unwilling to comply with environmentally friendly activities.

Based on the findings of this study, the following recommendations were made:

Government, NGOs and private entities should take the responsibility of enlightening households on the need to dispose of their wastes timely and properly. Also, they should organise educational campaigns on anthropogenic activities to seek attitudinal modification that promotes pro-environmental behaviours. Education campaigns should appeal to emotions, be visually attractive, and use of various media platforms.

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PSYCHO-SOCIAL PROBLEMS AND WELLBEING OF INTERNALLY DISPLACED PERSONS (IDPS) IN SELECTED CAMPS IN ABUJA, NIGERIA

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ABSTRACT
Internal displacement is a universal phenomenon that has called for many researchers' concerns. This study aimed to investigate the psycho-social problems and their implications on the well-being of internally displaced persons in the selected IDP camps in Abuja, Nigeria. The research uses a qualitative research method through the distribution of questionnaires in four IDP camps, including Kuje IDP camp, New Kuichigoro IDP camp, Wassa IDP camp and Area 1 IDP camp. A total of 370 questionnaires were administered in the camps mentioned. A survey and Key in-depth interview (KII) were carried out during the research. The key findings of the research show that IDP suffers many psychological problems, such as post-traumatic stress disorder PTSD, depression and anxiety. Lack of food supply, water, toilets, poor sanitation, poor healthcare and educational facilities have been significant challenges faced by IDPs in Abuja. The study also examined the interventions from government, NGOs and religious groups, studying their impacts. Most of the IDPs adopted various coping strategies ranging from farming, trading, and riding bikes, among others. The study recommends that the government improve the livelihood of IDPs by providing relief materials and making policies that will favour the IDPs.
Keywords: Internally Displaced Persons (IDPs), Psycho-social challenges, post-traumatic stress disorder (PTSD), Abuja IDP camps.

INTRODUCTION

Ever since World War II, various factors such as war, poverty, persecution, and trauma have led to a high report of forced displacement all around the world, becoming one of the highest human tragedies (Koch, 2020). The Internal Displacement Monitoring Centre (IDMC) report stated there has been a 20% increase in the annual record of internally displaced people in the world, resulting in about 71.1 million people, primarily associated with violence and conflict. Ukraine war recorded about 16.9 million people. Other countries such as Pakistan, Nigeria and Brazil have also recorded a high number of displaced people due to flood calamity and conflict, while countries like Somalia, Kenya and Ethiopia recorded a high number of displaced people due to drought and poverty (Internal Displacement Monitoring Centre (IDMC, 2021). This disaster includes heavy rains, floods, storms, and earthquakes, among others. The United States of America has experienced many natural disasters, including earthquakes, tornadoes, hurricanes, floods, landslides and thunderstorms, resulting in people forcefully evacuating their homes and causing internal displacement. Natural disasters might have been one of the significant factors causing displacement in the United States of America. The number of internally displaced persons in Africa has increased over the years. Sub-Saharan Africa recorded about 31.7 million IDPs, and 12.8 million in the Middle East and North Africa. (IDMC, 2023).

According to the Guiding principles on internal displacement, internally displaced persons comprise individuals who are compelled to leave their residences due to the threat of violence and brutal disasters- both natural and human-made and human rights violations. Importantly, these individuals have not crossed country borders but remain within their

country's territory (Deung, 1999; Draper 2023). Due to the significant number of internally displaced persons in various countries globally, the government deemed it fit to establish camps to accommodate them. Although IDPs may sometimes be confused with refugees, they are distinct in that they have not exceeded their international borders and remain within their IDPs, which can be differentiated from refugees even though they are sometimes mistakenly called refugees because they do not exceed their country's borders and are displaced within the territory. As citizens of their country, IDPs are entitled to human rights, privileges, and protections. (Akpotor, 2023). Displacement exerts economic, social, physical, and environmental pressures on victims, rendering them highly vulnerable. This vulnerability often necessitates reliance on government support for everyday survival needs, particularly shelter (Ba-Ana-Itenebe, 2021). In Africa, the Kampala Convention, established by the African Union in 2009, and the National Commission for Refugees, Migrants, and Internally Displaced Persons (NCFRMI) provide protection and relief materials for internally displaced persons. However, despite their efforts, these organizations often struggle to meet the demands of IDPs (Akujobi and Awhefeada, 2021). The government of a specific country bears the duty of safeguarding the human rights of displaced individuals. Ensuring the well-being of these individuals includes essential provisions such as food, shelter, and healthcare services. Internally Displaced Persons (IDPs) camps act as a safeguard against threats, providing a protective shield. Additionally, they receive aid and support for economic rehabilitation to aid in the recovery of lost assets (UNHR, 2020).

The study of the psycho-social implication of displacement on victims in Abuja is highly

significant as it will help to suggest policies and strategies for improving their quality of life, aiding their adaptation and survival within the IDP camp. The theoretical significance is that it will also serve as an exposure to show that displacement has a physical effect and a profound psycho-social effect. This research aims to contribute to academic studies for future reference and research on the impact of internal displacement. This research is aimed at

- Identifying psycho-social factors that affect IDPs in selected camps.
- Identify the challenges faced by the IDPs.
- Study the intervention services that were provided.

METHODOLOGY

A cross-sectional survey design was employed in this research. It used a comprehensive strategy and an analytical method to ensure a thorough investigation of the research problem. The research was focused on Abuja, the Federal Capital of Nigeria, with about 3,840,000 people as the case study of this research. IDP camps included in this research were Wassa, Kuje, Durumi, and New Kuchigoro IDP camps. The total IDPs in these camps are 10,521. Cochran was used to determine the sample size of 370 respondents during the research. The research instruments are qualitative, including the KII and survey, and quantitative, including the questionnaires. The sources of data are primary sources.

RESULTS AND DISCUSSION

This study shows that about 33.7% of the IDPs stated that the camp's living conditions are faced with lots of difficulties. The survey of the IDPs within camps in Abuja revealed that most of the occupants faced a variety of psycho-social problems. This is due mainly to the poor living conditions of the camps. It was noticed that the shelters provided tents, uncompleted buildings, and houses made of zinc. The social challenges discovered in the study are poor educational facilities, problems such as lack of teachers, structures and teaching materials, health challenges such as typhoid, malaria, and skin diseases, poor healthcare facilities, lack of drugs, medical structures, and medical professionals. The limited accessibility to food and adequate health care has also led to post-traumatic stress disorder PTSD, anxiety, and depression.

The mental health services made available in the camp included counselling, group therapy, and crisis intervention. However, there is a lack of information regarding these services, and the IDPs that have benefited from them complained of long waiting times, far distances, and unknown cultural beliefs. The government, concerned individuals, religious groups and NGOs have provided interventions through food, mental awareness and health care services. The IDPs adopted economic coping strategies, including trading, farming, selling food, riding bikes and knitting as well as psychological coping strategies such as religious activities, meaning-making, sleeping and talking to family.

S/N	Questions	Strongly agreed	agreed	Disagreed	Strongly Disagreed	Undecided	Total
1.	Do you agree that the educational facilities suffers from problems such as lack of teachers and structures?	193 (54.6%)	78 (22.1%)	42 (13.0%)	40 (10.2%)	0 (0%)	353 (100%)
2.	Do you think the healthcare facilities in the camp suffers problems such as lack of drugs, lack of structures, lack of personnel and lack of equipment?	257 (72.8%)	72 (20.4%)	4 (1.7%)	0 (0%)	20 (7.1%)	353 (100%)
3.	Do you think IDPs experience violence and lack social security within the camp?	123 (31.1%)	165 (35.1%)	27 (7.6%)	18 (5.1%)	20 (9.7%)	353 (100%)
4.	Do you agree that food available is a major problem face by IDPs?	127 (36.0%)	92 (26.1%)	97 (25.5%)	6 (1.7%)	31 (8.8%)	353 (100%)
5.	Do you agree that IDPs experience health challenges such as typhoid, malaria, skin diseases, major injuries, diarrheal malnutrition, toilet infection, respiratory infection and ulcer?	199 (56.3%)	46 (13.0%)	19 (5.4%)	25 (7.1%)	64 (18.1%)	353 (100%)
6.	Do you agree that IDPs get treatment mostly in hospitals outside the camp, engaged in self-medication and herbal treatment? Do you agree that most children in the camp have access to vaccination?	147 (41.6%)	100 (30.7%)	60 (19.1%)	15 (2.1%)	31 (7.0%)	353 (100%)
7.	Do you agree that the psychological problems faced by IDPs are Post-traumatic stress disorder PTSD, anxiety and depression? Do you agree that psycho-social problems affect the well-being of IDPs?	144 (40.8%)	90 (25.5%)	37 (9.6%)	16 (4.5%)	66 (19.5%)	353 (100%)
8.	Do you agree that social factors faced by IDPs are social isolation, loss of identity, stigma and discrimination?	132 (37.4%)	143 (40.5%)	0 (0%)	40 (11.1%)	38 (11.0%)	353 (100%)

CONCLUSION

The survey of respondents shows that IDPs within the camps in Abuja face many psycho-social problems. Most of the respondents reported that the living conditions of the camps were terrible and not favourable. The shelters provided in the camps were not suitable for the IDPs. Tents, uncompleted buildings, and houses made of zinc were used in the camps. There is a lack of electricity in all the camps except Area 1, which does not have a constant electricity supply. The water supply includes buying water outside and fetching water from rivers in the Wassa IDP camp. The survey underscored that the lack of proper disposal of refuse and lack of toilets has caused pollution and improper sanitation.

The survey shows that most camps lack educational facilities and have problems with books, staff and structures. The study shows that healthcare facilities in most camps have challenges, such as a lack of drugs, structures, medical professionals and equipment. Violence within and outside the camps and lack of social security have been a significant challenge faced by IDPs. Poor food availability and health issues have also been the challenges of the IDPs. These health challenges include typhoid, malaria, skin disease, significant injuries, malnutrition diarrhea, toilet infection, respiratory infection and ulcers.

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