

Socioeconomic Factors Influencing Agricultural Productivity Among Rural Crop Farmers in Osun State, Nigeria

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Abstract

This study examined the socioeconomic determinants of agricultural productivity among rural crop farmers in Osun State, Nigeria. Primary data were collected from 147 respondents using structured interviews and analysed with descriptive statistics, chi-square tests, and correlation analysis. The results showed that the majority of the farmers were male (84.4%), married (93.2%), and in their active age with a mean of 44.7 years. Education levels varied, with 21.8% having no formal education, while 25.8% attained tertiary education. Findings revealed that educational attainment had a significant positive relationship with crop productivity ($p=0.032$), indicating that higher levels of education enhance farmers' decision-making capacity and efficient resource use. In contrast, household size ($r=-0.230$, $p=0.005$) and monthly income ($r=-0.179$, $p=0.031$) showed significant negative relationships with productivity. This suggests that larger households and high-income diversification may limit farm output, as not all household members contribute to labour, and off-farm activities may divert resources away from crop production. The study fills the empirical gap in understanding how specific socioeconomic factors interact to influence agricultural productivity among rural crop farmers in Osun State, a context that has received limited attention in prior regional and national analyses. The study concludes that education remains a key driver of productivity, while household and livelihood factors exert constraining influences. It recommends strengthening farmer education through extension and training, encouraging youth participation in agriculture, optimizing household labour, and providing supportive rural infrastructure and inputs to enhance sustainable productivity.

Keywords: Agricultural Productivity, Socioeconomic Factors, Rural Farmers, Crop Farmers, Nigeria.

Introduction

Agriculture remains the backbone of Nigeria's rural economy, providing livelihoods for the majority of the population. It accounts for nearly 35% of employment and contributes significantly to gross domestic product (GDP), largely through crop production and smallholder farming systems. Despite this pivotal role, agricultural productivity remains persistently low, often below potential, due to structural challenges such as limited access to modern inputs, weak extension services, poor infrastructure, credit constraints, and climate variability (Amankwah et al., 2023; Balana & Oyeyemi, 2020). Improving

productivity at the smallholder level is therefore a key strategy for improving rural livelihoods, strengthening food security, and promoting sustainable development.

Understanding the socioeconomic determinants of productivity is essential for targeted intervention. Amankwah (2023) found that the adoption of sustainable agricultural practices, such as improved seeds, fertilizers, and intercropping, significantly boosted productivity in rural Nigeria, with access to technology influenced by farmers' socioeconomic characteristics. There is a pressing need to identify and quantify the socioeconomic determinants most salient to productivity outcomes in this region. A clearer understanding of these relationships will enable policymakers and extension agents to design interventions that improve yields and strengthen rural livelihoods.

In Osun State, where rural livelihoods are increasingly threatened by youth outmigration, resource competition, and diversification of livelihoods, it is imperative to understand how farmers' socioeconomic attributes influence their productivity. Without such knowledge, policies aimed at improving food security and rural welfare may fail to address the root causes of low productivity.

Problem Statement

Despite the centrality of agriculture to rural livelihoods in Osun State, productivity among smallholder crop farmers remains low and below attainable potential. Recent studies across Nigeria and sub-Saharan Africa indicate that socioeconomic characteristics play a critical role in shaping farmers' ability to adopt improved practices, allocate resources efficiently, and respond to market and climate challenges (Balana & Oyeyemi, 2020; Amankwah et al., 2023; Anyachukwudinarum et al., 2024). However, empirical evidence specific to Osun State remains limited. Factors such as education and farming experience, representing human capital, are expected to enhance farmers' decision-making capacity, technology adoption, and resource management efficiency (Egbetokun et al., 2023). Household size and income diversification, which reflect household structure and livelihood dynamics, may exert mixed or constraining effects; larger households may increase consumption burden, while income diversification can divert labour and investment away from farming activities (Hassan & Knight, 2023). Few studies have simultaneously examined how these human capital and household factors interact to determine productivity outcomes among rural crop farmers in Osun State. The absence of such evidence limits the formulation of interventions aimed at improving yields and farmer welfare. This study, therefore, addresses this gap by empirically analysing the influence of education, farming experience, household size, and income diversification on agricultural productivity among rural crop farmers in Osun State, Nigeria.

Objectives

The general objective is to examine the socioeconomic factors influencing agricultural productivity among rural crop farmers in Osun State, Nigeria.

Specific Objectives include:

1. To examine the socioeconomic characteristics of rural crop farmers in the study area.
2. To estimate the relationships between key socioeconomic variables and measured agricultural productivity (yield) among these farmers.

Hypothesis

H₀: There is no significant relationship between farmers' socioeconomic characteristics and agricultural productivity among rural crop farmers in Osun State.

Literature Review

Education and Agricultural Productivity

Education has consistently been highlighted as a significant driver of agricultural productivity, as it equips farmers with the knowledge and skills necessary for adopting innovations and making informed decisions. Studies across sub-Saharan Africa show that higher educational attainment improves farmers' ability to adopt improved technologies, optimize resource allocation, and engage with extension services (Amankwah, 2023; Egbetokun et al., 2023). Similarly, Hassan and Knight (2023) found that education positively influenced climate adaptation practices among Nigerian farmers, thereby improving resilience and yield outcomes. Despite these findings, gaps remain in understanding how different levels of education (primary, secondary, and tertiary) specifically contribute to productivity gains, particularly in rural enclaves where informal learning and indigenous knowledge also play a role.

Household Size and Labour Contribution

Household size is another important socioeconomic factor, often viewed from the perspective of labour availability. While larger households are assumed to provide more family labour, empirical evidence is mixed. For instance, Hassan and Knight (2023) observed that larger households facilitated adaptive farming practices, while Ayinde et al. (2022) showed that rural-urban youth migration often reduces the actual labour contribution of household members, creating a mismatch between household size and effective farm labour. More recent evidence suggests that large households may increase consumption burdens without corresponding gains in productivity (Anyachukwudinarum et al., 2024). A critical gap exists in distinguishing between household size as a demographic characteristic and household labour as an active input, which may better explain its relationship with agricultural productivity.

Income Diversification and Farm Output

Income diversification has become a common livelihood strategy among rural households to reduce risks associated with climate variability and unstable agricultural markets (Balana & Oyeyemi, 2020). However, while off-farm income sources can improve household

welfare, their impact on agricultural productivity is debated. Amankwah (2023) noted that income from non-farm activities sometimes provides resources for farm investment, while Anyachukwudinarum et al. (2024) found that diversification often diverts attention and resources away from farming, leading to lower crop yields. This ambiguity suggests that the relationship between income diversification and productivity may be context-specific, influenced by factors such as access to credit, labour allocation, and the profitability of farm enterprises. More nuanced research is needed to establish when and how income diversification complements rather than undermines farm productivity.

Farming Experience and Productivity

Farming experience is generally associated with accumulated knowledge, resilience, and improved decision-making in agricultural production. Studies such as Akintobi (2020) and Egbetokun et al. (2023) confirm that experienced farmers tend to have higher productivity, partly due to their ability to manage risks and optimize labour inputs. However, recent research indicates that experience alone may not guarantee higher productivity without access to modern technologies and extension support (Amankwah, 2023). In addition, younger farmers with less experience may be more open to adopting innovations compared to older, more experienced farmers who rely on traditional methods (Ayinde et al., 2022). This suggests a research gap in understanding the interaction between farming experience and openness to innovation in determining productivity outcomes.

Conceptual Framework

This study is anchored on Human Capital Theory and the Household Production Theory, which jointly explain how socioeconomic factors influence agricultural productivity.

Human Capital Theory, popularized by Becker (1993), posits that individuals' knowledge, education, skills, and experience are forms of capital that enhance their productivity and efficiency. In the agricultural context, farmers with higher levels of education and longer years of farming experience are expected to make better production decisions, adopt improved technologies, and manage resources more effectively, leading to higher yields (Amankwah, 2023; Egbetokun et al., 2023). Education also facilitates access to information and extension services, which are crucial for adapting to changing production conditions and climate risks (Hassan & Knight, 2023). Thus, human capital provides a basis for understanding how education and farming experience drive productivity among rural farmers.

The Household Production Theory (Singh, Squire, & Strauss, 1986) conceptualizes the farm household as both a production and consumption unit, where decisions on labour allocation, income diversification, and household size directly affect farm output. Larger households may provide additional labour, but they also increase consumption needs and sometimes reduce farm efficiency if members engage in non-farm activities. Similarly, income diversification, while serving as a risk management strategy, can either supplement

farm investment or divert labour and resources away from agriculture (Anyachukwudinarum et al., 2024). This framework helps explain the observed trade-offs between household characteristics, livelihood strategies, and agricultural productivity in rural settings.

By combining these two theories, this study conceptualizes agricultural productivity as an outcome shaped by the interplay of human capital variables (education and experience) and household dynamics (household size and income diversification). This integrated perspective highlights the importance of strengthening farmers' education and training, while also designing interventions that balance household welfare strategies with agricultural investment priorities.

Methodology

The Study Area

The study was carried out in Osun State, Nigeria. Osun State is an inland state in South-Western Nigeria. It is bounded in the north by Kwara state, in the east partly by Ondo State and partly by Ekiti State, in the south by Ogun state and in the west by Oyo State. Osun State is located within coordinates 7°30'N 4°30'E. It has an area of 9,251km² and a population of 4,435,800 (City Population, 2022). The state consists of thirty (30) Local Government Areas. The major sub-ethnic groups in Osun state are Ife, Ijesa, Oyo, Ibolo and Igbomina of the Yoruba people, although there are also people from other parts of Nigeria. The people are predominantly peasant farmers cultivating mostly food crops. They also embark on livestock production such as rearing of goats, sheep, pigs, rabbits and poultry as well as marketing of their products. There are other occupations practised in the study area, which include hand-woven textiles, tie and dye, leather work, calabash carving and mat-weaving for the purpose of generating income to their living.

Population of the Study

The population of the study comprises all crop farmers in Osun State.

Sampling Procedure and Sample Size

A multistage sampling procedure was used to select crop farmers for the study.

Stage 1: Two local government areas were purposively selected due to the presence of mining activities in the area. The local government areas include Atakunmosa West Local Government and Ilesa West Local Government

Stage 2: Five (5) communities were selected from the two local governments due to their closeness to mining sites. The communities are: Itagunmodi, Igila, and Ibodi (Atakunmosa West local government), and Ilowa and Akaadi (Ilesa West local government)

Stage 3: Thirty (30) crop farmers were selected from each of the five (5) communities using the snowballing technique to give a total of one hundred and fifty respondents. However, only 147 out of the 150 instruments were used in data analysis. The snowballing technique was used in the last stage because a comprehensive list of registered or active farmers was

not available in the study area. The technique enabled to identification of respondents through referrals, where each contacted farmer recommended another farmer cultivating nearby within the same community. This method was particularly useful for reaching dispersed and less formally organized rural farmers. However, the use of snowball sampling may introduce selection bias, as respondents are more likely to refer individuals within their social or geographic networks, potentially limiting sample diversity and representativeness (Etikan, Musa, & Alkassim, 2016). To mitigate this, the research initiated multiple referral chains in each community and encouraged referrers to identify farmers of varying age, gender, and farm size.

Instrument for Data Collection

Primary data was collected through the use of an interview schedule. Data were collected through structured interviews

Measurement of Variables.

The dependent variable of the study is the crop farmers' productivity (crop yield), and the independent variables are socioeconomic characteristics of the farmers.

Validation of Instrument

The research instrument used for this study was a structured questionnaire designed to collect data on the socioeconomic characteristics of rural crop farmers and their agricultural productivity. To ensure its validity and appropriateness for the study objectives, the instrument underwent face and content validation by a panel of experts in Rural Sociology and Agricultural Extension at the University of Ibadan.

Method of Data Analysis

Data were analysed using descriptive statistics and Correlation Analysis.

Results and Discussion

Age

The age distribution in Table 1 reveals that there were more youth and adults in the area than the elderly. The result of the analysis on Table 1 on age shows that 18.4%, 40.1% and 31.3% are between the ages of 25-35, 36-46 and 47-57years, respectively. The mean age of 44.7 implies that the farmers are still in their active ages. This aligns with the findings of Akintobi (2020) that most of the smallholder farmers in Nigeria are in their active age and have the potential to drive sustainable agricultural production.

Sex

Results of the analysis in Table 1 shows that the majority (84.4%) of the farmers in the study area were male, while 15.6% were female. This shows that farming in the enclaves is

dominated by males. The Result analysis aligns with the findings of Kolawole (2017) that males still dominate the rural income-generating activities. The implication of this is that crop farming is tedious and few females can afford to take the task; also, some agricultural activities are more male-dominant than their female counterpart.

Marital Status

Results of analysis in Table 1 on marital status shows that the majority (93.2%) were married, while 5.8% were single, 0.5% were divorced, and 0.5% were widowed. The majority being married shows the importance of the marriage institution in the study area, as marriage is believed to confer responsibility on individuals. The result of the analysis corroborates the assertion of Ogunfolaju *et al* (2025) that states the majority of farmers are married.

Educational Attainment

Education is pertinent to any transforming structure because it improves or restructures the knowledge, skills and attitudes of an individual. The result of the analysis supported qualitative reports that the study area is endowed with a high literacy rate, as Table 4.2 reveals that 21.8% of the respondents had no formal education, 27.9% completed primary education, 24.5% completed secondary education, and 25.8% completed tertiary education. Consequently, their productivity will be affected as they attain higher education. This corroborates Hassan *et al.* (2020), that the majority of farmers have one form of formal education or the other. This significantly reduces language barriers in communication and aids policy entry in the community because education is an important tool for any development to take place globally, nationally, and locally.

Household Size

Results of analysis in Table 1 on household size shows that the majority (57.8%) of the farmers in the study area had between 4-6 members in their households. Also, 22.4% had between 7-9 members in their households, while 15.6% had between 1-3 members and 4.1% had between 10-12 members in their households. A mean score of 5.5 household size implies that most of the crop farmers in the study area had more than three household members to cater for in their households. This corroborates the findings of Hassan and Knight (2023) that the majority of farmers had more than three people in their household. This result implies that the more the number of members in the household, the more readily available family labour who will assist the farmers on their farms, and this could lead to increased agricultural production.

Income

Table 1 shows that 72.1% of the respondents earned $\leq$ N25,000, which ranks the majority, and 11.6% earned between N25001- N45000 monthly. More so, 10.9% and 5.4% earned between N45, 001-N65000 and N65001–N85000 as monthly income, respectively.

Years of Farming Experience

Table 1 reveals that the mean years of farming experience is 25.22, and the standard deviation of 11.66. It indicates that the majority (70.8%) of the farmers are well experienced in crop production. This aligns with Akintobi (2020), that the majority of rural farmers have more than 10 years of farming experience.

Table 1:

Socioeconomic characteristics of the respondents

Variable	Frequency	%	Mean	SD $\bar{x}$
Age (years)				
25-35	27	18.4	44.71	10.66
36-46	59	40.1		
47-57	46	31.3		
58-68	7	4.8		
69-79	8	5.4		
Marital Status				
Single	10	6.8		
Married	137	93.2		
Household size				
1 - 2	23	15.6	5.45	2.45
4 - 6	85	57.8		
7 - 9	33	22.4		
10 – 12	6	4.1		
Monthly income				
N5000 - N25000	106	72.1	25420.59	
N25001 - N45000	17	11.6		
N45001 - N65000	16	10.9		
N65001 - N 85000	8	5.4		
Educational attainment				
No formal education	32	21.8		
Primary school	41	27.9		
Secondary	36	24.5		
OND	30	20.4		
BSC/HND	8	5.4		
Nativity Status				
Non indigene	39	26.5		
Indigene	108	73.5		
Years of Farming Experience				
5-16	31	21.1		

Variable	Frequency	%	Mean	SD $\bar{x}$
17-28	61	41.5	25.22	11.66
29-40	43	29.3		
41-52	10	6.8		
53-64	2	1.4		

Hypothesis of the Study

There is no significant relationship between socioeconomic characteristics and crop farmers' level of productivity in the study area.

The result of the analysis in Table 2 reveals that there was no significant relationship between sex ($\chi^2 = 1.316$, $p = 0.251$), marital status ($\chi^2 = 0.135$, $p = 0.714$), and the level of crop production of respondents in the area, a significant relationship exists between educational attainment ($\chi^2 = 10.589$, $p = 0.032$) and the level of crop production of respondents in the area. The implication of this is that the level of crop production neither increases nor decreases with sex and marital status, Since the majority had a form of formal education or the other, educational attainment has a significant relationship with the level of crop production in Osun state. This implies that education improves the knowledge, skills, and attitude of people. Also, it increases the capabilities of people to help make decisions and also help in the proper management of available resources. Respondents with higher education thus have an increase in their level of production, and they will likely embrace any developmental programme that is likely to contribute to their level of education. This corroborates Egbetokun *et al* (2023) that the level of education influences the proper management of available resources that will improve livelihood.

Table 3 reveals that there is no significant relationship between the age ($r = 0.085$, $p = 0.306$), years of farming experience ($r = -0.035$, $p = 0.672$), years of residency ($r = -0.048$, $p = 0.590$) and level of crop production of respondents in the area. The implication of this is that the level of crop production in the study area neither increases nor decreases with years of farming experience and years of residency

However, there exists a significant relationship between household size ($r = -0.230$, $p = 0.005$), monthly income ($r = -0.179$, $p = 0.031$) and the level of crop production of respondents in the area. There exists an inverse relationship between household size and level of production. The implication is that as household size increases, the level of crop production decreases. This is likely because the majority of the members of the household are not contributing sufficiently to farm labour. This might be because the youths who are in their active age have abandoned farming for other occupations (Ayinde *et al*, 2022). There also exists an inverse relationship between income and the level of crop production. The implication is that as income increases, the level of production decreases. This might be a result of high livelihood diversification among the farmers. This is a livelihood security strategy among the farmers to spread risks and cope with insufficiency. This corroborates Anyachukwudinarum *et al.* (2024) that rural households have reasons for taking up many

income-generating activities which help them to spread risks, cope with insufficiency, seasonality and compensation for failures.

Table 2:

Chi-square relationship between socioeconomic characteristics and the level of crop productivity of respondents

Socioeconomic Characteristics	value (χ^2)	p-value	Remark	Decision
Sex	1.316	0.251	NS	Accept Null
Marital Status	0.135	0.714	NS	Accept Null
Religion	4.667	0.097	NS	Accept Null
Educational Attainment	10.589	0.032	S	Reject Null

Chi-square - χ^2 , p-value- probability coefficient

NS- not significant S- significant

Table 3:

Correlation between socioeconomic characteristics and the level of productivity

Socioeconomic Characteristics	r-value	p-value	Remark	Decision
Age	0.085	0.306	NS	Accept Null
Years of farming experience	-0.035	0.672	NS	Accept Null
Household size	-0.230	0.005	S	Reject Null
Monthly Income	-0.179	0.031	S	Reject Null
Years of residency	-0.048	0.560	NS	Accept Null

S at $p \leq 0.05$ r - Correlation coefficient p-probability coefficient s-significant NS-not significant

Limitations of the Study

This study, while providing valuable insights into the socioeconomic determinants of agricultural productivity among rural crop farmers in Osun State, is subject to certain limitations. First, the use of a snowball sampling technique, necessitated by the absence of a comprehensive farmer list, may have introduced selection bias, as respondents were likely drawn from interconnected social networks. This limits the generalizability of the findings to the wider farming population in the state. Second, the study relied on self-reported data, which may be influenced by recall bias or respondents' subjective assessment of their productivity and income. Third, the cross-sectional design of the research restricts the ability to measure changes in productivity over the years.

Contribution to Literature and Future Research

This study contributes to the literature by empirically demonstrating how socioeconomic characteristics interact to shape productivity outcomes in a subnational Nigerian context that has been underexplored in prior research. Future studies could build on these insights by employing panel data to observe temporal changes, decomposing the effects of livelihood diversification on farm and non-farm income, and distinguishing household labour availability from household size to provide a clearer understanding of intra-household labour allocation and its effect on productivity.

Conclusion

This study investigated the socioeconomic determinants of agricultural productivity among rural crop farmers in Osun State, Nigeria. The findings show that while age, marital status, sex, and farming experience did not significantly influence productivity, educational attainment, household size, and monthly income played critical roles. Education was found to positively improve productivity by improving knowledge, decision-making, and resource management, whereas large household sizes and high-income diversification were inversely related to farm output. These results underscore the central role of education in improving agricultural performance while also highlighting how household dynamics and livelihood strategies may constrain productivity.

Recommendations

Based on these findings, several policy directions are suggested. First, strengthening farmer education through extension services, adult literacy programs, and technical training is essential for boosting productivity. Second, youth-targeted incentives such as input subsidies, credit access, and agribusiness support should be promoted to reduce rural-urban migration and enhance labour availability. Third, household labour should be better harnessed through awareness campaigns and access to labour-saving technologies to minimise the negative effects of large family sizes on output. Fourth, interventions should help farmers balance income diversification with sustained investment in farming to avoid productivity trade-offs. Finally, policy support should prioritize rural infrastructure, access to credit, and improved inputs to create an enabling environment for sustainable crop production.

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