Innovations

Influence of Yam Farmers' Socioeconomic Characteristics on Access to Production Resources in Kogi State, Nigeria

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Abstract: *This study examined the influence of yam farmers' socioeconomic characteristics on their access to production resources in Kogi State, Nigeria. A structured sampling procedure aligned with the Agricultural Development Programme (ADP) framework was employed. This involved a multi-stage sampling technique that selected 50% of the zones, 25% of blocks and cells, and five registered yam farmers per cell, resulting in a sample size of 120 respondents. Data were collected using a structured interview schedule and analyzed through descriptive statistics (frequencies and percentages) and multiple regression analysis.The results showed that most respondents were male (85.0%) and married (89.2%), with a significant proportion lacking formal education (69.2%). Furthermore, 74.2% were not members of any farmers' association, and a similar percentage lacked cosmopolitan exposure. The average age of respondents was 43.5 years, with a household size of 6 persons, farming experience of 12.4 years, anda farm size of 1.6 hectares. Notably, 69.2% of the farmers reported low access to production resources.Regression analysis revealed that age, sex, formal education, years of farming experience, cooperative membership, cosmopolitanism, extension contact, and annual income had significant effects on access to production resources. The model yielded an* R^2 *value of 0.825, indicating that these variables explained 82.5% of the variation in access.It is recommended that policy interventions prioritize the variables that significantly affect access to production resources to improve farmers' productivity, food self-sufficiency, and national food security.*

Key words: *SEC, production resources, productivity, sustainable production, Nigeria*

Introduction

Yam belongs to the genus Dioscorea, which comprises numerous species (IITA, 2023), among which white yam (*Dioscorea rotundata*) is the most widely cultivated. Yam production is a major agricultural activity in West Africa, with the region accounting for between 90% and 95% of global production. Nigeria alone contributes an average of 72% of yam production in West Africa and approximately 70% of global output (FAO, 2017).

Despite Nigeria's position as the world's leading yam producer, the country has consistently fallen short of meeting its domestic demand for the crop. This shortfall is largely attributed to the rapidly growing population, which is increasing at an annual rate of 3.3%, compared to an agricultural growth rate of 2.3% (Ikeorgu&Igwilo, 2002; Okeola et al., 2014). The imbalance between supply and demand is not unique to yam alone but is reflective of a broader trend affecting the production of key staple crops such as maize and rice. According to Oredipe and Akinwumi (2002, as cited in Zalkuwi, Moses, & Tortange, 2014), inadequate food supply remains one of Nigeria's most pressing economic challenges, underscoring the country's ongoing struggle to achieve self-sufficiency in food production.

Okwuokenye and Onemolease (2011) classified Nigeria's persistent food crisis into two broad categories: production and marketing constraints. This study focuses on the production aspect, which is often linked to challenges related to access to productive resources. Production, in economic terms, refers to activities involved in the creation and distribution of goods and services to meet human needs. Thus, production is considered complete only when goods reach the final consumer.

Agricultural production, including that of yam, involves three main actors: producers (farmers), distributors (middlemen), and consumers (the general public). For farmers to fulfil their role as primary producers, they must have access to critical production inputs, both tangible and intangible. These include land, labour, capital, entrepreneurship, and access to relevant information.

In recognition, successive Nigerian governments have implemented various agricultural development programs and policies to increase food production. However, the goals of food self-sufficiency, national food security, and the achievement of SDG Goal 1 remain largely unmet (FAO, 2018). A major constraint appears to be farmers' limited access to essential production resources, which may be linked to their socioeconomic characteristics (SECs).

Given the foregoing, this study was undertaken to examine how the socioeconomic characteristics of yam farmers influence their access to production resources in the study area. Specifically, the study aims to: (1) describe the socioeconomic

characteristics of yam farmers; (2) identify the production resources available and accessed; and (3) determine the level of access and the extent to which farmers' socioeconomic characteristics affect their access to these resources.

Methodology

The study was conducted in Kogi State, located in the North-Central agricultural zone of Nigeria. The state lies between latitudes 7°30′N and 8°10′N and longitudes 6°01′E and 7°50′E, covering a land area of approximately 1,147 km². According to Oluyomi (2017), the region is recognized as one of Nigeria's major yam-producing areas, contributing approximately 34% of the country's total yam output, which accounts for 75% of global production.

To obtain the study sample, the researchers adopted the Agricultural Development Programme (ADP) structure and employed a multistage random sampling technique. Kogi State is administratively divided into four ADP zones: A, B, C, and D, with headquarters located in Ayetoro-Gbede, Anyigba, Kotonkarfe, and Aloma, respectively. From these four zones, two zones (A and B) were randomly selected for the study. Each of the selected zones comprises six (6) blocks, out of which two (2) blocks per zone were randomly chosen, totalling four blocks.

Each block is subdivided into 48 cells. From each selected block, 25% of the cells (12 in total across both zones) were randomly sampled. Using the Kogi State ADP yam contact farmers register, five (5) registered yam farmers were randomly selected from each of the 24 sampled cells, resulting in a total of 120 respondents used for the study (Table 1).

Table 1: Multistage procedure for selecting respondents

State	ADP Zones	Selected Zones (50%)	Blocks	Selected Blocks (25%)	Cells	Selected Cells (25%)	Selected farmers
Kogi	A-Ayetoro	A	6	2	48	12	5x12=60
	B-Anyigba	B	6	2	48	12	5x12=60
	C-Kotonkarfe	-	-	-	-	-	-
	D-Aloma	-	-	-	-	-	-
Total	**4**	**2**	**12**	**4**	**96**	**24**	**120**

Source: Computation from field survey (2023)

Primary data used for this study were gathered using a structured interview schedule. Data collected was analysed using both descriptive statistics and multiple regression analysis. The general model set to determine the influence of yam farmers' Socioeconomic Characteristics on access to production resources in the study area was specified as follows.

$$Y = f(X1, X2, X3, X4, X5, X6, X7 \ldots\ldots\ldots\ldots + bn + e1) = \text{equation } 1$$

Y = Access to production resources (access score computed as a continuous variable)
X_1 = Age of farmers in years
X_2 = Sex (Male = 1, Female = 0)
X_3 = Marital status (Married = 2, Single = 1)
X_4 = Household size in numbers
X_5 = Formal education (years spent schooling)
X_6 = Years of farming experience in years
X_7 = Farm size in hectares
X_8 = Membership of farmers' association (Yes = 1, No = 0)
X_9 = Cosmopoliteness (Yes = 1, No = 0)
X_{10} = Contact with extension (number of visits in a farming season)
X_{11} = Annual income from yam production in Naira (₦)
e_1 = Error term

Results and Discussion

Socioeconomic Characteristics (SECs) of Yam Farmers

Results presented in Table 2 show that the mean age of respondents was 43.5 ± 3.3 years, with approximately 70% of the respondents falling within the mean age or older. The majority (85.0%) were male, while 15.0% were female. Furthermore, 89.2% were married, and only 10.8% were single. These findings imply that the farmers were largely young, within their economically active age range, predominantly male, and mostly married. This supports the findings of Falola et al. (2017) and Pamphile and Nassirou (2020), who similarly reported that most yam farmers were in their productive years, male—owing to their greater physical capacity for the labor-intensive nature of yam farming—and married, which is often associated with access to family labor for farming activities.

The mean household size was 6.5 ± 1.4 persons, with an average of 12.4 ± 3.5 years of yam farming experience. The mean farm size was 1.6 ± 0.6 acres, and the mean annual income was ₦67,350 ± 4.7. These results suggest that most respondents had moderately sized households, reasonable years of farming experience, small farm sizes, and relatively low income levels. These findings align with those of Ameh and Iheanacho (2017) and Komolafe et al. (2022), who observed similar patterns among smallholder yam farmers, particularly about household labour supply and limited economic returns.

Additionally, 69.2% of respondents had no formal education, 74.2% were not members of yam farmers' associations, and 60.8% had limited exposure to cosmopolitan networks. This implies that the majority of respondents were illiterate, lacked cooperative or group affiliation, and had minimal interaction with

communities beyond their own. Similar findings were reported by Ibitoye and Onimisi (2013) and Olatinwo et al. (2022), who noted that limited education, weak social capital, and low external engagement negatively affect farmers' access to information, agricultural inputs, government support programs, and the adoption of improved technologies.

Table 2: Distribution of respondents according to their socioeconomic characteristics (n = 120)

Characteristics	Total		Mean
	Frequency	Percentage (%)	
Age (in years)			
< 31	03	2.5	
31 – 40	38	31.7	43.5±3.3
41 – 50	57	47.5	
>50	22	18.3	
Sex			
Male	102	85.0	
Female	18	15.0	
Marital Status			
Married	107	89.2	
Single	13	10.8	
Household size			
1-5	51	42.5	
6-10	65	54.2	6.5±1.4
>10	04	03.3	
Formal education			
Yes	37	30.8	
No	83	69.2	
Years of farming experience			
1-10 years	43	35.8	
11-20 years	53	44.2	12.4±3.5
>20 years	24	20.0	
Farm size			
<1 acre	71	59.2	
1-2 acres	40	33.3	1.6±0.6
>2 acres	09	07.5	
Membership of farmers' Association			
Yes	89	74.2	

No	21	25.8	
Cosmopoliteness			
Yes	31	39.2	
No	89	60.8	
Annual income			
Less than = ₦50,000:00	49	40.8	
₦50,000:00 – ₦100,000:00	54	45.0	
More than ₦100,000:00	17	14.2	

Source: Computation from Field Survey (2023)

Access to Yam Production Resources

Results on yam farmers' access to production resources, as presented in Table 3 using Weighted Scores (WS), reveal several key trends. The majority ofthe respondents (WS = 70.0) had access to land primarily through inheritance. This suggests that most farmers in the study area are natives with permanent land tenure. While this provides security for existing farmers, it may discourage investment by non-natives or prospective commercial farmers. This finding aligns with those of Oguntade et al. (2010) and Tasie et al. (2021), who reported that most yam farmers in Oyo and Rivers States, respectively, acquired land through inheritance.

Regarding access to farm labour, although a high proportion of respondents (WS = 84.4) relied on self and family labour, labour availability was reported to be insufficient. This indicates that despite familial labour being the primary source, it remains inadequate for the labour-intensive demands of yam production. This observation is consistent with Ogbonna et al. (2012) and Ufondu (2021), who noted that rural farm labour in Nigeria is becoming scarce as parents increasingly prioritize education or vocational training for their children.

In terms of farm financing, the majority of respondents (WS = 85.1) relied on personal and family savings, with only a small fraction (WS = 12.9) accessing formal credit. This suggests that limited access to institutional funding may restrict investment in inputs and expansion, thereby constraining productivity. These findings echo those of Omojola (2014) and Olubode (2023), who noted that most farm enterprises in Nigeria are self-financed and face funding limitations due to poverty, small landholdings, and limited access to credit facilities, often hindered by a lack of formal education, collateral, and high interest rates.

In terms of planting material, a large proportion (WS = 70.9) of respondents sourced seed yam from previous harvests. This implies a reliance on recycled planting materials, which may compromise seed quality and yields. This finding is in line with earlier studies by Izekor (2010) and Ayoola (2012), who reported that farmers often depend on

previous harvests for seed yam, leading to a competition between food consumption and planting needs.Access to agrochemicals was also limited. Most respondents (WS = 91.5) obtained agrochemicals from open markets, while only a small proportion (WS = 8.5) accessed them through government sources. The high cost and inadequate distribution of fertilizers, herbicides, and pesticides remain key constraints.

Table 3: Distribution of respondents according to access to yam production resources (n = 120)

Resources	**Sources**	**Accessible**	**Limited access**	**Not accessible**	**Weighted Score**
Land	**Inheritance**	**33.6**	**2.8**	**00.0**	**70.0**
	Communal	3.9	2.3	18.9	10.1
	Gift	2.4	0.0	23.9	4.8
	Leasehold	1.4	0.0	24.3	2.8
	Purchased	1.3	3.9	19.9	7.5
	Rent	2.4	0.0	24.6	4.8
Labour	**Self/family**	**40.0**	**4.4**	**4.0**	**84.4**
	Hired	1.4	4.0	20.2	6.8
	Exchange	1.0	6.8	17.2	8.8
Farm financing	**Self/family**	**40.5**	**4.1**	**5.7**	**85.1**
	BOA	0.0	0.0	00.0	00.0
	MFB	0.7	2.5	21.8	3.9
	Commercial Banks	1.0	2.3	21.7	4.3
	Co-operative society	3.2	12.0	9.8	18.4
	Money lenders	0.6	3.5	20.9	4.7
	Governmental Organization	0.0	0.0	00.0	00.0
	Non-Governmental Organization	0.0	0.0	00.0	00.0
Seed-yam	**Self-supplied**	**29.0**	**12.9**	**00.0**	**70.9**
	Purchased	3.0	8.5	13.0	14.5
	Gift	2.9	8.8	13.4	14.6
Agrochemical	From Governmental Organization	2.3	3.9	8.9	8.5
	From Open	**38.3**	**14.9**	**11.4**	**91.5**

	market				
Agricultural information sources	Agric. Extension	10.2	8.0	6.8	28.4
	Other farmers	**18.9**	**5.7**	**00.0**	**43.5**
	Print media	2.4	3.4	19.2	8.2
	Electronic media (Radio/TV)	5.7	8.5	10.8	19.9
Farm Mechanization	**Private Tractor owners**	**30.4**	**9.4**	**13.0**	**70.2**
	Governmental Organization	0.5	1.4	22.2	2.4
	Co-operative society	10.2	7.0	15.7	27.4

Source: Computation from Field Survey (2023)

Level of access to yam production resources

Results presented in Table 4 indicate the level of yam farmers' access to production resources. The mean access score was 15.3 ± 7.5. Based on this benchmark, the majority of respondents (66.4%) were classified as having a low level of access to production resources. This limited access may negatively impact yam productivity in the study area, as resource availability is critical for efficient and sustainable agricultural production.These findings are consistent with those of Onyenweakwu and Nwaru (2005) and Ufondu et al. (2021), who reported that 65.1% of arable crop farmers in Imo State and 67.2% of yam farmers in southeastern and north-central Nigeria, respectively, had low access to production resources. These farmers are often classified as resource-poor, which limits their capacity to adopt improved farming practices, invest in quality inputs, or scale up production.

Table 4: Distribution of respondents by level of access to yam production resources (n = 120)

Level of access to yam production resources	**Score range**	**Total**	
		Frequency	**Percentage (%)**
Low (below mean)	2 – 16	73	66.4
High (mean and above mean)	17 – 40	37	33.8

Mean = 15.3±7.5

Source: Computation from Field Survey (2023)

Relationship between Socioeconomic Characteristics and Access to Production Resources

The hypothesis tested in this study examined the relationship between yam farmers' socioeconomic characteristics (SECs) and their access to production resources. The hypothesis was evaluated using regression analysis, with results presented in Table 5. Among the functional forms tested, the semi-logarithmic (semi-log) model was identified as the lead equation, based on its superior goodness of fit. It had the highest coefficient of multiple determination (R^2) at 82.5% and included a greater number of statistically significant variables that aligned with a priori expectations.

The coefficients for age (X_1 = 0.018***), sex (X_2 = 0.072***), formal education (X_5 = 0.132***), and years of farming experience (X_6 = 0.342***) were all positive and significant at the 1% level. In addition, annual income (X_{11} = 0.032**), cosmopoliteness (X_9 = 0.062**), contact with extension agents (X_{10} = 0.680**), and membership in farmers' associations (X_8 = 0.034**) were positively related to access to production resources at the 5% significance level. Conversely, the coefficient for farm size (X_7 = -3.531**) was negative and significant at the 5% level. This implies that an increase in farm size is associated with greater resource demand, which may exceed available access and thus reduce efficiency unless accompanied by proportional increases in input availability.

The positive relationship with age suggests that older, more experienced farmers may have accumulated greater social capital, established stronger networks, or gained more knowledge about available resources and application processes over time. Similarly, the significance of sex, with a positive coefficient, indicates that male farmers, in this context, might have comparatively better access to resources. This finding warrants further investigation into potential gender-based disparities and cultural norms that might restrict female farmers' access. The strong positive association with formal education highlights its role in enhancing farmers' ability to understand information, navigate bureaucratic processes, and potentially access financial services or training programs that lead to resource acquisition. Furthermore, extensive farming experience appears to be a crucial asset, likely contributing to a deeper understanding of resource needs, established trust with suppliers or lenders, and a demonstrated capacity for effective resource utilization.

Higher annual income likely provides farmers with the financial leverage to purchase or rent necessary inputs and equipment, thereby directly improving access to resources. Cosmopoliteness, indicative of a farmer's exposure to outside information and ideas, suggests that farmers who are more outward-looking are better informed about available resources, market opportunities, and innovative farming practices. This broader perspective can lead to proactive engagement with resource providers. The significant positive coefficient for contact with extension

agents indicates that extension services are a powerful conduit for resource access. Extension agents often serve as crucial intermediaries, providing information on new technologies, best practices, market linkages, and direct assistance in accessing inputs, credit, and training. Finally, membership in farmers' associations is a vital mechanism for collective resource access. Associations can facilitate bulk purchasing, provide platforms for knowledge sharing, offer collateral for loans, and enhance bargaining power, ultimately improving members' access to a wider range of production resources.

These findings are consistent with the results of Zalkuwi et al. (2014), Ameh and Iheanacho (2017), Komolafe and Adesoji (2018), and Ufondu et al. (2021), who found that age, education, farming experience, cooperative membership, extension contact, and external exposure significantly improved farmers' access to agricultural information, inputs, and production technologies.

Table 5: Regression estimate of the effect of selected SEC on access to yam production resources

S/N	Variable	Estimate	Std. Error	t-value
X1	Age	0.018	0.00263	6.844***
X2	Sex	0.072	0.01555	4.632***
X3	Marital Status	-0.067	0.15402	-0.435
X4	Household Size	-0.014	0.02053	-0.682
X5	Formal Education	0.132	0.02519	5.241***
X6	Years of Farming Experience	0.342	0.07183	4.762***
X7	Farm Size	0.009	0.00255	3.531**
X8	Membership of Association	0.034	0.01288	2.640**
X9	Cosmopoliteness	0.062	0.01974	3.141**
X10	Contact with Extension	0.680	0.22517	3.021**
X11	Annual Income	-0.032	0.01006	-3.180**

Note: *** (P<0.01) & ** (P<0.05) represent statistical significance at 1% & 5% levels, respectively.
Source: *Computation from Field Survey (2023)*

Conclusion and Recommendations

The contribution of rural farmers to Nigeria's quest for food self-sufficiency and national food security is undeniable. However, one of the most significant barriers to achieving this goal remains the farmers' limited access to essential production resources. As revealed by this study, this constraint is strongly linked to various socioeconomic characteristics (SECs) such as age, sex, low levels of formal education, small farm size, non-membership in farmers' associations, limited exposure to external networks (cosmopoliteness), and low annual income.

In light of these findings, the following recommendations are proposed to enhance farmers' SECs and, in turn, improve their access to production resources:

1. Promote Adult and Functional Education: Expanding access to formal and non-formal education will empower farmers with the knowledge and skills needed to access and utilize production inputs effectively.
2. Encourage Membership in Farmers' Associations: Mobilizing farmers into organized groups or cooperatives will strengthen their collective bargaining power and improve access to credit, inputs, and extension services.
3. Enhance Cosmopoliteness through Exposure and Training: Facilitating farmers' interaction with broader markets, institutions, and innovations will improve their decision-making and resource access.
4. Strengthen Agricultural Extension Services: Increasing the frequency and quality of extension visits will improve farmers' access to timely agricultural information and technologies.
5. Subsidize and Ensure Availability of Key Resources: The government should improve the affordability and accessibility of critical inputs such as land, farm capital, agrochemicals, and information through well-structured subsidy programmes.

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