



**ANALYSIS OF THE CONTRIBUTION OF YAM PRODUCTION TO
HOUSEHOLD INCOME AMONG THE FARMING HOUSEHOLD IN
OKPOKWU L. G.A OF BENUE STATE, NIGERIA**

¹Aliyu, Y.M., ²Mamaza, J.N. and ²Sulum A.A.

¹Department of Agricultural Extension Services, Faculty of Agriculture, University of Maiduguri

²Mohammed Lawam College of Agriculture, Borno State, Nigeria.

Corresponding Author's Email: aliyumudi2@gmail.com, **GSM:** 08067941311 and 09022588260

ABSTRACT

This study examined the contribution of yam production to household income among farming households in Okpokwu Local Government Area of Benue State, Nigeria. Data were collected using structured questionnaires and analysed using descriptive statistics and inferential statistics. The results indicated that yam farming is predominantly a small-scale but commercially oriented activity, with most farmers cultivating between 1 to 2 hectares. White yam appeared as the most mostly cultivated variety (43.8%), reflecting strong consumer preference and market demand. Majority respondents received yields of 2 to 4 tons per hectare, representing moderate productivity hindered by high input costs; very severe, pest and disease infestation, very severe, limited access to credit; very severe and inadequate storage facilities; severe Which are ranked (1, 2 3 and 5) Respectively. The study further showed that yam production significantly enhances household income, as many farmers who previously earned below ₦200,000 annually now earn between ₦201,000 to 400,000 and above after engaging in yam farming. Yam production also improved household welfare through better food and nutrition, payment of school fees, improved housing conditions, and access to healthcare services. Major production constraints identified include high cost of inputs (19.9%), lack of credit (15.2%), and poor storage facilities (15.7%), while the key marketing challenges were seasonal price fluctuations (30.3%) and low market prices (27.8%). Regression analysis revealed that the regression results showed that farm size, access to credit, farming experience, and educational level significantly and positively influenced yam output. Farm size, access to credit, and educational level were significant at the 1% level, while farming experience was significant at the 5% level. Overall, the model was statistically significant ($F = 35.62$, $p < 0.001$) and explained 73.1% of the variation in yam output ($R^2 = 0.731$). This study therefore concludes, yam production is crucial in improving the income levels, welfare of farming households in study area. The study recommends improved access to credit, strengthened extension services, enhanced storage facilities, and better market linkages to boost productivity and maximize the socio-economic benefits of yam production. This study recommends that; Government and financial institutions should design flexible and farmer friendly credit schemes that enable smallholder yam farmers to access production loans at low interest rates.

Keywords: Yam, Production, Household, Income, Welfare, Constraints

INTRODUCTION

Yam (*Dioscorea spp.*) is among the most important and mostly cultivated tuber crops in Nigeria, most especially in the central and southern regions, including Benue State. Yam is one of the most important food crops in Nigeria and is widely grown and eaten in many parts of the country. It comes from a group of plants known as *Dioscorea*, and there are different types, including *Dioscorea rotundata* (white yam), *Dioscorea alata* (water yam), *Dioscorea cayenensis* (yellow yam), and *Dioscorea dumetorum* (bitter yam). Each type has its own features and is used in different ways depending on local preferences and the environment where it is grown (Tsuwa & Yilwa, 2020). It holds an important position in the agricultural sector and serves as a major food source, contributing to the nutritional needs of rural households. In addition to its consumption value, yam production has substantial economic importance, particularly in rural areas, where it serves as a primary source of income for many farming households (Eze, 2018). The production of yam is embedded in the agricultural practices of these communities, and its economic importance cannot over emphasised, as it



impacts household livelihoods, local economies, and regional markets (Adebayo, 2016). Nigeria is the highest yam producing nation in the world, making up more than 65% of global yam production (FAO, 2020). National Bureau of Statistics (2021) shows that Nigeria cultivated over 47 million metric tonnes of yam per annum on more than 5.4 million hectares of land. Benue State, known as the Food Basket of the Nation, is one of the top producers of yam due to its good soil and weather conditions. In areas like Okpokwu Local Government, many farming families depend on yam farming for food and income. Yam farming helps them take care of their families, get money, and support their daily living. Yam (*Dioscorea spp.*) is a key agricultural crop in Nigeria, with significant contributions to both food security and income generation, particularly in rural areas. In Benue State, yam cultivation is an important economic activity that sustains the livelihoods of many farming households, especially in local government areas such as Okpokwu. The role of yam cultivation in improving household income and the overall economic wellbeing of farmers has not been adequately explored in the context of Okpokwu. Existing literature on rural livelihoods and agricultural income often addresses general farming practices without disaggregating the contribution of specific crops such as yam. Moreover, factors such as fluctuating market prices, input costs, access to land and markets, and the effects of climate change may significantly influence the economic benefits derived from yam cultivation. These factors are rarely examined in the context of yam production at the household level, leaving a gap in understanding the true economic potential of yam farming in the region. Furthermore, while yam farming is often seen as a vital source of income for rural households, the degree to which it impacts the financial stability and socio-economic status of farmers remains unclear. There is also limited knowledge about the distribution of income generated from yam farming within households and how it compares to income from other sources of livelihood. This lack of information complicates efforts to formulate effective policies and interventions aimed at enhancing the economic benefits of yam cultivation for rural farmers. Thus, this study investigated contribution of yam production to household income among farming households in Okpokwu L.G.A of Benue State, examining how yam cultivation impacts the financial well-being of these households and identifying the factors that influence the income derived from yam farming in the area. This study was therefore carried out to;

- i. identify Socio-economic characteristics of yam farmers in Okpokwu L.G.A of Benue State;
- ii. assess the contribution of yam production to household income among farming households in Okpokwu L.G.A;
- iii. identify the constraints faced by yam farmers in Okpokwu L.G.A; and
- iv. examine the socio-economic factors influencing yam production in the study area

METHODOLOGY

The Study Area

The study was conducted in Okpokwu Local Government Area (LGA) of Benue State, located in the North-Central geopolitical zone of Nigeria. Okpokwu LGA is one of the 23 LGAs in Benue State and has its administrative headquarters in **Okpoga** town (Ameh, and Odoemenem, 2018). The study area is predominantly rural and agrarian. Okpokwu LGA lies between latitude 6°52'N and 7°10'N and longitude 7°30'E and 8°00'E. It shares boundaries with Ogbadibo LGA to the west, Ado LGA to the south, and Obi LGA in Nasarawa State to the northeast (Agbo and Lemchi, 2019). The study area shares boundaries with Ogbadibo LGA to the west, Ado LGA to the south, and Obi LGA of Nasarawa State to the northeast (Agbo & Lemchi, 2019). Okpokwu LGA covers a land area of approximately 695 km² and had a population of about 157,000 people based on available population estimates. The area is predominantly rural, with agriculture serving as one of the major economic activities of the inhabitants Adikwu (2025) The area falls within the tropical savannah climate zone, characterized by distinct wet and dry seasons. The rainy season typically begins in April and ends in October, while the dry season spans from November to March. Average annual rainfall ranges between 1,200 mm and 1,800 mm, which is generally adequate for yam cultivation. The average annual temperature ranges between 24°C and 34°C, with the hottest months occurring between February and April. Humidity levels vary seasonally, with relative humidity ranging from 50% during the dry season to about 85% during the wet season (Shaibu *et al.*, 2017). The soil type in Okpokwu is predominantly loamy and sandy loam, which



is fertile and suitable for root and tuber crops, especially yam (Ameh, and Odoemenem, 2018). The topography is characterized by gentle undulating plains and low hills, conducive to both crop and livestock farming. Food production is the major economic activity in the area. The major crops cultivated in the study area are; yam, cassava, corn, rice, soybeans, and groundnuts, with yam being the most economically significant due to its high cultural and market value (Tsuwa & Yilwa, 2020). Apart from crop farming, the respondents also rear livestock which included goats, sheep, cattle, pigs, and poultry. Livestock serves as both a source of income and food security for many farming households. The agro-ecological and socio-economic characteristics of Okpokwu LGA make it an ideal location for studying the contributions of yam production to household income (Okoro and Agwu, 2021).

Sampling Procedure and Sample Size

A multi-stage sampling technique was employed to select respondents for this study. In the first stage, two districts Okpoga & Ichama were purposively selected from the six districts in Okpokwu Local Government Area based on their proximity and accessibility. In the second stage, a random selection of villages was carried out within the chosen districts. From Okpoga, four villages (Okpoga Central, Ugwu Okpoga, Ejor, and Ulayi) were randomly selected, while from Ichama, three villages (Ojoga, Iwewe/Ichama, and Ipole Aiona) were chosen. In the final stage, individual yam farmers were randomly selected from the sampling frame provided by the Agricultural Development Programme (ADP) and local farm records. A total of 180 farms were selected from a population of 2,000 registered farms, representing (9%) of the total farm population.

Table 1: Sampling Frame

S/N	District Name	District Selected	No. of Villages in District	Villages Selected	No. of Registered Farms	No. of Farms Selected
1	Okpoga	Okpoga	8	Okpoga Central, Ugwu Okpoga, Ejor, Ulayi	1,100	99
2	Ichama	Ichama	6	Ojoga, Iwewe/Ichama, Ipole Aiona	900	81
3	Ugbokolo	–	10	–	–	–
4	Ingle-Okpale	–	8	–	–	–
5	Edumoga	–	9	–	–	–
6	Ameju	–	7	–	–	–
	Total	–	48	7 Villages Selected from 2 Districts	2,000	180

Source: Field Survey, 2025

Analytical Technique

In this study, both descriptive and inferential statistics were employed in analysing the objectives of this study. Descriptive statistics in the form of mean, frequency and percentage was used to analysed objective (i, ii, iii). While multiple regression was employed to analyse objective (iv)

$$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, e) = a + \beta_1 + 1\beta_2 + 2\beta_3 + 3\beta_4 + 4\beta_5 + 5\beta_6 + 6 + e \text{ Where:}$$

Y = Yam Production Index

B₁ – B₆ = Parameters estimated

X₁ – X₉ = Independent variables

X₁ = Age (years)

X₂ = Gender (1 = male, 0 = female)

X₃ = Marital Status (1 = married, 2 = divorce, 3 = single)

X₄ = Educational level (years spent in formal education)

X₅ = Farm size (hectares)

X₆ = Access to credit (1 = access, 0 = no access)

X₇ = Access to extension (1 = access, 0 = no access)

e = error term

a = constant



RESULTS AND DISCUSSION

Socio-Economic Characteristics of Yam Farmers in Okpokwu L.G.A

The results in Table 2 revealed the majority (63.3%) of yam farmers were within the age bracket of 31 to 50 years, implying that the farmers are within the active age range capable of performing farm intensive activities agriculture. Males constituted (70%) of respondents, revealing that yam farming is male-dominated due to its demanding physical nature. (85%) of respondents had some level of formal education, indicating a relatively literate farming population.

Table 2: Socio-Economic Characteristics of Yam Farmers in Okpokwu L.G.A

Variable	Frequency (n=120)	Percentage (%)	Mean	
Age (years)				
21–30	18	15.0	42 years	
31–40	40	33.3		
41–50	36	30.0		
51–60	20	16.7		
Above 60	6	5.0		
Gender				
Male	84	70.0	8 persons	
Female	36	30.0		
Educational Level				
No formal education	18	15.0		
Primary	32	26.7		
Secondary	40	33.3		
Tertiary	30	25.0		
Household Size				
1–5	30	25.0	8 persons	
6–10	70	58.3		
Above 10	20	16.7		
Farming Experience (years)				
1–5	18	15.0	12 years	
6–10	36	30.0		
Above 10	66	55.0		
Farm Size (ha)				
<1	10	8.3	2.1 ha	
1–3	82	68.3		
Above 3	28	23.3		
Access to Credit				
Yes	42	35.0	45.0	
No	78	65.0		
Cooperative Membership				
Yes	54	45.0		
No	66	55.0		
Extension Contact				
Yes	46	38.3	61.7	
No	74	61.7		

Source: Field Survey, 2025

The results in the Table above, revealed that the mean household size was 8 members, which provides ample family labour but could also exert pressure on household resources. In addition the results



indicated that more than half (55%) of the respondents had more than 10 years of farming experience, showing a good level of expertise in yam production. The majority (68.3%) of farmers cultivated between 1 to 3 hectares of land, signifying that yam production is primarily on a smallholder scale. The respondents had limited access to credit (only 35%) and poor extension contact (38.3%) highlight the institutional challenges that could hinder productivity improvement. These findings are in agreement with Eze & Okeke (2019) and Agbaje and Adeolu (2020) who reported similar socio-economic profiles among yam farmers in North Central Nigeria.

Table 3: Contribution of Yam Production to Household Income by Income Pathway

Income Pathway from Yam Production	Estimated Annual Income (₦)	Percentage Contribution (%)
1. Sale of Fresh Yam Tubers	520,000	34.7
2. Value Addition (flour, chips, roasted/fried yam, instant pounded yam)	180,000	12.0
3. Seasonal Price Advantage (off-season sales profits)	95,000	6.3
4. Employment & Labour Hiring (income from farm labour services)	70,000	4.7
5. Income Diversification Through Yam Farming	110,000	7.3
6. Access to Credit & Financial Services (income enabled through loans, cooperative benefits)	65,000	4.3
7. Improved Food Security Leading to Cost Savings	140,000	9.3
8. Sales of Seed Yam (setts)	160,000	10.7
9. Participation in Yam Festivals/Exhibitions (sales, prizes, special buyers)	55,000	3.7
10. Women & Youth Economic Activities (marketing, processing, packaging, transport)	105,000	7.0
Total Contribution of Yam to Household Income	1,500,000	100.0

Field Survey; 2025

The results presented in the Table 3 indicated that yam production contributes significantly to household income through diverse and interconnected pathways. The total estimated annual income from yam-related activities is ₦1,500,000, representing 100% of yam-based livelihood earnings. This demonstrates that yam production plays a central role in rural economic stability, food security, and livelihood resilience in yam-producing communities in Nigeria. The sale of fresh yam tubers accounts for ₦520,000 (34.7%), representing the single largest contribution to household income. This finding aligns with the assertion of Okonkwo and Adediran (2021), who emphasized that yam remains a major cash crop for rural farmers due to its high market value and steady demand. Similarly, Ayodele and Samuel (2020) reported that fresh tuber sales constitute the primary income source for yam farmers across North Central Nigeria. Value addition contributes ₦180,000 (12.0%), reflecting the growing importance of processing activities such as yam flour (elubo), yam chips, and roasted or fried yam. These products command higher prices and are especially significant for women engaged in agro-processing. According to Otekunrin, Ogunleye, and Adekoya (2019), value-added yam products enhance profitability and create new income opportunities for women and youth in rural areas.

Yam stored for off-season sales contributes ₦95,000 (6.3%), showing the economic benefits of storage technologies. Research by Eze and Nweke (2020) highlighted that yam prices rise by 20–40% during the dry season, enabling farmers with storage capacity to earn premium prices. Income from labour services such as staking, weeding, and harvesting contributes ₦70,000 (4.7%). Yam production is labour-intensive, and farmers often hire out their labour skills. This supports the findings of Onyeka (2016), who stated that yam farming generates extensive farm and off-farm employment within rural economies. Yam-based diversification activities provide ₦110,000 (7.3%) in income. Yam acts as a buffer crop, enabling farmers to spread livelihood risks. This agrees with the work of Nwosu and Okoli (2018), who found that yam farming significantly enhances livelihood diversification and reduces



vulnerability to income shocks. Access to credit secured using yam barns or seed heaps contributes ₦65,000 (4.3%) indirectly to household income. In rural credit systems, yam is often used as collateral. According to Orebiyi *et al.* (2017), stored yam serves as a form of wealth and credit security among smallholder farmers. Improved food security saves ₦140,000 (9.3%), representing money that would otherwise be spent on purchased food. This supports the findings of Nwajiuba (2019), who emphasized that yam-enhanced food security indirectly improves household savings, investment, and wellbeing. Seed yam production contributes ₦160,000 (10.7%), demonstrating its profitability. Farmers producing high-quality setts usually earn substantial revenue during planting seasons. This aligns with the findings of Otoo, Asare, and Adekunle (2019), who noted that seed yam trading is one of the most lucrative components of yam value chains. Participation in yam festivals contributes ₦55,000 (3.7%), reflecting income from special sales and cultural exhibitions. Yam festivals attract premium buyers and prizes, as documented by Igwe (2018), who noted the economic and social value of yam festivals in Southern and North Central Nigeria. Women and youth activities contribute ₦105,000 (7.0%), showing their significant involvement in yam marketing, processing, transport, and distribution. This aligns with the findings of Adekola and Olatunde (2020), who emphasized the critical role of women and young people in Nigeria's yam value chain. The discussion clearly demonstrates that yam contributes to household income through multiple direct, indirect, and value-enhancing pathways. Beyond fresh tuber sales, yam supports value addition, storage-based profitability, seed yam trading, employment generation, improved food security, and cultural economic activities. These findings reinforce the view that yam is not only a staple crop but a major livelihood asset capable of strengthening rural welfare, supporting poverty reduction, and enhancing economic resilience.

Constraints Faced by Yam Farmers in Okpoku L.G.A

Yam farmers encounter several challenges that affect production efficiency and profitability. The identified constraints are ranked according to their severity using a mean score derived from a 3-point Likert scale (1 = Not Severe, 2 = Severe, 3 = Very Severe).

Table 4: Constraints Faced by Yam Farmers

Constraint	Mean Score	Rank	Decision
High cost of farm inputs	2.81	1 st	Very severe
Inadequate access to credit	2.67	2 nd	Very severe
Pest and disease infestation	2.60	3 rd	Very severe
Poor road and market infrastructure	2.52	4 th	Severe
Irregular rainfall/climate variability	2.44	5 th	Severe
Poor extension services	2.39	6 th	Severe
Land tenure problems	2.30	7 th	Severe
Post-harvest losses	2.25	8 th	Severe

Source: Field Survey, 2025

High input costs, inadequate access to credit, and pest infestation were the most pressing constraints. These constraints hinder farmers' capacity to expand production or adopt improved technologies. Poor rural infrastructure and erratic rainfall patterns further exacerbate production challenges, resulting in yield instability and post-harvest losses. This finding aligns with Nwachukwu and Nwosu (2020) who noted that input cost, credit limitation, and climatic factors are the primary barriers to yam production in Nigeria's Middle Belt region.

Socio-Economic Factors Influencing Yam Production

To identify the socio-economic variables that significantly influence yam output, a multiple regression model was estimated with yam output (in kilograms) as the dependent variable and selected socio-economic factors as independent variables.

Table 5: Socio-Economic Factors Influencing Yam Production

Variable	Coefficient	Standard Error	t-value	Significance (p-value)
Constant	1.215	0.142	8.56	0.000***
Age (years)	-0.045	0.038	-1.18	0.242
Education (years)	0.134	0.049	2.73	0.007***
Household Size	0.056	0.037	1.52	0.132
Farming Experience (years)	0.092	0.042	2.19	0.031**
Farm Size (hectares)	0.418	0.063	6.63	0.000***
Access to Credit (1=Yes, 0=No)	0.257	0.079	3.25	0.002***
Extension Contact (1=Yes, 0=No)	0.164	0.068	2.41	0.018**

R² = 0.731, Adjusted R² = 0.710, F-Statistic = 35.62 (p < 0.001)

Source: Field Survey, 2025

(Note: *** = significant at 1%, ** = significant at 5%)

The regression results showed that the farm size, education, farming experience, access to credit, and extension contact significantly influenced yam output in the study area. Education was positive and significant at the 1% level ($p = 0.007$), indicating that farmers with more years of formal education tended to achieve higher yam output, possibly because education enhances managerial efficiency and facilitates the adoption of improved production practices. Farming experience was positive and significant at the 5% level ($p = 0.031$), suggesting that experienced farmers may possess better knowledge and skills for managing yam production. Farm size had a positive and highly significant effect at the 1% level ($p < 0.001$), implying that expanding the land area devoted to yam cultivation is associated with increased yam output. Similarly, access to credit was positive and significant at the 1% level ($p = 0.002$), indicating that farmers with access to credit may have greater capacity to purchase improved inputs and undertake timely farm operations. Extension contact was also positive and significant at the 5% level ($p = 0.018$), suggesting that farmers who had contact with extension personnel were more likely to obtain information and technical advice that could improve yam production. In contrast, age ($p = 0.242$) and household size ($p = 0.132$) were not statistically significant determinants of yam output at the 5% level. Overall, the model was statistically significant ($F = 35.62$, $p < 0.001$) and explained 73.1% of the variation in yam output ($R^2 = 0.731$), while the adjusted R^2 of 0.710 indicates that approximately 71.0% of the variation was explained after adjusting for the number of predictors. Farming experience had a significant positive effect, confirming that more experienced farmers perform better due to accumulated knowledge. The R^2 value (0.731) indicated that approximately 73% of the variation in yam output is explained by the included variables, showing the model's robustness. These findings are consistent with Okonkwo (2021) who identified education, farm size, and credit access as major determinants of crop productivity in rural Nigeria. The findings underscore that yam production is an economically viable enterprise capable of improving rural household welfare if key production challenges are addressed. Enhancing access to credit, strengthening agricultural extension systems, and improving rural infrastructure could significantly boost productivity and income in Okpokwu LGA. Furthermore, policies aimed at promoting youth participation and female empowerment in yam production will enhance sustainability and food security in the region.

CONCLUSION AND RECOMMENDATION

The study concludes that yam cultivation constitutes a significant component of rural survival in Okpokwu Local Government Area of Benue State. It provides food security & income for farming households. Though, yam cultivation remains largely at the small-scale level, with limited mechanization and low input use. The results showed that socio-economic factors such as education, farm size, farming experience, access to credit, and extension contact significantly affect yam output. Therefore, interventions aimed at improving these variables are likely to enhance yam productivity in the study area. Notwithstanding, significance of yam farming to reduce poverty and improve living standards, its growth is hindered by high input costs, insufficient credit, pest and disease infestation &



poor rural infrastructure. These constraints be addressed through governmental policies & institutional support will improve farmers' wellbeing and increase the contribution of yam production to household food security and rural development in Benue State and Nigeria at large.

Based on the findings and conclusions of this study, the following recommendations are made:

1. Improved Access to Credit Facilities; Government and financial institutions should design flexible and farmer-friendly credit schemes that enable smallholder yam farmers to access production loans at low interest rates. Farmers' cooperatives should be strengthened to act as intermediaries between farmers and financial institutions, ensuring easier credit disbursement and recovery.
2. Enhanced Agricultural Extension Services; The Benue State Agricultural and Rural Development Authority (BNARDA) should intensify extension service delivery in Okpokwu LGA by increasing the frequency of visits and the number of extension personnel. Training programs should focus on improved yam cultivation techniques, pest and disease management, and post-harvest handling practices.
3. Subsidy and Input Support; The cost of critical inputs such as fertilizer, improved yam seedlings, herbicides, and staking materials should be subsidized by government agencies to encourage increased production. Input distribution systems should be transparent and timely to ensure that farmers receive inputs before the planting season.
4. Infrastructure Development; Government should invest in the construction and maintenance of rural roads and market infrastructure to reduce post-harvest losses and facilitate easy movement of produce from farms to markets. Improved storage facilities such as yam barns and modern warehouses should be provided to help farmers reduce spoilage and seasonal price fluctuations.
5. Climate Adaptation Strategies; Farmers should be trained on climate-smart agricultural practices such as mulching, early planting, and soil conservation to cope with unpredictable rainfall patterns.

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