



**PROFITABILITY ANALYSIS OF YAM PRODUCTION IN
ADO LOCAL GOVERNMENT AREA OF BENUE STATE, NIGERIA**

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ABSTRACT

The study analyzed the Profitability of Yam production in Ado Local Government Area of Benue State, Nigeria. A total of 100 farmers were selected using simple random sampling technique. Primary data were collected through the administration of a well-designed Questionnaire and analyzed using descriptive statistics and gross margin. The results revealed that yam production was dominated by male farmers (94.0%), with a mean age of 38.2 years, indicating that most respondents were within their active and productive years. The results also revealed that majority were married (81.0%), had an average household size of 4.6 persons, a mean of 6.8 years of formal education, and an average farming experience of 13.3 years. Gross margin analysis showed that farmers incurred an average total variable cost of ₦118,320 and generated an average total revenue of ₦458,750. The average gross margin was ₦340,430, indicating that yam production is a profitable enterprise in the study area. The major constraints identified were weed pressure (100.0%), high labour cost (100.0%), inadequate capital (100.0%), difficulty in obtaining staking materials (86.0%), declining soil fertility (79.0%), and scarcity of seed yam (68.0%). The study concludes that yam production is economically viable and contributes significantly to farmers' livelihoods despite the numerous production challenges faced. The study recommends improved access to credit facilities, promotion of labour-saving technologies, strengthened extension services, enhanced availability of improved seed yam, and adoption of sustainable soil fertility management practices to improve productivity and profitability among yam farmers.

Keywords: Profitability, Yam, Production, Gross, Margin

INTRODUCTION

Yam (*Dioscorea spp*) is one of the oldest recorded food crops cultivated by humans (Ani *et al.*, 2014). It is an important tropical tuber crop and remains one of the major root and tuber crops in the Nigerian economy, both in terms of the area cultivated as well as the volume and value of production (Bamire and Amujoyegbe, 2005). Yam is a carbohydrate-rich food crop that is considered nutritionally superior to many other root and tuber crops because of its higher protein content and important minerals such as calcium, magnesium, and potassium (Ebewore *et al.*, 2013). In addition, yam is relatively tolerant to drought, pests, and diseases, and it can adapt to varying climatic conditions, making it a reliable crop for farmers (Ugwumba and Omojola, 2012). Yam tuber can be prepared and consumed in several traditional forms, including boiling, frying, and roasting. It may also be processed into yam flour (Ugwumba *et al.*, 2014). Nigeria ranks first among the top yam producing countries in the world, accounting for about 67.3% of global production (FAO, 2019). Despite the importance of Yam in food production and rural livelihoods, its productivity has continued to decline due to poor soil fertility, inappropriate cropping practices, and the high cost of planting materials, which accounts for a significant share of production expenses (Ariyo *et al.*, 2020). Yam farmers also face challenges such as inefficient resource allocation, inadequate use of production inputs, and low adoption of improved technologies, resulting in suboptimal economic performance (Idisi *et al.*, 2019). In addition, price fluctuations, pests and diseases and poor storage facilities further constrain small-scale farmers and contribute to low production levels (Ariyo *et al.*, 2021). This study aims to analyze the profitability of yam production in the study area. Specifically:

- i. describe the socioeconomic characteristics of the respondents;
- ii. determine the profitability of yam production; and;
- iii. identify the constraints of yam production in the study area.



METHODOLOGY

The Study Area

The study area for this study was Ado Local Government Area, Benue State, Nigeria. Ado is one of the nine (9) Local Government Areas in the southern senatorial zone which is mainly occupied primarily by the Idoma and Igbo people of Benue State. Its coordinates are Latitude 6° 47' 58" N and Longitude 8° 0' 19" E. The Administrative headquarters is at Igumale, situated on the railway line transversing the north-south of Nigeria. The population of the Local Government Area is about 291,535 people (projected with the annual growth rate of 2.3% from the 2006 population census of 184,389 people). The landmass of the study area is about 991.9Km². It lies within the tropical savanna climatic belt and experiences distinct wet and dry seasons, with wet season from April to October and the dry season from November to March. The temperature ranges from 28°C to 32°C. The vegetation in the study area is of rain forest with tall trees, tall grasses and oil palm trees. The people are majorly farmers who are into yam, rice, cassava, maize and palm oil production. They are also involved in activities like fishing because of the water resources found in the area and livestock rearing.

Sampling Technique and Sample Size

Simple random sampling technique was used to select the respondents. These respondents were yam farmers selected across the three (3) council wards (Agila, Igumale and Utonkon) in the study area. These council wards were selected because of the high concentration of yam farmers. A total of 100 yam farmers were sampled (30 farmers from Agila, 35 farmers from Igumale, Utonkon).

Data Collection and Analysis

The study made use of primary data, which was collected through the administration of a Questionnaire. The analytical techniques used were Gross Margin function, frequency and percentage distribution.

Gross Margin Function

The Gross Margin Function is stated as follows:

$$GM = TR - TVC$$

Where,

GM = Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Yam Farmers

Table 1 show the result of the socio-economic characteristics of the yam farmers in the study area. From the result, majority (94.0%) of the farmers were male, indicating that yam production in the study area is dominated by men who have the natural energy to undergo the stress involved in yam production. The age distribution shows that majority (53.0%) of the farmers were between the ages of 37-46years with a mean age of 38.2years, implying that the farmers are young and in their economically active and productive years, which is advantageous for undertaking the physically demanding activities associated with yam farming. Married farmers accounted for the highest proportion (81.0%), implying that family responsibilities and access to family labour may play important roles in farming activities. Regarding household size, 48.0% of the respondents had between 4 and 6 household members, with an average household size of 4.6 persons, suggesting the availability of family labour that can support farm operations and reduce reliance on hired labour. In terms of education, the majority (51.0%) had secondary education, while the mean years of schooling was 6.8 years, indicating that most farmers possess a moderate level of formal education that can facilitate the adoption of improved farming practices and innovations. Furthermore, 44.0% of the respondents had between 11 and 15 years of farming experience, with a mean farming experience of 13.3 years, reflecting substantial practical knowledge and expertise in yam production, which can positively influence farm management and productivity.

Overall, the results suggest that yam farmers in the study area are relatively young, experienced, and moderately educated individuals with adequate household labour resources to support production



activities. This result resonates with the findings of Ugwumba *et al.* (2014), who found out that the yam farmers in Southwest Nigeria were predominantly male, young with mean age of 44years, married with mean household size of 6 persons. Also, Iroegbu *et al.* (2022), reported that yam farmers in Imo State were relatively literate with majority (53.3%) attaining secondary education and experienced in yam production.

Table 1: Distribution of Socio-economic Characteristics of the Yam Farmers

Variable	Frequency	Percentage (%)	Mean
Sex			
Male	94	94.0	
Female	6	6.0	
Total	100	100.0	
Age (years)			
27-36	39	39.0	
37-46	53	53.0	38.2
47-56	8	8.0	
Total	100	100.0	
Marital Status			
Single	19	19.0	
Married	81	81.0	
Total	100	100.0	
Household Size			
1-3	29	29.0	
4-6	48	48.0	4.6
7-9	23	23.0	
Total	100	100.0	
Education			
No Formal Education	21	21.0	
Primary Education	22	22.0	
Secondary Education	51	51.0	6.8
Tertiary Education	6	6.0	
Total	100	100.0	
Farming Experience (years)			
5-10	34	34.0	
11-15	44	44.0	13.3
16-20	16	16.0	
21-25	3	3.0	
26-30	3	3.0	
Total	100	100.0	

Source: Field Survey, 2023

Profitability of Yam Production in the Study Area

Table 2 shows the gross margin analysis of yam production enterprise in the study area. On average, farmers spent ₦26,500 on seed, ₦20,100 on fertilizer, ₦4,020 on chemicals, and ₦96,450 on labour, making labour the highest variable cost component and highlighting the labour-intensive nature of yam production. Activities such as land preparation, planting, staking, weeding, and harvesting require substantial labour inputs, thereby increasing production costs. The average total variable cost (TVC) was ₦118,320. Farmers produced an average of 1,503 yam tubers and sold them at an average price of ₦313 per tuber, generating an average total revenue (TR) of ₦458,750. After deducting the total variable cost from the total revenue, the farmers realized an average gross margin (GM) of ₦340,430. The substantial positive gross margin demonstrates that revenue from yam production considerably exceeded production costs, indicating that yam farming is economically viable and profitable. This level of profitability suggests that yam production has the potential to improve farmers' incomes and livelihoods while contributing to agricultural and rural economic development in the study



area. The findings of Baba *et al.* (2021) agree with this result as they also reported yam production in Paikoro Local Government Area of Niger State as a profitable venture.

Table 2: Gross Margin Analysis of the Yam Farmers

Variable	Mean	Minimum	Maximum
Cost of seed yam	26500	7500	40000
Fertilizer cost	20100	5000	50000
Chemical cost	4020	1000	10000
Labour cost	96450	10000	100000
Total Variable Cost (TVC)	118320	33500	190000
Output (No. of Tubers)	1503	1000	2500
Selling price per tuber	313	200	450
Total Revenue (TR)	458750	200000	875000
Gross Margin (GM)	340430		

Source: Field Survey, 2023

Constraints to Yam Production in the Study Area

The results on the constraints affecting yam production in Table 3 show that weed pressure, high labour cost, and inadequate capital were the most severe challenges, as all the respondents (100.0%) identified them as major constraints. This indicates that yam farmers face significant production and financial difficulties, with weed infestation increasing management costs and reducing yields, while high labour costs reflect the labour-intensive nature of yam cultivation. The unanimous identification of inadequate capital further suggests limited access to funds for purchasing inputs and expanding production. In addition, 86.0% of the respondents reported difficulty in obtaining staking materials, highlighting challenges associated with the availability and cost of materials required for proper yam growth and development. Declining soil fertility was identified by 79.0% of the farmers, indicating that soil nutrient depletion remains a major factor limiting productivity. Furthermore, 68.0% of the respondents reported scarcity of seed yam as a constraint, suggesting difficulties in accessing adequate and quality planting materials. This is in line with the findings of Iroegbu *et al.* (2022) who identified high cost of labour, inadequate finance, lack of access to credit, insecurity of the rural areas, high cost of planting material (seed yam), as well as inadequate storage facilities as major constraints against small scale yam farmers in Imo State.

Table 3: Distribution to Yam Production Constraints in the Study Area

Constraints	*Frequency	Percentage (%)
Weed pressure	100	100.0
Labour cost	100	100.0
Inadequate Capital	100	100.0
Difficulty in getting staking material	86	86.0
Decline in soil fertility	79	79.0
Scarcity of seed yam	68	68.0

*multiple responses

Source: Field Survey, 2023

CONCLUSION AND RECOMMENDATIONS

The study found that yam production in the study area is predominantly carried out by male, married, economically active farmers with relative education and experienced in yam production. The gross margin analysis revealed that yam farming is a profitable enterprise, with an average total variable cost of ₦118,320, total revenue of ₦458,750, and gross margin of ₦340,430. However, farmers face several production constraints, particularly weed pressure, high labour costs, and inadequate capital, alongside difficulties in obtaining staking materials, declining soil fertility, and scarcity of seed yam. Despite these challenges, yam production remains economically viable and contributes significantly to farmers' livelihoods.



The study recommends the need for stakeholder to provide access to affordable credit in order to improve or address inadequate capital and enable farmers to purchase production inputs when needed. Also extension services should be strengthened to promote effective weed management and sustainable soil fertility practices. Efforts should also be made to increase the availability of improved seed yam and affordable staking materials through government and private-sector interventions. In addition, the adoption of labour-saving technologies and the strengthening of farmer cooperatives should be encouraged to reduce production costs, improve access to inputs, and enhance the overall productivity and profitability of yam farming.

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