



**ECONOMICS AND CONSTRAINTS OF YAM PRODUCTION IN  
GBOKO LOCAL GOVERNMENT AREA OF BENUE STATE, NIGERIA**

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**ABSTRACT**

This study analyzed the economics and production constraints of yam farming in Gboko Local Government Area of Benue State, Nigeria, against the backdrop of declining productivity despite the crop's importance to food security and rural livelihoods. A multistage random sampling technique was used in selecting 120 yam farmers from the study area. Data were collected from through the administration of structured questionnaires and analyzed using descriptive statistics and a gross margin analysis. The results indicated that yam production is economically viable in the study area, with an average gross margin of ₦63,253.31 per production cycle, confirming its profitability among smallholder farmers. However, the findings also revealed significant constraints limiting optimal production, notably the incidence of pests and diseases (mean = 4.23), limited access to credit facilities (mean = 4.20), and inadequate extension services (mean = 4.09). These constraints adversely affect productivity, input use efficiency, and farmers' capacity to scale up production. The study concludes that yam production in the study area is profitable enterprise, its full potential is undermined by institutional, financial, and biological challenges. It is therefore recommended that policies prioritize the timely and affordable provision of agrochemicals, improved access to agricultural credit, and strengthened extension service delivery to enhance productivity, profitability, and the sustainability of yam production in the region.

**Keywords:** Economics, Constraints, Yam and Production

**INTRODUCTION**

Nigeria ranks as the world's leading producer of white yam, accounting for approximately 66% of annual global production, equivalent to about 50.1 million tonnes (FAO, 2021). Yam is a major staple food consumed across both rural and urban communities in Nigeria and plays a significant role in food security, poverty alleviation, and employment generation. Nutritionally, yam is an important source of energy, being rich in complex carbohydrates, dietary fibre, and essential micronutrients including B-complex vitamins, potassium, and manganese (Obidiegwu *et al.*, 2020). Unlike simple sugars, the complex carbohydrates in yam release energy gradually, making it a low glycemic index (GI) food recommended for healthy diets, particularly for individuals managing diabetes. In addition, the dietary fibre content of yam aids digestion, reduces constipation, lowers cholesterol levels, and helps reduce the risk of colon cancer. Beyond macronutrients, yam tubers contain most essential amino acids and therapeutic bioactive compounds that confer antioxidant, anti-inflammatory, and antidiabetic properties (Obidiegwu *et al.*, 2020). Beyond its nutritional value, yam occupies an important socio-cultural position in many Nigerian communities. It features prominently in social gatherings, festivals, and religious ceremonies, where the size of yam holdings often serves as a symbol of wealth and status. Economically, yam production contributes significantly to household income and the national food supply. A vibrant yam production sector supports food availability and helps maintain health standards necessary for sustained productivity in a growing economy (Owusu Danquah *et al.*, 2022). Despite these benefits, yam production in Nigeria remains insufficient to meet the increasing demand at its current level of cultivation and productivity (Aighewi *et al.*, 2022).

The importance of yam in West Africa, particularly in Nigeria, cannot be overstated. According to Aighewi *et al.* (2022), yam provides approximately 200 dietary calories daily for over 300 million people in the region, making it a cornerstone of food and nutrition security. West Africa accounts for approximately 94% of global yam output, with Nigeria, Ghana, and Côte d'Ivoire as the top three



producing countries (Aighewi *et al.*, 2022). In addition to its role as a staple food, yam serves as a major source of income and trade for farmers, highlighting the need to assess the profitability of its production. According to FAO (2022), global yam and taro volumes grew by 123% between 2000 and 2022, demonstrating expanding demand and considerable export potential that could generate foreign exchange earnings for Nigeria. Enhancing yam production would therefore contribute to improving national food output and economic growth. Over the years, the area cultivated for yam production has expanded, accompanied by increased use of farm inputs. However, these increases have not translated into proportionate gains in output, indicating declining productivity (Ariyo *et al.*, 2020). A study by Iheanacho *et al.* (2020) found that smallholder yam farmers across Nigeria operated below optimal efficiency levels, with systemic barriers limiting their ability to achieve potential yields. In response, the Nigerian government has implemented various policies to promote agricultural investment, including yam production for export. Notably, in 1998, the Export Promotion Incentive Scheme led to the removal of yam from the export prohibition list. Similarly, the Root and Tuber Expansion Programme (RTEP), initiated in 2001, aimed to improve farmers' productivity and profitability. Despite these interventions, yam production has continued to decline, with reductions in both cultivated area and output reported over the years (Balana & Oyeyemi, 2022).

Production trends from Benue State, as documented by the Benue State Agricultural and Mechanization Development Authority, further highlight this decline. Average yam yield per hectare dropped from 18.53 tonnes in 2009 to 14.12 tonnes in 2012, and Ariyo *et al.* (2020) note that yam yield across Nigeria continues to decline principally due to poor soil fertility and inappropriate cropping systems. In 2019, global yam production reached 74.32 million tonnes, with Nigeria accounting for 67.34% of this total and cultivating 70.03% of the world's total yam area (FAO, 2019). Yam remains one of the most important sources of dietary calories in countries such as Côte d'Ivoire, Benin, Ghana, and Nigeria. Consequently, yam plays a crucial role in food security and income generation, with West Africa's yam industry sustaining over 160 million people (Aighewi *et al.*, 2022). In Nigeria, yam functions as both a food and cash crop, supporting the livelihoods of over 60 million people in the West African region. However, despite its economic and nutritional significance, yam production faces several constraints that limit its capacity to drive rural development and meet consumer demand for affordable and nutritious food. Against this backdrop, this study examines the profitability of yam production and identifies the constraints affecting yam farmers in the study area. The motivation for this research stems from evidence of declining productivity and output over time (Ariyo *et al.*, 2020; Iheanacho *et al.*, 2020). Specifically, the study focuses on the economics and constraints of yam production in Gboko Local Government Area of Benue State, Nigeria. The findings are expected to provide insights into the challenges faced by yam farmers, highlight potential areas for improvement, and serve as a guide for farmers and policymakers in enhancing productivity, profitability, and yield performance. The study is anchored on the theory of production.

## **METHODOLOGY**

### **The Study Area**

The study was conducted in Gboko Local Government Area in Benue State, Nigeria. Gboko is a town in Benue state of north-central Nigeria Latitude 7° 19' 30" N and Longitude 9° 0' 18" E. The LGA was created on 11th May 1970, with its headquarters at Gboko. The LGA has a population of about 571,360 people (projected from 2006 census with the annual growth rate of 2.3%) and a landmass of 2,264Km. Tarka LGA borders Gboko to the North, Ushongo LGA to the South, Buruku LGA to the West and Konshisha LGA to the East, with a total area of 1,835 Km<sup>2</sup> and a density of 257.49 Km<sup>2</sup>. The area is characterized by a tropical climate with very thick forests. Farming is the major occupation of indigenes of the LGA. Yam, Tomatoes, Cassava, pepper and vegetables are the majorly cultivated crops in the LGA, which makes it suitable for the study.

### **Sampling Technique and Sample Size**

The population of the study consists of yam farmers in the study area. Purposive and simple random techniques was used to select the respondents. Firstly, 5 council wards (Mbakepgh, Igyorov, Mbatan, Mbadim, Yandev-North) were purposively selected from the 17 council wards in the study



area based on the high concentration of yam farmers in those council wards. From the selected council wards (380 farmers in Mbakpegh, 410 farmers in Igyorov, 392 farmers in Mbatan, 520 farmers in Mbadim and 315 farmers in Yandev-North) using a sampling proportion of 5% 120 yam farmers were randomly selected and sampled.

**Data Collection and Analysis**

Data were collected through the administration of structured questionnaire to the respondents randomly drawn from the study area. Data were analyzed using descriptive statistics and gross margin analysis.

**Gross Margin Analysis**

The gross margin (GM) analysis examined costs and returns in yam production. The difference between the total revenue and total variable cost is the gross margin (GM) (Iroegbu *et al.*, 2022). The gross margin analysis will be used assuming that fixed costs in small-scale farming are negligible. Gross margin is expressed as:

$$GM = TR - TVC \quad \dots 1$$

Where:

GM = Gross margin (₦/ha)

TR = Total Revenue (₦/ha)

TVC = Total variable Cost (₦/ha)

**Mean score**

Likert scale was developed by Rensis in 1930s to measure the mean score of variables

The 5 Likert scale was used as specified below

Opinion	Point
Very Serious (VS)	5
Serious (S)	4
Somehow Serious (SS)	3
Not Serious (NS)	2
Undecided (UD)	1

The mean score to each item will be calculated using this formula

$$\bar{X} = \frac{\sum FX}{N}$$

Where

X = mean response

∑ = summation

F = Number of respondent choosing a particular scale point

$\bar{X}$  = numerical value of scale point

N = total no of respondent to the item

Decision any problem with mean score of above 2.5 will the considered as a serious problem and those below 2.5 will be considered as not serious problem in yam production.

**RESULTS AND DISCUSSION**

**Profitability of Yam Production**

The results in Table 1 presents the estimated costs and returns associated with yam production in the study area. The results showed that the average total variable cost (TVC) of yam production was ₦229,837.36. This cost comprised expenses on transportation (6.06%), labour (6.53%), yam seeds (44.96%), fertilizer (20.23%), land rent (6.53%), and herbicides (8.64%). Among these components, expenditure on yam seeds accounted for the largest share of the total variable cost (44.96%), with an average value of ₦103,335.50. This finding is consistent with Ariyo *et al.* (2020), who reported that seed yam costs constitute the single largest component of production expenses among smallholder yam



farmers in Ekiti State, Nigeria, reflecting the perennial challenge of seed yam availability and affordability. Similarly, Iheanacho *et al.* (2020) found that yam farmers in southeastern Nigeria incurred disproportionately high seed costs due to the practice of purchasing planting materials annually rather than retaining seed tubers from previous harvests. The higher proportion of seed cost observed in the present study may be attributed to the practice of purchasing new seed yams annually. Farmers in the study area reportedly sell most of their harvested tubers after each production cycle and do not retain seed yams for subsequent planting seasons, thereby incurring higher seed procurement costs each year. The average total revenue from yam production was estimated at ₦293,090.67, representing income generated from the sale of yam tubers. Consequently, the gross margin for yam production during the production period was ₦63,253.31. This positive gross margin indicates that yam production is a profitable enterprise in the study area. The profitability result aligns with the findings of Ariyo *et al.* (2020), who reported a positive gross margin for yam farmers in Gboyin Local Government Area of Ekiti State, confirming the economic viability of smallholder yam production. Likewise, Iheanacho *et al.* (2020) documented profitable returns among yam farmers in southeastern Nigeria, underscoring that despite high input costs, the enterprise remains economically worthwhile. Overall, the findings suggest that despite high production costs, particularly for seed yams, yam farming remains economically viable in the study area.

**Table 1:** Profitability of Yam Production in the Study Area

Variable	Minimum	Maximum	Mean	Std Deviation	Percentage (%)
Labour cost	0	200000	15016.67	21778.825	6.53
Seedlings cost	0	750000.00	103335.5000	1.315165	44.96
Cost of land	0	100000	15016.67	21778.825	6.53
Fertilizer cost	0	1000000	46513.13	96209.159	20.23
Transport cost	200	65000	13932.67	11784.346	6.06
Herbicide cost	0	250000	19878.98	29112.091	8.64
TVC	25600.00	1173000.00	<b>229837.3583</b>	1802.145	<b>100.00</b>
TR	12000	1600000	<b>293090.67</b>	295027.225	
GM	779000.00	1554800.00	<b>63253.3083</b>	3.408095	

**Source:** Field Survey, 2023

### Constraints Faced by Yam Farmers in the Study Area

The constraints faced by yam farmers in the study area are presented in Table 2. The results indicated that the most severe constraint to yam production was the incidence of pests and diseases, with a mean score of 4.23. This was followed by limited access to credit facilities (mean = 4.20), poor road infrastructure (mean = 4.12), inadequate extension services (mean = 4.09), and shortage of labour (mean = 4.03). These findings suggest that yam production in the study area is adversely affected by biological, financial, infrastructural, and institutional challenges, which collectively hinder farmers' ability to achieve optimal production levels. The high severity of pest and disease infestation implies that increased production potential cannot be fully realized without effective control measures, as infestations significantly reduce yield and productivity. In addition, poor road conditions limit farmers' ability to transport inputs to farms and convey harvested produce to markets, leading to increased costs and post-harvest losses. This finding is consistent with Wumbei *et al.* (2022), who identified poor road access as a critical third-ranked constraint to yam production, limiting market participation and increasing transaction costs for smallholder farmers. Furthermore, the results align with Iheanacho *et al.* (2020), who found that poor access to credit (91.7%), high pesticide costs (87.5%), and inadequate extension services (83.5%) were among the leading constraints confronting yam producers in Nigeria. The findings are also supported by Balana and Oyeyemi (2022), who documented that inadequate rural infrastructure and limited extension coverage remain persistent barriers to agricultural productivity in Nigeria. Their nationwide study confirmed that smallholder farmers in underserved areas lack access to improved production techniques, integrated pest management strategies, and current agronomic information necessary to enhance productivity, consistent with the pattern observed in the present study.

In addition, to the major constraints identified, the study further revealed that inadequate capital (mean = 3.93), lack of improved yam varieties (mean = 3.80), insufficient storage facilities (mean = 3.79), and land tenure issues (mean = 3.63) also posed significant challenges to yam farmers in the study area. These constraints limit farmers’ ability to expand production scale, adopt improved technologies, and reduce post-harvest losses. The finding on inadequate capital is consistent with Balana and Oyeyemi (2022), who documented that agricultural credit constraints are pervasive among smallholder farmers in Nigeria, with limited access to formal financial services severely hampering productive investment and input adoption. Similarly, Binge *et al.* (2023) observed that inadequate storage facilities contribute to significant post-harvest losses that further erode profit margins for smallholder yam farmers.

**Table 2: Constraints Facing Yam Farmers in the Study Area**

<b>Problems</b>	<b>Very Serious (VS)=5</b>	<b>Serious (S) =4</b>	<b>Somehow serious (SS)=3</b>	<b>Not Serious (NS) =2</b>	<b>Undecided (UD)=1</b>	<b>Mean score</b>
Shortage of farm labour	52 (43.3)	36(30.0)	16(13.3)	15(12.5)	1(8)	4.03
Lack of improved yam varieties	37(30.8)	39(32.5)	29(24.2)	13(10.8)	2(1.7)	3.80
Lack of access to credit facilities	64(53.3)	30(25.0)	14(11.7)	10(8.3)	2(1.7)	4.20
Inadequate extension worker	50(41.7)	43(25.8)	17(14.2)	8(6.7)	2(1.7)	4.09
Problem of pest diseases	55(45.8)	42(35.0)	18(15.0)	5(4.2)		4.23
Lack of storage facilities	41(4.2)	37(30.8)	22(18.3)	16(13.3)	4(3.3)	3.79
Inadequate capital for yam production	43(35.8)	39(32.5)	25(20.8)	13(10.3)		3.93
Land tenure	31(25.8)	38(31.7)	31(25.8)	15(12.5)	5(4.2)	3.63
Poor road facilities	56(46.7)	35(29.2)	16(13.3)	13(10.8)		4.12

The values in parenthesis ( ) are the percentages

**Source:** Field Survey, 2023

## CONCLUSION AND RECOMMENDATIONS

The study concludes that yam production in the study area is a profitable agricultural enterprise, as evidenced by the positive gross margin realized by yam farmers. Despite its economic viability, the study identifies the incidence of pests and diseases as the most critical constraint limiting optimal productivity, alongside other challenges such as limited access to credit, inadequate extension services, and poor infrastructure. These constraints reduce farmers’ capacity to maximize yields and fully benefit from yam production. Addressing these constraints holistically will not only improve the profitability of yam production in the study area but also contribute to food security, employment generation, and sustainable agricultural development in Benue State and Nigeria at large.

Based on the findings, the study recommends that:

- i. Government and relevant agricultural stakeholders ensure the timely and affordable supply of appropriate agrochemicals to yam farmers to effectively control pest and disease infestations.
- ii. Stakeholders should strengthen extension service delivery in order to improve farmers’ knowledge of modern pest management practices, efficient input use, and improved production techniques.
- iii. Access to affordable credit facilities should also be enhanced to enable farmers to invest in quality inputs, adopt improved yam varieties, and expand their scale of production.
- iv. Farmers should be encouraged to adopt improved production and management practices and reinvest profits into yam farming in order to increase output, enhance income levels, and improve their overall standard of living.



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