



**PROFITABILITY OF PLANTAIN PRODUCTION (*Musa Spp*) IN RIVERS STATE,
NIGERIA**

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ABSTRACT

The study examined the profitability of plantain production in Rivers State, Nigeria. A multi-staged sampling method was employed to select 240 plantain producers. Descriptive statistics including mean, frequency, percentages and budgetary analysis were employed. From the result, males (60.40%) dominated plantain production, with an average age of 46 years, majority of plantain farmers (60.41%) were married, 94.17% had some kind of education, the average household size was 5 persons, and the farmers' average farming experience was 14 years. Additionally, the majority of farmers (56.67%) had a typical farm size of 0.78 hectares and used both family and hired labour. In terms of estimated cost and returns related to plantain cultivation, the overall production cost amounted to ₦ 482,010.27, while the total realized revenue was ₦ 1,638,000, resulting in a net income of ₦ 1,155,989.75. The analysis showed that it was profitable to produce plantains. The main factors militating against plantain production are low market value, poor quality roads, insufficient land. The study concluded that plantain production in the study area was dominated by small scale farmers. The study recommended that farmers should increase their farm size thereby increase their output.

Keywords: Cost, Examine, Plantain, Profitability and Production.

INTRODUCTION

To address Africa's food security issues, active intervention plans are needed, particularly in Nigeria, a populous nation reliant on crude oil exports. Low resource utilization in developing countries like Nigeria contributes to low agricultural productivity. (Ikuemonisan *et al.*, 2020). Motivating farmers to optimize their limited resources, particularly land, labour, and capital, is crucial for the growth and development of agriculture and related agro-ecologies. With the abundance of material and human resources, Nigeria is not dependent on its own food production but rather on imported agricultural raw materials to meet its food needs. Of its estimated 72 million hectares of arable land, only 34 million hectares (47.7%) were under cultivation (Kainga *et al.*, 2013; Nigerian Institute of Social and Economic Research [NISER], 2000).

One of the major food crops that grow fastest in Nigeria is plantain, which is also becoming more and more popular among farmers as industrial demand for the commodity rises steadily. Plantains are perennial herbaceous plants that grow to a height of 2 to 9 meters and have an underground rhizome or corm. They are members of the Musaceae family and Genus *Musa*. According to Ekunwe and Ajayi (2010) the three main species are *Musa paradisiaca* (French plantain), *Musa acuminata* (Gross Michel and Cavendish), and *Musa corniculata* (Horn plantain). French plantain, French horn plantain, false horn plantain, and horn plantain are the plantain cultivars. This enormous herb grows in sub-Saharan Africa's wet forests and mid-latitude region. Its origins are believed to be in South East Asia. Sub-Saharan Africa does however, have a remarkably diverse range of plantain sources for starch and energy (Akintade, 2016; Dankyi *et al.*, 2007). Plantains are mostly grown by small holders and contribute significantly to food security and income generation for millions of people living in impoverished rural areas worldwide, particularly in African and Latin American nations. They are also a viable source of income for



small-scale farmers who grow them in their gardens (Elum and Tigiri, 2018). Twenty-five million metric tons of plantains were produced worldwide in 1985, according to estimates. Latin America, with 4.1 million tonnes ranked second in terms of production, whereas 19.6 tonnes expected for Africa. With an average yield of 15.7 tons/ha, Nigeria, Uganda, Colombia, Ghana, Rwanda, and the Democratic Republic of the Congo are the top producers of plantains (Food and Agriculture Organization Statistics [FAOSTAT], 2017). With an annual production of over 2.8 million metric tons, Nigeria was thought to be the leading producer of plantains in West Africa in FAO Statistics of 2013, the majority of this production came from the southern states (FAOSTAT, 2013; Maps of globe, 2016).

Currently Nigeria is one of the largest producers of plantain in West Africa producing 2.4 million metric tonnes annually (Adeoba, 2021). West Africa accounts for two thirds of Africa's estimated yearly plantain production of 12 million metric tonnes (International Network for Improvement of Banana and Plantain [INIBAP], 2003). According to studies, plantains are now produced at a low and uneven level in Nigeria, which permits domestic use and small-scale trade (Tijani *et al.*, 2009). Furthermore, Nigeria does not rank among the countries that export plantains despite its popularity because it produces more for domestic use than for export (Fortaleza, 2012).

One of the main commodities for investment in Nigeria's south-south zone, including Rivers state, is plantains. Plantains are essential in the kitchen of Rivers state and are used as the base for a variety of regional snacks and specialties (Newilah *et al.*, 2005). Plantains can be boiled, fried, or roasted as *bole* and served with roasted fish or as plantain chips. This all depends on how they are consumed. Due to its economic significance, plantains are a lucrative cash crop in Nigeria, where the country's rapidly expanding population necessitates a focus on food safety, nutrition, and health. Despite its significance, it has not received the attention and prominence it merits in Rivers State, Nigeria, as compared to cash crops like oil palm and arable crops like cassava and maize.

Profitability refers to an enterprise's ability to generate income, measured by revenue and cost. Businesses produce goods and services to earn income, and if income doesn't exceed production costs, the firm can't stay in business. The significant changes in agricultural practices that have occurred over the previous 100 years has been in response to social needs, we cannot go back in time and continue to feed the world's population (Oyeindoubra and Morgan, 2020). As a key staple food in the humid tropics, plantain is not exempt from some of the costs associated with other food crops, and sustainable plantain production is essential to the security of food and the source of livelihood for millions of people, this includes Rivers State. According to reports, the recent rapid urbanization and population growth have significantly decreased plantain output (Faturoti *et al.*, 2007). Given that small-scale farmers typically lack the financial means for continuous production through the application of fertilizers, fungicides, and pesticides, they place little value on the aforementioned and apply less, believing that plantains can always produce for themselves with minimal organic manure derived from kitchen and animal remains.

The broad objective of this study was to examine the profitability of plantain production in Rivers State, Nigeria. The specific objectives were to; (i) describe the socio-economic characteristics of plantain producers (ii) analyze the cost and returns associated with plantain production (iii) ascertain the factors militating against plantain production.



MATERIALS AND METHODS

The Study Area

The study was conducted in River's state, Nigeria. Rivers State is located in Nigeria's Niger Delta region. The states of Anambra, Imo, and Abia border the state to the north; Akwa Ibom State borders it to the east; and the states of Bayelsa and Delta border it to the west. The state covers 9,669 km² and has a population of about three million people in its 2006 census (National Population Commission, 2006) and a projected population of approximately 7,476,800 in 2022. In the state, the Ijaw, Ikwerre, Etche, Ogoni, and Ogba/Egbema are the major ethnic groups. The primary occupation of Rivers State is agriculture, and the state government's agricultural policy is centered on food production. Both recent college grads and young school dropouts can be gainfully employed consequently. Every year, the rainy season lasts from March to October. Due to its closeness to the Atlantic Ocean, the state also benefits from low temperature ranges of 22 to 33°C and high relative humidity (The Ministry of Information for River State, 2008).

Method of Data Collection

The data was collected with the aid of a structured questionnaire, to elicit information on (a) farmer's socio-economic characteristics such as age, household size, educational status, etc., (b) cost and returns in plantain production and (c) factors militating against plantain production.

Sampling Technique

A multi-staged sampling technique was used to arrive at the sample size. Stage one involved a cluster of plantain farmers into the three senatorial namely; Rivers East, Rivers South-East and Rivers West Agricultural Zones. The second stage involved a purposive selection of four (4) local government areas in each zone because of their dominance in plantain production in the area making a total of 12 local government areas namely; Ikwerre, Etche, Omumma and Emuoha (Rivers East), Tai, Eleme, Khana and Gokhana (Rivers South-East) and Ogba/Egbema/Ndoni, Ahoada west, Ahoada east and Abua /Odual (Rivers-West). Thirdly four (4) communities was randomly selected from each LGA. Finally, 5 plantain farmers were randomly selected from the sample frame provided by the Agricultural development programme (ADP) making a total of two hundred and forty (240) plantain farmers.

Statistical Analysis

Descriptive statistics and budgetary model were used to achieve objectives of the study.

Budgetary Model

According to Kainga and Seiyabo (2012) budgetary analysis entails estimating gross revenue and total cost of production for the given period. Net income is determined by calculating the difference between these two estimates. It was applied to the estimation of plantain production costs and returns. Budgetary model can be expressed mathematically as:

$$NFI = GR - TC \quad \dots(1)$$

Where,

NFI= net farm income (₦);

GR= gross revenue (₦);

TC= total cost of production (₦); Also,

$$TC = TVC + TFC \quad \dots(2)$$

Where,

TVC= total variable cost (₦) and

TFC= total fixed cost (₦)

Total Cost (TC) = Total Variable Cost (TVC) + Total Fixed Cost (TFC)



The fixed inputs are normally not used up at long run in a production cycle.

Returns per naira invested (RNI) will be realized by dividing the gross income (GR) by the total cost (TC).

Therefore,

$$RNI = \frac{GR}{TC} \quad \dots(3)$$

Where:

RNI = returns per Naira invested

GR = gross revenue and

TC = total cost.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents

Table 1 result displays the distribution of plantain farmers by sex. The findings indicated that majority (60.40%) of plantain farmers were male and 39.60% were females. This finding is consistent with Elum and Tigiri's (2018) findings that in Khana, LGA, Rivers state, who reported 61.3% of the plantain producers were male. Okoruwa *et al.* (2014) reported that 70% of the participants in plantain production were male. However, this is in deviation from Wilcox, (2021) who recorded 71.5% females in Bayelsa State.

The results also showed that 40.42% of plantain farmers were within age bracket of 41–50 years, while 1.67% and 25.42% were between the ages of 21–30 and 31–40, respectively with mean age of 46 years. This suggests that the plantain farmers in the research region are still young and in their active stages. The result show that 11.25% of plantain farmers were single, 49.17% were married, 13.33% were widowed and 26.25% divorced/separated. This is consistent with Oyeindoubra and Morgan's (2020) observation that early marriage is favored by culture and custom, suggesting that marriage may have cultural roots. The result also revealed that 13.0% of plantain farmers had farming experience of 5 years. The mean farming experience was 14 years. Experience in farming also indicates the practical knowledge that a farmer has gained from trial and error, which will improve the efficiency of his output. This aligns with the findings of Kainga *et al.* (2019). However, Idumah *et al.* (2016) found that age and farming experience may explain the inclination to adopt new technology and innovations.

The results also showed that 94.17% of plantain farmers had completed one form of formal education. This finding suggest that plantain farmers are literate. This result was in consistent with the findings of Wilcox's (2021) who reported that plantain farmers with high literacy rate can accept innovations that maximized productivity and profit by better utilizing resources. The mean household size was 5 persons. According to Ashaye *et al.* (2017) moderate household size suggests that family labour is accessible for production, which lowers the amount spent on hired labour and increases the profitability of the enterprise. Furthermore, a reasonable number of family workers could aid in farming activities. Oyeindoubra and Morgan (2020) reported that larger households may entail additional responsibilities for the household heads.

The result in Table 1 revealed that majority (56.67%) of the farmers employed hired workers, 24.16% of farmers employed family members, while 19.17% employed. The result shows that 72.91% of plantain farmers had 0.1–1 hectare as farm size and the mean farm size was 0.78 hectares. Therefore, the result suggests that small-scale farming accounts for the bulk of farming in the study area. A relatively small size could be the outcome of the land fragmentation and



distribution system. This consistent with the findings of Idumah *et al.* (2016), who observed that the average farm size in their study was 1.12 hectares, indicating a small-scale holding. Few farmers had more than one field, indicating that land fragmentation may not be typical in the study area. The leaders of the community may assign them farm areas.

Table 1: Socio-economic Characteristics of the Respondents (n= 240)

Variables	Frequency	Percentage	Mean
Sex			
Male	145	60.40	
Female	95	39.60	
Age (years)			
21 -30	4	1.67	
31- 40	61	25.42	
41 -50	97	40.42	
51 -60	57	23.75	
61 -70	17	7.08	46
71-80	4	1.67	
Marital Status			
Single	27	11.25	
Married	118	49.17	
Divorced/Separated	32	13.33	
Widowed	63	26.25	
Educational Level			
No formal Education	14	5.83	
Primary	25	16.42	
Secondary	139	57.92	
Tertiary	62	25.83	
Household Size			
1 -3	39	16.25	
4 – 6	179	74.58	
7 – 9	22	91.67	5
Farming Experience (years)			
1 – 5	32	13.30	
6 – 10	36	15.00	
11- 15	76	31.70	
16- 20	40	16.70	
21-25	56	23.30	14
Labour Type			
Family Labour	58	24.16	
Hired Labour	46	19.17	
Both	136	56.67	
Farm Size			
0.1 -1	175	72.91	
1.1 -2	59	24.58	
2.1-3	6	2.50	0.78

Source: Field survey, 2024

Costs and Return of Plantain Production

The expenses and returns for plantain production in the study area was presented in Table 2. The total variable cost (₦ 321,281.23) includes costs for fertilizer (12.27%), pesticide (8.10%), herbicide (7.61%), transportation (5.27%), plantain suckers (26.26%), harvesting (7.75%), and maintenance (6.58%). The result shows that cost of suckers (₦84,375.00) and land preparation



(₦84,081.33) were the highest variable cost of production. The cost of land accounted for 47.49% of the fixed cost (₦160,728.44). The total cost of production was ₦ 482,010.27 and the revenue realized was ₦ 1,638,000 as realized. However, the net income was ₦ 1,155,989.75. The analysis showed that plantain production in the study area was profitable. The result was in line with the findings of Kainga *et al.* (2019); Kainga and Seiyabo (2016) who reported that plantain production is a profitable venture in southern part of Nigeria.

Table 2. Estimated Costs and Return of the Plantain Production (per hectare)

Variable	Total cost of the Production period/Ha (₦)	Percentage (%)
A.. Returns		
468 bunches		
@ 3500 per bunch	1,638,000	
B.Fixed cost		
Land (ha)	72,363.64	47.49
Matchete	10,496.67	6.93
Hoe	10,475.00	6.92
Spade	10,016.95	6.62
Wheelbarrow	30,723.39	20.29
Knapsack sprayer	17,331.24	11.45
Depreciation of fixed input	9,322.22	
Total Fixed Cost (TFC)	160,728.44	100
C.Variable cost		
Fertilizer (kg)	39,433.22	12.27
Herbicide (kg)	24,438.33	7.61
Pesticide (liter)	26,014.04	8.10
Land preparation	84,081.33	26.17
Transportation	16,920.00	5.27
Sucker (kg)	84,375.00	26.26
Harvesting	24,932.31	7.75
Maintenance	21,150.00	6.58
Total Variable Cost (TVC)	321,281.23	100
Total Cost = TFC + TVC	482,010.27	
Total Revenue	1,638,000 .00	
A. Net Farm Income		
NFI = TR – (TFC + TVC)	1,155,989.75	
ROI = (NFI/TC)	2.34	

Source: Field survey, 2024

Factors Militating Against Plantain Production

All the farmers (100%) reported that poor market price was the major constraint militating against plantain production in the study area especially during harvest season. High cost of fertilizer was identified by the farmers (99%) as their second biggest constraint which increase the cost of production. However, bad road conditions affected was also a problem that affect transporting farm produce especially during harvest period. Inadequate Farm Land was also report as a major constraint to plantain production in the study. This leads to land fragmentation where farmers produce in less than 1 hectre. Other challenges include theft and low extension contact which reduce the amount of information on improved farm technologies.



Table 3. Factors Militating Against Plantain Production

Items	Frequency	Percentage	Rank
Poor/low plantain price at harvest	240	100	1 st
High cost of fertilizers	238	99	2 nd
Bad Roads	235	97	3 rd
Inadequate farm land	221	92	4 th
Theft	211	87	5 th
Low extension contact	196	82	6 th
Pest and Diseases	193	80	7 th
Destruction by wind	174	72	8 th
Total	1708*		

Source: Field Survey, 2024 *Multiple Responses

CONCLUSION AND RECOMMENDATIONS

The study concluded that plantain production was dominated by married men and farmers were small scale in production. Despite the constraint of poor/low plantain price at harvest, high cost of fertilizers, bad roads condition, inadequate farm land and theft. Plantain production was profitable in the study area. Based on the findings of the study, the following recommendations were made;

- Farmers should increase their farm size to increase output was found to be insufficient, which affects the increase of food production.
- Rivers state government should subsidize farm input and provide farmers with soft loans.
- The State Government should strengthen the relationship between extension agents and farmers by adequately funding ADPs, offering incentives, and improving the agents' salaries.

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