Analysis of Cost and Returns of Plantain Production in Tai Local Government Area, Rivers State, Nigeria

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Abstract

The study analyzed costs and returns of plantain production in Tai Local Government Area of Rivers State, Nigeria. Objectively, the study described the socio-economic characteristics of plantain producers, estimated the costs and returns of plantain production, and identified the constraints associated with plantain production in the study area. Using survey research design, copies of structured questionnaire were administered to 90 farmers by simple random sampling technique and the emanating data were analyzed with the use of descriptive statistics, mean score (likert scale), and gross margin. On socioeconomic characteristics, the result showed that 55.6% of the plantain farmers were male against 44.4% whom were female. Also 54% of them were between the ages of 31-35 years and 17.8% were between the ages of 44-56 years. On education status, 40% of the farmers had Secondary education, 34% of them had Primary education, while 25.6% of them had tertiary education. Gross margin analysis showed that, the annual variable cost of plantain production was ₦2,133,056 which accounted for a gross margin of ₦309,167.00. In addition, the estimated average annual profit of the plantain farmers stood at ₦2,075,577, an indication of the profitability of plantain production. Result on the constraints associated with plantain production showed that lack of storage facility and theft were the major constraints identified having a respective mean score of 3.61 and 3.17. The study recommended that Government and civil society should work to enhance security in rural areas to curb the incidence of theft of agricultural produce.

Keywords: Plantain production, Plantain farmers, Costs and returns

Introduction

Plantains represent the world's second largest fruit crop with an annual production of 28,000000 metric tons (FAOSTAT, 2013). They ranked as the sixth most important global food commodity after rice, wheat and maize in terms of gross value of production (FAOSTAT, 2013). Nigeria is one of the largest plantain producing countries in the world and despite its prominence, Nigeria does not feature among plantain exporting nations because it produces more for local

consumption than for export (FAO, 2011). Plantain is a versatile food in the kitchen as well as a raw material for many popular delicacies and snacks. This reason and the growing population of Nigeria leads to an enormous increase in demand for the crop in the consumers market (Aina *et al.,* 2012). Among plantain products are plantain flower, chips, beer and ethanol. The ripe ones are sliced and fried in oil as "dodo". Over-ripe ones are both compacted and fried in oil as "dodo Ikire" or mixed with plantain flour to make "ekuru", a delicious local dish (Aina et al., 2012).

Production of plantain in Nigeria between 1990 to 2000 indicates a downward trend in terms of yield per hectare while price per ton have steadily increased within the period (FAO, 2006, FAOSTAT, 2011). The growing of plantain is left in the hands of subsistence farmers who account for about 80% of Nigeria`s agricultural output. The crop is grown in the backyard or home stead and recently in plantations for the commercial market (Aina et al., 2012). Perhaps, this drawback explains why the demand for plantain surpasses the supply such that, plantain is becoming more and more expensive in Rivers State (Alagoa, 1999). To harness the economic potentials of plantain, the current level of its production must be improved. This implies that the limited resources available to plantain have to be used efficiently. The poor plantain output problem in Nigeria therefore centers on the efficiency with which farmers use resources on their plantain farms. It also borders on how the various factors that affect plantain production can be examined so as to improve plantain production in the country.

Objective of the Study

The specific objectives of this study were to:

i. describe the socio-economic characteristics of plantain producers in the study areas;

ii. estimate the costs and returns of plantain production in the study area; and

iii. identify the constraints associated with plantain production in the study area.

Materials and Methods

The study was conducted in Tai Local Government Area (LGA), Rivers State Nigeria. Tai has an area of 159km2 and a population of 117,797 and a projected population of 142,602 in 2011 (NBS, 2012; NPC, 2006). The LGA lies between latitudes 4° 43' and 7° 18'N of the equator and longitudes 4.72°and 7.30°E of the Greenwich Meridian. The LGA is within the tropical climate and experiences two distinct seasons, the rainy season and the dry season. Tai LGA has two

broad sections: the Tua Tua Kingdom and the Barasi Nonwa Kingdom, both under the overall Tai Kingdom. The primary occupations are farming, and fishing to a lesser degree.

Survey research design was employed by the study and copies of structured questionnaire were used in obtaining the data. In respect to the study population, the Rivers State Ministry of Agriculture (2018) gave an estimate of 105 registered plantain farmers in the LGA. Consequently 105 plantain farmers will serve as the population of this study. Thus with a level of significance of 5%, the Taro Yamene Yamane (1967) formula yielded a sample size of 83 plantain farmers and for the purpose of equal allocation among the communities selected in the study area, the study increased the sample size to 90 plantain farmers.

Multi-stage sampling procedure was used in selecting the sample size of the study. The first stage involved the purposive selection of ten (10) communities out of the seventeen (17) communities in Tai LGA was employed. This was because, there were more plantain farmers concentration in the selected communities. The second stage involved the simple random selection of nine (9) farmers each from Botem, Kpite,, Korokor, ueken, Bunu Nonwa, Sime, Kira, Borobara and Gbene-ue, thus making a total of 90 respondents. Objective (i) was achieved using frequency count and percentages. Objective (ii) was achieved using gross margin analysis objective. Objective (iii) was achieved viz., 4 point Likert scale.

Gross Margin

Gross margin mode was used to determine the costs and returns from gross margin obtained; further analysis was conducted to obtain profit associated with the trade in the study area. The model is specified as:

GM = TR-TVC

equ.1

Where: GM = Gross margin; TR = Total revenue; TVC = Total variable cost; TFC = Total fixed cost; and π (profit) = GM- TFC

Likert Scale Rating Technique

The 4-point Likert scale rating technique was used particularly in identifying problems associated with plantain production. This was done on a four-point basis. According to

Umoinyang (2014) the 4-point scale rating technique does not give room for the respondents to be indifferent. The rating is presented in the following order:

Strongly agreed (SA) = 4; Agreed (A) = 3; Disagree (D) = 2; and Strongly disagree (SD) = 1.

The mean scores of the respondents based on the 4-point scale was 4 + 3 + 2 + 1 = 10, 10/4 = 2.5.

Benchmark: The benchmark using the four- point Likert Scale to analyze the constraints militating against pepper production was 2.5.

The 2.5 constraint benchmark indicated the constraints that militated against farmer's production, mean values from 2.5 and above shows that the parameter is a constraint.

Results and Discussion

Socio-economic Characteristics of the Respondents

The socio-economic characteristics of plantain producers in the study area are presented Table 1.

Table 1: Socioeconomic Characteristics of the Respondents (n = 90)

Characteristics	Frequency	Percentage (%)	Mean
Gender			
Male	50	55.6	
Female	40	44.4	
Total	90	100	
Age (Years)			
18-30	15	16.7	
31-43	49	54.4	40 years
44-56	16	17.8	
> 56	10	11.1	
Total	90	100	
Marital status			
Single	66	73.3	
Married	16	17.8	
Separated	8	8.9	
Total	90	100	
Household size (Person)			
2 – 4	49	54.4	
5 – 7	23	25.6	5 persons

8 – 10	8	8.9	
>10	10	11.1	
Total	90	100	
Farming experience (Years)			
1-3 years	24	26.7	
4-6 years	15	16.7	
7-9 years	16	17.8	7 years
> 9 years	35	38.9	
Total	90	100	
Educational attainment			
No formal education	0	0	
Primary	31	34.4	
Secondary	36	40	
Tertiary	23	25.6	
Total	90	100	
Monthly Income (₦)			
10000-40000	34	37.8	
41000-80000	41	45.6	
81000-120000	8	8.9	₦56866.6
>120000	7	7.8	
Total	90	100	
Farm size (Plot)			
1-3 plots	50	55.6	
4-6 plots	33	36.7	3.56 plots
>6 plots	7	7.8	
Total	90	100	

Source: Field Survey, 2022.

Table 1 shows that 55.6% of the respondents were males, while 44.4% of them were females. This may imply that because, plantain bunch is bulky and the sucker grows to it may require more of masculine energy to cultivate. The Table, further shows that 54.4% of the farmers were within the age of 31-43 years, 17.8% were within the age of 44-56 years, 16.7% were of ages 18-30 years and 11.1% were greater than 50 years. This indicates majority of the respondents were young and in their active ages. According to Ibekwe *et al.,* (2010) young individuals have the ability to withstand stress and risk. On marital status, 73.3% of the respondents were single, 17.8% of the respondents were married, and 8.9% of them were separated. This implies that majority of the respondents were single. Since majority were single, it would mean that they

would invest more time and resources in their plantain farms since there would be little or no distraction from family obligations and commitments.

The result on household size shows that 54.4% of the respondents had household size of 2-4 persons and was followed by 25.6% of the respondents who had household size of 5-7persons. Entries on farming experience shows that 38.9% of the respondents had greater than 9 years of experience in plantain production while 26.7% of them had 1-3years experience. Years of experience in agricultural production is handy in lowering risk suffered by farmers. It can be applied in areas of farm financing, product storage and marketing and can also be of use in sourcing for farm inputs which may eventually translate into increase in farm profit or reduction in farm cost. Result on educational attainment shows that 40% of the respondents had secondary school educational attainment, 34.4% of them had primary school educational attainment, and 25.6% of them had tertiary educational attainment. This indicates that majority of the respondents had secondary school educational attainment. This also implies that all the respondents were educated as they had one form of formal education or the other. Higher educational level or literacy level can lead to better adoption of farm technology in agriculture. This result is in agreement with the observation of Kainga and Seiyabo (2012) which stated that majority of their respondents were educated. Table 1 further shows the majority (45.6%) of the plantain farmers earned ₦41,000 - ₦80,000 monthly. The Table also shows that majority (55.6%) of the farmers had farm size of 1-3 plots.

Costs and Returns of Plantain Production

The average annual costs and returns of plantain production in the study area is presented in Table 2.

Table 2: Average Annual Costs and Returns on Plantain Farming

Items	Amount (₦)
Total Revenue (TR)	**2,442,222**
Cost of plantain seedling	266386.7
Fertilizer	16097.56
Herbicide	24280
Labour	28,702
Total Variable Cost (TVC)	309,167
Gross Margin (GM)	**2,133,056**
Depreciation	3,392
Rent on Land	54086.67
Total Fixed Cost (TFC)	57,478
Total Cost (TC)	**366,645**
Profit (TR – TC)	**2,075,577**
Net return on Investment (TR/TC)	6.67

Source: Field Survey, 2022

Table 2 presents the costs and returns analysis of plantain production. Result shows that the total variable cost of production per annum was ₦2,133,056 and the total revenue was given as ₦2,442,222. The average annual gross margin for plantain production stood at ₦309,167.00 followed by an annual profit of ₦2,075,577. The rate of return on investment of ₦6.67 was obtained by (TR/TC), implying that for every ₦1 invested ₦6.67. Overall, this result shows that plantain production is profitable and is supported by the findings of Agbagwa *et al.* (2021).

Constraints Associated with Plantain Production

The constraints faced by the plantain producers in the study area are presented in Table 3.

Table 3: Constraints to Plantain Farming

Constrains	SA (4)	A (3)	SD (2)	D (1)	Total Score	Freq.	Mean ($\bar{X}$)
Fragmented land	8	53	30	0	251	90	2.79
High cost of land	0	7	38	45	142	90	1.58
Theft	30	45	15	0	285	90	3.17
Poor demand	9	16	42	23	191	90	2.12

Lack of storage facility	55	35	0	0	325	90	3.61
Poor roads	13	37	6	34	209	90	2.32

$\bar{x}$ >= 2.50 = important; $\bar{x}$ < 2.50 = un important
Where: SA = Strongly Agree A = Agree, D = Disagree, SD =Strongly Disagree
Source: Field Survey, 2022

The problems associated with plantain production as identified by the respondents are presented in Table 3. The result shows that the most dominant constraint was the lack of storage facility with mean score of 3.61. The economic implication of this finding is that, since plantain is a perishable commodity, its producers will likely suffer loss when it is not quickly disposed in the market place. Incidence of theft had mean score of 3.17. Theft of plantain will adversely affect the profit of the farmer and could weaken his/her ability to continue production. Conversely, the plantain farmers, did not identify high cost of land and poor demand of plantain as constraints because their respective mean scores of 1.58 and 2.12 fell below the benchmark of 2.50. Availability of demand for agricultural products can serve as an incentive in fostering agricultural production.

Conclusion

From the findings gathered, the study concludes that plantain production in Tai Local Government Area is profitable. The study affirms that lack of storage facility and theft were the major constraints facing plantain production in Tai.

Recommendations

On the basis of the findings reached, the study recommendations that:

i. Government and civil society should work to enhance security in rural areas to curb the incidence of theft of agricultural produce.
ii. Owing to the profitability of plantain production, government should train unemployed youths on skills necessary to cultivate and manage plantain farms.

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