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Estimation of Cost and Return of Plantain Production in Orhionwon Local Government Area, Edo State, Nigeria

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Abstract

The study examined the cost and return of plantain production in Orhionmwon Local Government Area, Edo State. Multi-stage sampling procedure was used to select 40 plantain farmers from two clans in the study area. Data required for the study were generated using questionnaire and interview schedule. Information generated was coded and analyzed using descriptive statistics, gross margin analysis, t-ratio statistic and likert scale method. The finding shows that plantain production is a very profitable enterprise and that for every one naira invested in plantain production, there is a return on investment of about N12.60 kobo. The result shows that the farmers are relatively young with majority (90 percent) below 54 years of age. About 45 percent of farmers acquired formal education. The study indicates that both male and female were engaged in plantain production enterprise. Total cost of production was N37, 983 with the variable cost item as the major component while the fixed cost was (3,934). There was a net profit of N36, 421.70. The result also shows that plantain production is affected by farm size and also that output is corrected to farm size too.

Keywords: Production, cost, returns, profitability, plantain and liker scaling method

Introduction

Plantain belongs to the family Musaceace and the genus Musa. It is a perennial herbaceous plant that belongs to a group of shrubs 2 to 9m tall with an underground rhizome or corm. It strives on a wide range of tropical and sub-tropical climate. Plantain requires an optimum temperature of 30^0C. Mean monthly rainfall of 100mm, p^H of 4.5 to 7.5 and sandy loam soils (Oluwatosin 2003).

Swennen (1990) observed that plantain is an important food crops in the Sub-Sahara Afric, providing more than 25% of the carbohydrate and 10% of the calories of approximately ten million people in the region. Frison and Sharrok, (1990) observed that banana and plantain play vital role in the feeding systems of both human beings and farm animals. It has a high nutritional value. It is a source of dietary carbohydrate, vitamins and minerals. Plantains are extremely rich in vitamins A. CBN (2003), observed that plantain is one of the major stable food in Nigeria. It has the highest percentage increase in output over the years 1999 to 2003, implying the existence of market potential but increased productivity in the market potential in the country.

Nigeria is one of the largest plantain producing countries in the world (FOA,

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2006). It is the highest producer of plantain in the West African, which is mainly obtained from the Southern States with the share of its annual production of about 2.4 million metric tons.

In Nigeria, plantain is produced in large quantities in Edo, Delta, Ogun and Ondo State. Other producing States are Rivers State. Cross River State, Imo, Anambra, Lagos, Kwara, Benue, Plateau, Kogi, Abia and Enugu. Plantain cultivation is not limited to big plantations, but is often grown in small orchards which sometimes go unnoticed.

In Edo State, as in other humid forest zones of the country, plantain is consumed as a staple crop. It is either consumed boiled alone, or used to make porridge or boiled and pounded with yam or cassava (called fufu in Nigeria). It can also be roasted on heated charcoal by women on the road sides (boli) as means of sales.

Researchers have shown that plantain is an important food crop rich in carbohydrate, protein, vitamins and minerals. Also it has been observed that demand for plantain in the last one decade has increased tremendously. Despite the importance of plantain, its production is still with small holder farmers. Several studies have been conducted in different aspects of plantain production, processing and marketing. However little or no work exist on estimating cost and return of plantain production in Orhionmwon Local Government Area, Edo State, Nigeria. It is against this background that this work was carried out.

Methodology

This study was carried out in Orhionwon Local Government Area Edo state, Nigeria with Abudu as the head quarter. It has a total population of 182,717 (2006 census) with men recording 98,203 and women recording 84,514 and an area of 2,382 km2 (National population census, 2006).

The Local Government Area has climatic and edaphic factors that support the growth of plantain trees well, thereby making it suitable for plantain production.

The sampling technique used for this study is the multi-stage random sampling technique. A total of forty eight small holder plantain farmers were randomly selected for the study. First involved the selection of communities. Three communities each were selected from the two clans in the study area. The second involved selection of respondents. From the six communities eight respondents each were selected given a total of forty eight respondents that were used for the study.

The statistical techniques employed in this study include descriptive statistics, t-ratio statistics and gross margin analysis. The likert scale method was also used.

The socio economic variables were determined using descriptive statistics such as table, frequency distribution, mean and percentages. The profitability (returns) technique was determined using the gross margin analysis. The likert scale method was used in determining the constraints of plantain production in the study area. The relationship between the farm output and farm size was determined by the use of t-ratio statistics. The gross margin analysis was estimated for the cost and returns in plantain production. Gross margin model is expressed as

$$GM = GFI\text{-}TVC \; OR \; GM = TR\text{-}TVC$$

Where,

GM = Gross Margin
TR = Total Avenue
TVC = Total Variable Cost
GFI = Gross Farm Income

Also, the profitability technique following Ogbonna and Ezedinma, (2005) as adapted from Jirgi and Baba, is expressed as;

$$NFI = GFI = TC$$
$$GFI = PQ.Q$$
$$TC = TVC + TFC$$

Where,

NFI = Net Farm Income
GFI = Gross Farm Income
PQ = Price per unit of output
Q = Total Output
TC = Total Cost of plantain product
TFC = Total fixed cost
TVC = Total variable cost

The likert scaling is a bi-polar scaling method, measuring either positive or negative response of statement, commonly involved in research that employs questionnaires. It is a summative scale. The likert scale method was used in determining the constraints faced by farmers in production of plantain in the study area. It is a 5-point scale and employs an ordinal level of measurement. The various responses to the various constraints were scored in a way that the response indicating the most serious constraint is given the highest score (that is 5). As a 5-point scale, the responses are grouped into 5 that is;

Very serious (VS) = 5, Serious (s) = 4, moderately serious = 3, least serious (LS) = 2 and not serious (NS) = 1

Results and discussion

Socio-economic profiles of the respondents: The socio-economic traits of the respondents were examined under the variables: age, gender, marital status, level of formal education attained and household size.

Age of respondents: The mean age of the respondents is 47 years. The study reveals that two of the respondents were within the age range of 25-35, twelve were within the age range of 35-45, twenty-two were within the age range of 45-55 and four were within the age of 55 and above. This represents 5 percent, 30 percent, 55 percent and 10 percent respectively (Table 1). This implies that majority of the farmers are relatively young and that youths are involved in plantain production.

Gender of respondents: Distribution of respondents by gender is shown in (Table 1). Out of the forty households that participated in the study, 91 of them (73%) were male while 11 of them (27%) were female. This indicates a dominance of male folks in plantain production. It also reveals that plantain production in the area is not restricted to male folks only.

Marital status of respondents: The marital status of the sampled respondents indicates that 23 of them (57%) were married and living together, 10 of them (25%) were single while 7 of them (18%) were widowed.

Table 1: Socio economic characteristics of respondents

Characteristics	Frequency	Percentage %	Mean
Sex			
Male	29	73	20
Female	11	27	
Total	40	100	
Age of farmers in years			
25-35	2	5	47
35-45	12	30	
45-55	22	55	
55 and above	4	10	
Total	40	100	

Marital Status			
Married	23	57	
Single	10	25	
Widow	7	18	
Divorced	-	-	
Level of Education			
No formal education	22	55	
Primary school	11	27	
Secondary	7	18	
Others	-	-	
Family size (person)			
4 and below	6	15	
5-9	26	65	7.3
10-14	8	20	
15 and above	-	-	
Total	56.7		2.835

Field data (2013)

Level of formal educational attainment by respondents: Most of the respondents sampled had no formal education. About 22 (55%) of the respondents had no formal education, while 11 (27%) of them had primary education. The study (Table 1) indicates low literacy level. This has a great implication as literacy level determines to what extent the respondents is ready to accept new technology and willingness to spread new idea.

Household size of respondents: Household size is the number of persons that contribute and draw on the incomes of the household. The average household size of the respondents is 7.3 (Table 1). A detailed investigation indicates that 6 (15%) have a household size of less than 4 while 26 (65%) have a household size of 5 to 9. However, about 8 (20%) have a household size of 10 and 14. The study indicates a large household size. The implication of this is that there will be more pressure on the household income. Also, more persons will be available for labour. However, large household size have been reported to have correlation with food insecurity and poverty especially when the household head is engaged in agriculture as the main sources of livelihood and income (Ike and Uzokwe, 2011).

Table 2: Determination of relationship between output and farm size

Items	T-calculated	T-tabulated	Remark
Farm size	0.48783	1.796 (df=11)	Reject H_0

Field data (2013)
T-test statistics

Output and farm size: The T-test was used to determine output and farm size relationship (Table 2). A detailed study of the farm output and farm size shows that T-test tabulated (T-test table value) was greater than T-calculated at 11% degree of freedom and (0.05) level of significance. Since T-tabulated (1.796) was greater than T-calculated (0.488), H_o was rejected. Alternative hypothesis (H_1) plantain production output is affected by farm size was accepted.

This implies that plantain production in the study area is affected by farm size. It also shows that plantain production output is correlated to farm size.

Cost and return of plantain production and Profitability analysis: the cost and return and

profitability of plantain was determined (Table 3). The result reveals that total income was N74, 404.70. The analysis also shows that total cost of production was N37, 983.00 with the variable cost items (N34, 048) as the major components while the fixed cost was (N3, 934.00). Using the profitability technique following Ogbonna and Ezedinma (2005) as adopted form Jiriga and Baba (2001), the result shows that the net farm (NFI = GFI –TC) income was N36, 421.70. The return on investment was 12.60%. This implies that for every one naira invested, there is a profit of N12.60kobo. This indicates that plantain enterprise is profitable in the study area.

Table 3: Cost and returns of plantain production and profitability analysis

Items	Value in naira (n)
Returns	VALUE (N)
Plantain bunch	74,404.70
Variable cost	
Planting material (suckers)	4,149.00
Fertilizers	600.00
Chemicals	500.00
Labour	28,800.00
Total variable cost (TVC)	34,049.00
Fixed cost	
Cost of land/annum (renting)	1,530.00
Description of tools and equipment	1,271.70
Interest on capital	1,132.30
Total fixed cost	3,934.00
Total cost (TFC+TVC)	37,983.00
Total gross returns	74,404.00
Net farm income (NFI=GFI –TC)	36,421
Return per naira	12.6%

Field data (2013)

Constraint to plantain production

Plantain producers in the study area were confronted with a number of problems that tend to limit their production profitability frontier and consequently expansion on investment in plantain production.

Table 4: Major constraints to plantain production

Constraint	Mean value	Standard deviation
Transportation	1.39	1.3
Labour	1.36	1.26
Storage	1.32	1.15
Processing	1.27	1.11
Land	1.17	1.07
Finance	1.13	0.93
Marketing	1.03	0.77
Fertilizer	0.53	0.8
Chemical	0.47	0.78

Field data (2013)

The result of the production constraints as presented in Table 4 using the likert scaling method, shows that transportation ranked first as the most serious constraint with the mean value of (1.39) (1.3). This is followed by labour (1.36) (1.26), storage (1.32)

(1.15), processing (1.27) (1.11), land (1.17) (1.07), finance (1.13) (0.93) and marketing (1.03) (0.77). Fertilizer and chemical were ranked as minor in the production of plantain in the study area with a mean value of (0.53), (0.47) and standard deviation of (0.8) and (0.78) respectively.

Conclusion

The study established that plantain production in the study area is a very profitable venture and that for every one naira invested, there is a return on investment of ₦12.60 kobo. It also established that output is a function of farm size. The result established a low literacy level in the study area. This may affect production, productivity efficiency. Low level of education may likely impact negatively on the input and output relationship and efficiency of farmers. This is so because educated farmers have more access to useful information. The result established too that variable cost items (N34, 049) was the major components of the cost incurred in plantain production in the study area. It is hoped that if the recommendation given in this study are taken seriously, plantain farmers will not only maximize cost or profit, but will also enhance their standard of living.

Policy recommendation

Following the result of the study, recommendations are made as follows:

The result show that literacy level of farmers was low and that farmers are relatively young with a mean age of 47 years. It is recommended that an out of school education campaign should be carried out. This will not only increase the literacy level but will help the farmers to imbibe new farming technique with a consequent increase in production efficiency.

The result shows that plantain production is very profitable enterprise. It is recommended that campaign on the potentials, economics and/or profitability of plantain should be carried out. By this, many youths will be involved in plantain production.

Since plantain production is affected by farm size and since majority of the farmers are small-holder farmers, it is recommended that plantain farmers should form co-operative groups and pull their resources together to maximize their production possibility frontier.

A number of constraints were identified as challenges to plantain production in the area. Notable among these are transportation, labour, storage and processing. It is recommended that the government should create more access roads to reduce the problem of transportation. Since labour was identified as one of the major constraints, it is therefore recommended that a cheaper but labour saving device should be introduced. Similarly, storage and processing equipment should be made available to the farmers to avoid economic waste of scarce resources.

Since the variable cost of items dominates in plantain production, government and private sector participation is therefore recommended.

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