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## Determinants of Net-returns of Plantain Marketing in Ikwuano Local Government Area of Abia State, Nigeria

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### Abstract

The study analyzed the determinants of net-returns of plantain marketing in Ikwuano Local Government Area of Abia State, Nigeria. Specifically the study examined the socioeconomic characteristic of plantain marketers, estimated net-returns of plantain marketers, determinants of net-returns and the constraints that affected plantain marketing. Two village markets were purposively selected based on the activities of plantain marketing in the area. A simple random sampling technique was used to collect data from 40 plantain marketers with the use of questionnaire. Data collected were analyzed with the use of descriptive statistics, net-returns and marketing margin formulas were implored to estimate the net-returns and marketing margin respectively. Regression model was used to estimate the determinants of net-returns. The results shows that 42 % of plantain marketer fell within the age bracket of 31-40 year, 50% of the respondents had primary education. An estimated monthly net- returns of ₦61,004.00, marketing margin of 25% were obtained respectively. Variables such as level of education, had positive relationship with net-return while transport cost, was negatively related to net-returns. Inadequate fund and others were the constraints facing the marketers. The study recommends that marketers should form cooperative societies in order to mobilize funds.

**Keyword:** Determinants, net-returns, plantain marketing

### Introduction

Plantain belongs to the family, *musaceae* and the genus *musa*. It is a giant herb that is cultivated in humid forest and mid- latitude zone of sub- Sahara Africa. Its origin is believed to be from South East Asia. Plantain has always been an important staple food for both rural and urban populace. It supplies up to 25% carbohydrate for approximately 70 million people in the humid region of Sub-Saharan Africa (Swennen, 1990; Ferris, 1997). Plantain is widely accepted across many country all over the world. Total world production is estimated to be over 76 million metric tons. Twelve (12) million metric tons are produced in Africa annually (Fakayode *et al.*, 2011).

In East Africa, its annual consumption is over 200kg per capita and in West and central Africa more than 10 million tons are produced annually and are traded locally (Latham, 2001). Nigeria is the largest producer of plantain in West Africa with annual production of about 2.4 million metric tons mostly obtained from the Southern States (Ogazi, 1996). It occupies a strategic position for rapid food production in Nigeria, among the starchy staple food it is ranked third. Nutritionally, it contained 35% CHO, 0.2 to 0.5% fat, 1.2% protein, and 0.8% and it is also rich in potassium and vitamins. Medically it is used in the control of Gastro-intestinal disorders like diarrhoea, vomiting, sore throat, tongilolitis and it is said to be a major diet in the production of soy-musa which can be used in the treatment of kwashiorkor (Idachaba, 1995; Ogazi, 1996; Folayan and Bifarin, 2011). More so, the fresh juice from plantain trunk, fruit stalk and leaves is a healing and soothing remedy to burns, it can also be used as an anti-bleeding on wounds (Ogbonna, 1999). Furthermore Aina *et al.* (2012), posited that plantain serves as a source of income for small holders who produce it around their compound farms, mixed farms and small scale sole plantain farms. The marketing of plantain serves as a means of livelihood to many who are involved in its direct marketing and

processing. In some part of Nigeria it sells as processed products such as bole, chips, flour and others forms which creates job opportunities for thousands of people. Marketing is an important component of production; economic theorist predicts that, in a market oriented system, before a farmer produces he considers the targeted consumers who are the end users of the product. This task is fulfilled through the process of marketing by creating various form of utilities of time, form and place. More especially an efficient marketing system provides a platform in which all participant in the marketing chain are satisfied from producers to consumers. The system ensures that farmers receive the amount commensurate to their investment in order to break even and remain in business in the short run. Similarly the marketers make profit commensurate to the services rendered and function performed as the products moves from one point to the other along the marketing chain. Likewise the consumers pay what is adequately enough for the value of goods and serves received and hence utilities derived from these services.

However, 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's and recently in plantations for the commercial market due to increase in demand for the crop in the consumers market. (Aina *et al.*, 2012). Nevertheless plantain is a typical agricultural produce with a limited shelf life which necessitate immediate disposal through marketing in order to reduce postharvest losses. Researcher like Echebiri and Mejeha. (2004), noted that poor post-harvest handling practices has been fingered as a culprit and also poor storage facilities as problems militating against agricultural production and marketing. These have compounded the problem of productivity. Hence the objectives of the study is (i) examine the socio-economic characteristics of the respondents in the study area. (ii) estimate the marketing margin (iii) net return (iv) estimate the factors that influenced the net returns of the marketers (vi) identify the problems that militates against plantain marketing in the study area.

### **Materials and Methods**

The work was carried out in Ikwuano Local Government Areas of Abia State, Nigeria. Its headquarters is in Isiala Oboro. It is located between 5<sup>0</sup>31' N latitude and 7<sup>0</sup>37'E longitude covering an area of 31000 ha. It has an area of 281km<sup>2</sup> and a population of 137,993 (Census, 2006). The area represents the typical humid forest ecology in the south east Agro Ecological Zones of Nigeria. The area is also characterized by bimodal annual precipitation of over 2000mm, air temperature ranging from 22-31°C, and high relative humidity of 77% during the wet seasons. Ikwuano Local Government Area is referred to as the food basket of Abia State because she is endowed with rich soil that supports agricultural activities. Data for the study were collected by the use of structured questionnaire. Stage one was a purposive selection of two major village markets with high plantain marketing activities namely Ndioro and Ariam markets which are weekly market that holds every seven days. The second stage involved a simple random selection of twenty plantain marketers from each of the markets to give a total of forty marketers. Objective (i) and five on socioeconomic characteristics and constrain to plantain marketing were realized by the use of table, frequency distribution and percentages

Objectives (ii) on marketing margin and (iii) on net return of the respondents were achieved by the use of marketing margin formular and net return approach as used by Olukosi *et al.*,(2005) and Obasi *et al.*,(2012) respectively and are stated thus:

$$\text{Marketing Margin (MM)} = \frac{Sp - Pp}{Sp} \times \frac{100}{1} \dots 1$$

Where, *SP* is the selling price and *Pp* is the purchasing price.

MM is the Marketing Margin

TMC is the Total Marketing Cost

Net Return (NR) = Total Revenue (TR) – Total Marketing Cost (TMC) ... 2

Objective (iv) on factors that influence net returns of the marketers, was realized using multiple regression analysis and the model is specified explicitly as thus:

$$Y = X_1, X_2, X_3, X_4, X_5, X_6, X_7 \dots 3$$

Where

Y = Net income (naira) derived as Total Revenue – Total marketing Cost

X<sub>1</sub>, = Age of respondents in years

X<sub>2</sub>, = Education level in years

X<sub>3</sub>, = Marketing experience (years)

X<sub>4</sub>, = Selling price (naira)

X<sub>5</sub>, = Cost of transportation (naira)

X<sub>6</sub>, = Quantity sold (naira)

X<sub>7</sub>, = Household size (persons)

e<sub>1</sub>, = error term

b<sub>0</sub>, = Coefficient

## Results and Discussion

Results from Table 1 shows that 42 % of plantain marketers in the study area fell within the age bracket of 31-40 year. This result shows that the respondents are still in their active age. This corroborates the findings of Oladejo and Sanusi (2011); Aina *et al.*, (2012) and Nse- Nelson *et al.*, (2016) who reported that most people involved in marketing activities were averaged aged women who are vibrant and energetic and can positively influence plantain marketing. On the educational distribution, majority of the marketers had primary education representing about 50% of the total sampled respondents, 40% had both secondary and tertiary education while 10% had no formal education. This is not an encouraging situation this is because education has a way of influencing the managerial ability of an individual with regards to business thereby increase the net return from business endeavours. The findings is in contrast with the findings of Aina *et al.*, (2012); who reported that greater percentage (64%) of the respondents had post primary education. The result also shows that the business was dominated by woman representing 87% of the marketers. This corroborates the findings of Mayokun and Fisayo, (2010); Aina *et al.*, (2012) and Nse-Nelson *et al.*, (2016) who reported that majority of the respondents in their study areas were women and concluded that women play crucial roles in the processing and distribution of agricultural produce. The study shows that 75% of the marketers were married. This implied that plantain marketing is relatively profitable to maintain a family. This also supports the findings of Aina *et al.*, (2012) who reported that majority of the marketers are married with families. The marketers had relatively small household size of 3-5 persons representing 47%, of the marketers. This implies that the marketers use family labour to support their business activities. Over 70% of the marketers have marketing experience of above 6 years. This is an indication that the marketers had wealth of knowledge on the marketing of plantain. This corroborates Obasi (2008) and Nse-Nelson (2016) findings that increased marketing experience help marketers adapt to new marketing strategies that helps to reduce loss and increase income of the marketers.

**Table 1: The socioeconomic characteristics of the respondents:**

Age	Frequency	Percentages
<20	2	5
21-30	6	15
31-40	17	42.5
41-50	10	25
>50	5	12.5
Total	40	100
Educational level		
Primary	20	50
Secondary	12	30
Tertiary	4	10
No formal education	4	10
Total	40	100
Sex		
Female	35	87.5
Male	5	12.5
Total	40	100
Marital status		
Single	8	20
Married	30	75
Widowed	2	5
Total	40	100
Household size		
< 2	3	7.5
3-5	19	47.5
6-8	10	25
>8	8	20
Total	40	100
Marketing experience		
1-5	8	20
6-10	5	12.5
11-15	14	35
16-20	6	15
>20	7	17.5
Total	40	100

Source : Field Survey (2016)

Results from Table 2 shows the monthly Net Returns of plantain marketing.

The marketers made a monthly returns of ₦61,004.00. A total variable cost of ₦189,506.032 was incurred. This amount constituted 99.91% of the total cost of marketing plantain in the study area. This implied that plantain marketing is profitable. The findings of the study is in consonance with the findings of Adetunji, and Adesiyani (2008) who obtained a net returns of N1,275.75 per day; Aina *et al.*, (2012) got ₦6,962.40 per dozen of plantain. A marketing margin of 25% was estimated. This implied that the marketers had adequate margin high enough for them to cover cost hence they could make profit to remain in business. The result on the rate of return shows that the marketers obtained a return on investment of 1.3. This implied that for every ₦1.00 invested on plantain marketing, a return of ₦1.30 was realized.

Table 2: Monthly net return of plantain marketing in Ikwuano Local Government Area of Abia State.

Item	Amount
<b>A: Returns</b>	
Selling Price (kg)	157.60
Quantity sold	1590.57
<b>Total Returns</b>	250673.83
<b>B : Variable Cost</b>	
Purchased price (kg)	117.60
Quantity purchased in (kg)	1590.00
Total Purchasing Cost	187051.03
Transportation	945.00
Storage	200.00
Market charges	600.00
Feeding	590
Nylon cost	120
Total variable cost	189506.032
<b>C : Fixed cost</b>	
Basin	1200.00
Knife	150.30
Tray	280.00
Total fixed cost	1630
D: Depreciation of fixed cost (10%)	163.
E: Total cost (B+D) = (E)	189669.032
F: Net Return (A-E)	61,004.798
G: Marketing margin	25.38
	1.3
<b>Rate of return on investment</b>	

Source: Field Survey, (2016)

**Result on the determinants of net returns of plantain marketing is presented in Table 3.**

The result from Table 3 shows that Semi-log functional form was chosen as the lead equation based on the value of  $R^2$ , number of significant variables and conformity to *a priori* expectation. From the result,  $R^2$  value of 0.863 was obtained. This implies that 86.30% of the variability in Net returns was explained or was accounted for by the independent variables. The F-ratio of 13.06 was highly significant at 1% level of probability indicating goodness of fit. The significant variables are level of education ( $X_2$ ), marketing experience ( $X_3$ ), selling price ( $X_4$ ), transport cost ( $X_5$ ), quantity sold ( $X_6$ ), household size ( $X_7$ ).

The co-efficient of level of education, marketing experience and selling price were positively signed and statistically significant at 1%. This implies that as the variable of level of Education, marketing experience and selling price increases, the net return (profit) of the plantain marketers also increase. This finding is in concordance with Nwaru and Iwuji (2005), who observed that selling price was positively related to net returns. Quantity sold ( $X_6$ ) was statistically significant

at 10% and directly related to net returns. This implies that the more the quantity of plantain the marketers sell the higher the net returns of the marketers. Transport cost and household size were significant at 10% and 1% respectively but were inversely related to net returns. This implies that an increase in any of these variables will lead to a decrease in the net returns of the plantain marketers and vice versa. This finding is related to the research done by Oladejo and Sanusi (2008), Nwaru *et al.*, (2011) who also reported that household size was negatively related to net return respectively.

**Table 3 : Regression analysis on the determinants of net returns in the study area**

Variables	Linear	Semi-log (+)	Double log	Exponential
Constant	1342.32 (2.48)**	26.08 (3.88)***	0.39 (3.01)***	201.89 (10.26)***
Age (X <sub>1</sub> )	0.42 (0.89)	0.42 (0.80)	0.42 (0.12)	0.81 (1.20)
Level of education (X <sub>2</sub> )	0.29 (1.92)*	0.90 (2.38)***	0.12 (0.88)	0.88 (2.01)*
Marketing Experience (X <sub>3</sub> )	0.32 (1.08)	0.02 (3.09)***	0.22 (2.89)***	0.92 (1.90)*
Selling Price (X <sub>4</sub> )	0.39 (6.43)***	0.80 (4.82)***	0.20 (1.20)	2.30 (1.08)
Cost of Transportation (X <sub>5</sub> )	-0.36 (0.84)	-0.42 (1.96)*	-0.46 (0.82)	-0.29 (4.88)***
Quantity Sold (X <sub>6</sub> )	0.10 (0.88)*	0.21 (2.03)*	0.10 (2.01)*	0.90 (0.49)
Household Size (X <sub>7</sub> )	-0.43 (2.55)	-0.42 (3.89)***	-0.02 (0.10)	0.88 (3.90)***
R <sup>2</sup>	0.82	0.86	0.54	0.81
R <sup>-2</sup>	0.8026.04***	0.823	0.501	0.794
F-ratio	3.29***	13.06***	2.86***	9.06***

Source: Field survey, (2016)

Note: Values in parenthesis are t-values \*=10% level of significance \*\*=5% level of significance \*\*\*=1% level of significance (+) = lead equation.

**Constraints that militated against plantain marketing in the study area**

The factors that militated against the marketing of plantain in the study area are presents in Table 4: and it shows that plantain marketers in the study area were constrained with insufficient funds. About 77.5% of the marketers identified lack of fund as the major problem that obstruct their business Similarly high cost of plantain and high cost of transportation closely followed inadequate fund as the second most serious constraint they faced in the business. Seasonality in supply and fluctuation in price were also major constraints since about 50% of the marketers indicated them as constraints that affected their marketing activities. Although plantain spoilage is the least constraint identified by 47.5 % but is still a high value which represents a serious problem faced by marketers especially at the peak of harvest in the study area.

Table 4: Constraints that militated against plantain marketing in Ikwuano LGA of Abia State.

Problem	Frequency	Percentages
Inadequate fund	31	77.5
High cost of plantain	26	65.0
High cost of transportation	25	62.5
Seasonality	20	50.0
Fluctuation in price	20	50.0
Plantain spoilage	19	47.5

Multiple responses were taken  
 Sourced: Field survey (2016)

**Conclusion and recommendation**

It could be inferred from the study that plantain marketing is profitable since the marketers were able to make profit and remain in business. Inadequate fund, high cost of plantain, cost of transportation and others were identified by the marketers as constraint militating against them. The study therefore recommends that marketers should form marketing cooperative which could serve as means of fund mobilization among marketers which could increase quantity sold and hence increase in net income.

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