

# Determinants of Market Participation by Plantain Farmers in Ifedore Local Government Area, Ondo State, Nigeria

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## ABSTRACT

The study investigated the determinants of market participation by plantain farmers in Ifedore Local Government Area of Ondo State, Nigeria. Eighty respondents were selected using a multistage sampling procedure. Primary data were collected through the administration of a structured questionnaire and analyzed using descriptive statistics and truncated regression analysis.

Results showed that the mean age of the respondents was 43 years. There were more male farmers than female farmers. Results showed that age, quantity harvested, farm size, unit price, farming experience and farm distance are the significant determinants of market participation by plantain farmers in the study area. It could be concluded that the extent of commercialization in the study area was high but not sufficient enough, which calls for the attention of all the concerned parties (government and individuals) to put in place measures that will critically improve the extent of agricultural commercialization in the study area. In order to enhance market participation of plantain farmers, well equipped market centers in various villages should be established by government and private individuals.

(Keywords: determinants, farmers, agriculture, horticulture, plantain, market participation, Nigeria).

## INTRODUCTION

Many of the world's poor still directly or indirectly depend on agriculture for their livelihoods, most of them as small-scale farmers. Besides building up farmers' production capabilities, improving their access to markets has become a key element in strategies to promote rural development and poverty reduction.

In order to be successful, development programs have to address the multiple market failures that the small farm sector suffers from (Jayne, *et al*, 2010). One important way to reduce poverty in rural areas is to enhance the market participation of rural farmers, as this can increase the net returns from agriculture (World Bank, 2007).

Many farmers in Sub-Saharan Africa, however, remain subsistence farmers whose production activities are conducted mainly for home consumption (Verheye, 2000). Commercializing smallholder agriculture is an indispensable pathway towards economic growth and development for most developing countries relying on the agricultural sector (von Braun 1995; Pingali and Rosegrant 1995; Timmer, 1997). As the agricultural sector in developing countries transforms towards commercialization, smallholder farmers require systems that are responsive to their needs: access to markets, market information, market intelligence and effective farmer organization (Jagwe, Machethe, and Ouma, 2010).

The importance of plantain cannot be overemphasized, Plantain is one of the most important horticultural crops and it is among the ten most important food security crops that feed the world (USDA, 2012) and has always been an important staple food for both rural and urban populace (CBN, 2003). Plantain is a versatile food in the kitchen as well as a raw material for many popular delicacies and snacks (Aina *et al*, 2012). It is among the foremost sources of carbohydrates in humid tropical Africa and contains 35% CHO, 0.2 to 0.5% fats, 1.2% protein, and 0.8% ash (IITA, 2009).

Plantains have the potential to contribute to strengthening national food security and decreasing rural poverty (Adejoro *et al*, 2010). Available trade records and associated indices

showed that Nigeria is one of the largest producers of plantain in the world (FAO, 2013). She ranked first in Africa and fifth in the world producing 2,722,000 metric tonnes in 2011 (FAO, 2012).

In particular, small-scale farmers face many constraints that impede them from taking advantage of market opportunities. Often living in remote areas with poor infrastructure, they face high transaction costs that significantly reduce their incentives for market participation (Barrett, 2008; Key, Sadoulet, and de Janvry, 2000; Omamo, 1998). Smallholder agriculture contributes greatly to the national income, employment, foods and nutrition in Nigeria. However, the market participation of the smallholder farmers is very low despite the fact that there are benefits of market orientation and favorable trends in the commercialization of agriculture.

The major challenge now in Nigeria is the inability of the smallholder farmers and other rural farmers to benefit from commercialization by participating in the market. Over the years it has been noted that smallholder farmers almost never leave the poverty level, they record low income and have poor standard of living. This is as a result of farmer's poor participation in the market that is most farmers' main objective for producing is mainly for food self-sufficiency.

It is against this background that this study investigates determinants of market participation by plantain farmers in Ifedore Local Government Area of Ondo State, Nigeria. Though there are studies on market participation by smallholder farmers in Africa (Oparinde and Daramola, 2014, Omiti, *et al.*, 2009, Alene, *et al.*, 2008, Barrett, 2008) to name a few. However, empirical assessment of market participation by plantain farmers is scarce in Nigeria.

The study provides answers to pertinent questions such as: what are the socio-economic characteristics of plantain farmers? What are the extent of commercialization of agriculture? What are the factors influencing the degree of commercialization and what are the constraints facing the respondents in the study area?

## **MATERIALS AND METHODS**

### **Study Area**

The field survey was carried out in Ifedore Local Government Area of Ondo State, Nigeria. It has an area of 295 km and a population of 176,372 (Ondo State Government, 2011). The study area is located in the rain forest belt with the climate condition characterized by two distinct seasons (rainy and dry). Agriculture remains the primary means of livelihood for majority of inhabitants. The farmers cultivate both arable and cash crops. The cash crops cultivated include, cocoa, kola nut, rubber and oil palm, while the arable crops cultivated include cocoyam, sweet potatoes, plantain, cassava, vegetables, yam and maize.

### **Data Source and Sampling Technique**

Primary data were collected through the administration of a structured questionnaire. Multi-stage sampling procedure was used to select eighty respondents. In the first stage, Ifedore Local Government Area was purposively selected because plantain cultivation is prominent in the area. In the second stage, four villages were randomly selected in the Local Government Area and in the final stage, twenty (20) plantain farmers were randomly selected in each village from the list obtained from Agricultural Development Programme to make a total of eighty respondents that were used for the study.

### **Analytical Technique and Model Specification**

Descriptive Statistics such as mean, percentage and tables were used to analyze the socio-economic characteristics. Household commercialization index was used to determine household specific level of commercialization and truncated regression model was used to investigate the factors influencing the degree of commercialization in the study area.

$$\text{Household Commercialization Index (HCI)} = \frac{\text{Gross value of crop sales hh } i \text{ year } j}{\text{Gross value of all crop production hh } i \text{ year } j} \times 100$$

The household commercialization index (HCI) to determine household specific level of commercialization (Govereh, *et al.*, 1999; Strasberg *et al.*, 1999). The index measures the ratio of the gross value of crop sales by household *i* in year *j* to the gross value of all crops produced by the same household *i* in the same year *j* expressed as a percentage. The index measures the extent to which household crop production is oriented toward the market. A value of zero would signify a totally subsistence-oriented household and the closer the index is to 100, the higher the degree of commercialization.

### **Truncated Regression Model**

To determine the factors influencing the degree of commercialization among households or output that is actually sold in the market, truncated regression analysis was used. The mathematical notation for the analysis is presented below:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + \mu_i \quad (1)$$

Where

$Y$  = The percentage of plantain (output) that is sold by household,

$X_1$  = Age of the household head (years),

$X_2$  = Sex of the household head (male=1, female=2),

$X_3$  = Education level of the household head (years spent in school)

$X_4$  = Farming experience, (years)

$X_5$  = Household size (number)

$X_6$  = Total quantity of output produced per hectare in a season in (kg)

$X_7$  = Average farm size of the household in hectares,

$X_8$  = Market information source/arrangement,

$X_9$  = Average price at which each unit of output is normally sold in Naira,

$X_{10}$  = Type of farming practice,

$X_{11}$  = Average distance from farm to main point of sale in Kilometer,

$X_{12}$  = Proportion of nonfarm income in total monthly household income in Naira, and

$\mu_i$  = Error term.

Omiti, *et al.*, (2009) stated that because of the predetermined selection of only market participants in this study, the data collected do not allow use of selectivity models such as those applied in similar studies by Goetz (1992), Omamo (1998) and Lapar *et al.*, (2003). A zero value of  $Y_i^*$  is observed when a household has no surplus to sell but has excess demand on the commodity. On the other hand,  $Y_i^* = 100$  if a household sells all output.

## **RESULTS AND DISCUSSION**

### **Socio-economic Characteristics of the Respondents**

The distribution of the respondents by sex indicated that most (85.0%) of plantain farmers in the study area were males, while the remaining 15% of the respondents were females. This is an indication that farming activities were dominated by male-headed households in the study area. One of the reasons for this scenario could be the laborious nature of agricultural activities which made females to distance themselves from on-farm activities.

The distribution of the respondents by age indicated that 15.0% of the respondents were less than 30 years old, while 15.0% were between the ages 31 and 40 years old. About 27.5% were between ages 41 and 50 years old, while 22.5% of the respondents were between the ages 51 and 60 years old. This indicated that majority (80.0%) of the respondents were less than 60 years old. This is an indication that majority of the respondents were still within the economically active age. This is expected to assist in the degree of agricultural commercialization in the study area.

The distribution of education level of the respondents indicates that majority (92.5%) of the farmers in the study area had one form of education or the other which could assist them in the area of adoption of innovations that are being brought to farmers by the extension agents and in

making decisions that will enhance their marketing strategies.

The household size explains the family labor supply for production and household consumption levels (Alene, *et al.*, 2008). The mean household size was 7 persons. This result implies that the household size was fairly large enough to influence the adoption of a new technology significantly, increase in production and as well as assist to reduce labor intensiveness and costs in the long run.

Most (76.3%) of the respondents were married, while 13.7% were widowed. This indicates that majority of the farmers in the study area value marriage and this will afford them the opportunity of getting family labor to use on the farm, thereby, probably leading to enhancement of market participation by the plantain farmers.

**Table1:** Distribution of Respondents according to Socio-economic Characteristics.

Variables	Frequency	Percentage
<b>Age</b>		
<30	12	15.0
31-40	12	15.0
41-50	22	27.5
51-60	18	22.5
61-70	11	13.7
≥70	5	6.3
<b>Sex</b>		
Male	68	85.0
Female	12	15.0
<b>Education</b>		
No formal Education	6	7.5
Primary Education	21	26.3
Secondary Education	29	36.2
Tertiary Education	22	27.5
Adult Education	2	2.5
<b>Household Size</b>		
1-5	25	31.2
6-10	44	55.0
>10	11	13.8
<b>Marital Status</b>		
Single	2	2.5
Married	61	76.3
Widowed	11	13.7
Divorced	6	7.5
<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: Field Survey, 2018.

### **Extent of Agricultural Commercialization for Plantain Enterprise**

The distribution of plantain sold in the market by the household in Table 2 shows that 6.2% of plantain farmers sold between 41 and 60 per cent of their produce in the market. Majority (72.5%) of the farmers sold between 61 and 80% of plantain harvested, while 21.3% sold above 81 per cent of their produce in the market. The mean percentage of plantain harvested which was taken to the market for sale by the respondents in rural area was 64.63%. This implies that the extent of commercialization in the study area was not high enough.

**Table 2:** Degree of Agricultural Commercialization.

Percentage Sold %	Frequency	Percentage
21 - 40	0	0
41 - 60	5	6.2
61 - 80	58	72.5
>81	17	21.3
<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: Field Survey, 2018.

Mean = 64.63  
 Maximum = 89%  
 Minimum = 50%

### **Determinants of Percentage of Plantain Sold by Smallholder Farmers**

The regression results revealed that age, quantity harvested, farm size, unit price, farming experience and farm distance had significant influence on the proportion of plantain that were offered for sale in the market in the study area.

Age exhibits a positive effect. This can be explained by farming experience, which is usually positively correlated with age. Quantity harvested exhibits a positive relationship with the percentage of plantain sold in the market. This is plausible, because the more the harvested plantain, the more the proportion the farmers offer for sale in the market.

The farm size had a positive significant effect on the percentage of plantain that is offered for sale in the market; each additional hectares of land owned increases the probability of having more plantain to sell in the market. This is plausible, because larger farms are not only wealthier but also have a higher capacity to expand plantain production.

The unit price and the proportion of plantain sold in the market were positively related. This simply obeyed the law of supply that the higher the price, the higher the quantity that farmers are ready to offer for sale.

There was a positive relationship between the farming experience and the percentage of plantain sold in the market. This may be due to farmers having a better knowledge of crop management practices (Hassan and Nhemachene, 2007). This improves their productivity which invariably leads to increase in outputs that are offered for sale in the market.

Finally, the farm distance exhibits negative effect. Farmers located very close to the market have better access. This is plausible, because the cost of transportation to the market increases with distance. Thus, farmers in a very long distance may prefer selling to traders at lower prices at the farm gate.

### **Constraints Faced by the Respondents in their Farming Activities**

Majority of the respondents in the study area were faced with insufficient capital, poor road network, high cost of transportation, lack of credit facilities, price instability, long distance from farm to the markets, inadequate, problem of pests and diseases, weather problem, poor storage facilities and inadequate agricultural inputs in order of ranking. All the problems identified by the respondents might be among the reasons for their poor market participation which would have adverse effects on their welfare. These problems could also discourage farmers who are ready to engage in market participation since they would have presumed that market conditions were not favorable to them.

**Table 3:** Determinants of Percentage of Plantain Sold by Smallholder Farmers.

Variables	Coefficients	Standard Errors
Const.	1.310	0.17
Age	0.602***	0.180
Gender	2.537	2.138
Marital Status	0.093	0.256
Educational Level	0.251	0.161
Household Size	-0.394	0.750
Quantity Harvested	0.231***	0.080
Farm Size	0.005**	0.002
Market Information Source	0.007	0.044
Unit Price	0.150**	0.072
Non-Farm Income	0.147	0.175
Farm Practice	0.023	0.051
Farming Experience	0.458***	0.174
Farm Distance	-0.023***	0.007
R <sup>2</sup> =0.68		

Source: Field Survey, 2018.

Note: \*\* = Significant at 5% level, \*\*\* = Significant at 1% level

**Table 4:** Distribution of Farmers based on the Constraints Faced in their Farming Activities.

Constraints	Frequency	Rank
Insufficient Capital	49	1 <sup>st</sup>
Poor Road Network	45	2 <sup>nd</sup>
High Cost of Transportation	45	2 <sup>nd</sup>
Lack of Credit Facilities	42	4 <sup>th</sup>
Inadequate Storage Facilities	21	9 <sup>th</sup>
Pest and Diseases	34	7 <sup>th</sup>
Long Distance to the Markets	37	6 <sup>th</sup>
Weather problem	30	8 <sup>th</sup>
Poor processing Facilities	13	10 <sup>th</sup>
Inadequate Agricultural Inputs	5	11 <sup>th</sup>
Price Instability	38	5 <sup>th</sup>

Source: Field Survey, 2018.

Multiple responses exist.

### **Constraints Faced by the Respondents in their Farming Activities**

Majority of the respondents in the study area were faced with insufficient capital, poor road network, high cost of transportation, lack of credit facilities, price instability, long distance from farm to the markets, inadequate, problem of pests and

diseases, weather problem, poor storage facilities and inadequate agricultural inputs in order of ranking. All the problems identified by the respondents might be among the reasons for their poor market participation which would have adverse effects on their welfare. These problems could also discourage farmers who are ready to engage in market participation since they would

have presumed that market conditions were not favorable to them.

## CONCLUSION

This article investigates determinants of market participation by plantain farmers in Ifedore Local Government Area of Ondo State, Nigeria. Results showed that the degree of agricultural commercialization in the study area was not high enough. Results also revealed that age, quantity harvested, farm size, unit price, farming experience and farm distance had significant influence on the proportion of plantain that were offered for sale in the market in the study area.

Based on the findings highlighted above, it could be concluded that the extent of commercialization in the study area was not high enough which calls for the attention of all the concerned parties (government and individuals) to put in place measures that will critically improve the extent of agricultural commercialization in the study area. In many developing countries, poor infrastructure and remoteness have led to highly inefficient supply chains, with a number of non-value adding intermediaries involved.

Market participation can reduce the number of intermediaries and is therefore particularly relevant in cases where supply chains are long and inefficient. Therefore, the following recommendations are suggested; government should create room for the expansion of agricultural production, which will increase market participation. Provision of improved infrastructural facilities is a good condition for enhancing agricultural commercialization. Credit facilities, adequate agricultural inputs and processing facilities should be put in place (by government and private individuals) for plantain farmers in order to create room for the expansion of agricultural production, which will lead to commercialization of agriculture.

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