Determinants of farmers' access to output markets and the effects on income; A case study of Ikenne local government area, Nigeria.

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ABSTRACT

This study analyzes factors that determine farming households' access to output markets. It also assesses the effects of the determinant factors of access of farming households to output markets on income of the farmers in Ikenne local government area of Ogun State. Primary data., using questionnaire, was collected from 59 respondents farmers in the study area and analysed using descriptive statistical analysis, logit regression and multiple regression technique. The result of the logit regression analysis revealed that cost of transportation, distance of farms to the market, access to market information and influence of cooperative societies were all factors which determined the sale of a farmer. The study also assesses the impact of these factors on their income and from the linear regression results, the distance of the farm to the output markets, the cost of transportation, the medium of sales of farm produce, access to market information and impact of cooperatives on sales of farm produce have significant impacts on the income accruable to the farming households....Therefore, policies should be geared towards providing and improving transportation facilities, roads and market information as a means of enhancing the farmers' access to output markets which will lead to increased incomes for the farmers.

Key words: *Access to markets, farmers' income, transport, Ikenne*

INTRODUCTION

Agriculture is one of the most important sectors of the Nigerian economy. This is because it contributes more than 30% of the total annual Gross Domestic Product (GDP), employs about 70% of the labour force, accounts for over 70% of the non-oil exports and provided over 80% of the food needs of the country, (Adegboye, 2004). Agriculture provided adequate food for the Nigerian populace both in quantity and quality during the era before independence in 1960. Helleiner, (1996) showed that in Nigeria, between 1950 and 1960, food production was at subsistence but self-sufficient level. The economy was experiencing rapid growth of 4.5% between 1958 and 1963, the driving force being a booming trade in agricultural commodities export, growing annually at 5.5%. The first decade of Nigerian independence (1960-1970) opened the way

to food shortages as a result of declining agricultural production and increasing population growth rate. The increase in population at a rate considerably higher than the rate of increase in food production has continued to widen the gap between domestic food supply and domestic demand. This disparity has led to rising food prices (85-125% increases in many Nigerian cities) and declining foreign exchange earnings from agricultural exports. The interaction of these factors has led to food insecurity and the idea of self-sufficiency is becoming more and more difficult to achieve due to declining agricultural production and inefficient food marketing system (Helleiner, 1996). In Nigeria, the greater part of food production is in the hand of small scale subsistence farmers who reside mostly in villages in the rural areas of the country. They are responsible for over 70% of the food that is made available to consumers. However,

these farmers farmed with local implements and unimproved inputs which limited their productivity, and with the ever growing population, food scarcity was not far fetched.

As the food situation and the performance of the agricultural sector got worsened, a number of agricultural development institutions were set up and special programmes and projects were launched, which include: National Accelerated Food Production Programme, NAFPP (1973); Agricultural Development Project, ADP (1975); Operation Feed the Nation, OFN (1976); River Basin Development Authorities, RBDA (1977); National Seed Service, NSS (1977); to mention a few.

However,, the special programmes and projects have not generated the expected results and the resultant increase in production have not translated into increased income for farmers in Nigeria as most of them still live below poverty line. Idachaba (2004) argued that the dwindling agricultural production in Nigeria is a confirmation of the unattractiveness of agriculture as a result of low returns and compensation being paid to farmers, which tend to discourage increased production. The food marketing problems are evidenced when farmers, (who are the primary producers and who reside mostly in rural areas) are unable to get their produce to the market at the right time (thereby incurring considerable post-harvest losses) leading to low returns. This food supply gap is evident not only from food insecurity but also seen in the high price variation and inconsistency which are all mainly as a result of the poor marketing functions and not inefficiency in production. This problem can be traced to access of farming households to output markets. In many parts of Nigeria today, bad transport system is still a problem of rural farmers. This has exposed them to various types of exploitation especially by middlemen who end up claiming a greater share of the consumers' expenditure and leaving the farmer and his household as impoverished as ever. This study attempts to contribute to farmers' income through increased accessibility to output markets.

METHODOLOGY
Study area
Ogun state came into being on the 1st April, 1976 as a result of the creation of three states out of the former western states by the Federal Military Government.It covers an area of approximately 10,000 square kilometres, the state shares common boundaries with Lagos, Oyo and Ondo states and partly with the Republic of Benin. The study will be carried out in Ikenne local government area. Ikenne local government has it's headquarter at Ikenne Remo. The local government is located along transitional forest zone of Southern Nigeria and Guinea savannah. It is situated 235.2 meters above sea level, have an annual rainfall of 1.2 meters, 65% mean relative humidity and $70.5^{o}F$ mean temperature. The whether is that of the general pattern of the entire country viz: rainy season, dry season and harmattan. However, the rainy season is bimodal (with a short August break) spanning from late March/ early April to mid-October. The major occupation of the people is farming and trading. The local government has the following towns: Iperu- Remo, Ilisan- Remo, Irolu-Remo and Ikenne- Remo. The population of inhabitants is over 72,980 people. The markets available to the framing households are: Awolowo market (Sagamu), Sabo market (Sagamu), Akesan market Iperu, Iperu market, Ikenne market, Ilisan market, Ogere market, Irolu market and Isara market.

Study design and data collection
The sampling technique adopted in the study was a random sampling technique. This is because there are four different towns with many villages and it was necessary to chose from each of the villages without bias to minimise error. Sample size was 100 farming households chosen from the various villages in each of the local government areas. Primary data was collected from the farmers from the four towns in the Local Government Area using a well structured questionnaire that was complemented by oral interview especially for those of them that are illiterate.

Analytical tools
The analytical tools used in this study include the descriptive statistics which was to identify the means of transport used by the farmers and other demographic characteristics. A logit regression model was used to identify and analyze the various factors determining their use of markets and a multiple regression analysis was used estimate the effect of the market related variables on their income.

Logit regression model
Following the work of Awoyinka *et* al(2003), the logit regression model is presented as
$$Y= f (X_i, ß)$$

Where Y=   1 (access to market)
              0 (no access to market)

Xi's are vector of explanatory variables which include

X1= level of education of respondent in years (EDUL)
X2= distance of farm to output market in kilometres (DFM)
X3= cost of transportation in Naira (COT)
X4= influence of extension workers on sales (IEW) (1= positive, 0= negative)
X5= influence of cooperative societies (ICS) (1= positive, 0= negative)
X6= access to market information (AMI) (1= positive, 0= negative)
X7= percentage of demand at farm gate (PDF) (1= low, 2=high)
ß= Parameter to be estimated

Cost of transport (COT): this is the amount paid to transport the produce from the farm to the market of choice. (Often the cost of hiring the means used and in some cases, the cost of operating personal vehicles)

Distance of farm from market (DFM): this is the distance in kilometers that the farmers have to go to reach the nearest output market.

Influence of extension workers (IEW): this denotes whether a farmer's choice or marketing pattern is influenced by an extension agent.

Influence of cooperative societies (ICS): This identifies if the farmer has some assistance from his cooperative society (especially market cooperative) on the sales of his produce.

Educational level of farmers (EDUL): this is the level or amount in years that a farmer attained. It is assumed that the farmers with higher level of education are more exposed and are better at marketing.

Percentage of demand reaching the farm gate (PDF): this is the amount in percentage, of consumers that go to the farm gate to buy their produce.

Regression analysis
To analyze the effect of the market related variables on income of the farmers, a multiple regression analysis is used following the work of A. Adejobi *et*

al (2006) on "Enhancing the Access of Rural Households to Output Markets for Increased Farm Incomes". The function is given as:

$$V_i = f(X_i)$$
………………… (i)

$$V_i = ß X_i + e_i$$
……………….. (ii)

Model specification

- Linear is given as:
$$V_i = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e_i$$
- Exponential is given as:
$$\text{Log } V_i = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e_i$$

Where:
V_i= Farmer's income
ß= vector of unknown parameters
X_i= vector of explanatory variables
E_i = error term

The independent variables, which describe rural household market access, are described as follows:

- **DFM** = Distance of the farm to the market. This is the distance in kilometers that the farmers have to go to reach the nearest market(s) to them.
- **COT** = Cost of transportation of farm produce to the nearest market. This is the amount (in Naira) the farmers have to pay to move their produce from the farm gate to the market of their choice.
- **MOS** = Medium of sales of farm produce (D = 1 if farm produce is sold in the market, otherwise D = 0). This is the point of sale the farmer employs to sell his produce.
- **ICS** = Influence of cooperatives on marketing of farm produce. This identifies if the farmer has some assistance from his cooperative society (especially market cooperative) on the sales of his produce.
- **MIS** = Access to market information (D = 1 if yes, otherwise D = 0). This is the degree of information that farmers, cooperatives, traders, exporters and market control institutions including government have about parameters relevant to their decision making.

The lead equation was chosen by using the value of coefficient of variation (R^2) and F-statistics, number of significant variation as judged by T-value, appropriate sign of the coefficient and a priori expectation

3.0   RESULTS AND PRESENTATION

Table 1: Summary description of rural farming household characteristics

Characteristics	Dominant indicator
Farmers' Gender	76.3% of the farmers are masculine
Farmers' age	44.1% of them are between 41-50years of age.
Educational status of farmers	56.6% of the farmers had education of 6years and over. This characteristic affects their decision making.
House hold size	64.4% of the farmers had a household of between 3-5
Access to market information	67.8% of the farmers had no access to any form of information.
Medium of sales of farm produce	42.4% of the farmers sold their produce at the farm gate
Distribution based on transport means	Only 37.3% of the farmers used effective means of transport and 35.6% did not transport at all.
Diversification of farm	45.8% of the farmers were strictly crop farmers, 38.9% are animal farmers and only 15.3% diversified
Farm size	Only 3.4% of the farmers have over 3 hectares of land.
Farmers income	74.6% of the farmers earned between N100,000 and N200,000 on farming activities

Determinants of Farmers' Access to Output markets
The factors affecting the access of farmers' access to output markets were captured with the aid of a logit regression analysis. The result is presented in Table 4.13

Degree of freedom= 5, chi-square= 43.45876, No of observation= 59

TABLE 2 Result of Logit Regression

Variables	Coefficients	Standard error	t-value
COT	-0.1743	0.3599	-4.841*
DFM	-0.3499	0.1465	-2.389***
IEW	0.8459	0.1035	0.817
ICS	0.3071	0.1011	3.037**
EDUL	0.5553	0.7847	0.708

SOURCE: Computer print out of Logit regression analysis

- Significant at 1% level   **Significant at 5% level   ***Significant at 10% level

The result of the logit regression model to identify the determinants of farming households' access to output markets revealed cost of transport, distance of farm to market and influence of cooperative on marketing of produce as the significant factors that affect their access to output markets.

The result shows that cost of transport negatively affected a farmers' decision to use a market. The higher the cost of transportation, the higher the reluctance of the farmers to use the market as their medium of sales since it might reduce their income. There is also a negative relationship between the distance of the farm to the market and their use of markets. The farther the farm is from their farm, the less their interest in using a market place. However, influence of cooperatives on the farmers' sales affects their decision positively. Thus, the better the influence of the cooperative, the more likely they are to use the markets. This is possible since the cooperatives may provide some service such as transportation at subsidized rates or enhance the market structure to provide a better place for marketing.

Note that access to market information system was removed from the analysis because all the farmers that had market information used a market as their medium of sales and thus is predicted the dependent variable perfectly. The same goes for the percentage of sales at farm gate as most of the farmers who sold over 50 percent of their produce at the farm gate did not use markets. From this, I can deduce the fact that the better the access of farmers to market information, the more they use markets and the more they sell at the farm gate, the less they use markets as their medium of sales.The non significance of influence of extension officers can be traced to the fact that most of the extension services provided are directed towards improving production and not marketing. Most of the farmers in the study area are educated and this does not contribute much to their use of markets.

Causal Relationship s between Farm Incomes and Market Related Factors

The causal relationship between farmers' income and the various market related features was captured through the use of a linear multiple regression analysis. The result of the analysis is presented in Table 4.12

TABLE 3 Result of multiple Regression

Variables	Unstandardized Coefficients (B)	t- value	Sig
Constant	148727.251	13.489*	.000
DFM	-2562.262	-2.424**	.019
COT	-0.647	-1.780***	.081
MIS	24685.052	2.787*	.007
MOS	54822.822	3.019*	.004
ICS	8298.756	1.048	.300

SOURCE: Computer print out of regression analysis

* Significant at 1% level

**Significant at 5% level

***Significant at 10% level

F= 15.864*

R^{-2} (Adjusted coefficient of determination) = 0.562

Table 4.12 shows the estimates from the regression analysis. It reveals that four out of five of the household market related variables are significant at between 1% and 10% level representing about 80% of the variables. The f-value was statistically significant at 1% level and this shows that the model is fit for the data. The value of the adjusted R^2 was 0.56 which indicates that 56% of the variation in income of the farmers was explained by the variables while the other 54% can be attributed to other variables not included in the equation.

The result can be further explained as follows:

Distance of farm to the market: The distance of a farm to the market had its coefficient significant at 5% level with a negative sign; suggesting that the farther away a market is from a farm the lower the farm income accruable t o farming household is. This may be due to the fact that most farm produce are perishable and there are poor/no storage facilities which could elongate the shelf live of the produce coupled with poor transport system; the farmer is forced to sell at any price rather than loose the whole produce. In another vein the distance of the market also determines the transport cost which further adds to the transaction cost thereby reducing the farmers' share/income.

A unit increase in the distance of the farm to the market leads to 0.24 decrease in the farmers income.

Cost of transportation: This variable had its coefficient significant at 10% and it carried a negative sign. This also suggests that the higher the cost of transport, the lower the income that accrues to the farming households as was the a priory expectation.

A unit increase in the cost of transport leads to 0.34% decrease in their income.

Access to market information system: This had its coefficient significant at 1% level and carries a positive sign; suggesting that those households who were up to date on market information were making higher incomes than those who did not. The obvious reason was that those up to date households were not susceptible to the tricks and exploitations of the traders they transact with and this of course subsequently increase their incomes.

Medium of sales of farm produce: This had its coefficient significant at 1% level and carries a positive sign; suggesting that those households who sell at the market had higher farm incomes than those that sell at the farm gate. This might not be unconnected with the fact that those traders/commission agents who buy at the farm gate have very high exploitative tendencies to buy at very low prices and this reduces the income of the farming households.

CONCLUSION

The study has identified the various determinants of access of farming households within Ikenne Local Government Area to output markets and analyzed their effects on their income. It could be inferred from the study that the market-related factors; particularly those that tend to increase the transaction cost of the farming households have serious impacts on the incomes that are accruable to the farming households in the study area. Policies to improve the living standard and welfare of the farming households within this location should be aimed at; increasing the scope of extension services beyond assistance on production but also in proper marketing of their produce; reducing transaction costs particularly in the area of transportation hence, more farmers will be encouraged to use the market and reduce the exploitative effects of middle-men; establishing an efficient market information network that will keep the farmers informed of the prices as this will make them less susceptible during transactions; creating and improving the state of roads within the rural areas. This will not only enhance both producer and consumer accessibility but also reduce transportation cost and secure availability of transport for the farmers all year round;. Encouraging and organizing cooperatives (especially marketing cooperatives) to empower the farmers and government- assisted expansion of the rural markets will increase off-farm incomes for other members of the household leading to an improved standard of living..

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