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Research Paper

Estimation of Factors Influencing Price of Maize Among Smallholder Farmers In Giwa Local Government Area Of Kaduna State, Nigeria.

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ABSTRACT
The central thrust of the study was on estimation of factors influencing price of maize among smallholder farmers in Giwa Local Government Area of Kaduna State, Nigeria. The specific objectives of the study were based on describing socio-economic characteristics of maize farmers, estimation of factors influencing price changes and identifying constraints associated with maize marketing. The study was conducted using random sampling in selecting 50 middlemen from Giwa and Shika markets respectively while 50 middlemen who produce maize were also randomly selected from the same source. The analytical tools used to achieve the stated objectives were descriptive statistics and multiple linear regression models. The analysis revealed that marketing experience and access to market information were significant at 1% level of significance while purchase price was also significant at 10% level of significance. The results of regression analysis for factors that influenced price changes showed that the coefficients of multiple determination R^2 was 51% which explained the changes in maize prices as accounted for by the independent variables used in the regression analysis. Hence, the results depict that factors that influenced price changes in maize marketing was slightly above average. Test of hypotheses were carried out based on the results of analysis using factors influencing price changes in maize marketing. The null hypotheses were rejected with respect to marketing experience, access to market information and purchase price as factors influencing price changes in maize with respect to their t-test statistics of -2.935, -6.358 and 2.947 respectively which were significantly different. The policy implications proffered for production planning and marketing of maize were anchored on some socio-economic attributes of farmers, improvements in market conditions and some measures geared towards overcoming constraints associated with maize production and marketing.

KEY WORDS: Factors influencing, Price, Maize, Smallholder, Farmers.

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I. INTRODUCTION

Agriculture is a major sector in the Nigerian economy providing employment for about 70% of the population, and the sector is also being transformed by commercialization at the small, medium and large scale enterprise level (Olomola, 2007). The country has a highly diversified agro-ecological condition which makes it possible for the production of a wide range of agricultural products. Nigeria has about 91.07 million hectares of which 77% of the land is cultivable and 13% are under forest and woodland (Eboh *et al.*, 2004). Despite these vast land resources most of the cultivable land was not put under cultivation thereby limiting agricultural production in terms of staple food and cash crop production. In the same vein, (Odedokun *et al.*, 2013) asserted that there has not been any meaningful impact of agriculture in achieving its target of self-sufficiency in food production and meet the desired need of supplying raw materials for agro-based industries, sustainable food security programme and exporting marketable surpluses to earn foreign exchange for the country.

It is based on this credence that the Federal Government of Nigeria through the ministry of agriculture and rural development had over the years introduced programmes aimed at improving the standard of living of the rural people. Some of these programmes include National poverty Eradication Programme (NAPEP, 2001)

and lately Agricultural Transformation Action Plan (ATA, 2012). These programmes were introduced to assist rural farmers to overcome challenges such as inadequate finance, untimely procurement and utilisation of production inputs such as improved seed, fertilizers and agro-chemicals and various marketing problems namely middlemen syndrome facing the agricultural sectors in the developing nations of which Nigeria is not an exception.

In Nigeria, many farmers do not breakeven let alone profiting from agricultural ventures because of inconsistent pricing and policies introduced in agricultural marketing. Past and present agricultural policies and pogrammes have not being able to adequately address the constraints faced by small scale farmers due to inconsistent policies in this regard (Okoro and Oliver 2009). This has created an unfavorable bargaining power in the marketing of maize which has subjected the small holder farmers into an unhealthy economic status.

1.1 Research Questions

It is on this premise that the study investigated the following research questions and attempts to proffer solutions to them.

i. What are the socioeconomic characteristics of maize farmers in the study area?
ii. What are the factors influencing price changes in marketing of maize?
iii. What are the constraints faced by farmers in marketing of maize?

1.2 Research Objectives

The broad objective of this study is to determine factors influencing price of maize among smallholder farmers in Giwa local government area of Kaduna state.

The specific objectives were to:

i. Describe socioeconomic characteristics of maize farmers in the study area.
ii. Determine the factors influencing price changes in maize marketing.
iii. Identify constraints associated with marketing of maize.

1.3 Research Hypotheses

In testing of hypotheses, making decisions about the population of maize producers and marketers on the basis of sample information is of paramount importance. Research hypothesis is an assumption or proposition that is formulated under consideration in order to reject or accept such proposition based on the result of statistical test of significance through which statistical inference was made. The following statistical hypotheses were made and tested based on some of the variables used in the study.

$H0_1$: There is no significant difference between marketing experience and maize marketing in the study area.

$H0_2$: There is no significant difference between access to market information and maize marketing in the study area.

$H0_3$: There is no significant difference between purchase price information and maize marketing in the study area.

II. METHODOLOGY

2.1 Study area

The study was conducted in Giwa Local Government Area of Kaduna State, Nigeria. The local government lies between latitudes 11.20^o and 11.50^o N and longitudes 7.0^o and 7.5^o E. It is located North-west of Zaria in the transition zone between Northern Guinea Savanna and Southern tip of Sudan Savanna and about 640m above sea level. The local government is bounded on the North by Funtua and Malumfashi Local Government Areas of Kastina State on the West by Birnin Gwari and on the South by Igabi Local Government Areas of Kaduna State. Dry and wet seasons are two distinct seasons in the study area. The wet season which begins in April/May. The average length of rainy period is 180 days. Rain starts April and ends October. The highest amount of rainfall is recorded in August. The intensity of rainfall influences maize production in the study area. The mean annual rainfall of the study area varies between 300 – 1524mm (Agricultural Department, Giwa LGA Report 2013).The dry season starts in November and ends in March. Giwa Local Government has an estimated population of 350,586 (NPC, 2006).

The predominant language spoken in the area is Hausa. Farming is traditional in nature and about 70% of the populations engage in farming which is carried out under traditional practices. Although, agriculture forms the principal means of livelihood for majority of the populace, the bulk of agricultural production is undertaken by small scale farmers of which women are included. Women perform the work of harvesting, processing and household activities. Examples of crops grown are maize, cowpea, sorghum, millet, rice and groundnuts. They also rear livestock such as cattle, sheep, goats and poultry. The inhabitants are also engaged in some non-farming activities such as blacksmithing, leatherworks and trading for men while women engaged in

technical hand crafting and trading while some are secluded as full time housewives according to Islamic doctrines.

2.2 Sampling Technique and sample size

Random sampling was used to select 50 middlemen from Giwa and Shika markets respectively. Also, 50 farmers who produce maize were randomly selected from the same source in the study area.

2.3 Method of Data Collection

Primary data was used for the study. The data was collected through a structured questionnaire, information collected include, the socio-economic characteristics of maize farmers and middlemen, marketing channels in maize marketing, marketing margin and efficiency in maize marketing and the constraints affecting maize farmers in the study area. Two (2) sets of questionnaire were designed for the respondents. One set for the middlemen and the other for farmers producing maize.

III. ANALYTICAL TECHNIQUES

3.1 Descriptive Statistics

Descriptive statistics such as mean, percentages, frequency distribution, tables, range and standard deviations were used to achieve objectives i, and iii.

3.2 Multiple Regression Analysis

The process applied in incorporating some independent variables (X_i's) in order to determine the magnitude and direction of functional relationship between them so as to make statistical inference is known as multiple regression analysis.

The model aimed at determining the level of output produced as dependent variable (Y_i) in the multiple regression analysis. In most cases, the multiple regression model is used as function in order to apply regression analysis establish relationship and predict values of estimated parameters and subsequently make statistical inference.

3.3 The model

Objective ii was achieved using multiple regression analysis. The model is a linear relationship between outputs (Y) and inputs (X_i's), which is expressed explicitly as follows;

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + e$$

Where;

Y	=	Price changes (Naira)
X_1	=	Storage cost (Naira)
X_2	=	Marketing experience (years)
X_3	=	Cleaning (Dummy: 1= if middlemen undertake proper cleaning of maize, 0 = if middlemen do not undertake proper cleaning of maize before selling)
X_4	=	Access to market information (Dummy; 1 = have access to market information, 0 = do not have access to market information)
X_5	=	Transportation cost (Naira)
X_6	=	Purchase price (Naira)
b_1-b_6	=	Coefficients of independent variables
a	=	Constant
e	=	Error term

IV. RESULTS AND DISCUSSIONS

4.1 Socio-Economic Characteristics of Maize Farmers

Objective (i) of the study was aimed at identifying socio-economic-characteristics of the respondents. Socio-economic characteristics that were investigated during the farm survey are those relevant to increasing maize production and marketing in the study area. The result in Table 1 revealed that about 28% of the respondents were within the age class of 19-30, 50% were within the age class of 31-40 constituted majority of the respondents who are in their active production age while 22% of the respondents fall within the age class of 41-50. The findings agree with the work of Yahuza (2012) in the analysis of improved poultry egg marketing system. Odedokun *et al.,* (2013) asserted that the middle age group is the active age range when farmers' performances are more meaningful. It was concluded that the productive age group constitutes 67.4% of the respondents which depends largely on the mental and physical labour productivity of cotton farmers in the study area. Majorities (92%) of the respondents were males and only few (8%) were females. These findings agreed

with the result of Alam *et al., (2013)* that majority (89%) of the respondents were males while about 11% of them were females indicating that there are more males in cotton production than their female counterparts in Taraba state, Nigeria.

Majorities (82%) were married while few (18%) were not married. Odedokun *et al., (2013)* asserted that the implication of large proportion of married farmers is that they will have various family sizes in the household which help in contributing labour input in most farm operations in the traditional setting. Marital status is an indispensable socio-economic factor in agricultural production. Its relevance lies in its contribution to the development of the traditional farming system through adequate supply and utilisation of labour among the farming population to accomplish farm tasks. Also, 44% of the respondents have household size ranging from 1-5, 32% have household size ranging from 6-10, and 12% have family size ranging from 11-15 and are very few. This implies that the farmers need less money as their disposable income, because most of them have small household size that they need to cater for. The study disagreed with the findings of Ismail (2000) in the marketing of maize.

About 30% of respondents have years of farming experience ranging from 1-5 years, while 42% have years of farming experience ranging from 6-10 years, and 22% have years of farming experience ranging from 11-15 years. This implies that 42 of the farmers have experience on farming as such, they know the prospects and problems of maize production which will allow them to find the production profitable. This finding disagreed with the findings of Olusegun, (1997) in the economics of maize production under rain-fed agriculture. Findings in Table 1 reveals that 38% of the respondents had primary education 40% had secondary education and 18% had tertiary education. Abdullahi, (2012) in his study reported that the respondents will be less vulnerable because, majority (96%) were educated,

Table1:Socio-economic characteristics of maize farmers

Occupation	Frequency	Percentage (%)
Farming	50	50
Marketing	50	50
Age range (Years)		
19 – 30	14	28
31 – 40	25	50
41 – 50	11	52
Level of Education		
No formal education	2	4
Attended Primary School	19	38
Completed Secondary School	20	40
Above Secondary Education	9	18
Marital Status		
Married	41	82
Single	8	18
Gender		
Male	45	90
Female	5	10
Farming Experience		
1 – 5 years	15	30
6 – 10 years	21	42
11 – 15 years	11	22
Above 15 years	3	6
Access to Credit Facilities		
Yes	23	46
No	27	54
Extension Contact		
Had extension contact	12	6
Had no extension contact	38	94
Total	**50**	**100**

Furthermore, Table 1 shows that 46% of the respondents had access to credit and 54% had no access to credit facility. This implies that the respondents will have problem with capital acquisition which consequently will also affect the number of farmers that will want to embark on maize production. With respect to extension contact, majority (94%) of the respondents had no extension contact and only (6%) had extension contact. This implies that majority of the farmers have no knowledge of the agricultural innovations that can help them improve on their productivity. Furthermore, some recommended production technological packages are not made readily available to majority of farmers in maize production due to inadequate exposure of farmers to extension contact through extension agents.

4.2 Factors Affecting Price Changes

These are the marketing functions undertaken by the middlemen. The middlemen carryout certain functions to add to the commodity utility either in form, place and time. These are the functions that influence price changes as the product move from the producers to the consumers. These functions include storage, transportation, cleaning, assembling and marketing experience, access to market information and purchase price.

Analysis revealed that marketing experience as a factor was significant in influencing price changes at 1% level of significance, access to market information is also significant at 1% level of significance while purchase price is significant at 10% level of significance. The regression result for factors that influence price changes showed the R^2 value of 51% explained the changes in maize prices as accounted for by the independent variable put together. The coefficient of marketing experience and access to market information were both negative and significant at 1% level of significance implying the decrease in access to market information and marketing experience would lead to decrease in the price of maize. The coefficient of purchase price was positive and significant at 10% level of significance. This implies that increase in purchase price would lead to increase in price of maize.

The coefficient of storage cost, cleanliness and transport cost are positive but not significant, as against the finding of Akarue and Okomunu in the economic analysis of tomato marketing in Ika North local government area of Delta State. This may imply that little amount of money was paid for these marketing functions and most of these marketing functions were done mostly by the children of the marketers or those learning trade under them and most of the marketers are in possession of stores.

Table 2: Factors influencing price changes in maize

S/N	Variables	Coefficient	Standard error	t value
1	Constant	2548.496	408.798	6.234
2	Storage cost	0.471	1.747	0.270
3	Marketing experience	-0.121	0.041	-2.935***
4	Cleanliness	9.091	9.886	0.920
5	Access to market information	-0.378	0.060	-6.358***
6	Transportation cost	0.535	1.388	0.386
7	Purchase price	10.109	3.430	2.947***

$*** = P < 0.01$

Table 3: Test of hypotheses for factors influencing price changes and maize marketing

	Null hypothesis	*Critical value*	*Calculated t − value*	*Decision*
Price Function	$x_2 = 0$	2.4	-2.935^{***}	$RejectH0_1$
	$x_4 = 0$	-	-6.358^{***}	$RejectH0_2$
	$x_6 = 0$	-	2.947^{***}	$RejectH0_3$
	$x_2 = x_4 = x_4 = 0$			

$*** = P < 0.01$

Test of hypothesis for factors influencing price changes and maize marketing

Test of hypotheses for factors influencing price changes were carried out using the result of analysis based on the objective (ii) of the study. The null hypotheses that were stated were with respect to X_2 , X_2 and X_4 that "there is no significant difference in factors influencing price of maize and maize marketing in the study area"; that is, H_0: $H_i = X_i = 0$. H_0: $H_1 = X_2 = X_4 = X_6 = 0$.The result of the analysis shows that the calculated t-values of $-2.935, -6.358$ *and* 2.947 were significant. This implies that the results of

the t

test statistics differ significantly with respect to factors influencing price changes and maize marketing in the study area. Hence, the null hypotheses stated in terms of the variables were rejected. See table 3.

The rejection of null hypotheses have some policy implications that can be deduced when planning for production and marketing of maize. These are closely enshrined with some of the socio-economic characteristics of farmers such as age, experience, educational status enhancing production and marketing improvement in the market conditions and some strategies required in overcoming constraints associated with maize production and planning.

4.3 Farmers Constraints

Survey revealed that, maize farmers in the study area have no enough resources to sustain themselves throughout the year, poverty after careful study and analysis is ranked the fifth problem affecting the respondent about 11% of the population interviewed complained of poverty. Farmers do not have the resources to educate their children and cater for themselves and their families' medical expenses. Most farmers cannot afford hired labour. Fluctuations in price are ranked the third problem affecting maize farmers in Giwa. About 14% of the respondents complained of price fluctuations, prices as a result of fluctuations experience downturn; this usually affects the farmers in the process of marketing and pricing of agricultural produce. Farmers were compelled to sell their produce at the harvest season when prices depreciate. Farmers in Giwa L.G.A were not adequately supported by government. This support could be in form of incentives on inputs such as seed, fertilizers and pesticides. This problem ranked first in terms of effect on farmers' productivity. About 17% of the respondents complained of this problem

Labour in agricultural production has become grossly inadequate and as a result of the massive rural-urban migration taking place in developing countries such Nigeria. This is caused by relatively poor living standard in the rural areas. Giwa was classified as rural area hence hired labourer is not readily available. This constraint was ranked ninth in terms of effect on farmers' productivity while 4.0% of the respondents (farmers) complained of this constraint. Some farmers sell their produce on the farm. They also take market into accounts in order to undertake some marketing functions namely cleaning, threshing and bagging. But they have little or no knowledge about what is happening in the market, this makes them fix low price for their produce compared to the amount the produce are sold in other markets. Therefore, the farmers cannot generate enough income that will enhance savings and investment in the following seasons and little to cater for subsistence and their families. This problem was ranked third in terms of effect on farmers' productivity and 14% of farmers complained of this constraint.

Farmers who have their farmlands proximal to water bodies suffer the problem of water logging, the water goes beyond field capacity, this problem was ranked fourth in terms of effect on farmers' productivity and 12% of farmers complained of this constraint. Also, transportation is one of the marketing functions sometimes undertaken by farmers. The cost of transportation increases with the deregulation of the petroleum sector by the Federal Government. According to MUU (2012) this has placed the farmers in financial difficulty and this had affected significantly profitability in agricultural production as a business. About 8% of the respondents complained of this problem and the problem is ranked eighth among constraints affecting productivity in agricultural production.

Farmers in Giwa have limited access to crucial financial services such as credit. Many farmers want to indulge agricultural production due to endemic shortage of capital, they find it difficult to invest in farming. This problem was ranked second affecting productivity in agricultural production. About 16% of the respondents complained of this problem. Many places in Nigeria have suffered from flooding previous year. MUU, (2012) asserted that this has resulted to serious losses to farmers. In Giwa, the incidence has caused a decline in the overall output of agricultural produce. Almost 12% of the respondents complained of this problem and the constraint ranked fourth among the constraints faced by famers in the area.

Table 4: Distribution of maize Farmers according to their constraints

Constraint	Frequency	Percentage %	Rank
Inadequate government assistance	42	17	1
Inadequate credit facilities	39	16	2
price fluctuations	35	14	3
Flooding	30	12	4
Poverty	28	12	5
Water logging	27	11	6
Inadequate market information	21	8	7
High cost of transportation	19	8	8
Shortage of labour	10	4	9
Total	**251**		

N.B. Multiple response allowed.

V. CONCLUSION AND RECOMMENDATIONS

Marketing activities of middlemen in maize basically centered on transportation and storage, other marketing functions were undertaken by the farmers. Based on above premise, the result obtained from marketing margin and marketing efficiency, we can assert that the activities of middlemen are fairly exploitative.

Based on the findings of this study the following recommendations were proffered.

i. Government should address the problem of access to credit by both farmers and marketers. Most socio-economic attributes of farmers investigated had meaningful bearings on farmers' ability to procure and use inputs to produce and market maize.
ii. Government should provide production facilities that will enhance improvement on farmers' productivity overtime. Provision of inputs at subsidized prices such as seeds, herbicides, fertilizers and pesticides should be put in place so as to help farmers in overcoming various constraints they encounter in production and marketing maize.
iii. Government and Government sponsored community-based agro-support agencies should look into establishing statutory commodity exchange board so as to stabilize prices and improving the conditions of markets particularly markets for agricultural commodities in planning for investment and marketing.

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