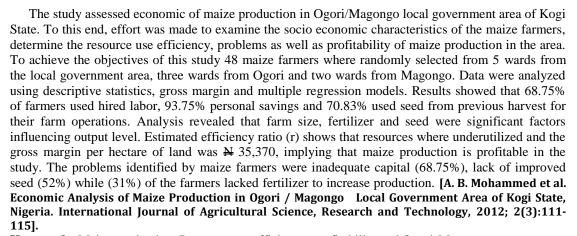# Economic Analysis of Maize Production in Ogori Magongo Local Government Area of Kogi State, Nigeria

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The study assessed economic of maize production in Ogori/Magongo local government area of Kogi State. To this end, effort was made to examine the socio economic characteristics of the maize farmers, determine the resource use efficiency, problems as well as profitability of maize production in the area. To achieve the objectives of this study 48 maize farmers where randomly selected from 5 wards from the local government area, three wards from Ogori and two wards from Magongo. Data were analyzed using descriptive statistics, gross margin and multiple regression models. Results showed that 68.75% of farmers used hired labor, 93.75% personal savings and 70.83% used seed from previous harvest for their farm operations. Analysis revealed that farm size, fertilizer and seed were significant factors influencing output level. Estimated efficiency ratio (r) shows that resources where underutilized and the gross margin per hectare of land was ₦ 35,370, implying that maize production is profitable in the study. The problems identified by maize farmers were inadequate capital (68.75%), lack of improved seed (52%) while (31%) of the farmers lacked fertilizer to increase production. **[A. B. Mohammed et al. Economic Analysis of Maize Production in Ogori / Magongo   Local Government Area of Kogi State, Nigeria. International Journal of Agricultural Science, Research and Technology, 2012; 2(3):111-115].**

Key words: Maize production, Resource use efficiency, profitability and Ogori-Mangogo

Abstract

1. Introduction

Maize (*Zea mays*) it is also known as corn, it belongs to the family of Graminea which has many characteristics common to other grasses. It is a cereal crop which produces grain that can be used as food for human being as well as animals. Maize is highly yielding, easy to produce readily digested and cheaper than other cereal. It is also a versatile crop, allowing it to grow across a range of agro ecological zones (IITA, 2001). It is an important source of carbohydrate and if eaten in the immature state, provides useful quantities of Vitamin A and C. Maize thrives best in a warm climate and is now grown in most of the countries that have suitable climatic conditions. Every parts of the maize plant has economical valve. The grain, leaves, stalks, tassel and cob can all be used to produce large varieties of food and non-food products. Maize is a stable food crop for most sub-saharan Africans of which Nigeria is inclusive with per capita kg year of 40 (FOA, 2003). In Nigeria maize is the third most important cereal crop after sorghum and millet (Ojo, 2000).Maize have played a central role in the life of people of Nigeria, over the years, it is the most highly consumed grain and it accounts for two-third of the calorific intake and grown by large proportion of Nigeria households.

Its utilization is in three principal ways as human foods, feed for livestock and industrial usage Maize as a cereal crop supplied approximately 65% carbohydrate as the major component. It is rich in carbohydrate, protein, mineral and vitamin b (Iken et al 2002). Maize can be used in making diesel, industries also make use of maize for the production of items such as semovita, maize flour, custard and it is also used as animal feed and as raw material for brewing beer and for producing starch (IITA, 2008).

Maize kernels' can also be used in place of sand in a sand box like enclosure for children's play, (Wikipedia 2007). As a very important staple food for millions of Nigerians and residents of West Africa, maize is one of the two major crops covering about 40% of the area under agricultural production, and its production accounts for 43% of maize grown in West Africa (Smith et al., 1997; Phillip, 2001; Iken and Amusa, 2004; McCann, 2005). Maize production therefore has strategic importance for food security and the socio-economic stability of countries and sub regions in sub Saharan Africa, including Nigeria. In Nigeria, maize is among the most important crops, but poor seed supply, inefficient marketing system, and low investment in research are among the factors that have limited production. Current production is about 8 million tons but the research, which involved

more than 1000 farmers, raised yield per hectare to about 4.2 tons from 1.5 tons, suggesting that national production could hit 20 million tons if the recommendations are scaled-up. The demand for maize as a result of various domestic uses shows that a domestic demand of 3.5 million metric tons outstrips supply production of 2 million metric tons (Akindele, 1994). Notable problems of maize production include inappropriate decision on how best to allocate resources, inadequate use of corresponding production inputs and inadequate adoption of improved technologies by farmers. Also farmers might use resources rationally but not at economic optimal level. All these contribute to inefficiency. Effort aimed at increasing maize output cannot be achieved unless the current level of inputs utilization is scaled up. Despite human and material resources devoted to agriculture, the productive efficiency of most crops maize inclusive still fall under 60 percent (Fakayode et al., 2008). Farmers output needs to be increased using existing inputs and technology. Therefore, it is proper to estimate resource use efficiency and profitability of maize production in Ogori/Mangogo Local Government Area of Kogi State. Thus the specific objectives of the study are to describe the socio economic characteristics of maize farmers, determine the level of profitability of maize production as well as examine the production function and resource use efficiency of maize production in the area.

2. Materials and methods
This study was carried out in Ogori/Magongo Local Government area of Kogi State, the Local Government was created by federal government of Nigeria from the present Okene Local Government Area and was created in the year 1996.The local Government Area consist of two villages which are Ogori and magongo and the main dialect spoken by the Ogorians is oko while Magongos speaks Osayin, other languages been spoken in Ogori/Magongo are English, Yoruba, Hausa, and Ebira The Local Government is located in the middle part of the state and shears boundary with Edo state with village and town like Osoroto Eastern part of the local government area, Ekpe and Bokuma to the south. To the north, it share boundary with Okene local Government area. The study area has estimate population of five hundred and fifty seven thousand people (557,000) according to population census in (2006).

Ogori Magongo local government area is known to have tropical savannah climate with distinct wet and dry season. The wet season ranges between the month of April and October while the dry season ranges between November and March. The main annual temperature varies between 27^0C and 37^0C. The relative humidity is similarly variable, ranging between 30and 40% in January and rising to between 70 and 80% in July and August. The soil in the study area is pre-dominantly clay loam in texture. The major crops grown are maize, cocoyam, cassava, sorghum, plantain, tomatoes, sweet potatoes etc. The major occupation of inhabitants of the people in this area is mainly farming with few people engaged in trading. The data used for this study was obtained from primary sources. The sampling frame of maize farmers in the study area is about 250. However 100 of these farmers are basically into maize production. Primary data were obtained through the use of questionnaire, administered to 50 respondents out of the 100 maize farmers. Random sampling technique was used to select farmer in the study area. This involved getting the list of the wards engaged in maize production. There are 10 wards all together in ogori-magongo, 6 wards in Ogori and 4 wards in Magongo. To this end Five (5) wards were purposively selected from the local government area, because of the population of the maize farmers in the wards and the numbers of wards in each of the villages that constitute the Local Government Area. Three (3) wards from Ogori and two wards from Magongo, (10) questionnaires each were randomly distributed to the farmers in each ward making a total number of fifty (50) questionnaires. However, forty eight (48) of the questionnaires were returned and found useful for analysis.

Descriptive statistics and inferential statistics were used to analyze the data. The descriptive statistics involved the use of frequency distribution, percentages and means, while the inferential statistics includes multiple regression (Cob-Douglas) and gross margin analysis.
The model are specified as
$Y = F(X_1, X_2, X_3, X_4, U)$
Where,
Y = Maize output (kg)
X_1 = Farm Size (ha)
X_2 = Labor (man-day's)
X_3 = Quantity of fertilizer (kg)
X_4 = Quantity of seed (kg)
U = Error term
GM = TR – TVC
Where,
GM = Gross margin (₦/ha)
TR = Total revenue (₦/ha)
TVC = Total variable cost (₦/ha)

3. Results and discussion
Table 1 reveals that there were no farmers younger than 21 years or older than 50 years in the study area. All the farmers were between 21-50 years

which constitute 100% of the farmers implying that able bodied and active men were involved in maize production. The study revealed that 60.42% of the farmers had no formal education while none had secondary education implying that most of them are illiterate which would have implication on record keeping and adoption of improved technology thus having a negative effect on maize production in the study area. Majority of the farmers 93.75% were male while 6.25% were female implying that maize production in the study area is male dominated. This also suggests that most women were engaged in domestic chores while their husbands engage in maize production to provide income to meet family needs. Results on the distribution of respondent according to family size revealed that the study area is dominated by family size ranging from 2-5 persons implying small family size which could have a negative effect on labor cost and profitability of maize production.

Results on farm size shows that majority of the farmers 95.55% cultivate less than 2 hectares implying that they are small scale farmers and maize production is basically for household consumption. Further analysis revealed that most of the farmers sourced capital from their personal savings and also sourced their seeds from previous harvest this could have a negative effect on maize production in the study area in terms of productivity and yield.

The production function that was used to determine the nature of inputs- outputs relationship is shown in table 2 (Cobb- Douglas production function) the estimated coefficients were further used in computing the resource use efficiency. Table 2 indicates that the coefficient of multiple determinations (R^2) was 0.99 implying that about 99% of the variation in the output of maize could be explained by the inputs indicated by the significant F-ratio.

The regression coefficient of farm land (x_1), fertilizer (x_3), and seed(x_4) were significant at 1 % level of probability indicating that a unit increase in land , fertilizer and seed would bring about 6.88%,4.4% and 19.69% increase in output respectively, this implies that, these inputs positively influence output.

Efficiency ratio was computed for each input by comparing the Marginal Value Product (MVP) to its Marginal Factor Cost (MFC) as shown in table 3.

Analysis of resource use efficiency in table 3 shows that land, fertilizer and seed were under utilized by the farmers based on their efficiency ratio which was greater than 1 .Result further revealed that resource use efficiency of labor input was less than one suggesting that labor was over utilized by the

farmers this can be attributed to the high cost of hired labor incurred. However the overall implication of this finding is that resources were not efficiently utilized.

Table 1. Socio-Economic characteristics of the respondents in the study Area

Variables	f	%
Age(Yrs)		
21-35	40	83.33
36-50	8	16.67
Total	48	100
Gender		
Male	45	93.75
Female	3	6.25
Total	48	100
Level of education (Yrs)		
No formal education	29	60.42
Primary education	8	16.67
Secondary education	-	-
Adult education	11	22.91
Family size (Num)		
2-5	39	81.25
6-10	6	12.5
10-15	3	6.25
Total	48	100
Farm size(Num)		
1-2	46	95.55
2-3	2	4.17
Total	48	100
Land acquisition		
Bought	2	4.17
Gift	4	8.33
Inherited	40	83.33
Leased	2	4.17
Total	48	100
Source of Capital		
Cooperatives	1	2.08
Banks	2	4.17
Personal Savings	45	93.75
Total	48	100
Source of labor		
Family labor	10	20.83
Hired labor	33	68.75
Tractor	5	10.41
Total	48	100
Source of seed		
Previous harvest	34	70.83
Local Market	11	22.91
ADP	3	6.25
Total	48	100

Table 2. Estimates of Cobb-Douglas production function for maize.

Independent variables	B	T ratios	Sig
Land (x_1)	6.88	13.23***	0.000
Labour (x_2)	-0.19	-0.49	0.643
Fertilizer (x_3)	4.4	4.34***	0.000
Seed (x_4)	19,69	5.38***	0.000
Constant	34.48		
R^2	0.985		
F ratio	1258 38		

*** = significant at 1% level

Table 3. Estimated Efficiency Ratio

Variables	MVP	MFC	Efficiency
Land (x1)	18005	8333	2.16
Labor (x2)	-291.2	396	-0.74
Fertilizer (x3)	2220	700	3.17
Seed (x4)	2362	200	11.81

Table 4. Cost and Returns of Maize Production

Cost	Cost ₦ /ha	% Cost
Labor	35107	78.26
Fertilizer	8750	19.51
Seed	1000	2.23
TVC	44857	
Gross income	64525	
Gross margin	19668	
Returns to investment	0.43	

Table 5. Problems Encountered in Maize Production

Problem encountered	Frequency
Theft	14
Lack of capital	33
Lack of fertilizer	15
Poor market	12
Lack of improved seed	25

Table 5 represents the various problems associated with maize production by farmers in the study area. Results revealed that 33 person of farmers lacked adequate capital to finance maize production.

Table 4 shows that the cost per hectare was ₦ 44,857. The study showed that a higher proportion of the cost was incurred on labor. The total revenue realized through the sale of maize output was ₦ 64,525. The Gross margin per hectare was ₦ 19,688 suggesting that maize is profitable in the area. Further analysis on the return on investment showed that maize has a profitability index of 0.43 indicating that the farmers earn 0.43 on every naira invested into production .The implication of this finding is that maize production is profitable in the study area with about 43% turn over on investment, however there is

room for improvement if resources used in the production are efficiently utilized.

4. Conclusion and Recommendations

This study revealed that farmers in the study area have small holdings. Land, Fertilizer and Seed were the main factors influencing output of maize in the study area. The profitability level of production was relatively low. However an appreciable increase in output/returns can be achieved if the available resources are judiciously utilized by the farmers. Land, fertilizer and seed were under utilized as such there is need to increase this resources appreciably to achieve efficiency and profitability. The major constraints of maize production in the study area are lack of capital and improved seed. This study is in line with the findings of Adebayo (2001) who reported that land, fertilizer and seed were underutilized. This study also disagrees with the findings of Ayanlere *et.al* (2012) which identified maize production to be economically profitable.

Recommendation
Fertilizer, improved seed varieties should be made available by Government at subsidized rate to the farmers.

Extension service should be adequately strengthened to deliver improved techniques for the farmers.

Adult education classes should be provided so that the essence of extension service wouldn't be defeated as most of the farmers in the study area are illiterate.

loans should also be made available to the farmers with low interest this would go a long way in improving productivity and profitability as most depend on personal savings for production, which most of the time is insufficient.

Finally a vigilante group should be formed among the farmers in the form of community service at no cost, to curb the incidence of theft among maize farmers in the study area.

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