



## Research Article

### Economics of Maize Production in Oyi Local Government, Anambra State, Nigeria

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#### ABSTRACT

The study investigated the economics of maize production in Oyi local government Area of Anambra State. Purposive and simple random methods were used to select 60 respondents. Data were collected using structured questionnaire and personal interview, and analyzed using descriptive statistics, gross margin analysis and cost benefit ratio. The specific objectives were to identify the socio-economic characteristics, determined the farming practices adopted by the farmers, evaluated the cost and return and constraints to maize production. Findings on socio-economic characteristics showed that the mean age of the respondents was 62.15, female dominance, majority married, mean family size of 5 persons, education attainment was 80%, mean (M) farm size was 0.8 hectare, mean farming experience was 11.0 years and 73.4% obtained their credit for take-off in maize production through personal savings. The findings also revealed that 73.3% of the framers acquired their land through inheritance and 75% adopted mono-cropping system. On profitability of the production, the enterprise proved profitable with farmers returning on the average 94 kobo for every 100 kobo invested in the business. The most perceived constraints were inadequate extension services, pests and diseases infestation, and lack of credit facilities among others.

**Key words:** Maize, Production, Profitability, Determinants.

#### INTRODUCTION

Maize is a cereal crop that is grown widely throughout the world in a range of agro ecological environments due to its versatility (IITA, 2001). Maize is the most important cereal crop in sub-Saharan Africa, a staple food for an estimated 50% of the population as an important source of carbohydrate, protein, iron, vitamin B and Minerals. Maize is mostly grown by small-scale farmers, generally for subsistence as a part of mixed agricultural system (FAO, 2005; Nkamigbo, Atiri, Gbughemobi and Obiekwe, 2015). Maize has now risen to a commercial crop providing raw materials to agro-based industries (Iken and Amusa, 2004). It is useful in alternative medicine, chemicals, biofuel and ornamentals etc. It is a major source of cooking oil (corn oil) and glutens, maize starch can be hydrolyzed and enzymatically treated to produce syrups, particularly high fructose corn-syrup, a sweater, and also fermented and distilled to produce grain alcohol for whiskey production

and as the starch source for beer. It is equally used for production of dough ball and fish bait (Ozor, 2017).

In Nigeria, maize is the third most important cereal crop after sorghum and millet. 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 (Ojo, 2000). Its consumption accounts for about 645 of the total calorie intake of rural dwellers crop during the hunger time Ugwumba (2009). 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 (Iken and Amusa, 2004). United States Department of Agriculture (2015) stated that United States produced 345,486 metric tonnes of maize as the leading world producer of maize followed by China and Brazil with 224,580 and 81,500 metric tonnes respectively. Africa imports 28% of the required maize from countries outside the continent (International

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Institute of Tropical Agriculture, 2009). FAO (2007) estimated that 158 million hectares of maize are harvested worldwide. Africa harvests 29 million hectares, with Nigeria being the highest producer in Sub-Sahara Africa, harvesting about 3% followed by Tanzania. Ozor (2017) stated that maize production in Nigeria was 7.1 million tonnes and that the contribution of maize to the Gross Domestic Product (GDP) is still low. Mohammed, Anyanlere, Ibrahim and Lawal (2013) stated that current production of maize is about 8 million tonnes but the research, which involved more than 1000 farmers, raised yield per hectare to about 4.2 tonnes from 1.5 tonnes, suggesting that national production could hit 20 million tonnes 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 tonnes outstrips supply production of 2 million metric tonnes.

## MATERIALS AND METHODS

The study was carried out in Oyi Local Government Area, one of the 21 Local Government Areas of Anambra State, Nigeria with 5 communities namely Nteje (the Headquarters), Awkuzu, Umunya, Ogbunike and Nkwelle-Ezunaka. It has a population of about 126,465, 1500 mm to 2200 mm annual rain fall and 27-28°C temperature, NPC (2006). The targeted population was maize farmers. Purposive and simple random sampling techniques were used to select sixty (60) maize farmers. Four communities, namely, Nteje, Awkuzu, Umunya, and Ogbunike were purposively selected due to high maize production activities in the areas. Fifteen (15) maize farmers each from the selected communities were selected using simple random sampling technique. This gave a total of sixty (60) respondents that formed the sample size for the study.

### Method of data collection

The data were subjected to descriptive and inferential analysis- mean, standard deviation, percentages, frequency distribution, benefit cost ratio and net farm income analysis.

### Gross margin and net income analysis

The method of cost and return technique that was used in determining profitability of the enterprise was given as;

$$\begin{aligned} \text{GM} &= \text{TR} - \text{TVC} \\ \text{NFI} &= \text{GM} - \text{TFC} \text{ OR } \text{TR} - \text{TC} \\ \text{NROI} &= \text{NFI} / \text{TC} \end{aligned}$$

Where:

GM = Gross Margin  
TR = Total Revenue  
TVC = Total variable cost  
TFC = Total fixed cost  
TC = Total cost  
NFI = Net farm income (profit)  
NROI = Net return on investment

The benefit cost ratio used by Oladejo and Oladiran (2014) is states as:

Total revenue (TR) = Price x quantity of the product sold  
Total cost (TC) = Total cost TVC) + Total fixed cost (TFC)  
Gross margin (GM) = Total revenue- total variable  
Profit (net return) = Gross margin – total fixed cost.

$$\text{Benefit Cost Ratio, BCR} = \frac{\sum \text{TR}}{\sum \text{TC}}$$

If BCR > 1 then the business is profitable  
If BCR < 1, the business is running at a risk

## RESULTS AND DISCUSSION

### Socio-economic characteristics of maize farmers

Socio-economic characteristics in Table 1 indicate that more females 70% participate in maize farming than male. Women involvement in the production of maize in the study area was mainly targeted at improving the poor economic conditions of their households. This is at variance with Nkamigbo *et al.* (2015) who stated that maize production in Osun State is dominated by male. The average mean age was 62.15 indicating that majority of the farmers were below the age of 60 years. This agrees with Nkamigbo, Ovuomarie, Inoni, Isibor and Mmaduka (2014) that the farmers are relatively young people and energetic. Majority of the farmers (85%) were married, the data showed that the family size ranges from 1-5 persons implying that small family size could have a negative effect on labour cost and profitability to maize production. Family or household size of respondents is of great value in maize production as it influences the amount of labour available for the farming activities. This signifies that low family size require a lot of hired labour to supplement the insufficient family labour. This result signifies that most of the respondents had acquired one form of formal education or the other and would readily adopt innovations to improve their productivity. The distribution of the respondents by level of farming experience shows that majority (60%) of the farmers had from 1–10 years of farming experience, it is expected that a high level of farming experience bears positively on the farmers' efficiency and productivity.

### Farming practices/systems of the study area

Table 2 reveals the various farming systems in the study area. The analysis showed that about 73.3% of the respondents acquired land through inheritance, (60%) of the farmers had from 0.6 – 1.0 hectare. Cropping pattern system reveals that about 75% of the farmers adopted mono-cropping system, 85% adopted use of ridges while 70% made use of inorganic fertilizer and 95% harvested their crops manually.

### Profitability analysis of maize production in the study area

The analysis of profitability of maize production using enterprise budgeting and Benefit cost ratio is shown in Table 3. Total revenue from maize production was N9, 335,365 while the total variable costs constitute a major portion (66.7%) of the total cost of production of maize in the area. The cost of labour (33.33%), fertilizer at 16.67%, least annual depreciation value of hoe (6.23%) while the total fixed cost was 33.3%.

**Table 1:** Percentage distribution of respondents according to their Socio-Economic characteristic.

Socio-economic variables	Frequency (n=60)	Percentage (%)	Mean (M)
<b>Gender</b>			
Male	18	30.0	
Female	42	70.0	
<b>Age</b>			
Less than 30	3	5.0	
31 – 40	12	20.0	
41 – 50	27	45.0	62.15
51 – 60	18	30.0	
<b>Marital status</b>			
Married	51	85.0	
Widowed	6	10.0	
Single	3	5.0	
<b>Family size</b>			
1-5	39	65.0	
6 -10	18	30.0	5.00
11-15	3	5.0	
<b>Educational level</b>			
No primary education	12	20.0	
Primary education	27	45.0	
Secondary education	15	25.0	
Tertiary education	6	10.0	
<b>Years of experience in farming</b>			
1-10	36	60.0	
11- 20	18	30.0	
21-30	3	5.0	11.00
31-40	3	5.0	
<b>Type of occupation</b>			
Full time farming	39	65.0	
Part time farming	21	35.0	
<b>Source of fund</b>			
Personal savings	44	73.4	
Friends and family	13	21.7	
Agricultural bank	1	1.7	
Micro-finance bank	2	3.2	

Source: Field Survey, 2017.

**Table 2:** Distribution of respondents according to their farming practices/systems adopted.

Farming System	Frequency (n=60)	Percentage %	Mean (M)
<b>Mode of land acquisition</b>			
Inheritance	44	73.3	
Gift	9	15.0	
Leased	7	11.7	
<b>Farm Size</b>			
0.1-0.5	15	25.0	
0.6 -1.0	36	60.0	0.8
1.1 – 1.5	9	15.0	
<b>Land Preparation:</b>			
Ridges	51	85.0	
Flat	3	5.0	
Zero tillage	6	1.0	
<b>Cropping System adopted:</b>			
Mono-cropping	45	75.0	
Mix –cropping	15	25.0	
<b>Fertilization:</b>			
Organic fertilizer	18	30.0	
Inorganic fertilizer	42	70.0	
<b>Harvesting:</b>			
Manual	57	95.0	
Mechanical	3	5.0	

Source: Field Survey, 2017.

**Table 3:** Estimated profit per 0.5 hectares of maize production in the study area (n=60).

Variables	Amount	Percentage
Total Revenue	₦9,335,365	
<b>Variable costs (VC)</b>		
Maize seed	₦300,000	6.25
Cost of labour	₦1,600,150	33.33
Fertilizer	₦800, 075	16.67
Agrochemicals	₦500, 075	10.41
Total Variables Cost	₦3, 200, 300	66.7
<b>Fixed Cost (FC)</b>		
Machete	₦500, 950	10.44
Wheel barrow	₦800, 150	16.66
Hoe	₦299, 050	6.23
Total Fixed Cost (TFC)	₦1, 600,150	33.3
Total cost (TVC + TFC)	₦4, 800, 450	100
Gross Margin (TR – TVC)	₦6, 135,065	
NFI (TR – TC)	₦4, 534, 915	
NROI (NFI/TC)	0.94.	

Source: Field Survey, 2017.

Also, the analysis of profitability of maize production using Benefit Cost Ratio is shown below.

$$\text{Benefit Cost Ratio (BCR)} = \frac{\text{Total Revenue}}{\text{Total Market Cost}} = \frac{9,335,365}{4,800,450} = 1.9$$

BCR > 1 = Profitable

From the result of the analysis, maize production in the study area with BCR> 1 is an indicator that the business is a profitable venture.

**Table 4:** Distribution of respondents according to problems of maize production in the study area

Inadequate extension services	2.8	1 <sup>st</sup>
Pest and diseases infestation	2.6	2 <sup>nd</sup>
Lack of credit facilities	2.1	3 <sup>rd</sup>
Poor storage facilities	2.0	4 <sup>th</sup>
Lack of information of modern technique	1.8	5 <sup>th</sup>
High cost of input	1.6	6 <sup>th</sup>
Poor yield	1.5	7 <sup>th</sup>
High cost of maize seed	1.4	8 <sup>th</sup>
Lack of fertilizer	1.3	9 <sup>th</sup>
High cost of transportation	1.3	10 <sup>th</sup>
Poor weather condition	1.2	11 <sup>th</sup>
Poor sales	1.1	12 <sup>th</sup>
Scarcity of maize seed	1.0	13 <sup>th</sup>

Source: Field Source, 2017.

The analysis further revealed that gross margin; net farm income and net return on investment were of N 6, 135,065, N 4, 534,915 and 0.94 respectively. This implied that for every 100 kobo invested in the production 94 kobo was gained. This agrees with Okeke and Nkamigbo (2013) that reported 67 kobo net returns to investment from their study area. The implication of this is that maize production in the study area is a profitable venture.

### Constraints of maize production in the study area

The constraints to maize production were shown in Table 4. Inadequate extension service, pest and diseases infestation, lack of credit facilities and poor storage facilities were perceived as the most serious with high mean scores of 2.8, 2.6, 2.1 and 2.0 respectively. Further result of the analysis indicated that lack of information on modern farming technique, high cost of input, poor yield,

high cost of maize seed, lack of fertilizer, high cost of transportation; poor weather condition, poor sales and scarcity of maize seed also affect maize production.

### Conclusion

Based on the findings, the following conclusions were arrived at: Maize production in the study area is dominated by women. The farmers are relatively young and energetic. Maize production in the study area is profitable with a gross margin and net return on investment of N6, 135,065 and 0.94 respectively. Maize production in the study area is faced with some serious problems such as post-harvest, incentives, and logistics. Efforts should be geared towards making maize production more viable and lucrative in the study area. This could be done by broadening extension education and services. This would provide solutions to bad management practices and the use of poor quality inputs. The farmers should form co-operative among themselves to easily access incentives from government. Government should engage the services of extension officers and mass media to disseminate information on modern maize production techniques and technologies.

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