



Economic Analysis of Maize (*Zea Mays*) Production among Smallholder Farmers in Awka South Local Government Area, Anambra State, Nigeria

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ABSTRACT

The study on the economic analysis of Maize production among smallholder farmers in Awka South Local Government Area, Anambra State, examined the socio-economic characteristics of maize producers and estimated the cost and returns of maize production. A structured questionnaire was used to collect data from a random sample of 100 maize producers. The study employed various analytical techniques, including descriptive statistics, and budgetary analysis. The socio-economic characteristics of maize producers revealed a male-dominated sector (67.0% male, 33.0% female), with farmers predominantly aged 41 and above, married, and possessing tertiary education. Farming experience averaged 11.60 years, and cooperative association membership was prevalent (73.0%). The majority had small farm sizes (51.0% with 0-0.50 hectares). The estimation of costs and returns demonstrated a positive financial outcome, with a gross margin of ₦2,621,923.66 and a net return of ₦2,533,977.99, indicating profitability in maize production. The study recommended to address challenges is to focus on improving access to capital for smallholder farmers.

Keywords: Economic, Analysis, Small Holder, Farmers, Production

INTRODUCTION

Agriculture plays a significant role in rural development, provides about 80% of the nation's required food for the growing population and terminates war against hunger and poverty [1]. Maize is one of the most important crop grown, followed by sorghum and millet and highly productive, cheap, and less rigorous to produce [2]. Maize (*Zea mays*), also known as corn in Nigeria, Ghana, North American and Australian English, is a tall stout grass that produces cereal grain, it is also an annual plant belonging to the grass family gramineae [2]. It originated from South and Central America and was introduced to West Africa by the Portuguese in the 10th century [3]. The leafy stalk of the plant gives rise to male inflorescences or tassels which produce pollen, and female inflorescences called ears with varieties that are usually yellow or white; other varieties can be of many colors [4]. Maize plants typically range from 6 to 12 feet (1.8 to 3.7 meters) tall at maturity, some varieties can grow even taller under optimal conditions). Maize can be classified according to the structure of the grain such as sweet corn, flint corn, popcorn, dent corn, soft or flour corn and waxy corn [4]. Maize is a cereal crop that is grown widely throughout the world in a range of agro ecological environments due to its versatility [5]. 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 [6]. Maize has now risen to a commercial crop providing raw materials to agro-based industries. 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 sweeter, and also fermented and distilled to produce grain alcohol for whiskey production [7]. Despite all the studies on maize production none of these studies have been able to establish the fact that maize production is profitable in Awka South Local Government Area of Anambra State. It is this gap that the study seeks to fill by focusing on the economic analysis

of maize production in Awka South Local Government Area. The broad objective of this study was to analyze the economics of maize production in Awka South Local Government Area of Anambra State. However, the specific objectives were to: describe the socio-economic characteristics of maize producers and estimate the costs and returns associated with maize production.

LITERATURE REVIEW

Concept of Maize Production

The demand for maize within the country is high, with supply struggling to meet demand. This has hampered the status of this crop as a foreign exchange earner. Over the years, maize has become an important crop, taking over acreages from traditional crops such as millet and sorghum. In 2018, about 10.2 million tons of maize was produced from 4.8 million hectares, making Nigeria the highest producer in Africa [8]. Maize has a variety of uses and its grain is a rich source of starch, vitamins, proteins and minerals [10]. The starch extracted from maize grain is used in making confectionary and noodles, and corn syrup from maize contains high fructose and act as sweetener and retains moisture when added to certain foods [10]. Plastic and fabrics can be made from corn stocks, ethanol obtained from maize can be used as a biomass fuel. Stigmas from female corn-flowers, known as corn silk, can be used as herbal supplements [10]. Maize straw can be used as a cheap source of energy in home-heating furnaces, maize can be used as forage, feed for livestock and making silage after fermentation of corn stocks. Maize is used extensively as the main source of calories in animal feeding and feed formulation, maize gives the highest conversion of dry substance to meat, milk and eggs compared with other cereal grains as is a valuable feed grain, because it is among the highest in net energy content and lowest in protein and fibre content. Maize grains that can be cooked, roasted, fried, ground, pounded or crushed to prepare various food items like pap, 'tuwo' 'gwate', 'dokunnu' and host of others [11]. Apart from food, maize is also useful as medicines and as raw materials for industries, it also serves as a source of revenue for many people and as raw material for industries producing value-added products in many parts of Nigeria [7]. Maize occupies a strategic role in rapid food production, being an annual crop with a short gestation period [11]. The major harvest comes in the raining season (April to June), when most other starchy staples are available for harvest. One of the advantages of maize cultivation is that it does not require the use of heavy and costly farm machinery.

Theory of Production

The production theory is the economic process that describes how certain specific inputs are combined to produce a given number of outputs. It deals with the question of 'how to produce'. It explains explicitly, how a firm chooses the optimum factor combination either to minimize the cost of production for a given level of output or to maximize the level of output for a given cost of input. It explains the principles by which a farmer decides how much of each commodity is to be sold (its "outputs" or "products") or produced, and how much of fixed capital goods, labor, raw material, etc. (its "inputs" or "factors of production") that will be put to use. The framework enveloping this theory, begins from the maize farmer, making decisions on the capital, labor and raw materials to be utilized in the farming activities; whether or not to utilize purchased labor or make the use of self-labor, the amount of capital to be invested into the farming Enterprise; the source of capital (personal savings, gifts or loans from banks), the skills, talents and creativity inherent in the owner of the enterprise or the labor to be employed or currently employed, among others. These decisions shape the position of inputs to be utilized and quantity of output to be returned. In this way, the plantain farmer can vary the level and composition of his or her farm inputs and outputs [11]. In applicable sense, maize farmers have a variety of goals ranging from, production of maize species that are of high yield and demand, generating more revenue. In achieving these, the maize farmers must add the commensurate level of input so as to get a high level of output.

METHODOLOGY

Research Design

This study employed Survey Research Design.

Area of the study

Awka south is a Local Government Area (LGA) in Anambra State, is situated in the southeastern part of Nigeria, within the coordinates of latitude 6° 12' N and longitude 7° 4' E. It shares boundaries with other LGAs such as Awka North, Aguata, Njikoka, and Orumba North. The communities in this LGA are made up of nine towns, namely, Amawbia, Awka, Ezinato, Isiagu, Mbaukwu, Nibo, Nise, Okpuno and Umuawulu. The LGA features two distinct seasons which are the dry season and rainy season with annual rainfall between 1300-3000mm thereby making the climate of Awka South tropical humid. The area is characterized by high temperature, rainfall and humidity. The area has a humidity of 70 percent while the average temperature is put at 27 degrees centigrade. The topography of the area varies from flat to undulating terrain, with the presence of rivers and streams, including the Anambra River, which traverses the region. The population of Awka South LGA comprises diverse ethnic groups, with the Igbo ethnic group predominating. The population density is relatively high, with both urban and rural settlements

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scattered across the area. Key urban centers within the LGA include Awka, the capital city of Anambra State, and various suburban areas experiencing rapid population growth due to urbanization and migration.

Population of the study

The study was comprised of all registered maize farmers (1,140) in the study area.

Sampling Technique and Sample Size

Multistage sampling procedure was used in selecting respondent for study. **In the first stage**, Awka south local government area was purposively selected because of the dominance of maize producers. **In the second stage**, 5 (five) communities (Awka, Amawbia, Okpuno, Nibo and Nise) were randomly selected from the local government area. **In the third stage**, from each of the selected 5 (five) communities, 20 maize farmers was randomly selected. This gave a total of 100 maize farmers that were selected for the study.

RESULTS AND DISCUSSIONS

Socioeconomic Characteristics of Maize Producers

The information about the socioeconomic characteristics of maize producers in the study area were presented in Table 1.

Sex: the study revealed that the majority (67.0%) of maize producers are male, while 33.0% are female. This is an indication that maize farming in the area is male male-dominated enterprise. This agreed with [11], were of the view that maize producers in were majorly male-dominated. This could be due to the fact that men are stronger, more active and have the potential to work for longer hours on the farm than their women.

Age: The age distribution shows that 30.0% of maize producers are between 21-40 years old, with a mean age of 47.77% are between 41-60 years old, 44.0% are above 60 years old, and only 3.0% are less than 20 years old, this indicates that maize farmers are still in their active farming age and can adopt in any new technology. This study correlates with [6] in their study who reported that the average age of the respondents was 39.15 years which implies that the majority of respondents were within their energetic age bracket and could afford to engage in production. **Marital Status:** The majority (65.0%) of maize producers are married, while 23.0% are widows/widowers, 12.0% are single, and none are reported as divorced. This suggests that married farmers dominated that enterprise. **Level of Education:** The educational background of maize producers varies, 13.0% have primary education (F.S.L.C), 30.0% have secondary education (WAEC/GCE/NECO), 41.0% have tertiary education (OND/HND/Degree), and the last 16.0% have postgraduate education. The fact that the majority of them had tertiary education is an indication that maize production rests in the hands of literate farmers. The findings was in agreement with that of [6], who stated that majority of the respondents had one form of formal education or the other in crop production.

Farming Experience (years): The majority of maize producers (32.0%) have 11-15 years of farming experience, with a mean experience of 11.60 years. Again, 30.0% have 16 years and above of farming experience, 20.0% have less than 6 years of experience, and 18.0% have 6-10 years of experience. The farmers have acquired over a decade of experience in the enterprise, which tells more of their expertise. This is in line with findings of [12] who reported that the average farming experience of small holder farmers were 10 years and above.

Household Size: The distribution of household sizes is fairly even, with 32.0% having less than 6 members, 48.0% having 6-10 members, and 20.0% having 11 members and above. The mean household size is 7.96 which is large enough to supply cheap family labour for the enterprise. This is in agreement with [12], who reported that the larger the family size the more advantage in terms of labour distribution, when task are allocated according to individual's strength and skill production is completed more effectively.

Cooperation Association: A significant majority (73.0%) of maize producers are part of a cooperation association and the last 27.0% are members. Only the last 27.0% will enjoy some benefits of the cooperative association.

Number of Extension Visits: The majority of maize producers (58.0%) have 0-3 extension visits, while 32% have 4-6 visits, and the last 10.0% have over 6 contacts. The average number of extension contacts was 3.07. This contradicts the findings of [13], who reported that civil unrest can affect the movement of trainers and trainees in the south east. **Major Occupation:** 47.0% of maize producers list farming as their major occupation. More so; 32.0% are involved in trading, 17.0% are civil servants, and the last 4.0% have other occupations. [14], reported that in Nigeria there are diversification especially among the small holder farmers. **Farm Size (Hectare):** The majority (51.0%) of maize producers have a farm size of 0 - 0.50 hectares, 19.0% have a farm size of 0.51 - 1.00 hectares, 23.0% have a farm size of 1.01 - 1.50 hectares, 7.0% have a farm size of 1.51 - 2.00 hectares. Though the mean farm size was 0.68 hectares. The mean farm size is an indication that maize production is in a smallholding enterprise.

Table 1: Description of the socioeconomic characteristics of maize producers

Socioeconomic characteristics	Frequency	Percentages (%)	Mean
Sex:			
Male	67	67.0	
Female	33	33.0	
Age:			
less than 20	3	3.0	47.77
21- 40	30	30.0	
41- 60	23	23.0	
Above 60	44	44.0	
Marital Status:			
Single	12	12.0	
Divorced	0	0.0	
Widow/widower	23	23.0	
Married	65	65.0	
Level of education:			
Primary (F.S.L.C)	13	13.0	
Secondary (WAEC/GCE/NECO)	30	30.0	
Tertiary (OND/HND/Degree)	41	41.0	
Postgraduate	16	16.0	
Farming Experience (years):			
Less than 6	20	20.0	9.40
6-10 years	18	18.0	
11-15 years	32	32.0	
16 and above	30	30.0	
Household Size			
Less than 6	32	32.0	7.16
6-10 people	48	48.0	
11 and above	20	20.0	
Cooperation association:			
Yes	73	73.0	
No	27	27.0	
Number of extension visits:			
0 – 3 times	58	8.0	3.00
4 – 6 times	32	32.0	
Above 6 times	10	10.0	
Major occupation:			
Farming	47	47.0	
Trading	32	32.0	
Civil Servant	17	17.0	
Others	4	4.0	
Farm Size (Hectare):			
0 - 0.50 ha	51	51.0	0.60
0.51 - 1.00 ha	19	19.0	
1.01 - 1.50 ha	23	23.0	
1.51- 2.00 ha	7	7.0	
2.01 ha and above	0	0.0	

Source: Field Survey, 2025.

Estimation of the Cost and Returns of Maize Production

The sales revenue indicates a substantial income generated from the sale of maize cobs, contributing to the overall economic viability of maize production. The cobs of maize are estimated to generate sales revenue of ₦4,913,000.00,

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with a quantity of 1965 cobs sold at ₦2500 per cob, and grains contribute an additional ₦421,600.00 to the total revenue, with 843 grains sold at ₦500 each. Thus; the total sales revenue summed to ₦5,334,600.00. Fertilizers, labour, transportation, cobs, and communication constitute the variable costs. It is crucial to note that these costs are associated with the production process and can fluctuate based on factors like market conditions and farming practices. The total variable cost is ₦2,712,676.34. Depreciation on assets is a fixed cost that represents the reduction in value of assets over time. Hence, the total cost, including both variable and fixed costs, is ₦2,800,622.01. On the profitability measures, the gross margin reflects the profitability of the production process before considering fixed costs. In this case, it is ₦2,621,923.66, while the Net Return is the actual profit after considering both variable and fixed costs, which is ₦2,533,977.99. The net return takes into account all costs, resulting in a profit of ₦2,533,977.99. This indicates a positive financial outcome for maize production in this scenario. The Return on Investment (ROI) of 0.90 or 90% suggests that for every ₦1 invested in maize production, ₦0.90 is returned as profit. An ROI above 1.0 would indicate a positive return. [14], [15], reported that profit triggers and motivates the speed of business.

Table 2: Estimation of the Costs and Returns of Maize Production

Items Description	Quantity	Unit Price (N)	Amount (N)
Sales Revenue:			
Cob of maize	1965	2500	4,913,000.00
Grain of maize	843	500	421,600.00
Total revenue			5,334,600.00
Cost of fertilizers	895.56	600	537,336.00
Labour cost	90	4500	405,000.00
Transportation	-	-	12,500.00
Cost of grains	2500	700	1,750,000.00
Communication	-	-	7,840.34
Total variable cost			2,712,676.34
Depreciation on assets			87,945.67
Total cost			2,800,622.01
Gross margin			2,621,923.66
Net return			2,533,977.99
ROI			0.90

Source: Field Survey, 2025.

CONCLUSION

The study estimated the economics of maize production in Awka south LGA of Anambra state. From the cost and returns analysis, it was revealed that maize enterprise is a profitable enterprise that should be encouraged. Maize farming in the study area is largely the major farming practice, it was revealed that the farmers are at their active age and are fairly literates thereby able to understand and engage in profitable farm practices, their major constraints are inadequate capital, high fertilizer costs, insufficient land space, unorganized marketing, scarcity of water, and inadequate storage facilities.

RECOMMENDATIONS

1. Government policies that would guarantee access to credit facilities to the maize farmers should be advocated for.
2. There is need for the provision of incentives by government for adequate number of extension Workers in order to handle the constraints faced by these maize farmers.

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