

## Cost And Return Analysis Of Sugarcane Production In Mubi North Local Government Area Of Adamawa State Nigeria

Anaryu. B. Wahu, Joyce D Moses and Jimjel Zalkuwi

Department of Agricultural Economics and extension, Faculty of Agricultural sciences. Adamawa State University  
Mubi. Adamawa State, Nigeria

Corresponding Author's Email: [jzalkwi4u@gmail.com](mailto:jzalkwi4u@gmail.com)

**Abstract:** This study analysed the cost and return of sugarcane production in Mubi North Local Government Area of Adamawa State Nigeria. The objective was to estimate the cost and returns in sugarcane production. Sample sizes of 80 sugarcane farmers were selected using multi-stage sampling technique and administered with well-structured questionnaire to generate primary data. Descriptive statistics and budgetary techniques (gross margin) were used as analytical tools for the study. Results shows that majority (97.5%) of the farmers were male and fall within the age of 41 years and above. About 25% of them had no formal education; while 75% have one form of education or the other. They cultivate average farm size of 1-2ha. The average total revenue/ha, average variables cost/ha, gross margin, average gross margin/ha, average total fixed cost/ha and the net from income were N500, 762.50, N222, 156.06, N65, 828, 933.94, N168, 852.44, N9091 and N26915.44 respectively. Based on the findings, it can be concluded that, the study area had great and substantial potential to increase sugarcane farmers' income, if efforts are made for the widespread of new technologies.

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**Keywords:** Cost; Return Analysis; Sugarcane; Production; Mubi North Local Government Area; Adamawa State; Nigeria

### Introduction

The demand – supply gap of major industrial crops in Nigeria and most countries in sub-saharan Africa is largely met by importation (Global Agriculture Network Information (GAIN), 2008). This is because most of the vital inputs in production such as planting material, fertilizer, herbicides and irrigation facilities are not always within the reach of the farmers. Thus crippling the return on investment and discouraging the farmers from continued production of these crops. This has contributed specifically to the poverty state of the nation judging from the fact that Nigeria is an agrarian economy and agricultural development is sine qua-non to economic growth. One of such industrial crop is sugarcane (Wayagari, Ayoola, Imolehin and Misari, 2003) Considering the shortfall in sugarcane production in Nigeria, the government has set up and mandated research institutes and agencies such as the national sugar development council (NSDC) and National Cereal Research Institute (NCRI) to facilitate increase in sugarcane production and utilization. The millennium village commission programme (MVCP) on sugarcane production, in Jigawa State is a fall out from this initiative. However, many if not all the established institutes have not met the set out objectives (Babalola; Ajani; Omonona, Oni and

Awoyinka, 2009). Many developing countries including Nigeria have made substantial investment in agricultural research and extension to increase agricultural production, through new technologies. Despite considerable technological change however, agricultural production in these countries continued to encounter substantial inefficiencies due to farmers unfamiliarity with new technology, poor extension and education service, infrastructure, low level of domestic production and poor storage facilities poor cane farming practices, high plot division within the cane rowing areas, reliance on unpredictable rain and high production cost are the various challenges among others (Oyewa and Isaac, 2011). Mubi North Local Government is not said to be exceptional from the above challenges. Despite the studies conducted in this area, there is still low yield due to inadequate input used by the farmers and poor management practices in the cause of production. It is against this background that is research finding intends of analyse the cost and return of sugarcane production in the study area.

### Methodology

#### Study area

The local government is located in the north east part of Adamawa State, Nigeria. It lies between latitude 90 30<sup>0</sup>N and longitude 11<sup>0</sup> 45<sup>0</sup>E, it has a land

mass of 4,772827km<sup>2</sup> according to National Bureau of Statistics (2008), and (Adebayo and Tukur, 1999; NPC, 2006) respectively. It shares common boundaries with Borno State to the North, Hong Local Government area to the West, Maiha Local Government to the South and Cameroun Republic to East temperature is normally warm to hot with minimum temperature of 120<sup>0</sup>C and maximum temperature of 370<sup>0</sup>C (Adebayo, 2004). The mean annual rainfall ranges between 1000-1200mm, the rainy season extend from May/June to September/October. The dry season start from September/October to April/May.

### Sources of Data and Sampling Procedure

Data for this research were collected from primary sources, using structured questionnaires. The questions were structured to elicit answers on the objectives of the study. MubiNorth comprises of four (4) districts (Mubi-Town, Bahuli, Mayo-Bani and Muchalla) out of which it is divided into eleven (11) political wards namely; Mijilu, Lokuwa, Mayo-Bani, Kolere, Digil, Yelwa, Vimtim, Muchalla, Bahulli, Sabon-layi and betso. The multi-stage random sampling techniques was used in selecting the respondents, out of the population, four wards were chosen from the local Government area that were noted for sugarcane production from which 20 farmers were selected from each ward.

### Analytical Technique

The analytical tools that were used for this study includes, descriptive statistics and gross margin.

### Gross Margin

The gross margin is the differences between gross farm income and the total variable cost of production. It was used to estimate the cost of production. It was used to estimate the cost and return. In sugarcane production in the study area gross margin analysis was used to evaluate the efficiency of an individual business. While the net farm income is the differences between the gross margin and the total cost of production less the sum of fixed variable cost (Olayide and Heady, 1982). The gross margin analysis was used to estimate cost and returns in sugarcane production to achieve objectives iii and determine the total variable cost of sugarcane production.

The gross margin model is estimated as follows:

$$GM = GI - TVC \quad (i)$$

$$NFI = GM - TFC \quad (ii)$$

Where

GM = Gross margin per hectare (₦)

GI = Gross income per hectare (₦)

TVC = Total variable cost per hectare (₦)

NFI = Net farm income per hectare (₦)

TFC = Total fixed cost per hectare (₦)

## Result And Discussion

### Socio Economic Characteristics of the Respondents

According to Wegner (1997), socio – economic studies of any society are very vital in understanding the type and nature of their livelihood as well as their social life. Several indicators were used in this study to identify the socio-economic status of sugar-cane farmers in the study area. The variables analysed in this study include, gender, age marital status, level of education, years of farming experience, sources of finance, farm size and household size.

### Gender

Results in table 1 below shows that majority (97.5%) of the respondents were male who engaged in sugarcane production in the study area while 2.5% were found to be female. This could be attributed to the fact that sugarcane production is strenuous and labour intensive. This is in line with Haruna (2002) that majority of farmers in the wetland of fadama areas of Adamawa state are male.

**Table 1:** Distribution of the Respondents by gender

Gender	Frequency	Percentage (%)
Male	78	97.5
Female	2	2.5
Total	80	100

Source: Field survey, 2016.

### Age

Table 2 shows that majority (30%) of the respondents ranges between the age group of 41 years and above. This could be considered as productive age bracket (Haruna and Kusiwaha, 2003). This is flowed by those in at the age of 26 – 30 years which constituted 27.5%. Also 25% were between 31 – 40years of age and lastly the minority (17.5%) fall in within the age bracket of 18 – 25 years. The young farmers are active in the adoption of new farming techniques and always willing to change for better than the older ones who are somehow conservative. Asumughaet *al.*, (2002) also stressed that the relatively young farmers assume greater risk in anticipation of high profit than the older ones.

**Table 2:** Distribution of Respondents by Age

Age (Years)	Frequency	Percentage (%)
≤ 25	14	17.5
26 – 30	22	27.5
31 – 40	20	25.0
41 and above	24	30.0
Total	80	100

Source: Field survey, 2016.

### Marital Status

Table 3 shows that 57.5% of the respondents in the study area were married, and 42.5% of the respondents were single. According to this result, majority of the respondents were married people.

This is because they have more family responsibilities such as provision of food, shelters, education to their children, also high percentages of married farmers might be also to provide lower the cost of hired labour.

**Table 3:** Distribution of the Respondents by Marital status

Marital Status	Frequency	Percentage (%)
Married	46	57.5
Single	34	42.5
Total	80	100

Source: Field survey, 2016.

### Level of Education

Analysis of the education level of respondents in table 4.4 revealed that majority (40%) had primary education followed by 25% of the respondents that had non-formal education. Also 20% of the respondents had secondary education and 12% had tertiary education. It could be deduced that most of the sugarcane farmers in the study area were literate. The level of formal education attained by an individual goes along way in shaping his personality, attitude to life and adoption of improved practice (Sullumbe, 2004).

**Table 4** Distribution of Respondents by level of Education

Level of Education	Frequency	Percentage (%)
Primary	32	40
Secondary	16	20
Tertiary	12	15
Non formal education	20	25
Total	80	100

Source: Field survey, 2016.

### Farming Experience

**Table 5:** Distribution of respondents by Farming Experience

Years in Farming	Frequency	Percentage (%)
≤ 5	10	12.5
6 – 10	24	30
11 – 20	32	40
20 and above	14	17.5
Total	80	100

Source: Field survey, 2016.

For farming experience, the results shows that majority (40%) of the farmers or respondents had farming experience of 11 – 20 years while (12.5%) had minimum farming experience of ≤5years. The remaining respondents had farming experience between 6 – 10 years of 30% and 20 years above. The majority (40) had attended formal school and so they could accept new technology and the farmers are generally experience in their management practices. This finding is consistent with the assertion of Adewumi and Okunmadwa (2001) that economic efficiency level of farmers is significantly affected by farming experience. Also the lower percentage will increase over time as more mobilization sensitization and incentives are provided.

### Source of Finance

The result in table 6 revealed that the majority of the respondents (62.5%) use their personal savings to farm while only (5%) acquired credit from financial institutions which means that the respondents in the study area have not enjoyed credit benefits from banks, which could be use to improve the level of productivity in sugarcane production.

**Table 6:** Distribution of Respondents by Sources of Finance

Sources of Finance	Frequency	Percentage (%)
Personal savings	50	62.5
Friends and family	14	17.5
Borrowing	12	15.0
Commercial bank	4	5.0
Total	80	100

Source: Field survey, 2016.

### Farm Size

Base on the result in table 7 below 55% of the respondents cultivated 1 hectare, 32.5% cultivated 2 hectares, 10% percent cultivated 3 hectares while 2.5% cultivated 4 - 5 hectares. This result conforms to the assertion of Okigbo, (1998) that the largest proportions of total farm holdings in Nigeria are small scale farmers holding below 5 hectares of land.

**Table 7:** Distribution of the Respondents by Farm Size

Farm Size	Frequency	Percentage (%)
≤1(ha)	44	55
2(ha)	26	32.5
3(h)	8	10
4-5(ha)	2	2.5
Total	80	100

Source: Field survey, 2016.

### Family Size

Majority (45%) had a family size between 3 – 10 persons, followed by those with the family size of 1-5 persons constituting (35%), and 11 – 15 persons constituted 17.5% and only 2.5% were found to be the minority which fall within the family size of 15 persons and above. Most of the respondent may not have labour problem as much of it could be supplied within the family. This agreed with the finding of Welsh, (2001) who stressed that a farmer incurs less production cost if family labour is being fully utilized for farm production.

**Table 8:** Distribution of the Respondents by Family Size

Family Size	Frequency	Percentage (%)
1 – 5	28	35
6 – 10	36	45
11 – 15	14	17.5
15 and above	2	2.5
Total	80	100

Source: Field survey, 2016.

Computation of Gross Margin and Net Farm Income.

**Table 9:** Gross Margin and net Farm Income

Items	Quantify/Values (₦)
Total Hectare Cropped	132
Total number of respondents	80
Average hectare cropped	$132/80 = 1.65$
<b>• Variable Cost</b>	
Sugarcane cuttings	8835500
Fertilizer	3638000
Herbicides	1062100
Labour	2491000
Weeding	547000
Harvesting	3289000
Planting	9462000
Total Variable Cost (TVC)	29324600
Average variable cost	222156.06
<b>• Fixed cost</b>	
Rent on land	1452000
Farm tools	528000
Total fixed cost (TFC)	1980000
Average total fixed cost	$1980000/132 = 15000$
Average total fixed/ha	$15000/1.65 = 9091$
Total cost of production (A+B)	31304600
<b>• Returns</b>	
Average unit price of output	1032.5
Total output	63972 ties
Average output	485 ties
Total revenue (TxQ)	66051090
Average total revenue	$485 \times 1032.5 = 500762.5$
Gross margin (TR-TVC)	65828933.94
Average gross margin (ATR-AFC)	$500762.5 - 222156.06 = 278606.44$
Average gross margin/ha	$278606.44/1.65 = 168852.4$
Average farm income (TR/Q)	$6601090/1032.5 = 6393.30$
Net farm income (AGM- AFC)	$278606.44 - 9091 = 269515.44$

Sources: Field survey, 2016.

The cost incurred in sugarcane production and the financial benefit derived from it was estimated using gross margin analysis in table 4.19 above. The average total revenue/ha generated from the farm was (₦) 500762.5. The average variables cost/ha (AVC) amounted to (₦) 222156.06, the gross margin/ha was (₦) 168852.44. On the other hand, the average fixed cost/ha was (₦) realised was (₦) 269515.44. This result implies that sugarcane production is profitable in the study area.

### Conclusion

It was found in the study that majority of the farmers who were engaged in sugarcane production in the study area were male. In which majority of respondents were found to be married. The farmers in the study area cultivated an average farm size of 1 hectare. The gross margin analysis indicates that sugarcane production is profitable.

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