

## Analysis of Cost and Return in Cowpea Production: A Case Study Mubi South Local Government Area of Adamawa State, Nigeria.

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**Abstract:** This study was designed to analyze the profitability of cowpea production in Mubi South Local Government Area of Adamawa state. The primary data were collected through the use structured questionnaires. purposive and simple random sampling technique were used for the selection of study area. Descriptive statistics and inferential techniques were used as analytical tools. The result shows that most of the cowpea producer 64% were aged between 20-49 years with males dominating the business and majority of the respondents (57%) were married. Household size were relatively large, 78% had some form of formal education and a greater proportion of the respondents (86%) do not belong to any farmer's association. Most of the respondents (61%) are full time farmer, while about 92 % of cowpea farmers had between 6 - >15 years of experience in cowpea production. Most of the farmers 78% had one form of formal education. The computed gross margin and net farm income were ₦289, 128.2/ha. and ₦286, 976.3/ha. respectively for cowpea production, which indicate that cowpea production is profitable in the area. It is recommended that, there is need for government support in terms of revitalization and priority finding extension delivery activities and agricultural development programs (ADP) in the study and area, access to subsidized farm input (such as pesticide, fertilizer and herbicide) and making credit facilities accessible and affordable to enable farmers boost their production.

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### Introduction

Cowpea (*Vigna Unguiculata*) is an important food grain legume in the tropics originated from Africa (IITA, 2010). It is a crop of major importance to the nutrition of poor rural households in the dry regions of Eastern Africa, where diets tend to heavily rely on starchy foods such as millet, sorghum, maize and cassava, and it is consumed both as a grain and a vegetable (Adeola *et al.*, 2011). However, the quality of protein leaves much to be desired particularly for children, pregnant and lactating women. Cowpea, because of its high protein content, constitutes the natural protein supplement and represents the legume of choice for many people in Africa. (Adeola, *et al.*, 2011). The grain contains 20 – 25% of protein, 64% carbohydrate and micronutrients such Zinc and Iron. It therefore has a tremendous potential to contribute to the alleviation of malnutrition specifically amongst the poor. (Ya'aishe, *et al.*, 2010). More than 5.4 million tons of dried cowpeas are produced worldwide, with Africa producing about 5.2 million tons Nigeria, being the largest producer and consumer, accounts for 61% of production in Africa and 58% worldwide every year (Adeola *et al.*, 2011).

In Nigeria, cowpea is mainly cultivated in the northern part of the country where it forms an

important part of the farming systems (IITA, 2010). The growth of cowpea production depends on the need to improvement either in through area expansion or productivity. The increase in cowpea production in Nigeria is mainly contributed by expansion of area. The average yield per hectare of cowpea in Nigeria is only 417 kg per hectare, below an achievable yield of between 1500-3000Kg/ha and the grain yield per hectare of 2,666 kg and 687 kg obtained in Egypt and Malawi respectively, i.e. production of cowpea per hectare is low compare to that of Egypt and Malawi in 2009. Over the years, the difficulties faced by many developing countries are satisfying the food requirement of her population. As a result, widespread food shortage, hunger and malnutrition have persisted particularly among the low-income groups in developing nations. (Adeola, *et al.*, 2011).

### Methodology

#### Study Area

The study was carried out in Mubi South Local Government Area of Adamawa State. The LGA is located in North eastern part of Adamawa State and lies on latitude 10°00' north and longitude 13°30' east on the altitude of 731.4m (Adebayo and Tukur, 1999). The wet season commences as early as May/June and attains its peak in July/August before it declines in

September and the average rainfall in the area is about 100mm/annum. The annual temperature ranges between 25°C-30°C (Adebayo and Tukur, 1999). It shares common border with the Republic of Cameroon and Maiha LGA of Adamawa State to the South. It also shares common border with Mubi north LGA to the north and with Hong LGA to the west (Adamawa State Government Dairy,1999). Mubi south LGA has a population of 128,937 people, (NPC, 2007). Farming is the major occupation of the people of the area with cowpea as the most cultivated crop. Other crops cultivated in the area included maize, rice, millet, sweet potatoes, cassava, cowpea and cotton which is the major cash crop cultivated.

#### **Sources of data and Sampling Procedure**

Data for the study were derived from primary source. The data were collected with the use of structured questionnaire. Purposive and simple random sampling technique was adopted at various stages for the selection of 100 respondents. Thus, Stage I: involves purposive selection of Mubi -South L.G.A, Stage II: 5 wards were purposely selected, Stage III: 10 villages were randomly selected and Stage IV: 10 % of the total respondents were selected from each village using random sampling to get a total number of 100 cowpea farmers.

#### **Analytical techniques**

The analytical tools used include descriptive and inferential statistics. The descriptive statistics used include mean, frequency distribution and percentages these were used to analyze socio-economic characteristics of the respondents and inferential statistics used include budgetary technique which was used for the analysis of cost and return.

#### **Gross Margin**

Gross margin is expressed as:

$$GM = \sum P_i Y_i - K_i X_i \quad (1)$$

Where: G M = Gross margin (₦/ha),  $P_i$  = unit price of output (₦/kg),  $Y_i$  = Quantity of output (kg/ha),  $K_i$  = Unit cost of variable input (₦/ha),  $X_i$  =

Quantity of variable input (kg/ha) and  $\sum$  = Summation sign.

#### **Farm Gross Ratio**

This is a measure of profitability ratio that gives overall success of the farm. The lower the ratio the higher the return per naira (Olukosi, *et al.* (1988).

The ratio is computed as given below:

$$GR = TFE / GI \quad (2)$$

Where:

GR = Gross ratio

TFE = Total Farm expense

GI = Gross farm Income.

## **Results and Discussion**

### **Socio-economic Characteristics of Cowpea Farmers**

The analysis below shows that 28% of the respondents were within the age bracket of 20 – 29 years, while 34% were between 30 – 39 years of age, also 20% of the respondents were between 40 – 49 years of age, 8% were between 50 – 59 years, 8% also between 60 – 69 years of age and 2% of the respondents attained the age of 70 years and above. This result reveals that majority of the respondents (82%) are in their most active age (20-49), hence their strength can be effectively utilized to increase agricultural output. This finding agrees with ZAlkuwi, *et al.* (2014) who reported that the average age of farmers in Guyuk Local Government Adamawa State was between 20- 49 this is when the farmers are active and still very productive.

It revealed that 62% of the respondents were males, while females constituted 38%. This indicates that most of the household heads were male. This is so, as the area is typically society in which males are expected to head and care for their families while women and children are subordinated under men. This study also indicates that the male gender is mostly involved in cowpea production than female gender in the study area and this may be attributed to the labor involved and the low percentage of women participating in the cowpea farming may also be explained by socio-cultural factors affecting women and not as a result of technical and managerial inefficiency as reported by Phillis and Umehali (2008).

The analysis of the study revealed that 30% of the respondents were single, 57% were married, 8% were divorced, while 5% were windows. This indicates that majority of the respondents are married people, hence supply of family labor for timely execution of farm operation would be guaranteed. This is expected to increase cowpea production or agricultural output as reported by Zalkuwi, *et al.* (2014). 46% of the respondents have family size of less than 5 persons, 35% have 5 -9 persons in their households, while 12% have 10 – 14 persons in this household, 5% have 15 – 19 persons in this household, only 2% of the respondents have 20 persons and above. This study reveals that household size in the study area is relatively large and this could increase the supply of family labor and reduce the cost of hiring labor for cowpea production. Table 1 shows that 78% of the respondents attained formal education and only 22% of the respondents do not have any formal education. This indicates that majority of the respondent (78%) had some form of formal education and this could be effectively utilized to boost cowpea production in the study area. Njoku (1991) observed

that years of formal education has a positive influence on adoption of innovation by farmers.

It indicated that only 14% of the respondents are affiliated of one farmer's association or the other, while majorities (86%) of the respondents are not affiliated. The above result shows that majority of farmers lack access to cooperative loans and supply of inputs which could increase cowpea production. 61% of the respondents were full-time farmers, 28% were civil servants, and 11% were traders. This study indicates that few of the respondents (39%) are part-time cowpea framers, hence resource from primary occupation is expected to be channeled to cowpea production which will lead to increased output and

guarantee a surplus cowpea secured household. This study agrees with Zalkuwi, *et al.* (2014) who reported that 61% of cowpea producers of the respondents took farming as their full-time main occupation. About 8 % of cowpea producers have a farming experience of less than 5 years, while 92 % of cowpea farmers have farming experience more than five years. This implies that majority of the farmers had cowpea experience to improve their production technique to increase their productivity. These farmers had experiences which could positively influence their management capabilities of the crops. As reported by Adeyumi and Okunmadewa (2001) that the economic efficiency of farmers significantly affects their farming experience.

**Table 1: Socio-economic Characteristics of Cowpea Farmers**

Socio-economic characteristics	Frequency	Percentage (%)
<b>Age</b> 20 – 29	28	28
30 – 39	34	34
40 – 49	20	20
50 – 59	8	8
60 – 69	8	8
<b>Gender</b> Male	62	62
Female	38	38
<b>Marital Status</b> Single	30	30
Married	57	57
Window	5	5
<b>Family Size</b> Less than 5	46	46
5 – 9	35	35
10 – 14	12	12
15 – 19	5	5
≥ 20		
<b>Educational level</b> Formal	78	78
Non-formal	22	22
<b>Farmers association</b> Affiliated		
Non-affiliated	14	14
	68	68
<b>Major occupation</b> Farming		
Civil Servant	61	61
Trading	26	26
	11	11
<b>Farming experience</b> < 5	8	8
6 - 10	32	32
11 - 15	47	47
>15	13	13

**Sources:** field survey, 2013

#### **Cost and Return in Cowpea Production per hectare**

The distribution of cost and returns involved in cowpea production systems is presented in Table 2. The table revealed that variable cost such as seeds, fertilizers, herbicides, insecticides, labor and other cost incurred amount ₦47, 021.3 while fixed cost

which includes rented land amounted to ₦2, 151.9 per hectare. Similarly, on the return side the total revenue of the respondent (100 farmers) amounted to ₦336, 149.5/ha. Item accounted for this case include sales of the farm product (Cowpea). Based on the costs and return analysis in table 2, the gross margin of the

farmers was estimated to be ₦289, 128.2/ha. while the net farm income was ₦286, 976.3/ha. This confirms that cowpea production enterprise is profitable in the study area despite the constraints being encountered. This study agrees with the study of Ya'aishe, *et al.* (2010) in their study of economics of cowpea

production among women farmers in Askira/Uba, Borno state. They stated that the gross margin per hectare is ₦28, 255.42 which showed that cowpea production in the study area is profitable and economically viable means of earning livelihood.

**Table 2: Profitability Analysis of cowpea Production per hectare**

Variable Cost	Values (₦)	Items %
Seeds	2,986.7	6.1
Fertilizer	2,686.4	5.5
Herbicides	2,160.3	4.4
Insecticides	698.3	1.4
Labor	35,829.9	72.9
Other cost incurred	2,659.7	5.4
<b>Total variable cost (TVC)</b>	<b>47,021.3</b>	
<b>Fixed Cost</b>		
Rented land	2,151.9	4.3
<b>Total fixed costs (TFC)</b>	<b>2,151.9</b>	
<b>Total cost of operation</b>	<b>49,173.2</b>	
<b>Returns</b>		
Total revenue	336,149.5	
Gross margin	289,128.2	
Net farm income (NFI) (NFI = TR – TC)	286,976.3	

### Conclusion

Findings from this research revealed that, cowpea production is a profitable venture and it is a good source of livelihood in the study area, despite the series of challenges affecting the business.

### Recommendations

Based on the analysis of the study the following recommendations are made.

- There is need for government support in terms of revitalization and priority finding extension delivery activities and agricultural development programs (ADP).

- Farmers should form cooperative societies to ease input procurement and to take advantage of the existence of Fadama programmes in the study area.

- Farmers should be encouraged to use improved seed varieties to reduce pests and Striga infestation.

- Farmers should form cooperative societies to ease input procurement and to take advantage of the existence of Fadama programmes in the study area.

- Policies to improve farmers' education should be intensified by the government and private sector as this would go a long way to aid farmers in production. This is because farmers make better technical decision if they acquire basic education and have greater farming experience.

- There should be a labor-saving device/technology to reduce the over dependence of most farmers on manual labor for cowpea production.

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