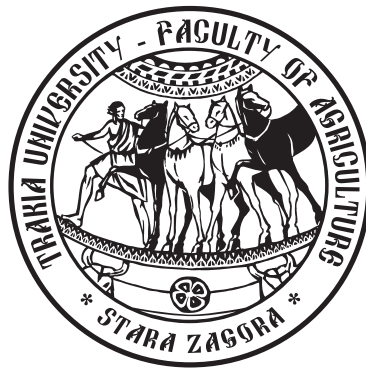


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## Analysis of cost and return in cowpea production: A case study Mubi south local government area of Adamawa State, Nigeria

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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 of structured questionnaires. Purposive and simple random sampling techniques were used for the selection of a study area. Descriptive statistics and inferential techniques were used as analytical tools. The result shows that most of the cowpea producers (64%) were aged between 20-49 years with males dominating the business and the majority of the respondents (57%) were married. Household size was relatively large, 78% had some form of formal education and a greater proportion of the respondents (86%) did not belong to any farmer's association. Most of the respondents (61%) are full-time farmers, 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 N289128.2/ha (=816.5USD) and N286976.3/ha (=810.4USD), respectively, for cowpea production, which indicated that cowpea production was 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.*

**Keywords:** cowpea production, profitability, budgetary technique

### Introduction

Cowpea (*Vigna Unguiculata*) is an important food grain legume in the tropics originating 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, 64-69% carbohydrate and micronutrients (Na, K, Ca, Mg, P, Zn, Fe) (Famata et al., 2013). 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 for 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 417kg/

ha, below an achievable yield of between 1500-3000kg/ha and the grain yield per hectare of 2666kg and 687kg obtained in Egypt and Malawi, respectively, i.e. production of cowpea per hectare is low compared to that of Egypt and Malawi in 2009. Over the years, the difficulties faced by many developing countries are satisfying the food requirement of their 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). This purpose of the study was to analyze the profitability of cowpea production in Mubi South Local Government Area of Adamawa state.

### Material and methods

#### *Study area*

The study was carried out in Mubi South Local Government Area (LGA) of Adamawa State. The LGA is located in the North eastern part of Adamawa State and lies on latitude 10°00' north and longitude 13°30' east at an 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 25-30°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

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(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 include 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 LGA, 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:

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

Where: GM = Gross margin (N/ha),  $P_i$  = unit price of output (N/kg),  $Y_i$  = Quantity of output (kg/ha),  $K_i$  = Unit cost of variable input (N/ha),  $X_i$  = Quantity of variable input (kg/ha) and  $\Sigma$  = Summation sign.

**Farm gross ratio.** This is a measure of profitability ratio that gives the 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 of the results in Table 1 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. The result reveals that the 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 and 49, that is when the farmers are active and still very productive.

**Table 1.** Socio-economic characteristics of cowpea farmers

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

Sources: Field survey, 2013

It established that 62% of the respondents were males, while females constituted 38%, the results indicate 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 to men. The data also shows 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 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 widows. The results indicate that the majority of the respondents are married people, hence supply of family labor for timely execution of farm operations would

be guaranteed. It is expected to increase cowpea production or agricultural output as reported by Zalkuwi et al. (2014). A total of 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 the household, 5% have 15-19 persons in the household, only 2% of the respondents have 20 persons and above. The 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 the majority of the respondents (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 were affiliated of one farmer's association or another, while the majority (86%) of the respondents were not affiliated. The above result shows that the majority of farmers lack access to cooperative loans and supply of inputs, which could increase cowpea production. A total of 61% of the respondents were full-time farmers, 28% were civil servants, and 11% were traders. 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. These results agree 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. That implies that the 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), the economic efficiency of farmers significantly affects their farming experience.

#### *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 data reveals that variable cost such as seeds, fertilizers, herbicides, insecticides, labor and other costs incurred amounted to N47021.3, while fixed cost which includes rented land amounted to N2151.9 per hectare. Similarly, on the return side the total revenue of the respondents (100 farmers) amounted to N336149.5/ha. Items 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 N289128.2/ha, while the net farm income was N286976.3/ha. This confirms that cowpea production enterprise is profitable in the

study area despite the constraints being encountered. The results agree with the study of Ya'aisha et al. (2010) in their study of economics of cowpea production among women farmers in Askira/Uba, Borno state. The authors stated that the gross margin per hectare is N28255.42, which showed that cowpea production in the study area is a profitable and economically viable means of earning livelihood.

**Table 2.** Profitability analysis of cowpea production per hectare

Items	Values (N)*	%
<b>Variable Cost</b>		
Seeds	2986.7	6.1
Fertilizer	2686.4	5.5
Herbicides	2160.3	4.4
Insecticides	698.3	1.4
Labor	35829.9	72.9
Other costs incurred	2659.7	5.4
Total variable cost (TVC)	47021.3	
<b>Fixed Cost</b>		
Rented land	2151.9	4.3
Total fixed costs (TFC)	2151.9	
Total cost of operation	49173.2	
<b>Returns</b>		
Total revenue	336149.5	
Gross margin	289128.2	
Net farm income (NFI) (NFI =TR - TC)	286976.3	

\*1N = 0.0028USD

### **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. 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; 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.

## References

- Adamawa State Government Dairy**, 1999. Ministry of Information, Yola Adamawa state, Nigeria.
- Adebayo AA and Tukur AL**, 1999. Adamawa state in Maps (eds. A.A. Adebayo and A.L. Tukur). Paraclete Publishers, Yola, Nigeria, p. 14.
- Adeola SS, Foloranso ST, Gama EN, Amodu MY and Owolabi JO**, 2011. Productivity and Profitability analysis of cowpea production in Kaduna state. Pelagia research library, pp. 72-73. Retrieved on 17/2/2013 from www.pelagiaresearchlibrary.com
- Adewuyi SA and Okunmadewa FY**, 2001. Economic Efficiency of Crop Farmers in Kwara State, Nigeria. Nigerian Agricultural Development Studies, 2, 45-57.
- Famata AS, Modu S, Mida HM, Hajjagana L, Shettima AY and Hadiza A**, 2013. Chemical composition and mineral element content of two cowpea (*Igna unguiculata* L. Walp.) varieties as food supplement. International Research Journal of Biochemistry and Bioinformatics, 3, 93-96.
- International Institute of Tropical Agriculture (IITA)**, 2000. Cowpea: Research Project and annual report, Ibadan.
- International Institute of Tropical Agriculture (IITA)**, 2010. Annual Report, Ibadan.
- Zalkuwi J, Yusuf C and Ibrahim A**, 2014. Analysis of cost and return in cowpea production in Adamawa State, Nigeria. The International Journal of Humanities and Social Studies, 2, 1.
- National population commission (NPC)**, 2007. Census.
- Njoku JE**, 1991. Factors influencing the adoption of palm production technologies by small holder farmers in Imo State of Nigeria, In: Appropriate Agricultural Technologies for Resource Poor Farmers (eds. J.O. Olukosi, A.O. Ogungbile and B.A. Kalu), pp. 207-218.
- Olukosi JO and Erhabor PO**, 1988. Introduction to farm management Economics Principles and Application. Agitab Publishers Ltd. Zaria, pp. 48-53.
- Philis IO and Umebali EE**, 2008. Revitalizing Nigerian Agriculture to meet the Developmental Challenges of the 21<sup>st</sup> Century, 10<sup>th</sup> Proceeding of the National Association of Agricultural Economics, October 10, 2008, Abuja. Productivity in Nigeria: A review.
- Ya'aishe Alice Putai and Petu-Ibikunle**, 2010. Economic analysis of cowpea production among women farmers in Askira Uba L.G.A. Borno State. African Journal of General Agriculture, 6, 7-9.