JOURNAL OF AGRICULTURE & SOCIAL SCIENCES
ISSN Print: 1813–2235; ISSN Online: 1814–960X
09–039/ZIP/2010/6–4–83–86
http://www.fspublishers.org

Full Length Article

Cocoyam Production and Economic Status of Farming Households in Abia State, South-East, Nigeria

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ABSTRACT

This paper presented the economic analysis of cocoyam production in Bende Local Government Area of Abia State of Nigeria. Data were collected from 80 farmers identified to be planting cocoyam selected through random sampling procedure. The data were analyzed using frequency counts, percentages as well as multiple regression. The result of the analysis indicated that majority of farmers were within the age range of 36-51 years and were mainly females. Lack of funds constituted major constraints to their production and factors such as family labour, cropping pattern and quality of seed planted affect the production positively. Recommendations were also offered on how to increase production as well as economic status of farmers in the Area. © 2010 Friends Science Publishers

Key Words: Cocoyam; Household; Farming; Economic status; Bende

INTRODUCTION

The need for increased food production to meet the demand of ever-increasing population in Africa, where population growth rate is higher than the rate of increase in agriculture production had been long emphasized (World Bank, 1992).

In the last decade, attention has been focused on means of eliminating food insecurity and hunger worldwide. The targets of the first Millennium Development Goal(MDG) between 1990 and 2015 are to halve, the proportion of people who suffer from extreme hunger and people, whose income is less than $1 a day (FAO, 2005).

Quoting Babatunde *et al*. (2007), FAO (2003) reported that there is prevalence of undernourishment in Africa, whereas 14% of the global population and 27.4% of the population of Africa as a whole is undernourished. In Nigeria, the percentage of food insecure households was reported to be 18% in 1996 and over 40% in 2005 (Sanusi *et al*., 2006). The per capita growth of production of major food items has not been sufficient to satisfy the demand of an increasing population. Cocoyam is the third important staple root/tuber crop after yam and cassava in Nigeria. The crop according to Ene *et al*. (1997) provides a cheaper yam substitute especially during period of food scarcity in many parts of Igbo land and as far back as 1975, the Nigeria Academy of Science predicted that cocoyam may not after all be a "poor man's food" or "a woman crop" but a crop of promising economic value. Nigeria happens to be the largest producer of cocoyam in the world with the production figure of about 1.8 tonnes per annum (CBN, 2001) and the production is being carried out by rural farmers who employed primitive technology and traditional practices. Nwaru (1993) reported that the low interest in cocoyam production is attributed to the abundance of food substitutes. In fact Onwuewe (1987) had observed that the overall picture of cocoyam in Nigeria is that of a crop that is "casually produced and consumed" and the totality of published work on cocoyam is insignificant compared to those of rice, cassava, cowpea on which much research is still in progress (Ezedinma, 1987).

According to FAO (1990), cocoyam is described as "a mother of life". Although it has been for centuries the traditional staples in many developing countries, it has received least attention by most national research institutes, extension services and agricultural development planners, despite its nutritional value and industrial uses.

Cocoyam is grown as a root crop because of its edible corms and leaves, which are used as spinach throughout the humid tropics (Mbanaso, 1991). The crop is now accepted as a crop that can guarantee food security, because it is relatively low-priced and could therefore feed many low income families. Nutritionally cocoyam composed of 70–80% water, 20–25% starch and 15–30% protein (Agboola, 1987; Enyinnaya, 1992). Its leaves are excellent sources of folic acid, vitamin C riboflavin and vitamin A. Daisey (1987) reported that flour made from cocoyam when compared to the properties and bread qualities of wheat flour diluted with cassava, yam and cocoyam flour, the cocoyam/wheat flour blends give nice bread qualities. Also cocoyam corms and cormel are rich in mucilage, which can be utilized in the paper industry and in medicinal tablet manufacture.

Despite economic importance of cocoyam, its potentials have not only been overlooked but also under-

To cite this paper: Azeez, A.A. and O.M. Madukwe, 2010. Cocoyam production and economic status of farming households in abia state, South-East, Nigeria. *J. Agric. Soc. Sci*., 6: 83–86

exploited. This paper therefore seeks to take a critical look at the economics of production of a crop that has been described as "mother of life" with a view to encourage its cultivation in the country. The paper will also help provide information on how to increase cocoyam production in the study area as well as furnish the farmers with adequate information on how to adjust and reallocate scarce resources for efficient production of the crop.

MATERIALS AND METHODS

Study Area: This study was conducted in Bende Local Government Area of Abia State. Bende has a population of over 200 thousand persons with a land mass of 2,000 sq. km (FGN, 2007). It has four major clans i.e., Ozuitem, Igbere Alayi and Bende. The Local Government Area is bounded by Aka-Eze in Ebonyi State, Itu L.G.A. in Akwa Ibom State, Aro-Chuckwu in Abia State and Ikwuano also in Abia State. It is situated in tropical zone with relative humidity varying from maximum of 90.23% to minimum of 52.5% of two district seasons. The rainy season begins from mid-March–April and the dry season begins towards the end of October and ends in March. The main occupation of the people is farming and trading. The cropping systems are mainly mixed cropping, intercropping and sole cropping with mainly cultivated crops being cassava, cocoyam, rice and oil palm.

Data Source and Sampling Procedure: The data for this research were obtained from a sample survey of cocoyam farmers in the area. Twenty farmers were randomly selected from each of the four clans that made up of Bende L.G.A. giving eighty farmers in all. Structured questionnaire was used to extract information such as household characteristics, economic variables and production activities. Personal interviews as well as discussion with farmers were also employed.

Frequency distribution and percentages were used to analyse the collected data. The study also employed gross-margin as well as profitability analyses. Multiple regression analysis was also used to determine factors that explain level of output of cocoyam. The regression model was slated as:

$$Q = f(X_1, X_2 \ldots\ldots X_9).$$

Where Q = Quantity of cocoyam produced (in kg).

X_1 = Quantity of cocoyam seed planted (in kg).
X_2 = Family labour utilized in man days
X_3 = Hired labour utilized in Naira.
X_4 = Land area cultivated (in acres).
X_5 = Cost of other inputs in Naira.
X_6 = Educational status of household head in years.
X_7 = Experience in farming (in years).
X_8 = Cropping pattern.
X_9 = Gender of the farmer: O if female.
I if male

RESULTS AND DISCUSSION

Socio-economic characteristics of households: The results of the study revealed that majority (55%) of the farmers were females (Table I). This could be attributed to the fact that women participate actively in cocoyam production. Majority of the farmers (77.5%) were between the age of 20-51 and at this stage productivity is at its peak. At this stage in life, Anyanwu *et al*. (2001) recognised that people are more likely to be energetic and have the capacity to use innovation. Most of the respondents had basic formal education and this constitute 72.5%. By implication, a reasonable number of farmers in the area should be able to understand the use of improved technologies and apply it to achieve increased production. This had been demonstrated in several studies that low level of education makes introduction of improved technologies by extension agents difficult (Bzugu *et al*., 2005; Idrisa *et al*., 2007; Babatunde *et al*., 2007; Azeez, 2009).

The results show that about 74% of respondents had more than six persons per household. Table I also reveals that majority of farmers (73.85%) had more than 6 years experience in farming and 26.25% of less than 5 years. Farm size of respondents in the area shows that majority of farmers (95.0%) cultivate less than 2 ha, while only 5.0% cultivate more than 2 ha. This probably is as a result of more female farmers, who are often denied access to own land in the study area. Also most farmers in the area are into mixed cropping, the approximate land area used in cultivating cocoyam was used as the farm size. The results also reveal that farmers that had no extension contact were 96.25%, while those with extension contact were 3.75%. This implies that the level of contact with extension by farmers is low and thus farmers may not be exposed to modern methods of production. Table I also shows method of land acquisition by farmers. Most associated mode of land acquisition was by inheritance with a 66.25%, while lease or rent constitutes 26.25%.

In terms of income from production, majority of farmers (98.8%) earn less than ₦120,000 from production, while 1.2% earn above ₦121,000 (See Table I).

Profitability estimation: The result indicate that total revenue accruing to cocoyam farmers in the study area amounted to ₦10,467,100, while total cost was ₦3,113,470 giving a profit margin of ₦7,353,630. Table II shows that the average profit accruing to a farmer is ₦91,920.38 and this indicate that cocoyam farmers make reasonable profit during production.

The unit cost of producing 1 kg of cocoyam is calculated as:

$$\text{Average Cost (AC)} = \frac{\text{Total cost of all respondents}}{\text{Number of respondents}}$$

$$AC = \frac{3,113,470}{80}$$

The total land area cultivated of cocoyam is 53.7 ha. Average Land Area Cultivated (ALAC):

$$ALAC = \frac{\text{Total land area cultivated by all respondents}}{\text{Number of respondents}}$$

$$ALAC = \frac{53.7}{80} = 0.67 \text{ ha}$$

Average Profit (AP) = AR–ATC
= ₦130,838.75 – ₦38,918.38
AP = ₦91,920.37.

Average Profit per hectare (AP/ha):

$$AP/ha = \frac{AP}{ALAC}$$

$$AP/ha = \frac{91,920.37}{0.67} = ₦137,194.58$$

Average Revenue per hectare (AP/ha):

$$AP/ha = \frac{AR}{ALAC} = \frac{130,838.75}{0.67}$$

AP/ha = ₦195,281.72

Average cost per hectare (AC/ha):

$$AC/ha = \frac{AC}{ALAC} = \frac{₦38,918.38}{0.67}$$

AC/ha = ₦58,087.13

Gross Margin = AR – ATVC
= ₦130,838.75 – ₦30,128.51
= ₦100,710.24

Gross Margin per hectare (GM/ha):

$$GM/ha = \frac{GM}{ALAC} = \frac{₦100,710.24}{0.67} = ₦150,313.79$$

Gross Margin per hectare stood at ₦150,313.79. This implies that cocoyam production is profitable with such a high gross margin per hectare.

Determinants of cocoyam output: The results of multiple regression model to determine factors that affect cocoyam output shows that the semi-log function is the best functional form with the largest R^2 value and highest number of significant variables (See Table IV), X_1 (Quantity of cocoyam seed planted, X_2 (family labour), X_3 (hired labour), X_9 (Gender of family head). The regression equation is given as:

$$Q = 6.004 + 0.0087\ln X_1 + 0.016\ln X_2 + 0.0122\ln X_3 - 0.140\ln X_4$$
$$(1.73) \quad (0.001) \quad (0.007) \quad (0.003) \quad (0.208)$$

$$-0.00000708\ln X_5 - 0.410\ln X_6 - 0.0107\ln X_7 + 0.3888\ln X_8 + 0.290\ln X_6$$
$$(000) \quad (0.48) \quad (0.015) \quad (0.103) \quad (0.089)$$

$R^2 = 0.743.$

From the results, the parameter estimates of X_1, X_2, X_3, X_8 and X_9 have positive signs, while those of X_4, X_5, X_6, X_9 have negative signs. This implies that quantity of seed planted (X_1), family labour utilized (X_2), hired labour (X_3), cropping pattern (X_8) and gender of the farmer (X_9) all have direct relationship with cocoyam output. Three of the estimated coefficients β_1, β_2, β_9 and β_2 are significant at 1 and 5% level, respectively. However the coefficient of land area cultivated (X_1), other inputs (X_5), educational status (X_6), years of farming experience (X_7) are negative but not significant. The results also show that a unit change in quantity of seed (X_1) would increase output by 0.0017 units; as hired labour and family labour increase by a unit, output will increase by 0.0122 and 0.016 units, respectively.

Problem faced by cocoyam farmers: The farmers in the area are confronted by a number of constraints as shown in Table IV. The problems ranged from lack of access to land (19.7%), lack of fund (22.98%), lack of access to extension agent (14.8%) and high cost of fertilizer (16.50%).

Table I: Socio-economic characteristics of Cocoyam Farmers

	Frequency	Percentage
Sex		
Male	36	45.0
Female	44	55.0
Age (Years)		
<20	0	0
20 – 35	25	31.25
36 – 51	37	45.25
> 51	18	22.5
Educational Qualification		
No formal education	22	27.5
Primary school	27	33.75
Secondary school	29	36.25
Tertiary institution	2	2.5
Farming Experience (Years)		
<2	1	1.25
3 – 5	20	25.0
6 – 9	34	42.5
> 9	25	31.25
Household Size (No. of Persons)		
1 – 3	11	13.75
4 – 6	10	12.50
7 – 9	40	50.0
10 and above	9	23.75
Estimated Annual Income ('000)		
0 – 40	15	18.75
41 – 80	41	51.25
81 – 120	23	28.75
> 121	1	1.25
Farm Size (ha)		
> 1	63	78.75
1 – 2	13	16.25
3 – 4	3	3.75
5 and above	1	1.25
Mode of Land Acquisition		
Inheritance	53	66.25
Purchase	3	3.75
Rent/Lease	21	26.25
Pledge	3	3.75

Source: Field Survey, 2007

Table II: Profit from Production

Item	(₦)	Average (₦)
Total Revenue (TR)	10,467,100	130,838.75
Total Cost	3,113,470	38,918.30
Profit (TR – TC)	7,353,630	91,920.38

Source: Computed from raw data

Table III: Estimated Regression Equation for Cocoyam (Semi Log)

Variables	Estimated Coefficient	Standard Error
Quantity of cocoyam seed (X_1)	0.0087***	0.0001
Family labour utilized (X_2)	0.016**	0.007
Hired labour utilized (X_3)	0.0122***	0.003
Land Area cultivated (X_4)	-0.140	0.208
Other inputs (X_5)	-7.0×10^{-7}	0.000
Educational status (X_6)	-0.410	0.48
Years of farming experience (X_7)	-0.0107	0.015
Cropping pattern (X_8)	0.3889	0.103
Gender of the farmer (X_9)	0.290***	0.089
Constant	6.004***	1.73

Source: Computer print-out
*** Significant at 5%
** Significant at 1%
$R^2 = 0.743$, $F = 22.455$

Table IV: Problems Faced by Cocoyam Farmers

S/No.	Constraints	Frequency	Percentage
1	Lack of access to land	61	19.70
2	Lack of fund	71	22.98
3	High cost of labour	17	5.59
4	Lack of extension contact	46	14.89
5	High cost of fertilizer	51	16.50
6	Pest and disease attack	42	13.59
7	Bad road network	21	6.79
	Total	**309***	**100.00**

*Multiple responses accounted for this number
Source: Field Survey, 2007

CONCLUSION

This paper revealed that cocoyam production in Bende Local Government Area of Abia State, South-Eastern Nigeria is profitable though farmers are faced with some challenges Improving cocoyam production therefore requires that attention be paid to the following:

- Cocoyam farmers are enjoined to form themselves into co-operative society so as to pool resources together to enhance members' production.
- Governmental agencies should ensure that credit facilities are extended to farmers in cocoyam producing area. This will help in reducing the incidence of insufficient capital being currently faced by farmers.
- There is also the need to assign more extension agents to attend to the farmers as this particular crop has not been given much attention by any governmental agency. Training should be constantly organised so as to keep farmers abreast of improved technologies in production.
- Farmers especially females should not be discriminated against in land acquisition so as to enable them cultivate more land area for the crop as well as other crops. To this end the land use act should be appropriately amended.
- Farmers are also to take appropriate measures in allocating their scarce resources such as land and reducing amount spent on labour. When farmers have access to reasonable hectarage of land, this will enable mechanization and with good management, better resource allocation can be employed by farmers to bring about the much desired increase in food production and food security.

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(Received 24 August 2009; Accepted 25 October 2009)