ECONOMIC ANALYSIS OF VEGETABLE (*TELFAIRIA OCCIDENTALIS HOOK F.*) PRODUCTION AMONG FARMING HOUSEHOLDS IN IBIONO IBOM LOCAL GOVERNMENT AREA OF AKWA IBOM STATE, NIGERIA.

Obinaju, L. C. and Asa, U. A.
Department of Agricultural Economics and Extension, University of Uyo,
Uyo, Akwa Ibom State, Nigeria.

ABSTRACT*: The study analysed the production of Telfairia occidentalis among farming households in Ibiono Ibom Local Government Area of Akwa Ibom State. Data for the study were obtained from 90 vegetable farmers (Telfairia occidentalis) farmers in the area using a 2 – stage sampling procedure and analysed using descriptive statistics, multiple regression and budgeting technique. Results showed that 66.7 percent of the respondents were aged between 31 – 50 years; 72.2 percent were married; 53.3 percent had farming experience of about 9 years and 53.3 percent had household sizes of about 6 – 10 persons. The result of multiple regression showed that age, farming experience, cost of fertilizer and the cost of Telfairia occidentalis seeds were factors that affect vegetable (Telfairia occidentalis) production in the study area. The cost and returns analysis indicated that the fixed cost constituted 79.68 percent of the total cost of vegetable, while variable cost constituted 20.32 percent. On the average a farmer in the study area incurred a total cost of N30,857.74 in the production of Telfairia occidentalis and had a total revenue of N44,005.55 giving a net income of N13,147.81 per farmer. The profitability ratios RRI%, RRVC% and OR were found to be 42.6, 309.71 and 0.14 respectively, indicating that vegetable production was profitable in the area.*

Keywords: Fluted Pumpkin, Profitability, Return on Investment, Fixed cost, Variable cost.

INTRODUCTION

Fluted pumpkin (*Telfairia occidentalis*, Hook F.) is one of the most important vegetables grown in Nigeria. It is generally regarded as a leaf and seed vegetable. The leaf has high nutritional, medicinal and industrial values being rich in protein 29%, fat 18%, minerals and vitamins 20% (Ndor, E., Dauda S. N., and Garba, M. N., 2013). These make the leaves potentially useful as food supplements (Oderinde, R; O. Tairu, F. Awofala and D. Ayediran, 1990). The tender and succulent leaves and immature seeds are cooked and consumed as vegetable. The leaves may be used alone or together with Okra, dika nut (Irvingia spp) or egusi seeds (*Citrullus lanatus* (*Thunb*). Sometimes they are mixed with 'eru' (*Gnetum africanum welw*) and Ptero *carpus soyauxii Taub*. They may also be cooked with fish, meat and tapioca, and are then eaten with pounded yam, 'eba', 'akpu' and 'amala' etc. These are favourites throughout Central and Southern Nigeria (Grubben and Denton, 2004; Schippers, 2002). Sometimes male flowers are picked for consumption together with the shoots and leaves. The seeds are used as propagating materials, eaten roasted, boiled or ground to paste as soup thickener. The nutritional value of the fluted pumpkin seeds (53% fat and 27% crude protein) justifies its wide consumption in Nigeria (Odiaka, 2001). Furthermore, Protein

Energy malnutrition (PEM) is rarely seen among the dwellers where *Telfairia occidentalis* is consumed in large proportion daily (Dike, 2010). The use of *Telfairia occidentalis* in reproductive and fertility is gaining grounds.

Nwangwa, Mordi, Ebeye and Ojieh (2007) showed that *Telfairia occidentalis* has the potential to regenerate testicular damage and increase spermatogenesis. *Telfairia occidentalis* is high in anti-oxidant and free radical scavenger properties and that may contribute to why many use the leave extract in oxidative damage conditions such as tonic by women that have just given birth; its high iron content assists in the replenishment of lost blood; being used for treatment of anaemia, chronic fatigue and diabetes (Alada, 2000; Dina, Adedapo, Oyinloye and Saba, 2006). The blood schizontocidal activity of the root of *Telfairia occidentalis* is comparable to that of chloroquine and also the leaf extract alone is useful in the management of hyperchelsterolaemia, liver problems and impaired immune system (Eseyin, Igboasoiyi, Oforah, Ching and Okoli, 2005a).

Despite the high nutritional, medicinal and economic value of *Telfairia occidentalis*, its production in Nigeria has failed to meet the domestic demand for its consumption (Opadode and Adeboye, 2005) and this include vegetable farmers in Ibiono Ibom Local Government Area of Akwa Ibom State. It is in view of this fact that this study seeks to determine the factors affecting vegetable production and also profitability of vegetable production in the study area.

METHODOLOGY

The study was conducted in Ibiono Ibom   Local Government Area of Akwa Ibom State. Ibiono Ibom Local Government Area is bounded by Cross River State and Itu local government area. It is situated along latitude 40^0 and 60^0 north, longitude 32^0 and 34^0 east of the Greenwich Meridian. Ibiono Ibom Local Government Area consists of nine (9) clans and covers a total land surface of 2761.76sq kilometers with a total population of 385.76 sq. kilometers with a total population of 385,145 people (National Population Commission, NPC 2006). Primary data were collected from 90 vegetable (*Telfairia occidentalis*) farmers in the area. A 2- stage sampling procedure was used to purposively select 30 farmers each from 3 clans out of the nine (9) clans that made up Ibiono Ibom Local Government Area to give a total sample size of 90 respondents. Analysis of data was done using descriptive statistics, such as frequencies and percentages, means and rank. The multiple regression was used to determine the factors affecting vegetable (*Telfairia occidentalis)* production in the area and the model is specified:

$$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + U$$

Where   Y = Output of Vegetable (measured in Naira)

X_1 = Gender
X_2 = Age
X_3 = Years of farming experience
X4 = Access to Credit facility

X5 = land size in hectres
X6 = Cost of fertilizer for the production period
X7 = Cost of seeds
X8 = Cost of Labour

RESULTS AND DISCUSSION

TABLE 1:

Socio Economic Characteristics	Frequency	Percentage
Gender		
Male	33	36.67
Female	57	63.33
Age		
24 – 30	7	7.78
31 – 50	60	66.67
51 – 60	18	20.00
61 – 65	5	5.55
Marital Status		
Single	14	15.56
Married	65	72.22
Widowed	10	11.11
Divorced	1	1.11
Household Size		
1 – 5 persons	41	45.56
6 – 10 persons	48	53.33
11 – 15 persons	1	1.11
Monthly Income from Vegetable Farming		
10,000 – 20,000 – -	8	8.89
20,001 – 30,000 -	26	28.89
30,001 – 40,000 -	23	25.56
40,001 – 50,000 -	16	17.78
50,001 – 60,000 -	11	12.22
60,001 – 70,000 -	6	6.66
Educational Status		
No formal Education	15	16.7
Primary Education	44	48.9
Secondary Education	18	20.0
Tertiary Education	2	2.2
Adult Education	11	12.2

Years of Farming Experience (In Years)

0 – 9	48	53.34
10 – 19	29	32.22
20 – 29	10	11.11
30 – 39	3	3.33

Access To Credit

Yes	13	14.44
No	77	85.56

Land Size (HA)

0.3 – 0.6	36	40.00
0.7 – 1.0	46	51.12
1.1 – 1.5	05	5.55
1.6 – 2.0	03	3.33

Source: Field Survey, 2015

The results in Table 1 show that there are more women (57) involved in vegetable (*Telfairia spp.*) farming than men in the study area, with majority of them between the ages of 31 and 60 years. Most of the vegetable farmers in the study area were married (65) with majority of them (48) having a household of between 6 to 10 persons. This corroborates (Subba – Reddy, Ram, Sastry and Devi (2004) who stated that household sizes have been noted to affect family labour available for farm work and other household activities. This was affirmed also by Effiong (2005) that large family size is the most important input for unpaid labour, especially in the rural areas. Vegetable farmers in the study area were well educated with most of them (83.3 percent) having attained at least primary education. They had enough experience in vegetable farming although only a few (14.44 percent) could secure credit to boost their production. It could be observed that the respondents had relatively large household sizes made up of between 6 – 10 persons with about (53.33 percent) of the respondents falling into this category. The high household size of the respondents could be attributed to the fact that these households are involved in farming activities and need more persons to make work easier on the farm. This corroborates the findings of (Obinaju and Asa, 2013) who opined that children in sub-Saharan Africa tend to be of economic value and are desirable assets for struggling parents.

TABLE 2: FACTORS AFFECTING VEGETABLE PRODUCTION IN THE STUDY AREA

Model	Beta Coefficients	t	Sign
Constant	10059.895	2.431	0.017
Sex	-0.088	-0.915	0348
Age	-0.339	-3.194	0.002***
Marital status	0.021	0.207	0.837
Education	0.073	0.772	0.442

Household size	0.095	0.973	0.334
Farming experience	0.546	5.318	0.000***
Cost of fertilizer	0.230	2.172	0.033**
Cost of seeds	0.219	1.835	0.070*
Labour cost	-0.062	-0.514	0.609
Land size	0.082	0.722	0.472

Dependent variable = Income from vegetable (Telfairia occidentalis) farming

Field Survey: 2014

N/B   *** = Significant at 1 percent

    ** = Significant at 5 percent; * = Significant at 10 percent

From the results as shown in Table 2 above, it was observed that Age, farming experience, cost of fertilizer and the cost of *Telfairia occidentalis* seeds were the factors that affected the production of vegetable in the study area.

With specific reference to age, it could be observed that the younger the farmer is, the more efficient he/she will be in vegetable production as the farmer will have enough strength to withstand the rigours of the cultivation process. Also experience matters in the cultivation of vegetable (*Telfairia occidentalis)* and those who have cultivated the vegetable over time have known the best cultural practice, appropriate herbicide/chemical etc to use in order to boost output.

Fertilizers and Telfairia seeds were also vital inputs needed in the production of the vegetable in the study area. Labour cost particularly had a negative coefficient indicating that *Telfairia occidentalis* can be cultivated and tended by the farmer and members of his immediate household, and would not require hiring labour to cultivate the crop. But if the farmer insists on hiring labour, this will reduce the profit he would have made from the production of the vegetable.

TABLE 3: COST AND RETURNS TO VEGETABLE FARMING

S/N	ITEMS	TOTAL COST OF PRODUCTION PERIOD	AVERAGE COST	%
A	**FIXED COST**			
	Rent on Land	2,102,500	23,361.11	95.01
	Machete	36,500	405.55	1.65
	Hoes	31,900	354.44	1.44
	Baskets	31,500	350.00	1.42
	Bags	10,550	117.22	0.48
TOTAL	**FIXED COST (TFC)**	**2,212,950**	**24,588.32**	**100**
B	**VARIABLE COST**			
	Labour (man/day)	194,500	2,161.11	34.47
	Fertilizer	189,650	2,107.22	33.62

	Transportation	89,000	988.88	15.77
	Seedlings	68,800	764.44	12.19
	Cost of water	22,000	247.77	3.95
TOTAL	**VARIABLE COST (TVC)**	**564,250**	**6,269.42**	**100**
TOTAL COST (TFC + TVC)		**2,777,200**	**30,857.74**	
C.	**TOTAL REVENUE**			
	Sales of vegetable	2,960,500	44,005.55	
D.	**NET FARM INCOME**			
	NFI = TR − (TFC + TVC) = 1,183,300		**13,147.81**	

E.   PROFITABILITY RATIOS

- Return on Sales = o.2987754

- Rate of Return on Investment (RRI)   = 42.60766

- Rate of Return on Variable Cost (RRVC) = 309.712

- Operating Ratio (OR) = 0.142

Computed by author: Using data from field survey (2015).

The profitability of vegetable farming, ascertained using cost and returns analysis is shown in Table 3 above. Fixed cost constituted 79.68% of the total cost of vegetable production while the variable cost constituted 20.32%. Rent on land was the major fixed cost incurred by the respondents while the cost of labour, and fertilizer constituted the major variable costs. The total quantity of vegetable (*Telfairia occidentalis*) produced by the farmers for February 2015 was ₦3,960,000 with each farmer making an average of ₦13,200 from his/her vegetable farming business. The ratios calculated to establish the profitability of vegetable production were the profitability index (PI), Rate of Return on Investment (RRI), Rate of Return on Variable Cost (RRVC) and Operating Ratio (OR). The average PI for the enterprise was 0.29, indicating that out of every naira (N) earned, about 29 kobo accrue to the farmer as net income. Also with an IRR% of 42.61 % the vegetable farmer therefore earns n42.61 profit on every naira spent on vegetable production. RRVC% was estimated to b about 309.71% per production period. In other words, every one Naira cost incurred on variable input generates about N309. Generally, it was noticed that vegetable (*Telfairia occidentalis*) production was profitable in the study area.

CONCLUSION AND RECOMMENDATIONS

Total revenue realized from total cost of vegetable farming in Ibiono Ibom Local Government Area of 2,777,200 was 3,960,500 giving a net income of 1,183,300. This shows that vegetable (*Telfairia occidentalis*) production in Ibiono Ibom Local Government Area is profitable. I therefore recommend that government should provide vegetable farmers with

22

soft loans in order to encourage them increase their scale of production, also the Government should ensure the farm inputs such as seeds and fertilizers get to the farmer on time so that they could be efficient in production.

REFERENCES

Alada, A. R. A. (2000): The Haematologic effect of *Telfairia occidentalis* in diet preparation. *African Journal of Biomedical Research, 3: 185 – 186.*

Dike, M. C. (2010): Proximate Phytochemical and Nutrient Compositions of Some Fruits, Seeds and Leaves of Some Plant Species at Umudike, Nigeria. *ARPN Journal of Agriculture and Biological Science. 5: 7 – 16.*

Dina O. A, A. A. Adedapo, O. A. Oyinloye and A. B. Saba (2006): Effect of *Telfairia occidentalis* extract on experimentally induced anaemia in domestic (sic). *African Journal of Biomedical Research, 3: 181 – 188.*

Effiong, E. O. (2005): Efficiency of Production in Selected Livestock Enterprises in Akwa Ibom State. Unpublished Ph. D Dissertation, Department of Agricultural Economics, Michael Okpara University of Agriculture (MOUA), Umudike, pp 51.

Eseyin, O. A., A. C. Igboasoiyi, E. Oforah, H. Mbagwu, E. Umoh and J. F. Ekpe (2005a): Studies of the Effect of Alchohol Extract of *Telfairia occidentalis* on Alloxan induced diabetic rats. *Global Journal of Pure and Applied Science 11: 85 – 87.*

Grubben, G. J. H. And Denton, O. A. (2004): Plant Resources of Tropical Africa 2 Vegetable, P: 668. PROTA Foundation, Wageningen*, Netherlands Backhuys Publishers, Leiden Netherlands/ CTA, Wageningen Netherlands*.

National Population Commission (NPC), (2006). National Population Report, Abuja, Nigeria.

Ndor, E; Dauda, S. N. and Garba M. N. (2013): Growth and Yield Performances of Fluted Pumpkin (*Telfairia occidentalis Hook F*.) under Organic and Inorganic Fertilizer on Ultisols of North Central Nigeria. *International Journal of Plant and Soil Science, 2 (2): 212 – 221, 2013. Article no: IJPSS.2013.004*

Nwangwa, E. E J. Mordi; O. A. Ebeye, A. O and A. E. Ojieh (2007): Testicular regenerative effects induced by extracts of *Telfairia occidentalis* in rats. *Caderno de Pesquisa*, *Series Biology, 19: 27 – 35 .*

Obinaju, L. C. and Asa, U. A. (2013): Analysis of Child Labour Among Farming Households: A Case study of Abak Local Government Area in Akwa Ibom State, Nigeria. *International Journal of Innovative Agriculture and Biology Research 1(1): 9 – 15, 2013.*

Oderinde, R; O. Tairu, F. Awofala and D. Ayediran (1990): A Study of the Chemical Composition of Some *Curcubitaceae* family. *Rivista Italiana delle Sostanza Grasse 67(5): 259 – 261.*

Odiaka, N. I. (2001): Survey on the Production and Supply of Telfairia occidentalis in Makurdi, Benue State, Nigeria. Crop Production Department, University of Agriculture Makurdi, Nigeria.

Opabode JT, Adeboye OC (2005): Application of biotechnology for the improvement of Nigerian Indigenous leaf vegetables. *African Journal of Biotechnology 4: 138 – 142.*

Schippers, R. R. (2002): African Indigenous Vegetables, An Overview of the Cultivated Species 2002. Revised Edition on CD – ROM. *National Resources International Limited Aylesford, United Kingdom.*

Subba- Reddy, S. P; Ram, R; Sastry, T. V. N. and Devi, I. B. (2004): Agricultural Economics. *Oxford and IBIT Publishing Company, New Delhi, pp. 646.*