

Economic Analysis of Fluted Pumpkin (*Telfaria Occidentalis*) Production in Ibadan Metropolis, Oyo State, Nigeria

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Abstract— The study was carried out to analyze the economics of fluted pumpkin production in Ibadan metropolis. A total of 80 fluted pumpkin farmers were selected using multistage sampling method. Data were collected using a set of questionnaire. Analysis of the data obtained from the questionnaire was carried out through the use of descriptive statistics such as frequency, percentage, profit function analysis, gross margin and multiple regression analysis. From the analysis, all the farmers interviewed were literate. From the gross margin analysis, fluted pumpkin production was found to be a profitable venture in the study area. The profit function analysis result of R^2 (0.8910) showed that 89.01 percent of the variability in profit in explained by the combined effect of the variable price items in the function. This is indicative of the price variable for output price had a positive significant effect on the profit level of farmers. The regression result showed that the coefficient for farming experience was positive and significant at 5 percent level. Recommendations from the study area include among others, government should provide inputs such as chemicals and planting seed at subsidized rate to farmers and also aim at solving the problems in vegetables production.

Keywords— Gross margin, Profit function, Production, Fluted Pumpkin, Chi-square.

I. INTRODUCTION

Agricultural production in Nigeria is dominated by small-scale farmers who produce the bulk of the food consumed in the country. One of the major crops produced are fluted pumpkin which represent an essential part of agricultural products. Their production remains entrenched in Nigerian agriculture and forms an important condiment in the national diet (Nwangwa *et al.*, 2007). Agriculture is considered the largest sector in Nigeria's economy. It employs 70 percent of the nation's labor force, contributes at least 40 percent of the gross domestic product and accounts for over three-quarters of the non-oil foreign exchange earnings (Ajekigbe, 2007). Fluted pumpkin is a very important vegetable that is popular in West Africa. It belongs to the family *Telfaria Occidentalis* Hook F. cucurbitaceae. It is a leafy vegetable that produces fruits. (Enabulele and Uavbarhe, 2001). Tindall, (1989) defined leafy vegetables as herbaceous plants used for culinary purposes. They are used to increase the dietary quality of soups. The fruit on full maturity has a weight of 10kg. and an appearance of 10 distinctive longitudinal ribs on the surface. It is popular in West Africa. The edible part of this vegetable are the large red seeds, leaves and young shoots used for traditional soup. Protein rich seed can be roasted or grounded for use in porridge. The flesh of the fruit has good oil content which can be used as cooking oil.

Amongst the different vegetable foods, production and consumption of fluted pumpkin is very important because of their contribution to good health by providing inexpensive sources of minerals and vitamins needed to supplement people's diet which are mainly carbohydrates (Yang *et al.*, 2002) cited in Abu and Asembler (2011). Fluted pumpkin is the most important and extensively cultivated food and income generating crops in many parts of Africa (Adebisi-Adelani *et al.*, 2011). Fluted pumpkin is a very important vegetable that is popular in West Africa. It belongs to the family *Telfaria Occidentalis* Hook F. cucurbitaceae. It is a leafy vegetable that produces fruits. (Enabulele and Uavbarhe, 2001).

Fluted pumpkin consumption has improved over the years and it is an important component of the daily diets of Nigerians (Okoli and Mgbeogu, 2003). Due its hypolipidemic action, it lowers blood cholesterol and thus protects from a large range of associated complications like cardiac problems, hypertension and diabetes (Margret, 2011).

II. MATERIAL AND METHOD

2.1 Area of Study

Ibadan, the capital of Oyo State is the third largest city in Nigeria by population (after Lagos and Kano), and the largest in geographical area. At independence, Ibadan was the largest and the most populous city in Nigeria and the third in Africa after Cairo and Johannesburg. The city of Ibadan is located approximately on longitude 3°55East of the Greenwich Meridian and latitude 7°23North of the Equator at a distance some 145 kilometers Northeast of Lagos. Ibadan is located in southwestern Nigeria about 120 km east of the border with the Republic of Benin in the forest zone close to the boundary between the

forest and the savanna. There are eleven local governments in Ibadan metropolitan area consisting of five urban local governments in the city and six semi-urban local governments in the fewer cities. The five urban local governments are: North East, North Ibadan, Northwest Ibadan, Southeast Ibadan, and Southwest Ibadan. Urban cores (high-density) and hinterlands (low-density) characterized Ibadan metropolis. The population of Ibadan metropolis is 2, 550,593 according to 2006 census. However, its population at 2016 is estimated to be 3.16 million. The general land use pattern of the Ibadan metropolitan area shows a clear distinction purely residential use. According to Ayeni (1994) residential land use is the most predominant among all land uses in the built up part of Ibadan. The administrative and commercial importance of Ibadan has resulted in land being a key investment, an asset and a status symbol for the population.

2.2 Sampling Techniques

Multi-stage sampling procedure was use to sample the respondent for proper data collection during the field survey as stated below. 1st stage: identification of fluted pumpkin farmers use in the study area of many marketers in the market. 2nd stage: the farmers of fluted pumpkin production in the market was sample for proper data collection. 3rd stage: 80 copies well structure questionnaire was randomly distributed to the respondent and allow them to have equal chance when the survey is being carried out.

2.3 Method of Data Analysis

Statistical tools such as frequency distribution, Gross Margin, Chi-square and Profit function analysis. Multiple regression analysis was used to identify the determinant of peasant farmer production in the study area. Below is the model specification:

$$Y = b_0 + X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + X_7 + X_8 + \mu$$

Where Y = Output (kg), X1 = Age, X2 = Educational level, X3 = Farming experience, X4 = problem farmer facing, X5 = solution to farmer's problem, X6 = Farm size, X7 = Capital, X8 = Labour used = Coefficient μ = error term.

III. RESULTS AND DISCUSSION

Table1 present the average costs and returns of pumpkin production in the study area. Total revenue of ₦367,150.6 was realized per hectare of pumpkin. The total cost of ₦138,737.60 was incurred. Of this, variable cost constituted about 83.03 percent (₦115,197.60) of total cost of pumpkin production. Further analysis of the variable cost component showed that labor accounted for 88percent, manure3.4%, pesticide 8.6percent and planting material 11.3percent of total variable cost of production. A gross margin and Net Income of ₦251, 953 and ₦228, 413 were realized per hectare. This indicated that pumpkin production is profitable in the study area. Comparing the net return with the current national minimum wage of ₦18, 000 revealed that pumpkin production is a profitable venture in the study area, hence can constitute a good source of employment for our young school leavers and the teeming population.

TABLE 1
INCOME AND EXPENDITURE BY PUMPKIN FARMERS PER HECTARE

| Items | Units | Value ₦ |
|-----------------------------|---------|------------|
| Revenue Items | | |
| Value of Output | Kg | 367,150.60 |
| Total Revenue | | 367,150.60 |
| Cost Items | | |
| Variable Cost | | |
| Labour Cost | Naira | 101,376.00 |
| Cost of Manure | Kg | 3,926.00 |
| Pesticide | Litres | 9,895.60 |
| Planting Materials | Kg | 1,500.00 |
| Total Variable Cost | | 115,187.60 |
| Fixed Cost | | |
| Land | Hectare | 10,120.00 |
| Depreciation on Fixed Items | | 13,420.00 |
| Total Fixed Cost | | 23,540.00 |
| Total Cost | | 138,737.60 |
| Gross Margin | | 251,953.00 |
| Net Income | | 228,413.00 |

Source: Field survey, 2019

Table 2 presents the regression result for the factors affecting fluted pumpkin output in the study area. Of the four functional forms that were estimated, (linear, semilog, double log and exponential), the linear model was chosen as the lead equation because of the high R^2 value and the significant number of explanatory variables. The coefficient for farming experience was positive and significant at 5 percent level. Experienced farmers are perceived to better understand and processed new farming information from extension agents and other sources and hence, improves upon their efficiency and output. They are also known to be early adopters of new farming techniques. (Enete and Okon, 2010, Nwosu et al., 2012 Bassey and Okon, 2008) reported a significant difference between farming experience and water leaf, amaranth spp and cassava output in the study area respectively. Household size impacted positively on pumpkin production in the study area at 5 percent level. Since pumpkin production is labor intensive, large household sizes would imply available labor for pumpkin production. This is the case in the study area where the vegetative pattern and land tenure system does not favour mechanization. Other studies such as (Okoroji *et al.*, 2012, Nwosu et al.,2012 Bassey and Okon, 2008) reported similar findings.

TABLE 2
PROFIT FUNCTION ANALYSIS FOR FLUTED PUMPKIN

| Parameter | Coefficient | Standard error | t-value | p-value |
|----------------------------|-------------|----------------|---------|---------|
| Intercept | 3135.61 | 2265.01 | 1.4015 | 0.2152 |
| Labour cost | 3.8459 | 0.4361 | 8.6327 | 0.0000 |
| Cost of manure | 2.3260 | 1.7631 | 1.2326 | 0.3190 |
| Output price | 8.3716 | 0.9074 | 9.0282 | 0.0000 |
| Capital cost | 0.5317 | 0.5147 | 1.0341 | 0.2920 |
| Land value | 0.9436 | 0.0818 | 12.9328 | 0.0000 |
| Cost of pest control | 3.3150 | 0.1261 | 27.9237 | 0.0000 |
| Cost of planting materials | 0.3465 | 0.3253 | 1.4163 | 0.2289 |
| R^2 | 0.8901 | | | |
| Adjusted R^2 | 0.78873 | | | |

Source: Field survey, 2019

The result of analysis of constraints encountered by fluted pumpkin farmers in the study area ranked from most critical to the least in table 3. The table showed that lack of access to irrigable land (water) took the lead indicated by 22.5%. This was followed by the high cost of equipments (17.5%) and inadequate finance (12.5%). It is interesting to note that these three constraints identified as most important constraints sum up to over half (52.5%) of the problems of fluted pumpkin farmers in the study area. It may be concluded that if these three constraints are looked into, other impediments such as 4th, 6th, 7th, 8th, and 10th, constraints may cease to exist or reduce to minimum in the study area.

TABLE 3
CONSTRAINT FACED BY FLUTED PUMPKIN FARMERS IN THE STUDY AREA

| Constraints | *frequency | percentage(%) | |
|-----------------------------------|------------|---------------|------------------|
| Inadequate irrigable land water | 27 | 22.5 | 1 st |
| High cost of irrigated equipments | 21 | 17.5 | 2 nd |
| Inadequate credit facility | 15 | 12.5 | 3 rd |
| Pest and disease problem | 14 | 11.7 | 4 th |
| Polluted water | 12 | 10 | 5 th |
| Inadequate inputs | 9 | 7.5 | 6 th |
| Transportation | 7 | 5.8 | 7 th |
| Pilfering | 6 | 5 | 8 th |
| Marketing problem | 4 | 3.3 | 9 th |
| High cost of hired labor | 3 | 2.5 | 10 th |
| Others | 2 | 1.7 | 11 th |
| Total | 120 | 100 | 12 th |

**Multiple response*

IV. CONCLUSION AND RECOMMENDATIONS

The study revealed that there is more married male participating in fluted pumpkin production in the study area. It also revealed that most of the respondents were between the age of 31-35 years. It was found that majority of the respondents were married; few of them were single. It was also concluded that most of the respondents have 5-10 household size that could be of help in their family labour. From the gross margin analysis carried out in this study, fluted pumpkin production is said to be a profitable venture. Based on the findings of this study, the following policy recommendations are given in order to improve production efficiency of fluted pumpkin in Ibadan metropolis (IAR&T AND NIHORT), Oyo State, Nigeria.

- i. Government should provide inputs such as chemicals (pesticides and herbicides) planting seeds etc at subsidized rates to farmers and also aim at solving major problem of vegetables production.
- ii. It is advised that policies and opportunities that meets the needs of the ideal situation of farmers should be established, and not just those that favour large scale farmers only.
- iii. Given the low level of cash income that farmers have at their disposal, promoting or making micro finance institutions accessible to small holder farmers could contribute immensely to the use of modern input.

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