



ECONOMICS OF PUMPKIN LEAF PRODUCTION IN OVIA NORTH-EAST LOCAL GOVERNMENT AREA OF EDO STATE, NIGERIA

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ABSTRACT

This study was therefore designed to estimate the profitability of pumpkin leaf production in Ovia North East Local Government Area of Edo State. A simple random sampling of 100 pumpkin leaf producers was carried out in the study area in order to generate the primary data used in the study. The data were gathered with the help structured questionnaire, administered through interview schedules. Data were analysed using multiple regression analysis, budgetary analysis and descriptive statistics. Results from the study showed that all the Pumpkin leaf producers were females (100%), with majority of them between the age range of 41-50 years, they had a low educational background and high pumpkin leaf farming experience of between 6-10 years. The profitability indices showed an annual total variable cost of ₦35,712.00 and an annual gross margin of ₦81,287.00. The return per naira invested was estimated as ₦2.28. Results of the regression analysis showed that variations in the total variable cost were explained by the costs of labour, miscellaneous expenditure, transport, fertilizer and depreciation of farm implements, with an R^2 value of 0.89 and ($p < 0.01$). However, on the socioeconomic regression on output only age and farm size of the farmer affected output since only two of them were significant ($P < 0.01$) with the model R^2 value of 0.62. The major constraints to pumpkin leaf production were difficulty in acquiring land for cultivation and high cost of labour. It was advocated that farmers should be encouraged to remain in the business through the evolution of policies that would ease land acquisition and provision of basic social amenities in the study area.

Keywords: Efficiency; Gaps; Malnutrition; Productivity; Protein; Viability

INTRODUCTION

Malnutrition is a serious problem for large and poor families who have no funding to buy or grow protein-food rich. The problem of malnutrition exists in the third world (Utomakili, 1992), and a baseline scenario of 132 million malnourished children in sub-Saharan Africa by 2020 was projected by the International Food Policy Research Institute (IFPRI, 2002). Animal protein has become very expensive leading to increasing emphasis on plant protein in preference to animal protein in human diets (Ekeleme and Nwofia, 2005). This emphasizes the importance of vegetables in our diets, which is cheap and an

affordable source of protein and vitamin which could help boost the nutritive value of the diets of the mass of the populace who may not be able to afford the relatively more expensive animal protein, thereby alleviating the problem of malnutrition (Emokaro *et al.*, 2007).

Pumpkin leaf is one of the leafy vegetables commonly considered as a cheap and affordable source of protein and vitamins that could be used to check the problem of malnutrition. Pumpkin leaf is an easily grown perennial tropical leafy vegetable with high nutritional, medicinal and industrial value. It is rich in protein (29%), fat (18%) and minerals and vitamins (20%) (Akanbi *et al.*, 2007).

Poverty induces hunger and malnutrition and these are known to impair mental (intelligent quotient) development in children and could lead to a large loss in quality of life, productivity and economic growth in developing countries (Von Braun, 2005). It is therefore imperative that concerted effort be made to reduce poverty level among the most vulnerable groups in Nigeria and one of the ways of doing this is by encouraging farmers to go into the production of pumpkin leaf. This would not only ensure the sustainability of the business, it would also ensure its availability to the poor and malnourished who may not be able to afford the more expensive animal protein.

For pumpkin leaf production to be sustained, the farmer needs to have the assurance that he will get good returns which is an assurance that the business will be sustained, and he also needs to be assured that there will always be a ready market for his produce and in the case of excess, he needs to be assured of good storage facilities.

A cursory look at the operation of pumpkin leaf producers in Ovia North-East Local Government Area of Edo State suggests that they are mainly resource-poor farmers who depend entirely on traditional farming techniques for their production. Does this crude or traditional technique affect their productivity and profitability adversely? Is pumpkin leaf production in this area economically viable? Is there a chance that these resource-poor farmers could eventually breakout of the vicious circle of poverty by cultivating pumpkin leaf? If the farmers have a choice will they go into some other businesses?

However, the problem calls for a careful and thorough study of the cost and returns of pumpkin leaf production to the farmers in the study area and adequate solutions given where necessary to ameliorate their plight. The objectives of this study were thus to look into pumpkin leaf production in Ovia North East Local Government Area (LGA) of Edo State, so as to estimate the profitability of the enterprise, examine the contribution of the different cost items to the farmers' total variable cost, examine the effect of farmers' socio-economic characteristics on output and identify the constraints facing pumpkin leaf producers in the study area.

MATERIALS AND METHODS

Study Area

This study was carried out in Ovia North-East LGA of Edo State. The LGA is bounded in the West by Ovia South-East LGA and in the South by Egor LGA. Edo State lies within the geographical co-ordinates of Longitudes 05° 04' and 06° 43' East and Latitudes 05°44' and 07°34' North. It is bounded in the North by Kogi State, in the South by Delta State, in the West by Ondo State and in the East by Kogi and Anambra States.

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The climatic condition of the State is tropical, which ranges from humid to sub-humid at different times of the year due to seasonal changes. The mangrove forest is the distinct vegetation identified in the State. The mean annual rainfall in the southern part of the State is about 252 cm-254 cm with an average temperature of 24° C - 33° C range.

The major occupation of the people is carving and farming. The major varieties of crops grown are vegetables, cassava, yam, plantain, pineapple, rubber, oil palm, cocoa, citrus etc. Other occupations of the people include livestock farming, small and medium scale businesses and other jobs done by artisans.

Sampling Procedure and Data Collection

Information gathered from the pumpkin leaf farmers union in the LGA showed that pumpkin leaf farmers in the LGA were about 203 in number. The simple random sampling method was used in selecting about 50% of the pumpkin leaf farmers in the study area. This gave a total of 100 Pumpkin leaf farmers used for the study.

Data used for this study were obtained from primary source. This involved the use of personal interviews through the administration of questionnaire due to low literacy level among pumpkin leaf producers, most of whom found it difficult to fill the questionnaire without assistance.

Data Analysis

The data collected were analyzed using descriptive statistics such as tables, figures, means, frequency distributions as well as budgetary analysis (net farm returns, gross margin and return per naira invested) and multiple regression analysis.

Socio-Economic Characteristics

Simple descriptive statistics was used to analyze this objective. To achieve this, the frequency counts, mean, percentages and standard deviation were used. The variables include sex of farmers, age of farmers, marital status of farmers, level of education of farmers, household size of farmers, years of experience of farmers, farm size of farmers, source of finance, and source of labour for pumpkin production.

Return per Naira Invested

This was used in assessing the viability of the business, and is given as;

Return/Naira invested = GM/TVC

Where;

GM = Gross Margin.

TVC = Total Variable Cost.

Gross Margin Analysis

Gross margin is the difference between total revenue and total variable cost and is given as;

GM = TR – TVC.

Where;

GM = Gross Margin; TR = Total Revenue; TVC = Total Variable Cost.

Contribution of Cost of Production to Total Variable Cost (TVC)

The simple linear regression (ordinary least square method) was used to assess the contribution of the respective cost items of production to total variable cost and is given as;

$$Y=X_1, X_2, X_3, \dots, X_n$$

Where;

Y= Total Variable Cost; X_1 =Cost of Labour; X_2 =Cost of miscellaneous expenditure

X_3 =Cost of Transport; X_4 =Cost of Fertilizer; X_5 =Cost of Implements.

Effect of Farmers Socio-economic Characteristics on Output

The simple linear regression (ordinary least square method) was used to assess the effect of farmers socio-economic characteristics on output and is given as;

$$Y=X_1, X_2, X_3, \dots, X_n$$

Where;

Y=Farmers output (t); X_1 =Age; X_2 =Marital Status; X_3 =Level of Education; X_4 =Family Size; X_5 =Years of farming Experience; X_6 =Farm Size; X_7 =Source of Finance; X_8 =Source of Labour

The Likert Scale

The Likert scale adopted from Emokaro *et al.*, (2007), was used to rank the production constraints facing pumpkin leaf farmers in the study area. The Likert scale involves a list of variables (such as labour, transportation etc.) related to the attitude in question. This scale is a five point scale and employs an ordinal level of measurement. Likert scaling is a bi-polar scaling method measuring either positive or negative response to statement. It is a summative scale. The responses to the various constraints were scored in a way that the response indicating the most serious constraint is given the highest score (that is 5.). As a 5-point scale, the responses were grouped into 5, that is: Very Serious (VS) =5; Serious (S) =4; Moderately Serious (MS) =3; Least Serious (LS) =2; Not Serious (NS) =1. For a given constraint, the mean was computed by summing the score on each item and then dividing by the total number of responses. This method of determining the constraints is important because it tells us exactly those constraints that are serious. When the mean is less than 3, it means that particular constraint is not serious. Mean scores equal to or greater than 3, indicate that those constraints are very serious.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Pumpkin Leaves Producers

Sex of Respondents: All the respondents were females indicating that pumpkin leaf production in Ovia North East LGA of Edo State was dominated by women.

Age Distribution of Respondents: About 26% of the Pumpkin leaf farmers were between the ages of 30-40 while 74% of the respondents were between 41-50 years. This indicates

that majority of the farmers are within the working population. This is in consonance with the results of Onoguogu and Nnadozie (2005), who reported that the age bracket of (30-50) represents an active productive age bracket in agriculture. The age of the farmer is important in determining productivity and rate of adoption of innovation (Olomola, 1988).

Marital Status of Respondents: The study showed that 22% of the respondents were married, 6% were single while 22% of the respondents were widowed. This indicates that most pumpkin leaf farmers were married and widowed and it also implies that pumpkin leaf farming may be a business for the married and widowed women who desire to be financially supportive to their families.

Level of Education of Respondents in the Study Area: It was observed that 40% of the respondents had no formal education and 60% of the respondents had formal education. Of the 60% respondents that were educated, 42% had primary school education while the remaining 18% had secondary school education.

The level of literacy of farmers in relation to farm productivity and production efficiency has been documented by Nelson and Phelps (1966), Noor (1981) and Olomola (1986) and shown to be positive. Most of the respondents only had formal education up to primary school level while 40% of them were illiterates and this might be due to the rural nature of the study area and the implications is that the respondents may not be readily receptive to new innovations in their methods of production.

Family Size of Respondents: The family size of pumpkin leaf farmers ranged from 1-10, 40% of the respondents had a family size of 1-5, while 60% had a family size of 6-10. This result indicates that most of the respondents had a family size of 6-10. This emphasizes large family and many mouths to feed and care for. This result fortifies the observed fact that (44%) of the respondents were married and (44%) were once married i.e. widowed.

Years of Farming Experience of Respondents in the Study Area: The study indicated that 64% of the respondents have been in the farming business for between 6-10 years. This indicates that majority of respondents have acquired a lot of experience in pumpkin leaf production as the number of years a farmer has spent in the farming business could give an indication of the practical knowledge acquired. It could have a considerable influence on production efficiency. This finding is in consonance with that of Emokaro and Ekunwe (2007) who studied the Efficiency of Resource-use and Marginal productivities in Dry season Amaranth production in Edo, South and found out that most of the farmers had several years of farming experience.

Farm Size of respondents: Results showed that 40% of the respondents had farm sizes ranging from 0.2-0.4 hectares while 24% of the Pumpkin leaf farmers had farm sizes of less than 0.2 hectares. This indicates that the respondents in the study area were smallholders. This compares closely with the findings of Olayemi (1994), that Nigeria's agriculture is characterized by small-scale farmers with small farm holdings ranging from 0.05-3.0 hectares per farm land.

Source of Finance for Farming Operations: It was observed that 70% of the respondents used their personal savings to finance their farming business while about 30% of respondents used loans obtained either from banks or cooperatives to finance their business. Those who obtained loans from bank/cooperatives societies incurred 50% interest rate. This result indicates that majority of the farmers used their personal savings for their business. This is in accordance with the findings of Omoraka (1999), and those of Onoguogu and Nnadozie (2005), that catfish/Tilapia farming and Broiler brooding are mainly funded with personal savings.

Source of Labour: From the results, 10% of the respondents used family labour, 82% utilized hired help while 8% used both family and hired labour for their production. This indicates that majority of the producers (farmers) utilized hired labour for their production activities. The highest cost of production came from labour.

Profitability Analysis

Results presented in Table 1 are based on the annual cost and return from a mean farm size of 0.2 hectare. As shown in the Table, the highest average cost of production came from labour (₦32,000.00), followed by cost of fertilizer (₦2,500.00), then transportation cost (₦1,015.00). The least was from miscellaneous expenditure with cost of ₦174.00. This suggests that labour takes most of the cost among the variable cost of production having a maximum value of ₦34,000.00 and a minimum of ₦29,000.00 compared to miscellaneous expenditure with a maximum of ₦300 and a minimum of ₦75.00. From the Table, the TVC of the farmer was ₦35,712.00 while the TR was ₦117,000.00 and this indicates an average Gross Margin (GM) of ₦81,287.00. This translates to a mean of ₦406,435.00 per hectare on an annual basis. The value shows that the GM was positive, thus suggesting that pumpkin leaf production was profitable in the study area. The return per naira invested was estimated as ₦2.28, with the implication that for every ₦1 invested by a pumpkin leaf farmer, ₦2.28K is the return. This is more than 100% of the average farmer's investment, again suggesting that pumpkin leaf production is a viable business. These findings compare favourably with results of Emokaro *et al.*, (2007).

Table1: Profitability analysis based on mean annual production per 0.2 hectare

Items	Minimum Cost(₦)	Maximum Cost(₦)	Mean(₦)
Labour	29,000.00	34,000.00	32,000.00
Miscellaneous Expenditure	75.00	300.00	174.00
Transport	600.00	1,250.00	1015.56
Fertilizer	2,500.00	2,500.00	2,500.00
Depreciation of Implementation	400.00	800.00	530.50
TVC	32,575.00	38,850.00	35,712.00
Output (bundles)	182.00	208.00	195.00
TR (@₦ 600/bundle)	109,200.00	124,800.00	117,000.00
Return per Naira invested	2.35	2.21	2.28
Gross Margin	76,625.00	85,950.00	81,287.5

Contributions of the Cost of Production to Total Variable Cost

As shown in Table 2, 89% of variations in the total variable cost were explained by the costs of labour, miscellaneous expenditure, transport, fertilizer and depreciation of implement, as indicated by the R^2 value of (0.89). There was no serial correlation as indicated by the Durbin-Watson (DW) value (2.029). All the independent variables were significant ($p < 0.01$).

This implies that a unit change in the cost of labour resulted in 0.825 change in total variable cost, that is, if the cost of labour increases by a naira, total variable cost would increase by approximately 83 kobo. Similarly a unit change in the cost of miscellaneous expenditure, transportation, fertilizer and implement, would respectively increase total

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variable cost by 0.030, 0.141, 0.043 and 0.029. A naira increase in the cost of miscellaneous expenditure, transportation, fertilizer and implement would result in increase in total variable cost by 3 kobo, 14 kobo, 4 kobo and approximately 3 kobo respectively. This again, implies that the cost of labour affected pumpkin leave production most in the study area.

Table 2: Contribution of the cost of production to variable cost

Variable	Coefficient	t-value	P-value
(Constant)		0.000	1.000
X ₁ (Cost of labour)	0.825	3.3*	0.000
X ₂ (Cost of miscellaneous expenditure)	0.030	4.3*	0.000
X ₃ (Cost of transport)	0.141	7.4*	0.000
X ₄ (Cost of Fertilizer)	0.043	2.3*	0.000
X ₅ (Cost of implement)	0.029	4.1*	0.000

Dependent Variable: T variable cost. R² = 0.89 Durbin-Watson (DW) = 2.029

**significant at 1% level.*

Effect of Farmers' Socioeconomic Characteristics on Output from Pumpkin Leaf

Results presented in Table 3 shows that farmers' socioeconomic characteristics explained about 62% of variations in their output from pumpkin leaf production. The Durbin-Watson (DW) value of 2.21 implies that there is no serial correlation in the variables. This is an indication that only age and farm size of the farmer affected output since only two of them were significant ($P < 0.01$).

Again, it is an indication that a unit change in the age of a farmer will increase the farmers' output by approximately three units while a similar unit increase in farm size will increase output by approximately six units. Marital status, level of education and source of finance were non – significant variables.

Table 3: Effect of farmers characteristics on output

Variable	Coefficient	t-value	P-value
(Constant)		-1.348	0.185
X ₁ (Age)	0.275	2.639*	0.012
X ₂ (Marital Status)	-0.084	-0.646	0.522
X ₃ (Level of Education)	-0.037	-0.359	0.721
X ₄ (Family Size)	-0.115	-1.074	0.289
X ₅ (Years of Experience)	0.084	0.766	0.448
X ₆ (Farm Size)	0.677	5.748*	0.000
X ₇ (Source of Finance)	-0.117	-0.864	0.392
X ₈ (Source of Labour)	0.060	0.451	0.654

Dependent Variable: Output (Pumpkin Leaf). R² = 0.62 Durbin-Watson (DW) = 2.210

**significant at 1% level.*

Constraints Faced by Pumpkin Leaf Farmers in the Study Area

Five items were ranked on a Likert scale in order to estimate the relevant variables that acted as constraints to pumpkin leaf production in the region, as shown in Table 4. According to the farmers, difficulty in acquiring land ($X=4.90$), high cost of labour ($X=4.75$), transportation problem ($X=3.50$) and difficulty in assessing credit facilities ($X=3.25$) were the most important constraints (as their mean values “x” were > 3.0).

Most of the respondent, however, indicated more than one production constraints, thereby confirming the result of Emokaro *et al.*, (2007), that farmers are faced with more than one production constraints.

Table 4: Mean Distribution of Constrains faced by Pumpkin Leaf Farmers

Items	Mean value (x)
High Cost of Labour	4.75
Transportation problem	3.50
Difficulty in acquiring Land	4.90
Difficulty in accessing credit Facilities	3.25
Worm Infestation of Leaves	1.50

CONCLUSION

Results from this study have shown that pumpkin leaf production in Ovia North East LGA, Edo State is a profitable and viable enterprise, dominated by women. The business is however faced with major constraints, which could threaten its sustainability. It is advocated that these resource-poor, largely illiterate farmers should be encouraged to remain in the business so as to ameliorate their poverty level and reduce the high level of malnutrition in the area, attributed to higher cost of alternative protein sources.

Based on findings from this study, the following recommendations are suggested towards improving on the current level of operation by pumpkin leaf farmers in Ovia North East LGA of Edo State. Relevant stakeholders should come up with policies that would ease land acquisition by pumpkin leaf farmers in the study area. Labour saving machines like tractors should be made available for the farmers at affordable cost. Government should intensify efforts on road rehabilitation, especially in the rural areas, construct farm roads and provide other transportation facilities for easy transportation of farm produce. Efforts should be made by intervening agencies to support the farmers through provision of credit facilities like loans, farm machineries, and improved seed varieties.

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