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Full Length Research Paper

Economics Analysis of Small Scale Vegetable Production in Odeda Local Government Area of Ogun State

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ABSTRACT: The study examined the economics analysis of small scale vegetable production in Odeda Local Government Area of Ogun State. A total of one hundred and twenty (120) vegetable farmers were randomly selected for the study and interviewed through the use of structured questionnaires. The statistical tools used for this study were descriptive statistical tools such as frequency distribution and percentages and the regression models. The age of the vegetable farmers ranged between 30 and above 60 years with a mean of 455. The majority of the vegetable farmers were within the age bracket of 41-50 years. There is a gender imbalanced involvement of vegetable farmers in the study area, with males and females scoring 69.2% and 30.8% respectively. In terms of religion, evidence shows that the majority (58.3%) of the respondents in the study area are Christians while 41.7% are Muslims. 85.8% of the farmers were married Majority of the farmers were fairly educated with 15.0%, 42.5%, and 31.8 having primary, secondary, and tertiary education respectively. As regards household size, 21.7% had less than 4 persons per household. The range and mean of farming experience of the vegetable farmers were between 5 and 20 years with the majority (75.8%) having more than ten years of experience. The coefficient of the level of education of the farmers and farming experience is statically significant in determining the profit level of the respondents in the study area. Vegetable production in the study area generated a total gross margin of N96793.3333 and a net farm income of N80401.6667 during the production period. This study recommends that production parameters for example; labour should be enhanced to increase food crop output. For labour supply, young and educated men and women should be encouraged to take up food crop production as the present corps of farmers is aging.

Keywords: Small scale, vegetable, production, analysis

INTRODUCTION

In Nigeria, vegetable crops are produced in different agro-ecological zones through commercial as well as small scale farmers both as a source of income as well as food. However, the type is limited to few crops and production is concentrated to some pocket areas. In spite of this, the production of vegetables varies from cultivating a few plants in the backyards for home consumption up to a large-scale production for domestic and export markets (Dawit *et al.*, 2004).

Vegetables are an important feature of Nigerian's diet of a traditional meal without which it is assumed to be incomplete. In developing countries, the consumption of vegetables is generally lower than the FAO recommendation of 75kg per year in habitat (206g per day per capita) (Badmus and Yekini, 2011). Vegetable crops are grown in many parts of the world contributing

significantly to income security and the nutritive diet of many households. According to (Mofeke *et al.,* 2003) Vegetable crops constitute 30 to 50 percent of iron and vitamin A in resource poor diet. Vegetable crops such as tomatoes, okra, pepper, cabbage etc. are widely cultivated in most part of the Sub-Sahara Africa, particularly by small scale farmers in most states of Nigeria (Adeolu and Taiwo 2009; Giroh *et al*., 2010).

Protective cultivation has been widely applied due to adverse climatic conditions unfavourable to warm season vegetable production. In many parts of the world, nets or screens are commonly used in crop production for reducing excessive solar radiation, weather effects on produce, and to keep away insects and birds. Vegetable production under protective structures such as netting reduces yield losses from insects, diseases, heavy rains and sunburn which results in higher productivity and returns per unit area (Ramasamy, 2011). Protective structures provide protection to vegetable crops against biotic and abiotic stresses (Palada, 2011). Mangmang (2002) reported that the total fruit yield and high returns of tomato crop was significantly enhanced by the plastic net covers. The net shade greatly reduced insect population by 80% and marketable yields were 1.5 to 2 times greater under than in the open field (Palada and Ali, 2007). Growing cabbage under nets reduced insect incidence by 38-72 percent and resulted in significantly higher returns (Neave *et al.,* 2011). Green house, the latest word in agriculture is one of such means, where the plants are grown under controlled or partially controlled environment resulting in higher yields than those that are under open conditions (Navale *et.al*. 2003).

In Nigeria, small scale irrigation systems have gone a long way to support dry season farming of crops all over the country. Irrigation farming is relatively low in Nigeria and Africa as a whole, with irrigated area estimated at only 6 percent of total cultivated area, compared with 37 percent of Asia and 14 percent for Latin America (FAOSTAT, 2009). Svendsen and Sangi (2009) observed that more than two-third of existing irrigated area is concentrated in five countries namely Egypt, Madagascar, Morocco, South Africa, and Sudan. Giving that irrigated crops yields are more than double of rainfed yields in Africa (Liangzhi *et al.,* 2010), it is important to invest on irrigation developments with particular focus on locations and technologies with greatest potential for irrigation.

The effort of the Federal Government of Nigeria, with the support of World Bank and the African Development Fund to develop irrigation systems in the country started with the approval of the implementation of the National FADAMA Development Project (2008- 2016). Dry season production of vegetables is common along the river banks that cut across villages, towns, and cities in Nigeria.

The year 2000 was set as a target date for the attainment of food self sufficiency by all African countries in the action plan agreed upon in Lagos, Nigeria (Salih, 1994). However, roughly 20 years after the deadline, little or nothing had been achieved. This failure is evident by the excess capacity in the agro industrial sector; rapid increase in food prices and the gradual resort to food importation among others. Rapid growth in agriculture is essential for broad based economic growth, but acceleration in agricultural growth requires sound use of science and technology embodied in improved seed, fertilizer, agrochemical and other agronomic practices.

However without an efficient and cost effective supply of these inputs at the farm gate, science based growth in agricultural productivity cannot be achieved.

Furthermore, with the phased withdrawal of subsidies and privatization, the input markets remained underdeveloped and fragmented and farmers do not receive good quality inputs and pay unreasonable high prices despite the fact that the private sector in Nigeria has a potential to supply agricultural inputs in a cost effective manner (IFDC, 2001).

One of the problems cited as constraining the production of vegetables in Nigeria is stagnant production technology among Nigerian farming community, majority of who are small-scale producers.

Furthermore, the extent to which inputs supply and productivity relates to a shortfall in food demand and supply in Nigeria is not clearly understood. At the same time, the impact of factors such as the policy environment, and the availability of markets for the disposal of farm outputs is not often considered despite the fact that such factors make farmers to work harder and thus, produce higher outputs.

Policy makers have been making frantic efforts to attract people into farming.

This study is expected to provide valuable benchmark information to these new entrants on resource productivity and profitability in vegetables production so as to enable them considers its production as a viable option.

As for farmers who are already cultivating the crop, the study will go a long way in providing information on ways of boosting production. In order to increase the production of vegetables, sound micro and macroeconomic farm policies are needed. These require prior to their formulation, an understanding of the input prices and output relationship in vegetables production. This will obviously go a long way in generating employment opportunities for thousands of Nigerians, improve the food security status of Nigerians and most importantly, improve export and generate additional foreign exchange for the country. This study attempts to assess the economics analysis of small scale vegetable production in Odeda Local Government Area of Ogun State.

The general objective of this study is to assess the economics analysis of small scale vegetable production in Odeda Local Government Area of Ogun State.

METHODOLOGY

Study area

This study was carried out in Odeda Local Government Area of Ogun State. Odeda Local Government has it's headquarter at Odeda, a place situated along Abeokuta-Ibadan Road, which is about 10 kilometres from Abeokuta (the State Capital). The Agura of Gbagura is the only state that recognized Oba in the Local Government Area. It has an extensive landmass mostly grass. The vegetation of the Local Government is mainly Orchard and of thick grasses, thus, the land is suitable for agriculture and livestock rearing. It as a land mass of 1263, 45sq km and a population of 99,000-115,000 people according to the 1991 census. The Local Government shares boundaries with Ibarapa and Iddo Local Government Areas of Oyo State in the north and east respectively, and Obafemi/ Owode Local Government Area to the south and west respectively. The Local Government enjoys a tropical climate, with double maxima of rainfall between April and July (short dry season in August) and from September to October. The long dry season start from November, thus the land is suitable for agriculture and livestock rearing. The major rivers in the area are Asag and Otere streams. The people are predominantly Egbas and they speak Egba dialect. However, their main language is Yoruba. The Local Government is made up of (3) three Zones these are: Odeda Zone, Ilugun Zone, Opeji Zone. The 3 three zones are further divided into 10 wards which are Alabata, Alagbagba, Balogunitesi, Illugun, Obantoko, Obete, Odeda, Olodo, Opeji, Osiele.

Data collection and sampling technique

A multistage sampling technique was used for the study. In the first stage, five wards were randomly selected from the study area. Second stage involved random selection of four villages from each of the 5 selected wards in the first stage thereby making a total of 20 villages. In the last stage, six households were randomly selected from each of the sample villages thereby making a total of 120 respondents.

Types of data used

Primary and secondary data were used in the study. Primary data was collected with structured questionnaire and will be personally administered on households in the study area. Secondary data was sourced from relevant literatures, Journals, and publications.

Methods of data analysis

Socio-economic characteristics of households

The socio-economic characteristics of the sample farmers were examined using relevant descriptive statistical tools such as frequency table, means, among others.

Cost and return of vegetable production

Gross Margin Analysis: The budgetary technique was used to determine the gross margin at various scales of operation.
Model used in estimating the Gross Margin is:

$$GMI = \Sigma TR - \Sigma TVC \quad (i)$$
$$TR = Py.Yi \quad (ii)$$
$$TVC = Px.X \quad (iii)$$
$$TC = TVC + TFC \quad (iv)$$
$$NFI = GM - TFC \quad (v)$$

Where:

GMI = Gross Margin Income (N)
TR = Total Revenue (N)
TVC = Total Variable Cost (N)
TC = Total Cost (N)
NFI = Net Farm Income (N)
Py = Unit Price of Output Produced (N)
Y = Quantity of Output (Kg)
Pxi = Unit Price of Variable Inputs Used (N)
Xi = Quantity of Variable Inputs (Kg)
This will be used to determine the cost and returns.

Factors influencing the profitability of vegetable production in the study area

Linear regression model was used to estimate the factors determining the net incomes derivable from the production of vegetables in the study area. The model is implicitly specified as,
$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, \mu)$
Where, Y = net income from vegetables (₦)
X_1 = age of respondents (years)
X_2 = educational level of respondents (years spent in formal schools);
X_3 = household size
X_4 = experience in vegetable farming (years)
X_5= farm size (ha)
X_6 = total farm expenditure incurred (₦)
μ = error term.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

Age of respondents

The age of the respondents is an important factor that affects their level of productivity and overall coping ability

within the business. Age is believed to influence the level of physical work. Age of the vegetable farmers ranged between 30 and above 60 years with a mean of 455. Majority of the vegetable farmers were within the age bracket of 41-50 years and this indicates that the vegetable farmers were aging (Table 1).

Table 1: Age distribution of respondents

Age group	Frequency	Percentage
Below 30 years	8	6.7
31-40 years	30	25.0
41-50 years	50	41.7
51-60 years	22	18.3
Above 60 years	10	8.3
Total	120	100.0

Source: Field Survey, 2019.

Sex of the respondents

Sex determines the ability to perform some physical work. It is generally believed that men are more efficient in activities than woman. The perhaps is because they are more energetic and can handle more tedious work than their female counterpart. This is in fact, the basis for comparing the sex of the farmers. There is a gender imbalanced involvement of vegetable farmers in the study area, with male and female scoring 69.2% and 30.8% respectively. By implication, there were more male in the study area than female. This may be due to the fact that female did not own land due to land tenure (Table 2).

Table 2: Sex distribution of farmers.

Sex	Frequency	Percentage
Male	83	69.2
Female	37	30.8
Total	120	100.0

Source: Field Survey, 2019.

Religion of Farmers

In terms of religion, majority (58.3%) of the respondents in the study area are Christians while 41.7% are Muslims (Table 3).

Table 3: Distribution of farmers by their religion.

Religion	Frequency	Percentage
Christianity	70	58.3
Islam	50	41.7
Total	120	100.0

Source: Field Survey, 2019.

Marital Status of Respondents

The marital status of respondents helps to reduce labor cost especially when the respondents are married in which they can supply labour from their household. This in turn increases their income considerably (Table 4). Table 4 shows that only 85.8% of the farmers were married by implication the farmers were married having enough family labour which offset the cost of family labour and hence boost productivity.

Table 4: Distribution of respondents by marital status.

Marital status	Frequency	Percentage
Single	10	8.3
Married	103	85.8
Divorced	7	5.8
Total	120	100.0

Source: Field Survey, 2019.

Educational status of respondents

Formal education is a widely known avenue for improving knowledge and rate of skill acquisition formal education is also important in business because it determine the degree of level of adoption of innovation and new technologies (Table 5). Educational attainment of farmers does not only raise agricultural productivity but also enhances farmers' ability to understand and evaluate information on new techniques and processes. Majority of the farmers were fairly educated with 15.0%, 42.5% and 31.8 having primary, secondary and tertiary education respectively. Only 10.8% had no any form of education. This means that the farmers had minimum level of education that could enable them to adopt modern agricultural technology and participate in food crop transformation agenda despite the fact that they are aging.

Table 5: Distribution of respondents by educational status.

Years of formal education	Frequency	Percentage
No formal education	13	10.8
Primary education	18	15.0
Secondary	51	42.5
OND/NCE	12	10.0
HND/B.SC	26	21.7
Total	120	100.0

Source: Field Survey, 2019.

Household size of respondents

The total household size of the respondents comprises the head of the home, the wives, children as well as all other dependants (Table 6).

Table 6: Distribution of respondents by household size.

Family size	Frequency	Percentage
1-3	26	21.7
4-6	34	28.3
7-9	42	35.0
10-12	18	15.0
Total	120	100.0

Source: Field Survey, 2019.

One of the most important factors affecting production level and productivity among farmers is the composition and size of the farming family; As regards household size, 21.7% had less than 4 persons per household. The average household size was 8 persons per household (Table 6).

Farming experience of respondents

The number of years in which the respondents have been involved in cooperative society could be used to measure their efficiency. Experience is expected to have a significant positive impact on the managerial ability of the respondents. Therefore, the more experienced they are, ceteris paribus, the more efficient he would be in management because the acquired experience over the years would be brought to bear on their activities (Table 7). The range and mean of farming experience of the vegetable farmers was between 5 and 20 years with majority (75.8%) having more than ten years of experience (Table 7). The many years of farming experience shows that the farmers are relatively experienced and there is some level of specialization and this would help in cost minimization and achieving greater efficiency.

Table 7: Distribution of respondents by farming experience.

Years of experience in farming	Frequency	Percentage
Below 5yrs	17	14.2
6-10	21	17.5
11-15	40	33.3
16-20	15	12.5
Above 20	27	22.5
Total	120	100.0

Source: Field Survey, 2019.

Farm size of respondents

Result further revealed that majority of the farmers had less or equal to four acres of farm land in the study area (Table 8). The mean farm size was 5acres

Table 8: Distribution of respondents by farm size.

Size of Farm	Frequency	Percentage
1-3acres	26	21.7
4-6 acres	77	64.2
7-9 acres	12	10.0
10-12 acres	5	4.2
Total	120	100.0

Source: Field Survey, 2019.

Gross margin

In other to determine the cost return structure of the vegetables production by the use of modern method, gross margin analysis was used to establish the difference between the total value of the production and the total variable cost of production. Table 9 shows the cost return structure of the smallholder vegetables farmers in the study area with their mean and percent. The net profit/profit is the difference between total revenue and total cost or the difference between gross margin and fixed cost and it was used to determine the profit of the smallholder vegetables farmers in the study area.

Vegetables farmers incurred several costs in the course of production. In the short run, these costs include both variable and fixed costs of production. The variable costs involved in vegetables production include labour, vegetables seed, fertilizer, transportation, feeding, herbicides, insecticides and tractor hiring costs. The fixed cost items are made up of depreciation values of farm building, bicycle, wheelbarrow, cutlass and hoes, axe, shovel and spades etc. The overall cost structure for an average vegetables farmer in the study area is presented in (Table 9). The total cost of production for all sampled farms amounted to N156306.6667. Out of this amount, the variable cost accounted for N139915.0000. Vegetables production in the study area generated a total gross margin of N96793.3333and a net farm income of N80401.6667 during the production period. Gross margin is the difference between TR and TVC, while net farm income is the difference between GM and TFC and the outcome signifies the profitability of enterprise. A positive NFI shows that an enterprise is a profitable one and worth continuing with. A negative NFI signifies otherwise, that is, a loss and a business not worthy of emulation or one that requires a total overhaul. Thus, in the study area vegetables farming having recorded a positive NFI is profitable.

Regression Analysis Result of the determinants of profitability of the investment among farmers

The estimated parameters and the relevant statistical test results obtained from the analysis are presented in (Table 10). The coefficient of level of education of the farmers is statically significant in determining the profit level of the respondents in the study area. This implies that there is a positive relationship between the respondent's level of education and their profit level in the study area. This implies increase in the level of education of the respondents will lead to increase in their profit in the study area. The coefficient of the years of farming experience of the respondents is statically significant in determining the profit level of the respondents in the study area. This implies that there is a positive relationship between years of farming experience of the respondents and their profit level in the study area .This implies increase in the years of farming experience of the respondents will lead to increase in their profit in the study area.

Table 10: Regression Analysis Result of the determinants of profitability of the investment among farmers.

Variables	Co-efficient	t-value
(Constant)		12.910
Age	0.040	0.330
Level of education	0.116***	4.229
Household size	-0.071	-0.752
Farming experience	0.030***	3.251
Farm size	0.067	0.710
Monthly income	0.033	0.342
f-value		6.504
R Square		0.793
Adjusted R Square		0.726

Source: Field Survey, 2019.
*1% Significance level= ***, 5% Significance level= ** and 10% Significance level= **

Conclusion

Vegetables production in the study area generated a total gross margin of N96793.3333and a net farm income of N80401.6667 during the production period. A positive NFI shows that an enterprise is a profitable one and worth continuing with. Thus, in the study area vegetables farming having recorded a positive NFI is profitable. Level of education of the farmers and farming experience are significant in determining the profit level of the respondents in the study area.

Recommendations

(i) The important production parameters for example; labour, should be enhanced to increase food crop output.
(ii) For labour supply, young and educated men and women should be encouraged to take up food crop production as the present corps of farmers is aging. This could be achieved by providing the young farmers with access to credit, improved varieties and farm mechanization implements services. By doing these, significant factors that reduce inefficiency such as education would be improved and problem of aging that reduces technical efficiency would be resolved.

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