

PROFITABILITY OF OKRA PRODUCTION AND MARKETING IN IMO STATE

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Abstract

This study looked at the profitability of okra production and marketing in Imo State, Nigeria. Multi-stage and random sampling technique were used to select 81 respondents for this study. Information on the objectives of this study was elicited from the sampled respondents through a structured questionnaire. Data were analyzed using descriptive statistics such as the mean, frequency distribution, percentage, gross margin analysis and multiple regression model. Majority of the respondents were females (79.0%), married (95.1%) and educated (45.7%) with a mean age of 52 years. The gross margin analysis estimated the farmers gross margin to be ₦130,873.36 with a net profit of ₦93,583.35. Furthermore, the rate of returns to investment was estimated to be 114.6% with a benefit cost ratio of 2.15, showing that okra production and marketing in the study area is thus a viable and profitable business that need to be encouraged. Again the Cobb-Douglas function produced the lead equation with the independent variables been highly significant at 1%. All the explanatory variables were positively correlated except age and were significant at 1% alpha level. About 81.1% of the total variation in productivity was explained by the explanatory variables investigated. Majority of the respondents indicated lack of storage facilities (96.3%) and high cost of labour (81.5%) as their major production and marketing constraints. Similarly, a call on the government to address the challenges of these farmers were recommended to enable the farmers increase output and enhance food security.

Key words: Profitability, Okra, Production, Marketing and Benefit cost ratio.

Introduction

Okra (*Abelmoscus esculentus*) known as lady's finger is a vegetable crop commonly grown by most rural farmers in sub-saharan Africa. It is a warm season crop that belongs to the cotton (mallow) family. Okra is referred to as "Gumbo" in some areas and "fingerlicks" due to its draw nature (Douglas, 2001). The crop is rich in vitamins and minerals (Law-Ogbomo et. al., 2013) and are grown widely in gardens for home use with its excess for markets.

In Nigeria, okra rank third among fruit vegetables (after tomato and pepper) in terms of consumption

and production. The world production is estimated at 6 million tonnes per year and India followed by Nigeria and Sudan are the world largest producers (Varmudy, 2011). The immature pods are used as boiled vegetable while in dried form, it is used as soup thickener. The green pods are rich sources of vitamins, calcium, potassium and other minerals (Ijoyah and Dzer, 2012). Over 60% of okra grown in Nigeria are produced under intercropping system and the intercropping of okra with maize and cassava by most small holder farmers is a common coping strategy for poverty reduction in Nigeria (Ibeawuchi, 2007). This practice may allow complementary interactions in crops that have greater system resilience, reduce insect-pest incidence and deliver environmental benefits such as greater soil and water conservation potential (Gupta, 2004).

Despite the nutritive values of okra, its production is very low in most developing countries. Most farmers in developing countries depend mainly on natural fertility of the soil and in addition, invest considerable labour in land preparation and weed control, so as to achieve a reasonable yield of the crop. In Nigeria the production of okra requires proper preservation and efficient marketing channels in order to enhance profitability and arrest some of the wastage being experienced during the peak season. The development of appropriate technologies for okra production and marketing is sine qua-non to high market value (Oguntade et.al., 2012). However, production has not been sustainable due to climate change and over dependence on rain fed farming. Consequently, okra deteriorate rapidly as there is a poorly developed storage and preservation technology for okra thus, there is a widening gap between the supply and demand of the product in Nigeria (IITA, 1993). There appears to be a "glut" in supply at the harvest period, while scarcity looms during the off-seasons. In other words, markets are flooded with okra vegetables during the harvest period usually in the rainy season with the resultant fall in prices. Most of the unsold products are wasted during off season due to high perishability of the product (Imoh and Ajaero, 2007).

This paper was designed to examine the socio-economic characteristics of the respondents, determine the profitability of okra production and

marketing, examine the productivity of resource-use by the farmers and analyze the problems encountered in okra production and marketing.

Methodology

Study Area and Data Collection

The study was carried out in Imo State. The state is located in the rain forest zone of South-Eastern Nigeria. It is bounded in the East, West, North and South by Abia State, Anambra State, Ebonyi State and Rivers State respectively. It has three distinct agricultural zones namely, Owerri, Orlu and Okigwe which were used for this study. This is to give a good representations of all the zones in the state. A local government area from each zone was randomly selected and they include Ikeduru, Orlu and Obowo . The list of okro farmers in each of the local government area as documented by their zonal ADP, was used as sample frame. The list contain about 103 okro farmers, in Ikeduru, 83, in Orlu and 114, in Obowo. Due to the unequal number of farmers in the selected local government areas, 30% of them from each local government area was selected. This gave about 90 randomly selected farmers where 31 are from Ikeduru, 25 are from Orlu and 34 are from Obowo. A well structured questionnaire was used to elicit information from the farmers and only 81 responses were found useful for data analysis.

Method of Data Analyses

Data were analyzed using descriptive statistics and other statistical/econometric tools. The socio-economic factors were analyzed using descriptive statistics such as mean, frequency and percentage. The profitability of okra production and marketing was analyzed using gross margin analysis. This is implicitly represented as follows:

$$GM = TR - TVC$$

$$\sum_{i=1}^{n_i} P_i Q_i - \sum_{i=1}^{n_i} C_i X_i \text{ ----- (i)}$$

Where

GM = Gross margin

TR = Total revenue

TVC = Total variable cost of production and Marketing

P_i = Price of unit output in naira

Q_i = Output per farmer in kg

C_i = Price of input used in naira

X_i = Quantity of variable input

If GM > 0, the enterprise is profitable

However, GM/Ha = GM/Mean Ha of land

Net profit/Ha = Net profit/Mean

Ha of land

Furthermore, the multiple regression model was employed to determine the productivity of resource-use of the farmers on the farm enterprise. The multiple regression model is implicitly specified thus;

$$Y = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, e) \text{ ----- (ii)}$$

Where:

Y = productivity (kg)

X₁ = age (years)

X₂ = education (years of schooling)

X₃ = farm size (Ha)

X₄ = farming experience (years)

X₅ = labour cost (naira)

X₆ = net farm income (naira)

X₇ = rent on land (naira)

X₈ = household size (No of persons)

e = error term

It is expected a priori that x₁, x₂, x₃, x₄, x₅, x₆, x₇, x₈ > 0; x₁ < 0

Again, the production and marketing problems were analyzed using descriptive statistics.

Results and Discussion**Table 1: Distribution of respondents according to socio-economic characteristics (n = 81)**

| Variables | Frequency | Percentage | Mean |
|---------------------------|-----------|------------|-----------|
| Gender | | | |
| Male | 17 | 21.0 | |
| Female | 64 | 79.0 | |
| Age | | | |
| 30-39 | 14 | 17.3 | 52.4 |
| 40-49 | 6 | 7.4 | |
| 50-59 | 44 | 54.3 | |
| 60-above | 17 | 21.0 | |
| Marital Status | | | |
| Married | 77 | 95.1 | |
| Divorced | 2 | 2.5 | |
| Widowed | 2 | 2.5 | |
| Education | | | |
| No formal education | 16 | 19.8 | |
| Primary education | 21 | 26.0 | |
| Secondary education | 37 | 45.7 | |
| Tertiary education | 7 | 8.6 | |
| Farm size (Ha) | | | |
| 0.1-1.0 | 69 | 37.95 | 0.8 |
| 1.1-2.0 | 2 | 3.1 | |
| 2.1-3.0 | 10 | 25.5 | |
| Farming experience | | | |
| 1-5 | 9 | 11.1 | 19.7 |
| 6-10 | 8 | 9.9 | |
| 11-15 | 37 | 45.7 | |
| 16-20 | 14 | 17.3 | |
| 21-above | 13 | 16.0 | |
| Household size | | | |
| 1-4 | 66 | 81.5 | 5.0 |
| 5-9 | 8 | 9.9 | |
| 10-14 | 7 | 8.6 | |
| Land acquisition | | | |
| Inherited | 72 | 88.9 | |
| Rent/lease | 5 | 6.2 | |
| Purchase | 4 | 5.0 | |
| Labour source | | | |
| Family only | 64 | 79.0 | |
| Hired only | 10 | 12.3 | |
| Both | 7 | 8.6 | |
| Annual income | | | |
| 40,000-60,000 | 9 | 11.1 | 70,222.22 |
| 61,000-81,000 | 66 | 81.5 | |
| 82,000-102,000 | 6 | 7.4 | |

Source: field survey, 2012

Table 1, showed that more females (79.0%) were involved when compared with males (21.0%). This is in agreement with Nkonya et., al, (2008) who stated that more women participation in farming activities increases agricultural production thereby reducing food prices by making food available hence, improving the living standard of farmers. The mean age of the respondents was 52 years. This depicts that the respondents were active to carry out their farming and marketing activities and this is in conformity with Imoh, (2004) and Onu et., al, (2000) who posited that experience correlates positively with age. The bulk of the respondents were married (95.1%). This indicates active family support for farm work and this is in agreement with Osuji et. al, (2012). Education status showed that majority of the respondents (45.7%) had secondary education which

is a significant factor for adoption of new and improved technology (Akinbile and Ndaghu, 2000). The mean farm size was 0.8 hectares which is an indication of subsistence production. Farming experience showed that farmers had up to 20 years experience which engendered their production and marketing expertise and this is in conformity with Osuji et., al, (2012). The mean household size was 5 persons which is a significant source of human power utilized in farming operation (Balogun et., al, 2012). Majority of the respondents (88.9%) acquired their land through inheritance. Furthermore most of the respondents (79.0%) utilized family labour partly due to the high cost of hired labour in the area. The mean annual income is ₦70,222.22 which is a significant indication of a thriving business.

Table 2: Gross margin analysis estimates

| Items | Quantity | Amount(₦/Ha) | Percentage |
|---|----------|-------------------|-------------|
| A. Production of Okra | | | |
| i. Variable Cost | | | |
| Fertilizer | 150Kg | 2,550.90 | 3.1 |
| Planting materials | 212Kg | 15,610.21 | 19.1 |
| Cost of labour | | 19,256.10 | 23.6 |
| Agrochemicals | | 1,787.19 | 2.2 |
| Total Variable Cost of Production | | 39,204.40 | 48.0 |
| ii. Fixed Cost | | | |
| Depreciation of fixed items | | 3,245.40 | 4.0 |
| Rent | | 17,345.65 | 21.2 |
| Interest on loans | | 12,562.16 | 15.4 |
| Total Fixed Cost of Production | | 33,153.21 | 40.6 |
| Total Cost of Production (i + ii) | | 72,357.61 | |
| B. Total Production | | | |
| i. Total Output | | 3035kg | 211,820.00 |
| ii. Estimated Output/Ha | | 3793.8kg/Ha | ----- |
| iii. Quantity Sold | | 2503kg | 175,210.00 |
| iv. Home Consumption | | 419kg | 37,240.00 |
| v. Wastage | | 113kg | 7,910.00 |
| C. Marketing of Okra | | | |
| i Variable Cost of Marketing | | | |
| Transportation cost | | 2,671.23 | 3.3 |
| Packaging/loading and offloading cost | | 2,461.01 | 3.0 |
| Total Variable Cost of Marketing | | 5,132.24 | 6.3 |
| ii Fixed Cost of Marketing | | | |
| Depreciation of fixed items | | 2,918.09 | 3.6 |
| Levies | | 1,218.71 | 1.5 |
| Total Fixed Cost of Marketing | | 4,136.80 | 5.1 |
| Total Cost of Marketing (i + ii) | | 9,269.04 | 11.4 |
| Total Cost of Production and Marketing | | 81,626.65 | |
| iii. Market Supply | | | |
| Total Market Supply 2503/kg @ ₦70.00/kg | | 175,210.00 | |
| Estimated Output rate/Ha 3129Kg/Ha | | ---- | |
| Total Revenue | | 175,210.00 | |
| D. Profitability of Okra Production /Marketing | | | |
| Gross margin (Ciii – (Ai + Ci)) | | 130,873.36 | |
| Net profit | | 93,583.35 | |

| | |
|-------------------------------|------------|
| Gross margin/Ha | 163,591.70 |
| Net profit/Ha | 116,979.19 |
| Unit Cost of production /Kg | 28.91 |
| Unit Cost of Marketing/Kg | 3.70 |
| Unit Selling Price/Kg | 70.00 |
| Marketing Margin/Kg | 41.09 |
| Net Marketing Margin/Kg | 37.39 |
| Rate of Returns to Investment | 114.6 |
| Benefit cost ratio | 2.15 |

Source: Field survey, 2012

Table 2, Showed that the gross margin analysis was used to determine the profitability of okra production and marketing in the study area. An average quantity of 3035 kg was produced while about 2503kg was marketed.. The table showed that 3.1% of the total cost was incurred on fertilizer to improve the soil fertility, 19.1% of the total cost was incurred on planting materials, 23.6% on labour, 2.2% on agro-chemicals, 3.3% on transportation cost, 1.5% on levies and 3.0% on packaging/loading cost. Also, 21.2% and 15.4% of the total cost was spent on rent and borrowed capital. The high cost of labour recorded in the area showed that labour wages was rather on a high side. However, about 419kg of okra was consumed which accounted for ₦ 37,240.00.

Total cost of production and marketing was estimated to be ₦ 81,626.65. Fixed items was depreciated using a straight line method of depreciation. Furthermore, the study estimated ₦130,873.36 as the gross margin with a net profit of ₦93,583.35. Consequently, the result showed that a 100% increase in the production and marketing of okra will yield over 114.6% rate of returns to investment with a benefit cost ratio of 2.14. This result is consistent with Law-Ogbomo et.al.,(2013).Hence, the gross margin is greater than zero and this implies that okra production and marketing is thus a viable and profitable enterprise in the area.

Table 3: Estimated Multiple Regression Parameters

| Variables | Coefficients | T-Values | Signifiant Levels |
|--------------------------------------|--------------|----------|-------------------|
| Constant | 547.236 | | |
| Age (x ₁) | -0.0675 | -2.9114 | ** |
| Education (x ₂) | 0.0206 | 3.6213 | ** |
| Farm size (x ₃) | 0.0392 | 3.1012 | ** |
| Farming experience (x ₄) | 0.0411 | 2.7702 | ** |
| Labour cost (x ₅) | 0.0513 | 4.1041 | ** |
| Farm revenue (x ₆) | 0.0712 | 3.2195 | ** |
| Land acquisition (x ₇) | 0.0671 | 2.7166 | ** |
| Household size (x ₈) | 0.0992 | 4.1034 | ** |
| R ² | 0.8106 | | |
| F value | 14.4011 | | * |
| n | 81 | | |
| t _{0-01,72} | 2.617 | | |
| t _{0,05,72} | 1.980 | | |
| f _{0,05} | 2.02 | | |

Source: Field survey, 2012

** Significant at 1% level

* Significant at 5% level

Table 3, showed that the multiple regression model was employed to determine the productivity of resource use of the farmers. Double-log functional form was chosen as the lead equation based on its ability to produce the lowest standard error, highest value of the co-efficient of multiple determination (R²) and a quite number of significant variables. The

table shows that all the explanatory variables such as age (x₁), education (x₂), farm size (x₃), farming experience (x₄), labour cost (x₅), farm revenue (x₆), land acquisition (x₇) and household size (x₈) were highly significant at 1% statistical level and were able to explain about 81.1% of the total variation of the dependent variable investigated. Age (x₁) was

significant but had inverse relationship with productivity implying that as farmer's grows older, their productivity levels declines. This is in conformity with Osuji et. al, (2012) who posited that older farmers are less receptive to new technologies and hence low productivity.

Education (x_2) was positively correlated with productivity. This implies that education enhances farmers knowledge in adopting new technologies which increase output and this is in line with Ojo and Akanji, (1996). Again farm size (x_3) and farming experience (x_4) were also positively related to productivity. This implies that increase in farm size

and farming experience tends to increase production efficiency (Onyenweaku et. al, 2010). Similarly variables such as labour (x_5), farm revenue (x_6), land acquisition (x_7) and household size (x_8) were all positively related to productivity and hence increased productivity by 5.13, 7.12, 6.71 and 9.92 respectively. This implies that increase in labour cost, farm revenue, land acquisition and household size tends to improve and increase the productivity level of the farmers. This assertion is in conformity with Ozor and Nnaji (2010). The F-value was significant at 5% probability level and this confirms the fitness of the model.

Table 4: Distribution of respondents according to production/marketing problems

| Problems | ** Frequency | Percentage |
|----------------------------|--------------|------------|
| Lack of access to credit | 39 | 48.1 |
| Lack of storage facilities | 78 | 96.3 |
| Lack of extension services | 27 | 33.3 |
| High cost of farm inputs | 44 | 54.3 |
| High cost of labour | 66 | 81.5 |
| Pest attack | 36 | 44.4 |
| Poor weather conditions | 24 | 29.6 |
| Lack of access to markets | 32 | 39.5 |

Source: Field survey, 2012

** Multiple responses recorded

Table 4, showed that the respondents perceived lack of storage facilities (96.3%) and high cost of labour (81.5%) as their major production and marketing constraints facing them. Other perceived constraints include, high cost of farm inputs, lack of access to credit, pest attack, lack of access to markets, lack of extension services and poor weather conditions which accounted for 54.3%, 48.1%, 44.4%, 39.5%, 33.3% and 29.6% respectively. This implies that production and marketing of okra in the study area will continue to dwindle if these factors remained unaddressed.

Conclusion and Recommendations

The study has shown that the production and marketing of okra (*Abelmoscus Esculentus*) in the study area is thus a profitable and viable business that should be encouraged. The profitability analysis showed that farmers in the study area made a gross margin of ₦130,873.36 and a net-profit of ₦93,583.35. Again, rate of returns to investment was estimated to be 114.6% with a benefit cost ratio of 2.15. In lieu of this, if the various constraints perceived by the farmers are addressed forthwith, production and marketing of okra will remain on the increase and consequently, the living standard of these farmers would be positively enhanced, thus food security.

References

Akinbile, L.A., and Ndaghu, A.A.T. (2000). Poverty Level and Poverty Alleviation Strategies of Farm Families, Michika Local Government Area of Adamawa State, Nigeria. *Journal of*

Economics and Rural Development, 41(2), 101-109.

Balogun, O.L., Adeoye, A., Yusuf, S.A., Akinlade, R.J., and Carim Canni (2012). Production Efficiency of Farmers under National Fadama II Project in Oyo State, Nigeria. *International Journal of Agricultural Management and Development (IJAMAD)*.

Douglas, C.S. (2001). "Okra Production", *Journal of the North Carolina Cooperative Extension Service*. Vol.1/01/Hil-19.

Gupta, R.P. (2004). *Agricultural Prices in a Backward Economy*. National Publishing House, Delhi. Pp. 134-135.

IITA, (1993). Agricultural Use of Physical Resources of Africa in Sustainable Food Production in Sub-Saharan Africa, Constraint and Opportunity. IITA Ibadan. Oyo State, Nigeria.

Ibeawuchi, I.K (2007). "Intercropping a Food Production Strategy for Resource-Poor Farmers", *Nature and Science*, Vol. 5. No 1, pp. 46-49.

Ijoyah, M.O. and Dzer, D.M (2012). Yield Performance of Okra (*Abelmoscus esculentus* L.Moench and Maize (*Zea mays*.L.) as Affected by Time of Planting in

- Makurdi, Nigeria. *Journal of Agronomy*. Vol.1(7).2012
- Imoh, A.N. (2004). Empowering Women Farmers for Household Food Security in Ezinihitte Local Government Area of Imo State, Nigeria. *Nigeria Journal of Rural Sociology*, 4(1), 1-5.
- Imoh, A.N., and Ajaero, J.P (2007). Rural Women Involvement in Dry Season Vegetable Production and Marketing in Ezinihitte Local Government Area of Imo State, Nigeria. *Nigeria. GAEP. Vol.:3, No 12* (pp.9-12).
- Law-Ogbomo, K.E., Osaigbovo, A.U and Ewansiha, S.U (2013). Responses of Okra (*Abelmoscus Esculentus*) to various Periods of Weed Interference in a Humid Tropical Environment. *International Journal of Agriculture and Rural Development (IJARD)*. Vol. 16 (1). 2013.
- Nkonya,E.,Philip, D.,Mogues, T.,Yahaya, M.K, Pender, J.,Adebowale, G.,Arokoyo,T.,and Kato, E.(2008).
The Impact of a Pro-Poor Community Driven Development Project in Nigeria. *International Food Policy Research Institute (IFPRI)*.
- Oguntade, A.E. and Adeleke, M.L (2012). Determinants of Marketable Surplus of Cassava Tuber Production for Food Security in Ondo State, Nigeria. Proceedings of International Agricultural Conference held in Anambra State University, Igbariam Campus.
- Ojo, M.O and Akanji, O.O (1996). The Impact of Macro-Economic Policy Reforms of Nigeria Agriculture. *CBN Economic and Financial Review*. 34(2): 549-579
- Onu, J.I, Amaza, P.S. and Okumadewa, F.Y. (2000). Determinants of Cotton Production and Economic Efficiency in Nigeria. *African Journal of Business and Economic Research*. 112, 34-40.
- Osuji, E.E, Ohajianya, D.O, Ehirim, N.C, Eze, E.U (2012). Effects of Land Use Patterns on Agricultural Productivity in Imo State, Nigeria. *International Journal of Food and Agricultural Research*. Vol. 9. No (1) ISSN: 0189-7136.
- Osuji, E.E, Ehirim, N.C, Eze, E.U, Oguegbuchulam, M.N (2012). Cost and Returns Analysis of Cocoa Marketing in Ikeduru Local Government Area of Imo State, Nigeria. Proceedings of International Agricultural Conference held in Anambra State University, Igbariam Campus.
- Onyenweaku, C.E., Okoye, B.C. and Okorie, K.C. (2010). Determinants of Fertilizer Adoption by Rice Farmers in Bende Local Government Area of Abia State, Nigeria. *Nigerian Agricultural Journal*. 41(2), 1-5.
- Ozor, N., and Nnaji, C. (2010). Difficulties in Adaptation to Climatic Change by farmers in Enugu State, Nigeria. *Nigeria Journal of Agricultural Extension*, 14(2), 107-123.
- Varmudy, V. (2011). *Marketing Survey Needed to Boost Okra Exports. "Facts for You"*. Unpublished
Article available at www.ffymag.com/admin/issue/pdf/okra/feb/11/.pdf.