Asian Journal of Agriculture and
Rural Development

Asian Economic and Social Society
www.aessweb.com
AESS

Socio-Economic Determinants of Seed Yam Production in Oyi Local Government Area of Anambra State

Okeke Daniel, C. † (Department of Agricultural Education, Nwafor Orizu College of Education Nsugbe, Nigeria)

Okeke Charity C. (Department of Agric Economics and Extension, Nnamdi Azikiwe University, Awka, Nigeria)

Udeora Samuel N. (Department of Agricultural Education, Nwafor Orizu College of Education Nsugbe, Nigeria)

† Corresponding author

Socio-Economic Determinants of Seed Yam Production in Oyi Local Government Area of Anambra State

Author(s)

Okeke Daniel, C.
Department of Agricultural Education, Nwafor Orizu College of Education Nsugbe, Nigeria

Okeke Charity, C.
Department of Agric Economics and Extension, Nnamdi Azikiwe University, Awka, Nigeria

Udeora Samuel, N.
Department of Agricultural Education, Nwafor Orizu College of Education Nsugbe, Nigeria

Abstract

This study assessed the socio-economic determinants of seed yam production in Oyi Local Government Area of Anambra State. Purposive and simple random sampling procedure was used respectively to select four communities and 120 respondents for the study. The data obtained were used to analyse the influence of socio economic factors on seed yam production and also determine the technical efficiency level of the seed yam farmers using descriptive statistics and stochastic production frontier functions. The result indicated that 88 percent of the farmers were below 60 years of age, 86 percent had more than 10 years farming experience and only 16 percent had no formal education. The findings also indicated that the effect of the socio economic variables such as age, experience, education level, household size and farm size were positive and significant. It is recommended among others that credit facilities should be provided especially to small holder farmers to engender their production capacity.

Introduction

For a sustainable economic development of the developing economies, there is absolute need to increase the productivity of the agricultural sector. Yam production and marketing are major sources of employment and income for 70% of the farming household population of over 140 million people (NBS, 2006). Among the world's producing countries, Nigeria is known to have the greatest share of the world's production (Ogbonna, 2006). Nigeria remains as the top producer of yam with annual production of 36.72 million metric tones (Mt) (Orkwor, 1998; Jaussen, 2001; FAO, 2008).

Yam production in Nigeria according to Idachaba (2004) is a more financially rewarding enterprise than groundnut, rubber and cotton production. Between 1991 and 1998, monetary value of total yam production surpassed that of any food crop in Nigeria (CBN, 2000). It commands the highest socio-cultural value among food crops in Nigeria hence is heralded as the "King" of all arable crops because it earns more money per unit weight than other food crops (Okwor, 1998). Over 95% of total production according to Ugwu (1996) is devoted for human consumption such that almost all the yams produced in Nigeria are consumed internally. The very little exported through informal sector is not recorded in international trade statistics and hence, is very difficult to estimate the volume of yam trade that moves through this sector (Lev and Shriver, 1998; Ugwu, 1999).

In Nigeria, the procurement of the required seed yam for ware yam production, its reoccurring scarcity and high cost during planting season, is a major constraint to seed yam production (Iroukwe *et al*., 2007). The seed yam constitute over 33% of the cost out-lay in yam production and limits the size of yam farms under traditional cropping method (Iroukwe *et al*., 2012). Again, Ikwelle *et al*. (2003) also stated that bulk, quantity, high cost of cultivable seed yams, and high cost of labour and staking materials requirements are among the major constraints to yam production and improvement in Nigeria.

It is necessary therefore to ascertain the factors that hinder the production of seed yams and the constraints encountered by the farmers. This study will examine the socio-economic determinants of seed yam production in Oyi Local Government Area of Anambra State, influence of the socio economic factors on productivity and, the farmers' level of technical efficiency.

Materials and Methods

The study was carried out in Oyi Local Government Area of Anambra State. The local government is situated in Anambra North. The major crops cultivated in the area are cassava, yam, rice, maize and leafy vegetables. Sole cropping, mixed farming and mixed cropping are the major farming systems and the farmers integrate the growing of different crop with the rearing of animals to promote food security (Ugwumba and Uzuegbunam, 2010). The primary data for the study was obtained through structural questionnaire.

A purposive and simple random sampling procedure was used in the selection of the communities and the respondents for the study. The first stage was the selection of four out of the six communities that make up the local government area which was done purposively as they are the major producers of seed yam. The second stage of sampling was the selection of thirty farmers from each of these communities to give a total of 120 respondents for the study.

Descriptive statistics (means, frequency distribution, percentages) and regression analysis was used to analyse the data collected.

Model specification

$Y = \beta_0 + \beta_1X_1 + U$ ....… (1)

Y = Seedyam output in kg
X_1 = independent variable (socio-economic characteristics)
β_0 = intercept parameters
β_1 = Slope of estimated parameters
U = Error term

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + ... \beta_nX_n + U$ ……….. (2)

Where: X_1 = Age of farmers in years
X_2 = Marital status – a dummy 1 for married and 0 for single
X_3 = Sex of respondents
X_4 = Household size
X_5 = level of education (Years)
X_6 = Farm size (ha)
X_7 = Farming experience (years)
X_8 = Occupation
U = Error term

The technical efficiency level of the yam farmers was determined using the stochastic frontier model of the form (Akerele & Akinleye, 2010)

$Y = F (X_1, X_2 .... X_n)$
$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + ... \beta_nX_n + V - U$ ……….. (3)

V = a symmetric error assumed to be independently distributed which accounts for the variation in output due to factors beyond the farmers control (weather, luck, measurement errors etc).

U = random error, what is left for the farmer to reach outer bound of the production frontier or operate on the frontier.

Where:
Y = Output of Yam in tons
X_1 = Farm size (ha)
X_2 = Labour Input in mandays
X_3 = quantity of yam sett (seed)
X_4 = capital (N)
X_5 = Quantity of fertilizer (kg)
The parameters were tested at 5 and 10 percent level of significance.

Results and Discussion

Analysis of socio economic characteristics of the seed yam farmers in Table 1 show that majority of the farmers (88.3 percent) was below 60 years of age. This implies that they are in their productive age. Also, about 86 percent were male indicating male dominance in seed yam cultivation. Most women are engaged in their husbands' farms. The result also indicated that 77 percent of the farmers are married; only 23 percent of the sample population is single. Male farmers usually engage in early marriage to enable them

exploit the benefits of family labour. Married men according to Awotide *et al*. (2009) were more allocatively efficient than their single counter parts.

Table 1: Distribution of the Socio-economic Characteristics of the Farmers

Socio economic characteristic	Frequency	Percentage (%)
Age		
< 30	28	23.3
31 – 45	40	33.3
46 – 60	38	31.7
> 60	14	11.7
Sex		
Male	17	14.2
Female	103	85.8
Marital		
Married	92	76.7
Single	28	23.3
Farming Experience (years)		
1 – 5	15	12.5
6 – 10	26	21.7
11 – 15	30	25.0
16 – 20	37	30.8
> 20	12	10.0
Education (years)		
No formal education	19	15.8
Primary	62	51.7
Secondary	26	21.7
Tertiary	13	10.8
Household Size (persons)		
1 – 5	55	45.8
6 – 10	62	51.7
> 10	3	2.5
Occupation		
Farming	37	30.8
Trading	40	33.3
Artisan	23	19.2
Civil Servant	18	15.0
Others	2	1.7
Farm Size (Hg)		
< 1	62	51.7
1 – 2	47	39.1
> 2	11	9.2

Source: Field survey, 2012

It was found that about 65 percent of the farmers had above 10 years farming experience. This implies more efficiency in productive activity as, Kalirajan (1981) and Kalirajan and Fllinn (1983), noted that farming experience is directly related to technical efficiency. Only 16 percent of the respondents had no formal education. Education enhances technical advancement in agricultural production for maximum returns on investment. Again, about 52 percent of the sampled respondents have between 6-10 persons in their households implying reduced labour constraints thereby leading to increases in productivity. Bravo-Ureta and Pinheiro (1997) opined that larger households might utilize family labour beyond the point where

the marginal product of labour is equal to the wage rate.

Explaining the determinants of yam farmers' output. The regression results in Table 2, showed the socio-economic factors that influence yam production. The variables were fitted into four functional forms:- Linear, semi-log, double log and exponential forms. The variables tested include age, gender, marital status, experience, education level, household size, farm size, and hired labour.

Table 2: Result of Regression Analysis

Variables	Linear	Semi-log	Double-log	Exponential
Constant	1236.61 (2.340)	628.64 (0.424)	6.529 (5.045)	7.143 (15.116)
X_1	-0.033 (-0.271)	0.033 (0.184)*	-0.094 (-0.668)	-0.085 (-0.721)
X_2	-2.225 (-2.276)	-0.218 (-2.228)**	-0.355 (-3.866)*	-0.373 (-4.148)*
X_3	-0.061 (-0.543)	-0.38 (-0.541)	-0.040 (-0.428)	-0.52 (-0.592)
X_4	0.018 (0.148)	0.018 (0.116)*	0.051 (0.269)	0.121 (0.938)**
X_5	0.052 (0.501)	0.043 (0.510)	0.028 (0.289)	0.012 (0.128)
X_6	0.083 (0.876)	0.082 (0.871)	0.086 (0.896)***	0.147 (1.578)
X_7	0.232 (2.188)**	0.214 (2.077)	0.276 (2.886)*	0.261 (2.646)
X_8	-0.236 (-2.242)**	-0.66 (-1.830)***	-0.171 (-1.826)	-0.232 (-2.434)**
Adjusted R^2	0.262	0.697	0.533	0.68
F-value	1.627*	1.502*	3.786*	3.780*

Figures in parenthesis are T-values; * = 1%, ** = 5%, *** = 10% level of significance
Source: Field Survey, 2012

The lead equation (semi-log) was chosen based on the statistical criteria, having the highest adjusted R-square, highest level of significance and expected signs. The adjusted R2 value of 0.697 obtained indicated that 69.7 percent variation in seed yam production could be attributed to the combined influence of the socio-economic variables. The result indicated that the effect of such socio-economic variables as age, experience, education level, household size and farm size were positive and significant. This means that they are significant determinant of seed yam production in the study areas, therefore, increase in these variables will increase seed yam production level. The other variables, gender, marital status and hired labour negatively influence seed yam production, implying that their increase may decrease the seed yam production level.

The result in Table 3 indicated that farm size, hired labour, family labour capital and fertilizer were critical inputs in rice production in the study area. The coefficient of farm size is significant at 1 percent hence is an important variable in yam production. The use of chemical input fertilizer was significant to the output at 1% level. This shows that output of seed yam is greatly affected by the use of fertilizer.

Table 3: Stochastic Frontier Regression Result

Variables	Parameters	Coefficient	Standard error
Production Frontier			
Constant	β_0	6.5671*	0.0745
Farm size	β_1	0.0064*	0.005
Labour (family)	β_2	0.4012**	0.0063
Labour (hired)	β_3	0.11461	0.0314
Capital	β_4	0.3632**	0.0007
Fertilizer	β_5	0.0013*	0.0003
Vt		1.1802	0.4813
Ut		0.3848	0.0479
Technical efficiency (mean)			0.6138

*, **, *** = coefficients significant at 1%, 5% and 10% levels
Source: Field Survey, 2012

The pressure on arable land is due to population increase in most developing countries, and there is not enough land to practice fallow, rotation with legumes to make up for lack of mineral fertilizer (Oluwatayo *et al.*, 2008). In view of this, Louise Fresco (2003) said that organic agriculture, which eliminates the use of synthetic inputs, does not present a feasible alternative. The mean technical efficiency of 0.6048 (60 percent) implies that the efficiency of the inputs used was low and there were 40 percent inefficient usage of production resources.

Conclusion and Recommendation

This study analysed the socio-economic determinants of seed yam production in Oyi Local Government Area of Anambra State. The variables which contribute significantly to the seed yam production include farm size, hired and family labour, fertilizer, capital, farming experience, educational level, household size. Based on the findings, the following recommendations and made:

- Investing in agriculture to raise productivity through provision of credit facilities especial to the small-holder farmers.
- More extension agents should be employed to facilitate easy adoption of modern techniques to increase productivity of the farmers.
- The rural household education should be improved through establishment of rural distant education centres by

tertiary institutions. This will facilitate improvement in the seed yam farmers' technical efficiency.

References

Akerele, E. O. & Akinleye, S. O. (2010). Socio Economic determinants of maize production in Yewa North Local Government Area, Ogun State. Proceedings of the 24th Annual National Conference of Farm Management Association of Nigeria, 11-14 Oct., 292-297.

Awotide, D. O., Ololagbose, O., kehinde, A. L. & Bamiro, O. M. (2009). Credit Access, Farm Size and Cost Inefficiency in Maize Production in Yewa North Area, Ogun State, Nigeria. *Faman Journal*, 10(12), 22-29.

Bravo-Ureta B. E. & Pinheiro, A. E. (1997). Technical, Economic and Allocative Efficiency in peasant Farming. Evidence from the Dominican Republic. *The Development Economics*, 35(1), 48-67.

CBN (2000). The Agrarian System in Changing Economy and Implications for Development. Research Department CBN, Realm Communications pp. 33-60.

FAO (2008). FAOSTAT. Statistical Division of the food and Agricultural Organization Rome Italy.

Idachaba, F. S. (2004). Policy Requirements for Root Crops market Economy in Africa. Proceeding 8th Triennial Symposium ISTRC-AB. IITA Ibadan, pp. 1-4.

Ikwelle, M. C., Ezulike, T. O. & Eke-Okoro, O. N. (2003). Contribution of root and tuber crops to Nigerian Economy. Proceedings of the Eight Triennial Symposium of the

International Society for Tropical Root Crops, Africa Branch (ISTRC-AB) held at IITA, Ibadan, Nov. 12 – 16, 2001, pp.13-18.

Iroukwe, A. G., Ogbonna M. C. & Olojede, J. C. (2007). Determinants of seed yam production by Woman farmers in Ohafia Agricultural zone of Abia State Nigeria. *International Journal of Agricultural and Rural Development*, 10(12), 96-101

Iroukwe, A. G., Asiedu, R. & Nwosu A. C. (2012). Utilization of Seed Yam production technology by small-holder yam farmers in South Eastern Nigeria. Proceedings of the 26th Annual Conference of Farm Management Association of Nigeria, October 15th – 19th, 2012

Janssens, M. (2001). Root & Tuber Crops. In r. H. Raemaekers R. H. Crop Production in Tropical Africa. DGIC Brussels, Belgium: 165-275.

Kalirajan, K. (1981). An Econometric Analysis of Yield Variability in Paddy Production. *Canadian Journal of Agricultural Economics*, 29(3), 287-294.

Kalirajan, K. & Flinn, J. C. (1983). The measurement of Farm Specific Technical Efficiency. *Pakistan Journal of Applied Economics*, 2(2), 167-180.

Lev, L. S. & Shriver, A. L. (1998). A Trend Analysis of Yam Production. Area, Yield and Trade (1961-1996) In: J. Berthaud, N. Bricas and J. Mardand (eds). Yam, old plant and crop for the future. Actes due Seminaire Inter. Cirad Intra-Orstom-Coraf. June 1997. Mantpellier, France: 11-20

Louis, F. (2003). Fertilizer and the future. FAO AG21 Magazine

NBS (2006). Statistical Year Book. 2006. Nigerian Bureau of Statistics (NBS), Abuja, Nigeria.

Ogbonna, M. C. (2006). Trend of Yam Production, Area, Productivity and Trade in Nigeria (1961-2006). *Nigerian Journal of Farm Management*, 12(2), 1-8.

Okwor, G. C. (1998). Yam production in Nigeria. In J. Berthand, N. Bricas and J. Mardand (eds). Yam, Old plant and Crop for the Future. Actes du seminaire Inter.Cirad-orstom-coraf. June 1997. Montpelliar, France: 81-85.

Oluwatayo, I. B., Sekumade, A. B. & Adesoji, S. A. (2008). Resource Use Efficiency of Maize Farmers in Rural Nigeria: Evidence from Ekiti State. *World Journal of Agricultural Sciences*, 4(1), 91-99.

Okwor, G. C., Asiedu, R. & Ekanayake, I. J. Eds. (1998). Food Yams. Advances in Research. IITA and NRCRI, Nigeria.

Ugwu, B. O. (1996). Increasing Cassava Production in Nigeria and Prospects for sustaining the trend. *Outlook on Agriculture*, 25(3), 179-185.

Ugwu, B. O. (1999). Policy Imperatives for Sustainable production of Root and Tuber Crops in Nigeria. In: A. C. Nwosu, C. U. Nwajiuba, and J. A. Mbanasor (eds). Agricultural Transformation in Nigeria. Proceedings of a National Conference in Honour of Prof. M. O. Ijere, held at Fed. University of Agriculture, Umudike, Abia State, Nigeria, 24-26th August, 1999: 58-64.

Ugwumba, C. O. A. & Uzuegbunam, C. O. (2010). Value Addition to Soybean (glycine max). A Case of Traditional small scale soymilk production in Awka Agricultural Zone, Anambra State, Nigeria. Proceedings of the 24th Annual National Conference of farm management Association of Nigeria. Oct., 2010; 283-287.