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SOCIO-ECONOMIC DETERMINANTS AND PROFITABILITY OF YAM PRODUCTION IN IPAO-EKITI, NIGERIA

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ABSTRACT

This study examined the economics of yam production in Ipao-Ekiti, Nigeria. It made use of data obtained through the administration of copies well structured interview instruments to 70 respondents selected by purposive and random sampling methods. Both parametric and non-parametric statistical tools were used to analyse the data. Majority (61.42%) of the respondents were educated male youths of 49 years and below. Net production income was statistically and significantly determined by gender, farm size, educational level, farming experience and cost of production, and weakly determined by age, marital status and household size. Gross Margin was ₦3,418,560; net farm income ₦3,299,710; and net return on investment 0.92, implying a profitable enterprise. Production was most seriously constrained by high cost of labour, and poor market price of product. Policy to boost production and maximize profit must be channelled towards measures that would combat the identified problems such as the provision of soft loans to the farmers and introduction of price control measures.

Keywords: *Socio-economic determinant, profitability, yam production, Ipao-Ekiti, Nigeria.*

INTRODUCTION

Yam is one of the principal tuber crops in the Nigerian economy, in terms of land under cultivation and in the volume and value of production (Bamire and Amujoyegbe, 2005; Mbah 2010). Nigeria is the leading producer of yam in the world with annual production of 5,489 million metric tonnes in 2007 (FAO, 2007) and 35, 017 million metric tonnes in 2008 (FAO, 2011). The edible yam (*Dioscorea species*) is one of the carbohydrate foods in Sub-Saharan Africa and is nutritionally superior to most roots and tubers in terms of digestible proteins and minerals (Ca, Mg, and P) (Green, 2003; Chukwu and Nwosu, 2008). It is a preferred staple food, appreciated for its taste and cultural role. This means tuber crops, such as yams have high relative value per unit of land used in their cultivation, when compared with other crops, particularly, the cereals (Mbah, 2010). As a food crop, yam has some inherent characteristics which make it attractive, especially to the producers in Nigeria. Firstly, it is rich in carbohydrates especially starch and consequently has a multiplicity of end use. Secondly, it is more resistant to drought, pest and disease and tolerates different climatic and edaphic conditions on the farm. It is one of the most recognised food crops in Ekiti State where it is grown extensively for various uses. In Ipao-Ekiti, yam has become the main staple food where the tuber is either boiled and eaten directly or pounded to form a cherished delicacy called pounded yam (Iyan). It is also used for festivities and ceremonies (traditional marriages most especially). The high value placed on it is expressed unequivocally by the celebration of new yam festival every last Saturday in the month of June which is done for no other crop (either cash or food crop).

The continuous increase in the demand for yam could be attributed to the value of the product and ever increasing population usually leading to product scarcity and soaring price (Ikeorgu and Igwilo, 2002). Other reasons could be due to production constraints such as root rot disease, lack of storage facilities, scarcity of labour, insufficient market information, high cost of inputs and lack of fund (Agwu, 2002; Njoku, 2008; Ugwumba, 2011). It is against this backdrop that this study was initiated to determine the effects of socio-economic factors of the respondents on net production income, estimate yam enterprise profitability and identify problems militating against yam production in the study area.

MATERIALS AND METHOD

Ipao-Ekiti is the second largest town in Ikole Local Government Area of Ekiti State, Nigeria with estimated population of 12, 460 people (NPC, 2006). It lies within latitude 7^{o} 47′ North and longitude 5^{o} 31′ East. The climate is tropical with vegetation typical of the rain forest zone of West Africa. Farming of arable crops such as maize, yam, cocoyam and vegetables are common. The town was purposively selected for the study because of its record as the highest yam producing community in the LGA. Historically, the town is made up of seven clans (Ila, Mogba, Agbara, Imole, Isinrun, Igbede and Oke-obele). Simple random sampling technique was used to select 10 yam farmers from each of the clans to arrive at a simple size of 70. Data were obtained by the administration of well structured questionnaire to the respondents. Data were collected on the respondents' socio-economic variables such as age, gender, farm size, farming experience, educational level, marital status and household size; output and input variables; and variables constituting problems to production. Descriptive statistical tools involving means, frequency distributions and percentages were used to analyse data generated on socio-economic status and constraints to yam production. The Ordinary Least Squares (OLS) method of multiple regression was used to establish socio-economic determinants of net production income, while costs and return analysis was used to determine enterprise profitability. The implicit and explicit forms of the multiple regression used to establish the influence of farmers socio-economic factors including age represented by AGE, gender (GEN), household size (HHS), marital status (MAS), farm size (FAS), educational level (EDL), farming experience (FAE), and cost of production (COP) on net production income are represented as:

$NPI = f(AGE, GEN, HHS, MAS, FAS, EDL, FAE, COP, e)$ and

$NPI = \beta_0 + \beta_1 AGE + \beta_2 GEN + \beta_3 HHS + \beta_4 MAS + \beta_5 FAS + \beta_6 EDL + \beta_7 FAE + \beta_8 COP + e_i$

Where:

NPI = net production income (₦)
AGE = age (years)
GEN = gender (dummy: male = 1; female = 2)
HHS = household size (number of people living together)
MAS = marital status (dummy: married = 1; single = 2)
FAS = farm size (ha)
EDL = educational level (years)
FAE = farming experience (years)
COP = cost of production (₦)

$\beta_0, \beta_1, \beta_2 \ldots \beta_8 = parameters\ to\ be\ determined$

$e_i = stochastic\ error\ term$

It is hypothesized that the independent variables are not significant factors in the determination of the farmers' net production income. The data were fitted with four functional forms of the regression model namely linear, exponential, semi-log and double log. The functional form which produced the best output in terms of sizes, signs and number of significant parameter estimates, overall significance of the regression shown by F-statistics, percentage of variation in net production income determined by R^2, and the existence or non-existence of autocorrelation given by Durbin-Watson statistic was chosen as the lead equation. The functional forms are given as:

Linear: $NPI = \beta_0 + \beta_1 AGE + \beta_3 GEN + \beta_3 HHS + \beta_4 MAS + \beta_5 FAS + \beta_6 EDL + \beta_7 FAE + \beta_8 COP + e_i$

Exponential: $lnNPI = \beta_0 + \beta_1 AGE + \beta_3 GEN + \beta_3 HHS + \beta_4 MAS + \beta_5 FAS + \beta_6 EDL + \beta_7 FAE + \beta_8 COP + e_i$

Semi log: $lnNPI = \beta_0 + \beta_1 lnAGE + \beta_3 lnGEN + \beta_3 lnHHS + \beta_4 lnMAS + \beta_5 lnFAS + + \beta_6 lnEDL + \beta_7 FAE + \beta_8 lnCOP + e_i$

Double log: $lnNPI = \beta_0 + \beta_1 lnAGE + \beta_3 lnGEN + \beta_3 lnHHS + \beta_4 lnMAS + \beta_5 lnFAS + \beta_6 lnEDL + \beta_7 lnFAE + \beta_8 lnCOP + e_i$

The costs and return technique used in determining profitability of the enterprise is given as:

$GM = TR - TVC$

$NPI = GM - TFC \; or \; TR - TC$

$NROI = \frac{NPI}{TC}$

Where:

GM = gross margin

TR = total revenue

TVC = total variable cost

TFC = total fixed cost

TC = total cost

NPI = net production income (profit)

NROI = net return on investment.

RESULTS AND DISCUSSIONS

Socio-Economic Statistics of the Respondents

Distribution of the respondents by socio-economic characteristics is shown in Table 1. It could be seen from the table that majority (61.42%) of the respondents were youths of 49 years and below. This implied that yam production in Ipao-Ekiti was dominated by youths endowed with adequate energy to tackle the challenges of yam production. Table 1 also shows that the enterprise was dominated by males (72.86%); most (74.29%) of the respondents were married; household size of 4-9 persons was in the majority (61.43%). Furthermore, majority (80%) of yam farmers had acquired one form of formal education or another. Notably, formal education is an essential tool for the adoption of modern production technologies and effective communication system that encourage increase in the productivity of any agricultural venture (Nwaru, 2004; Akanni, 2007; Ugwumba, 2010, Albert and Okidhum, 2012; Nenna and Ugwumba, 2012).

Table 1: Distribution of the respondents by socio-economic characteristics

VARIABLE	FREQUENCY	PERCENTAGE (%)
Age		
<20	8	11.42
20-29	17	24.29
30-39	12	17.14
40-49	6	8.57
50-59	17	24.29
60≥	10	14.29
Total	70	100
Gender		
Male	51	72.85
Female	19	27.14
Total	70	100
Marital Status		
Single	17	24.29
Married	52	74.29
Divorced/Separated	0	-
Widowed	1	1.42
Total	70	100
Educational level		
No School	14	20.00
Primary	6	8.57
Secondary	30	42.86
Above Secondary	20	28.57
Total	70	100
Household size		
1-3	20	28.57
4-6	31	44.29
7-9	12	17.14
10≥	7	10.00
Total	70	100

Source: Field survey, 2012.

Effects of Socio-economic Factors of the Respondents on Net Production Income

Outputs of the four functional forms of the multiple regression analysis are shown in Table 2. It could be seen from the result that output of the linear regression gave the best result in terms of number and sizes of significant parameter estimates and was therefore chosen as the lead equation. Out of the eight regressors, five namely gender, farm size, educational level, farming experience and cost of production were statistically significant, while the rest three (age, marital status and household size) were not statistically significant at 5% level of probability. The coefficient of multiple determination R^2 is 0.896, implying that 89.6% variation in the net production income of yam was accounted for by the predictor variables, hence the remaining 10.4%was due to random disturbance. The Durbin-Watson statistic value of 1.77 which lies within the benchmark of 2.0 signifies the absence of autocorrelation among observations of the regressors. The F-statistics value of 65.95% was significant, an indication of overall significance of the regression. The

coefficients of education and gender had a positive relationship with net production income and were statistically significant at 5% level of probability. This implies that as the numbers of educated and male farmers increase, output of yam is more likely to increase. Farmers with low level of education would be less receptive to improved farming techniques (Okoye *et al.,* 2004). The coefficients of farm size, farming experience and cost of production had positive and statistically significant effect on net production income at 5% level of probability. This implies that increases in farm size, farming experience and investable fund would lead to increase in output, hence net production income; thus corroborating Ugwumba, (2010, 2011) on egusi melon and catfish production respectively.

Table 2: Determinants of net production income

PARAMETER	LINEAR	EXPONENTIAL	SEMI-LOG	DOUBLE-LOG
Constant	-65936 (-2.82)	4.53 (56.42)	-992184 (-5.76)	1.58 (4.54)
AGE	492 (0.12)	0.00175 (1.21)**	23776 (0.31)	0.114 (0.73)
GEN	14454 (1.37)	0.0067 (0.18)	-12616 (-0.19)	-0.028 (-0.21)
HHS	-1245 (-0.61)	0.00394 (-0.56)	-15819 (-0.42)	-0.0561 (-0.74)
MAS	290 (0.03)	0.0266 (0.77)	34969 (0.42)	0.150 (0.89)
FAS	16543 (3.30)**	0.0062 (0.36)	96498 (2.51)**	0.202 (2.59)**
EDL	12531 (7.43)**	0.0289 (4.97)	-1216 (-0.21)	0.0024 (0.20)
FAE	690 (1.26)**	0.00068 (0.36)	Excluded	Excluded
COP	0.672 (5.48)**	0.000002 (5.21)**	224841 (7.44)**	0.679 (11.12)**
R^2	89.6%	81.6%	63.0%	77.3%
R^2 (adjusted)	88.3%	79.2%	58.9%	74.8%
F-Statistic	65.95	33.83	15.11	30.20
D-W Stat.	1.77	1.69	1.29	1.70

Source: Computed from survey data, 2012.

Estimated Yam Production Profitability

Table 3 shows the estimated profitability of yam production enterprise in the study area. The result implicated cost of yam seeds as the most important cost variable in yam production at 42.60%, while depreciation value of basket/head pan was the least cost

item with a score of 0.56%. The yam farmers realised gross margin, net production income and net return on investment values of ₦3,418,560, ₦3,299,710 and 0.92 respectively. The net return on investment value of 0.92 implied that the farmers returned 92kobo for every 100kobo invested in the business. By this result, yam production in the area was a profitable one.

Table 3: Estimated enterprise budget

VARIABLE	AMOUNT (₦)	PERCENTAGE (%)
Total Revenue	6, 893, 400	
Variable Cost		
Yam Seedlings	1, 509, 620	42.60
Herbicides	80, 500	2.24
Labour	1, 300, 467	36.19
Fertilizer	450, 320	12.53
Transportation	70, 500	1.96
Storage	63, 433	1.77
Total Variable Cost (TVC)	3, 474, 840	96.69
Fixed Cost		
Machete	50, 250	1.40
Hoe	48, 500	1.35
Basket/head pan	20, 100	0.56
Total Fixed Cost	118, 850	3.31
Total Cost $(TC = TVC + TFC)$	3, 593, 690	100
Gross Margin $(GM = TR - TVC)$	3, 418, 560	
Net Farm Income $(NFI = TR - TC)$	3, 299, 710	
Mean Net Farm Income $(MNFI = NFI/n)$	47, 138.71	
Net Return on Investment $(NROI = NFI/TC)$	0.92	

Source: Field survey, 2012. Notes: ** Significant at p≥0.05. D-W stat. = Durbin-Watson statistic. AGE, GEN, HHS, MAS, FAS, EDL, FAE and COP are as earlier defined. Figures in parenthesis are T-statistic values.

Constraints to Yam Production

Distribution of the respondents according to problems militating against yam production in the area is shown in Table 4. The result indicated that high cost of labour with a score of 58.57% constituted the major constraint to yam production in the area. This was followed by poor market price of product (40%), post harvest losses due to pests and diseases infestations (35.71%), scarcity of fertilizers, herbicides, etc (27.14%), and high cost of yam seeds which came last with a score of 22.86%. High cost of yam seeds was a minor production problem probably because majority of the farmers used yam seeds preserved from previous year's production. Also, scarcity of fertilizers and agro chemicals was a weak problem due to the traditional belief of most farmers (especially the non-educated

ones) that fertiliser use to boost output tantamount to "going against nature". Though the tubers produced would be big, their taste and shell-life would reduce significantly.

Table 4: Constraints to yam production

VARIABLE	FREQUENCY (%)	RANKING
High cost of labour	41 (58.57)	1st
Poor market price of product	28 (40)	2nd
Post harvest losses due to pests and diseases infestations	25 (35.71)	3rd
Scarcity of fertilizers, herbicides, etc	19 (27.14)	4th
High cost of yam seeds	16 (22.86)	5th

Source: Field survey, 2012. Note: Multiple responses considered.

CONCLUSION AND RECOMMENDATIONS

Yam production in Ipao-Ekiti, in Ikole Local Government Area of Ekiti State was a profitable enterprise gender-biased in favour of the male youth farmers. Net production income was statistically and significantly determined by socio-economic factors of gender, farm size, educational level, farming experience and cost of production. Production was majorly constrained by high cost of labour and poor market price of product. Policy to boost production and maximize profit must be channelled towards measures that would combat the identified problems (especially high cost of labour and poor market price of product) such as the provision of soft loans to farmers and introduction of price control measures.

REFERENCES

Agwu, A.E. (2002). Cowpea varietal needs of farmers in Bauchi and Gombe States of Nigeria. J Trop Agric Env Ext, 3(1): 55-62.

Akanni, K.A. (2007). Effect of microfinance on small poultry business in South-Western Nigeria. J Food Agric, 19(2): 38-47.

Albert, C.O. and Okidhum, A.I. (2012). Profitability and challenges of goat production in Etche Local Government Area of Rivers State, Nigeria. In AO Aniebo and COA Ugwumba (Eds.), Proceeding of International Agricultural Conference, ANSUAIC, 2012. Pp 84-86.

Bamire, A.S. and Amujoyegbe, B.J. (2005). Economic analysis of land improvement techniques in small holder yam-based production systems in the Agro-ecological Zones of South-Western Nigeria. J Human Eco, 18(1): 1-12.

Chukwu, G.O. and Nwosu, K.I. (2008). Yam rebirth: The renaissance of giant crop. Paper presented at the 17th Annual conference of Nigeria Rural Sociology Association, NRCRI Umudike, 17th – 20th September,2007. Pp192-196.

Food and Agriculture Organisation (F.A.O.) (2007). FAOSTAT. Publication of the Statistics Division of the Food and Agriculture Organisation. Retrieved from http//:fasostatfao.org

F.A.O. (2011). FAOSTAT. Publication of the Statistics Division of the Food and Agriculture Organisation. Retrieved from http//:fasostatfao.org

Green, B.O. (2003). Taxonomic and nutritional analysis of certain tuber crops in Niger Delta of Nigeria. Africa J Env Stu, 4(1): 120-122.

Ikeorgu, J.E.G. and Igwilo, N.H. (2002). Effects of mulching and staking on yam grown under irrigation during the dry season in Umudike in South-Eastern Nigeria. J Sust Agric Env, 4(1): 129-132.

Mbah, S.O. (2010). Analysis of Factors Affecting Yam Production in Ngor-Okpala Local Government Area of Imo State. In J. A. Akinlade; A. B. Ogunwale; V. O. Asaolu; O. A. Aderinola; O. O. Ojebiyi; T. A. Rafus; T. B. Olayeni and O. T. Yekinni (Eds). Proceedings of the 44th Annual Conference of the Agricultural Society of Nigeria, LAUTECH, Ogbomoso, 18th - 22th October, 2010. Pp 340-344.

National Population Commission (N.P.C.) (2006). Projected population figure for Nigeria; National Population Commission publication, Abuja, Nigeria, 2006.

Nenna, M.G. and Ugwumba, C.O.A. (2012). Influence of socio-economic variables on palm oil production in Delta Central Agricultural Zone of Delta State, Nigeria. In A.O. Aniebo and C.O.A. Ugwumba (Eds.), Environmental concerns and agricultural productivity: Addressing the challenges of food security. Proceedings of International Agricultural Conference of Anambra State University, Igbariam Campus, Anambra State, Nigeria. Pp 176-183.

Njoku, P.C. (2008). Nigerian Agriculture and the Challenges of the 20th Century Agro-Sc JTrop Agric Food Env Ext, 1(1): 42-53.

Nwaru, J.C. (2004). Rural credit markets and arable crop production in Imo
State of Nigeria. PhD Dissertation. Michael Okpara University of Agriculture, Umudike, Nigeria.

Okoye, B.C., Okorji, E.C. and Asumugha, G.N. (2004). Outlook on production economics of paddy rice under resource constraints in Ebonyi state. Proceedings of the 38th Annual Conference of Agricultural Society of Nigeria (ASN), held at Lafia, Nassarawa State on 17th - 21st, October, 2004. Pp 337-342.

Ugwumba, C.O.A. (2010). Allocative efficiency of 'egusi' melon (*Colocynthis citrillus lanatus*) production in Owerri West LGA of Imo State, Nigeria. J Agric Sc, 1(2): 95-100.

Ugwumba, C.O.A. (2011). Technical efficiency and profitability of catfish production in Anambra State, Nigeria. PhD Dissertation, Delta State University, Abraka.