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YAM PRODUCTION COST AND SALES REVENUE AMONG COOPERATIVE FARMERS IN ANAMBRA STATE, NIGERIA

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Abstract
Despite many studies on the dynamics of yam production, cost-return analysis among the Igbos have not received due attention. *This paper examined yam production cost and sales revenue among cooperative farmers in Anambra State, Nigeria. The marginal productivity theory served as the theoretical framework. Descriptive survey design was adopted and sample size of 400 was generated using Taro Yamane formula. Multi-stage sampling technique was used in selecting respondents. The major instrument for data collection was structured questionnaire. Data were analysed using frequency, percentage, mean score and multiple regression analysis. The results revealed that yam farmers coefficient operating ratio and return on investment were 1.66 and 1.67 (1.67 > 1), respectively. This suggests that they were operating on loss and not making profit. The hypothesis result showed that there is a negative but significant relationship between yam production cost and sales revenue among cooperative farmers in Anambra State. This paper concluded that the high operating cost of yam production has led to low returns among the cooperative farmers. It was recommended among others that cooperative societies should help their members to make cost analysis before embarking on farming projects. This will enable them to understand what it will take to make desired returns.*

Keywords: agricultural cooperative, cost, production, sales revenue.

Introduction

Yam is a member of the genus dioscorea which contain about 600 species, out of which six are socially and economically important as staples in the tropics (IITA, 2009). The economically important species grown are Dioscorea rotundata (white guinea yam) D. alata (water yam), D. cayenenifis (yellow yam), D. bulbifera (aerial yam) D. esculenta (Chinese yam) and D. dumentorum (trifoliate yam) (Ike & Inoni, 2006; Olubukola & Bolarin, 2006; Zaknayiba & Tanko, 2013). Yam is among the major cash and most consumed food crops in West Africa (Babaleye, 2003; National Bureau of Statistics, 2012).

Yam cultivation is profitable despite high costs of production and price fluctuations in the market (IITA, 2013; Izekor & Olumese, 2011). Industrially, yam is an important raw material for starch. The quality of starch varies with yam species and comparable to cereal starch (Osisiogu & Uzo, 1973). Due to the high demand of the product, non-edible species could serve industrial purposes. An average profit per yam seed after harvest and storage in Nigeria was estimated at over US$13,000 per hectare (IITA, 2013). In 2009, the country exported only 0.0013% of total production quantity. A report by the Nigerian Food Export Promotion Council (NEPC) in 2009 indicated that Nigeria realized $583 million from yam exports, against $466 million in 2008 (Vanguard, 2009). In spite of the possible gains, there has been decline in production

and export rate (Bamire & Amujoyegbe, 2015; CBN, 2012). They attributed it to rising cost of production resources, scarce and expensive labour occasioned by rural-urban migration.
However, agricultural cooperatives have for a long time been assisting farmers in crop production and mitigating in challenging areas. This is in a bid to improve efficiency and profitability in farm produce (Nwankwo, Ewuim & Asoya, 2013). Similarly, various governments in the country have floated interventions aimed at boosting agricultural production and the living standard of farmers. In spite of these noble efforts, many yam farmers in the country appear to be operating at loss without commensurate returns. It is against this background that this paper evaluates yam production cost and sales revenue among cooperative farmers in Anambra State, Nigeria.

Problem Statement
Despite many studies on the dynamics of yam production, cost-return analysis among the Igbos have not received due attention. The majority of rural dwellers engage in yam production but no one seems to be sure as to whether or not the farmers are profiting from the venture. Olumese (2010) observed that yam production is no longer profitable because of increasing cost. Conversely, NBS (2013) argued that yam production is profitable despite increasing cost. These conflicting views therefore call for interrogation about the economics of yam cultivation, especially in Anambra State.

There is a conventional that decline in production and low returns can be arrested with active cooperative involvement. Many farmers in Anambra State belong to cooperative societies and this is based on the notion that cooperative is a suitable vehicle for mobilization of resources for agricultural development. The expected mitigation effects from cooperatives and government interventions appear not to be impactful on the farmers' returns on investment; hence, their livelihood status is low.
Moreso, as Nigeria is one of the world largest producers of yam, output growth has not been consistent (FAO, 2007). This unusual volatility makes planning difficult and has increased curiosity of many stakeholders about the sustainability of yam production. Therefore, the understanding of the profitability level could assist policy makers in addressing recurring challenges facing yam profitability. It is against this backdrop that this paper evaluates yam production cost and sales revenue among cooperative farmers in Anambra State, Nigeria.

Objectives of the Study
The main objective of this paper is to evaluate yam production cost and sales revenue among cooperative farmers in Anambra State, Nigeria.

Research Hypothesis
H_0: There is no significant relationship between yam production cost and sales revenue among cooperative farmers in Anambra State.
H_1: There is a significant relationship between yam production cost and sales revenue among cooperative farmers in Anambra State.

Literature Review
The Concept of Yam Production
Yam is Nigeria's leading root crop, both in terms of land under cultivation and in the volume and value of production (Agboola, 1999). Yam (Dioscorea spp.) is a vegetative propagated crop that is cultivated for its underground edible tubers, and a very important food and income source for millions of producers, processors and consumers in West Africa. About 48 million tons of yams are produced annually in this sub region on four million hectare of land.
Yam is part of the religious heritage of several tribes in Nigeria and often plays key role in different ceremonies (Sanusi & Salimonu, 2006). In many farm communities the size of yam enterprise that one has is a reflection of the person's social status. Due to the importance attached to yam many communities celebrate the new yam festival annually (Izekor & Olumese, 2011). Traditionally, yam is a prestigious crop

that is viewed and received with high respect, prominently during special gatherings. The ritual, ceremony and superstition often surrounding yam cultivation and utilization in West Africa is a strong indication of the antiquity of use of this crop. It is widely considered a "man's property" with traditional ceremonies accompanied to cultivation (FAO, 2008).

There are various seed yam production systems in Nigeria. This encourages the set aside of 25% to 30% of harvested tubers as seedlings for the next planting season. This makes the crop not only expensive to produce but also insufficient. The multiplication rate in the field using the traditional system is also very low (1:5 to 1:10) compared, with some cereals (1:30). Low quality seed yam containing pests and pathogens also result in a poor yield of yam tubers (IITA, 2010). The vine cutting system was innovated to control the challenge. The use of vine cuttings further improves the pace of multiplication and reduces the amount of planting material. In this method, cuttings, usually one to two nodes with leaves are taken from the lateral branches of immature healthy-looking vines before tuber enlargement and planted into soil. Once the cuttings formed roots and shoots, they are transplanted to nursery beds, where they are nurtured for about 4-5 months. During this time they will produce mini tubers, which are then used as planting material for the next season. The minisett propagation method consists of using yam tubers of 20-25g pieces to produce planting material for ware tuber production. When compared to whole tubers, minisetts enable faster multiplication.

The Concept of Cost and Revenue Analysis

Cost versus revenue analysis is a powerful tool used by managers of businesses, government agencies and non-profits alike. If used properly, it can provide decision-makers with the information they need to assess the value of a project objectively (Altman, 2015). In some cases, cost revenue analysis is used to examine the socio-economic impacts of a particular program. According to Eka (2008), cost versus revenue analysis offers a number of key benefits for management. Perhaps the most important among them is that it offers objective information to help guide decisions.

Cost versus revenue analysis consists of two key elements: cost analysis and revenue analysis. Cost analysis provides a detailed estimate of the costs of resources, such as personnel, supplies and equipment associated with implementing a project, program, service, or other activity (Abdulahi, 2012). By contrast, revenue analysis examines the income realized from various sources. Revenues are sometimes considered in the scope of the project alone -- as in the case of business or fundraising activities. In other cases, the organization might find it more useful to consider all revenues it receives, whether directly associated with a particular project or not. Cost and revenue analysis presents the inputs and factors that impact the mix of products or services provided. This encompasses procurement, resource utilization, sales and marketing efforts, and product and service delivery. The information gleaned from this analysis helps owners and managers identify actions to be taken to reduce costs and drive additional revenues.

Producers incur costs in many ways. Costs result from the production of goods, the purchase of inventory, the operating of the business, and the purchase of assets. These costs include the fixed and variable costs associated with production, depreciation and investment costs, and general administrative costs (Jimoh, 2010). Cost analysis identifies and investigates the sources and components of these costs.

Cost and Returns (Sales Revenue) in Agriculture

Agricultural production decisions cannot hold without cost considerations (Arene, 2008). Cost refers to the value of inputs used in production and cost of producing a commodity such as yam in a given period of time. Olayide and Heady (2002) defined cost as the change in equity caused by the performances of some special operations. Cost concepts are of great importance as they enable the farmer to make choices among present alternative actions. Types of costs include;

a) Variable cost: This refers to operating cost and they vary in direct proportion to the level of activity and include costs of land clearing, cultivation, setts, fertilizer and weeding.

b) Fixed cost: They are the expenses that cannot be changed or altered in the short run (Oji, 2002). Fixed cost items include implement action such as machetes, hoe, Wheelbarrow, etc.
c) Total cost: This is derived from the summation of variable costs and fixed costs. Total cost of production is an important parameter in estimating the net profit associated with a given enterprise.
Returns: This is the revenue, income that is received from the sale of farm output (Olayide & Heady 1982). The net profit therefore is given by total revenue less total cost.

Gross Margin
A gross margin simply depicts a farm output minus its variable costs. The use of gross margin became widespread from around 1960 when it was first popularized amongst farm management advisers for analysis and planning purposes (Barnard & Nix 1979). The gross margin per hectare or per head for yam can be compared with standard' (published average of what might be typically possible in average conditions) obtained from other.

Generally, the gross margin for any agricultural crop is determined by deducting variable costs from the gross farm income on a given period of time (usually one year or per cropping season). They are not a measure of farm profit as they do not include capital (land, buildings, machinery, irrigation equipment etc.) or fixed costs (building and machinery depreciation, administration, insurance, rates, taxes etc.).

Determining income
The per hectare income from your crop is the on-farm price received per unit sold (tonne, kg, bunch, carton, bin etc.) multiplied by the number of units produced per hectare. The on-farm price is calculated by deducting freight, commissions and levies per unit from the market price.

Determining expenses
This is the consideration of all the expenses from initial land preparation through to harvesting, packaging and marketing. Remember to calculate all growing expenses on a per hectare basis. It is expected to include machinery and labour (mixing, spraying & cleaning up) costs and raw ingredients for fertilizer and pesticide applications.

Contributory Input and Output in Gross Margin Analysis
Output
- Marketable yield (t/ha)
- Price per ton (₦)
- Arable area payment (if applicable)
- **Total output (₦/ha)**

Variable Cost (₦/ha)
- Land preparation
- Seedlings
- Fertilizers
- Sprays (pest, disease and weed control)
- Irrigation (if applicable)
- Others (harvesting and packaging expense)

Total Variable Cost (₦/ha)
Gross Margin (₦/ha)

Allocatable fixed costs (₦/ha)
- Cultivation (disc & power harrow)
- Planting
- Depreciation

- Mechanical weeding
- Spraying & fertilizer
- Combine harvest

Total fixed costs (₦/ha)
Net Margin (₦/ha)
Source: (HDRA, 2001).

Theoretical Framework: Marginal Productivity Theory

This theoretical anchor of this paper is the marginal productivity theory. The theory was propagated by a German economist, T.H. Von Thunen in 1826 and it was further developed by economists, such as J.B. Clark, Walras, Barone, Ricardo and Marshall. The assumption of this theory is that under perfect competition the price of services rendered by a factor of production is equal to its marginal productivity. Marginal product refers to the amount of increase in output by the addition of one unit of factor of production, while keeping the other factors constant. The increase in output with the addition of one unit of factors of production is known as marginal productivity.

Adesiyan et al (2010) posits that under static conditions, every factor including entrepreneur would get remuneration equal to marginal product. The theory posits that in equilibrium each productive agent will be rewarded in accordance with its marginal productivity. When a farmer increases one unit of a factor of production the marginal productivity increases to a certain level of production. Thereafter, the marginal productivity starts to decline. This is because when a farmer keeps on increasing the amount of a particular factor of production, the marginal cost also increases. After reaching a certain point, the marginal cost exceeds marginal revenue, thus the marginal productivity drops. On the other hand, if the marginal revenue is greater than marginal cost, the organization opts for employing an additional unit of factor of production. The relevance of this theory to this paper is that it explains the relationship between inputs and output in yam production. It is useful in analyzing the cost and revenue effects to production.

Methods

Descriptive survey design was adopted in this paper. Anambra State where this research was carried out is made up of 21 Local Government Areas. It is located between latitudes 60 451 and 50 441 N and longitudes 60 361 and 70 201 E of the area with meridian. The temperature of the State during dry seasons, especially in January, ranges from 25.5 to 30.50C while during raining season especially in July it ranges from 25 to 27.50C. The rainfall between November and April ranges from 250 to 500 millimeters while between May and October it is over 2000 millimeters. The State is divided into four Agricultural zones namely, Aguata, Awka, Anambra, and Onitsha. Anambra State is bounded to the North by Kogi State, to the South by Imo and Abia States, to the East by Enugu State and to the West by Delta State. Yam and cassava mixed cropping dominate small scale farm holdings in the State. Population of study is 3,200 registered yam cooperative farmers and sample size of 400 was generated using Taro Yamane formula. Multi-stage sampling technique was used in selecting respondents. Main data instrument was structured questionnaire and was validated by two research experts. Out of 400 copies of questionnaire administered, 329 that were properly filled which represent 82% response rate were retrieved. Data were analysed using frequency, percentage, mean and multiple regression.

Results and Discussion

Socio-Economic Characteristics of Respondents

Table 1: Distribution of Respondents Socio-Economic Characteristics

S/n	Respondents' Socio-Economic Data	Frequency = 329	Percentage = 100	Mean = x
1	Sex			
	Male	273	82.9	
	Female	56	17.1	
2	Age			
	Below 25yrs	-	-	
	26 – 35	13	3.9	
	36 – 45	102	31.0	
	46 & Above	214	65.0	51
3	Marital Status			
	Married	281	85.4	
	Single	46	13.9	
	Separated	2	.6	
4	Size of Household			
	0 - 5	89	27.0	
	6-10	227	68.9	7
	11 & Above	13	3.9	
5	Farming Experience			
	1 – 4yrs	99	30.0	
	5 - 9 yrs	52	15.8	
	10yrs & Above	178	54.1	11
6	Farm Size			
	1 - 3 plots	169	51.3	
	4 - 7 hectares	76	23.1	4
	8 - 10 hectares	63	19.1	
	11 hectares & Above	21	6.3	
7	Academic Qualifications			
	No formal education	67	20.3	
	FSLC	10	3.0	
	SSCE	190	57.7	
	NCE	41	12.4	
	HND	17	5.1	
	BSC	4	1.2	
	MSc./PhD.	-	-	
8	Agricultural Specialization			
	Farming	246	74.7	
	Agric. processing	-	-	
	Agric. marketing	83	25.2	
9	Main Source of Income			
	Yam cultivation/sales	178	54.1	
	Livestock sales	47	14.2	
	Vegetable and fruit sales	14	4.2	
	Cassava sales	27	8.2	
	Maize/rice sales	59	17.9	
	Others	4	1.2	
10	Years of Cooperative Membership			
	Below 5 years	43	13.0	
	5-10	186	56.5	9
	11 – 15	74	22.4	
	16 - above	26	7.9	

Source: Survey, 2019.

Table 1 shows that majority of the respondents 273(82.9%) are males and 56(17.1%) were females. This large number of male involvement in yam production affirm the traditional belief in Igbo land that yam is crop of the men and as such is well revered, especially in the famous new yam festivals. The average mean age of the respondents is 51 years. This implies that the respondents are adults and at the peak of their productive active age. The result of the marital status of the respondents shows that majority 281(85.4%) were married, while the least of the respondents 2(.6) were separated with their spouses. This indicates that

married respondents were more in yam production and this could be attributed to responsibilities or those depending on them. Again, the average household size of the respondents is 7 persons. This suggests that they have a large family size, hence, the possibility of more responsibilities to carter for. The majority 178(54.1%) of the respondents have had 10 years and above farming experience. This was followed by 99(30.0%) that had between 1 to 4 years farming experience. Having spent an average of 11 years in yam cultivation, this suggests that the respondents are committed and possibly experienced in this area. Moreso, the table revealed that the respondents have an average of 4 plots of land for their cultivation. Although more may still be needed for effective commercialization, these four plots indicate seriousness in farming. Academically, majority of the respondents 190(57.7%) have acquired SSCE, while the least of them 4(1.2%) had B.Sc degree. This implies that the respondents are less educated, as 67(20.3%) had no formal education and this could possibly affect the techniques utilized in the farming practices. However, as majority of the respondents 246(74.7%) specialized in farming, 83(25.2%) were into marking of the produce. Interestingly, none was into processing of the produce. This could be attributed to non-availability of technologies for that or lack of the technical know-how. Furthermore, the main source of income for majority 178(54.1%) of the respondents was yam cultivation/sales and the least of them 4(1.2%) had other sources of income. This suggest that many of the respondents which perhaps yam farming is not favourable with rely on other sources such as livestock, vegetable/fruit, cassava sales and maize/rice sales for income. Lastly, the table showed that majority of the respondents 186(56.5%) have had between 5 to 10 years of cooperative membership and the least of them 26(7.9%) have been in cooperative for more than 16 years. The average years spent in cooperatives by the respondents is 9 years. This suggests that a good number of the respondents are aware of the benefits of cooperative membership and determined to harness that.

Yam Production Cost and Sales Revenue

Table 2: Statistical Analysis of Yam Production Cost and Sales Revenue

Cost and Sales Revenue of Yam Farmers in Anambra State

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Total Investment	329	1650020	940170	2590190	148130704	450245.30	2749.045	54981.224	38953650215.450
Depreciation (10%)	329	165002	94017	259019	14813070	45024.53	274.90	5458.01	3895365022.54
Total Revenue (Sales)	329	3728500	961003	4689503	65342700	2114830.31	17227.431	34454.862	113048230458.601
Yam Prod. (in tons)	329	7001	19,039	26040	51903800	2230358.78	1600345.03	3200690.061	39034242424.289
Total Cost.	329	1043926	79449	1123375	108492400	195277.21	10524.021	210481.042	78820341014.631
Variable Cost	329	995450	750	996200	24436745	147909.02	80054.034	160108.068	52834923841.772
Fixed Cost	329	205000	9000	214000	84055655	102755.15	2750.842	5501.684	2200617328.195
Profit Margin	329	3701206	29700	3730906	40905989	1740935.82	27495.032	549900.064	390370834832.824
Valid N (listwise)	329								

Source: Survey, 2019.

Interpretation:
GM = GR – TVC = 65,342,700 – 24,436,745 = 40,905,955.
OR = TOC/GR = 108,492,400 /65,342,700 = 1.66.
RoI = GM/TVC = 40,905,955 /24,436,745 = 1.67.
Where;
GM = Gross Margin
GR = Gross Revenue
TVC = Total Variable Cost
OR = Operating Ratio

TOC = Total Operating Cost
RoI = Return on Investment
The ratio of Total Operating Cost (TOC) by Gross Revenue (GR) in yam production gives the coefficient of Operating Ratio (OR). In this calculation, it is 1.66 which is significantly greater than 1 (i.e., 1.66 > 1). On the contrary, the ratio of Gross Margin (GM) to Total Variable Cost (TVC) gives Return on Investment of 1.67, which is also significantly greater than 1 (i.e. 1.67 > 1).

Table 2 shows that the average investment in yam production by a cooperative farmer was ₦450,245.30k and ₦148,130,704 for the entire farmers. This suggests that the farmers are committed to making returns from yam production. However, the yam farmers incurred about ₦108,492,400 cost/expenses in the course of production within the period under study. Again, the total variable and fixed costs were estimated at ₦24,436,745 and ₦84,055,655 respectively. The 1.66 operating ratio and 1.67 returns on investment indicates that the farmers were operating on loss and not making profit. It tends to suggest that high cost of production resources are influencing yam farming. In other words, to make sufficient profit in yam production there should be minimization of cost or production expenses. This finding aligns with Olumese (2010) that yam production is no longer profitable because of increasing cost. It also tries to validate the views of Arene (2008) that agricultural production decisions are not expected to hold without proper cost considerations. It could be argued that the farmers did not make adequate cost analysis before embarking on production, hence operating below expected returns. There is no gainsaying that the sole aim of every farmer is to make profit or good returns, and where this is not feasible the person would definitely get discouraged. The resultant effect could be destructive, if not detrimental to the public who depend on them to get what to eat or even make a living.

Test of Hypothesis
H_0: There is no significant relationship between yam production cost and sales revenue among cooperative farmers in Anambra State.
H_1: There is a significant relationship between yam production cost and sales revenue among cooperative farmers in Anambra State.

Table 3: OLS regression of hypothesis three

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	481082.513	10682.840		-3.175	.000
	production cost	.174	.010	-.059	14.053	.212
N = 329						

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.681[a]	.549	.627	137490.807

a. Predictors: (Constant), production cost
b. Dependent Variable: sales revenue

Source: Survey, 2019.

Table 3 shows the standardized coefficient of production cost to be negative (-.059) and the p-value is (.212). The coefficient result is therefore not statistically significant at 5% level since the significance value is above 0.05. However, the adjusted R (.627) indicates that about 63% changes in revenue are being caused by the production cost of yam. Therefore, we rejected the null hypothesis and accepted the alternative; implying

that there is a negative but significant relationship between yam production cost and sales revenue among cooperative farmers in Anambra State.

Conclusion

Indeed, the need for cost analysis in any production endeavour cannot be overemphasized. It is through this that a producer can be able to ascertain when operating on losses or making profit. There is no farmer who does not desire to make good returns after sales. Farmers' cooperatives are known to enlighten and help to market members' farm produce. However, cooperative yam farmers in Anambra State were operating on a ratio of 1.66, with 1.67 returns on investment, which is greater than 1. What this entail is that cost of some production resources is actually affecting returns of the farmers. This paper concludes that the high operating cost of yam production has led to low returns among cooperative farmers in Anambra State.

Recommendations

Based on the findings, the following recommendations are made;

1. Funding is the bane of any venture, especially agriculture. The government should make long term soft loans available and accessible for yam farmers to enable them acquire seedlings and other production resources.
2. Agricultural cooperative societies should help their members to make cost analysis before embarking on farming projects. This will enable them to understand what it will take to make desired returns.
3. The rising inflation and high cost of farming inputs should be controlled by organs of the government saddled with that responsibility. This could help strengthen farmers and enable them to cultivate more.

References

Agboola, S.A. (1999). *Yam cultivation and agricultural growth in Nigeria*. A Agricultural Paper Presented at Oxford University. Oxford University Press, pp.55-65.

Babaleye, T. (2003). Improving yam production technology in West Africa. Supplement Issues/Edition, p.463.

Bamire, A. S. & Amujoyegbe, B. J. (2015). Economic analysis of land improvement techniques in smallholder yam based production system in the agro-ecological zones of Southwestern Nigeria. *Journal of Human Ecology, 18*(1), 1–12.

Barnard, C.S. & Nix J.S. (1979). *Farm planning and control*. Cambridge: Cambridge University Press.

Central Bank of Nigeria (CBN, 2012). Statistical Bulletin 9 (20) 214-217 CBN Abuja.

Eka, C.U. (2008). The chemical composition of yam tubers. In: Osuji G (ed). Advances in yam Research. Biochemical Society of Nigeria, Enugu State University of Technology Enugu; pp. 51-73.

FAO (2007). FAO statistical division of food and agriculture. Retrieved 23rd April, 2019, from *www.faostat.org*

FAO (2008). Agricultural and yam production in Africa. Rome, Italy: Statistical Division of FAO.

IITA (2009). Yam (Dioscorea species). Retrieved 22nd June, 2019, from http//www.iita.org/yam

IITA (2013). Healthy yam seed production. Retrieved 16th September, 2018, from http:*//www.iita.org/publications*

Ike, P & Inoni, E. (2006). Determinants of yam production and economic efficiency among small-holder farmers in South Eastern Nigeria. *Central European Journal of Agriculture, 7*(2), 337-342.

Izekor, O.B & Olumese, M.I. (2011). Determinants of yam production and profitability in Edo State, Nigeria. *Afr. J. General. Agric., 6*(4), 30-35.

National Bureau of Statistics (NBS, 2012). Integrated surveys on agriculture: General household survey panel. Retrieved 22nd October, 2019, from *www.nigerianstat.gov.ng/pages/download/121*

National Bureau of Statistics (NBS, 2013). LSMS - integrated surveys on agriculture: General household survey panel. Retrieved 22nd October, 2019, from *www.nigerianstat.gov.ng/pages/download/194*

Nwankwo, F., Ewuim, N. & Asoya, N.P. (2013). Effect of cooperatives on the savings behaviour of members in Oyi Local Government Area, Anambra State, Nigeria. An International Multidisciplinary Journal, Ethiopia, 7(1), 209-227.

Olubukola, A.A. & Bolarin, T.O. (2006). Production efficiency in yam based enterprises in Ekiti State, Nigeria. *Journal of Central European Agriculture, 7*(4), 627-636.

Osisiogu, I.U.W & Uzo, J.O. (1973). Industrial potential of some Nigerian yam and cocoyam starches. *Tropical Sc. J., 15*(1), 353-357.

Sanusi, W.A & Salimonu, K.K. (2006). Food security among households: Evidence from yam production in Oyo State, Nigeria. *Agricultural Journal, 1*(4), 249-253.

Zaknayiba, D.B & Tanko, L. (2013). Costs and returns analysis of yam production among small scale farmers in Karu local government area, Nasarawa State, Nigeria. *PAT, 9*(1), 73-80.