Full Length Research Paper

Gross margin analysis and constraints to yam production in Osun State, Nigeria

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This study examined the gross margin and constraint to yam production in Osun State, Nigeria. Multistage, purposive and simple random sampling techniques were used to select 160 respondents for the study. Well structured questionnaires were administered to the respondents to obtain data. Descriptive statistics and gross margin analysis were used to analyze the data. Results revealed that majority (62.5%) were males, 90.3% were within the age range of 49 years and below, 58.3% were married, 70.9% had 6 - 20 years of farming experience and all the respondents had one form of formal education or the other. The enterprise was profitable based on the positive values of gross margin (N152,685,340), net farm income (N147,384,681) and net return on investment (0.92). Production was most seriously constrained by lack of capital, scarcity/ high cost of quality seed yams, high cost of labour, pests and diseases infestation and lack of modern technology. Yam farmer's problems would be meliorated by the injection of more funds into agricultural production activities and the production of seed yams using yam minisett techniques. This would improve efficiency, enterprise profitability and sustainability.

Key words: Gross margin, constraints, yam production, Osun State, Nigeria.

INTRODUCTION

Agriculture holds the key to rural development, poverty alleviation and overall economic development (Oluwafemi et al., 2010). Therefore growth in the sector where most of the nation's work force is located is a mist because it is fundamental to cutting hunger and reducing the burden of food import (Peacock, 2005). The sector accounted for about 31-42% of Gross Domestic Product (GDP) between 2005-2008. In addition, it provided paid and self employment for over 70% of the nation's population (Nigerian Export Promotion Council (NEPC), 2009). The Food Crop Sub-sector (with maize, sorghum, millet, rice, yam, cocoyam and cassava as the main food crops

grown in the country) contributed about 28% to GDP representing about 75-76% of the share of the agricultural sector's contribution to GDP (CBN, 2012).

Yam is an annual tuber and monocot plant which belongs to the genus "Dioscorea" and the family "Dioscoreacea" (Sesay et al., 2013) with world production estimate of 48.7 million tons in 2005 and 99% of this was from Sub-Saharan Africa (FAO, 2006). West and Central Africa accounted for about 94% of world production with Nigeria as the leading producer in the world with 34 million tons (IITA, 2009). In 2011, world production figure rose to 56 million tones with Nigeria producing about 37.1

million tones representing 67% of world production (FAO, 2012). The Federal Ministry of Agriculture and Water Resources (FMA & WR, 2008) reported that all the states in the Federation produce yam.

Medicinally, yam tubers are used for various traditional medicines in China, Korea and Japan (USDA, 2009). It contributes more than 200 dietary calories per capita daily for more than 150 million people in West Africa and also an important source of income generation and trade (Reuben and Barau, 2012). In addition to its importance in the diet, it is prominent in traditional festivals, marriages, burials and indeed in almost all social, cultural, religious and economic gathering (Omojola, 2014). In South Western Nigeria, Bamine and Amijoyegbe (2006) noted that there is an increasing gap between the levels of supply and demand for yam. Also, Oladeebo and Okanlawon (2010) noted that the absolute level of yam production has remained static over the decade.

This static trend may not be unconnected with production resources which are not being efficiently utilized, leading to low productivity. Inefficient resource allocation could limit the level of returns to an enterprise and in turn affect the attractiveness to such enterprise. Therefore, the objective of this study was to determine the level of farmer's cost and returns as well as economic performance of yam production in Osun State of Nigeria.

MATERIALS AND METHODS

Osun State is situated in tropical rainforest zone. It has 30 LGAs with 3 agricultural zones – Ife/Ijebu, Oshogbo and Iwo. It covers an area of approximately 14,875 Sq km and lies between latitude 7° 30' 0"N and longitude 4° 30' 0"E. It is boundaries by Ogun State to the South, Kwara State to the North, Oyo State to the West and Ekiti and Ondo States to the East. The annual rainfall ranges of 800 to 1500 mm and average temperature of 26°C. The state is made up of over 200 towns and villages and a population of 3,416, 959 people (NPC, 2006) who are predominantly arable crop farmers. The state was chosen for the study because of the preponderance of yam producers in the area. The study population comprised of yam farmers operating in the 30 LGAs in the state.

Multistage, purposive and random sampling techniques were adopted in the choice of 160 yam farmers selected from the sampled villages. In the first stage, 2 agricultural zones were selected. The selection was based on the preponderance of yam farmers in the area. At stage II, 2 LGAs were selected from each of the agricultural zones to arrive at 4 LGAs. Stage III involved the selection of 2 communities each from the 4 selected LGAs to arrive at 8

communities. Finally, simple random method was used to select 20 yam farmers from each of the eight selected communities to arrive at 160 respondents at stage IV. Data for the study were collected from primary sources for 2012/2013 production season using well structured questionnaire. Descriptive statistical tools were used to analyze data generated on socio-economic characteristics of the respondents while gross margin and net income analysis were used to analyze the data on profitability of production. The inputs used include seed yam, fertilizer, herbizides, labour as variable inputs and machete, hoe, bicycle/motor cycle, head pan/basket as fixed inputs. The fixed inputs were depreciated.

Gross margin is the excess of sales revenue over purchases or profit above variable cost (Okoh et al., 2008) while net farm income is the difference between gross margin and total fixed cost. The average prevailing market prices of inputs and output was used to derive the relevant monetary values of inputs and output. These are mathematically represented as:

$GM = TR - TVC$
$NFI = GM - TFC \text{ or } TR - TC$
$NROI = NFI/TC$

Where:
GM = Gross Margin
TR = Total Revenue
TVC = Total Variable Cost
NFI = Net Farm Income
TFC = Total Fixed Cost
TC = Total Cost
NROI = Net Return on Investment

RESULTS AND DISCUSSION

The study considered the following socio-economic characteristics of the respondents: farmers' gender, age, marital status, household size, educational level, farming experience, farm size, amount of credit obtained and contact with extension agents. Results of the analysis of the socio-economic characteristics of the respondents are shown in Table 1 which revealed that majority (62.5%) of the farmers were males. Nlerum (2006) noted that yam production in Rivers state, Nigeria was dominated by males. This could be attributed to the energy demanding activities involved in yam production which require men who are naturally endowed with abundant strength necessary for such jobs (Omojola, 2014). About 90.3% were within the active age range of 49 years and below while 58.3% were married. This implied that yam production in Osun state was carried out by married youths full of energy necessary to handle the

Table 1. Socio-economic characteristic of yam farmers.

Characteristic	Frequency	Percentage
Gender		
Male	99	62.5
Female	61	37.5
Total	160	100
Age		
< 20	16	9.7
20-29	38	24.3
30-39	44	28.5
40-49	43	27.8
50-59	14	7.6
60 and above	5	2.1
Total	160	100
Marital status		
Married	94	58.3
Single	66	41.7
Inidowcer	-	-
Divorced	-	-
Total	160	1-00
Household size		
1.3	23	14.4
4-6	76	47.5
7-9	34	21.2
10 and above	27	16.9
Total	160	100
Educational level		
Primary	44	27.5
Secondary	56	35.0
Higher institution	60	37.5
Total	160	100
Farming experience		
1-5		29.1
6-10	46	27.8
11-15	43	16.7
16-20	23	13.9
Above 20	21	12.5
Total	160	100

laborious jobs in yam production. This agrees with Ebewore (2010) who reported that age is considered as an important variable because of its influence on people's attitude, skills, aspiration and that young farmers tend to be more flexible in their decision and accept innovation more readily. Also, the result is consistent with Ayanwuyi

Table 1 Contd.

Farm size		
0.1-1	41	25.7
1.1-2	55	35.4
Above 3	41	25.7
Total	23	13.2
	160	100
Source of fund		36.3
Personal savings	58	15.6
Friends/Relations	25	13.7
Issue/cooperatives	22	11.3
Micro Finance Bank	18	12.5
Agric Bank	20	10.6
Total	17	100

farmers possess better opportunities for resource accumulation and family labour build up that would be of importance in farm establishment and management. Furthermore, Table 1 revealed that majority (70.9%) of the farmers had 6 - 20 years of farming experience. This agrees with Albert and Okhidim (2012) who reported that many of the goat farmers in Etche LGA of Rivers state had between 16- 20 years experience in farming.

The result of the estimated profit for yam production in Osun State is presented in Table 2. It is revealed in Table 2 that the respondent farmers spent 96.69% of their total cost of production on variable costs. Out of the percentage, seed yams accounted for 42.02% followed by labour 36.20% and the least variable cost was storage cost (1.77%). In all, the total cost of yam production in the area amounted to N160,228,574 with variable cost accounting for about 96.69% (N154,927,864) and fixed costs of 3.31% (N5,300,710) only. This agrees with the findings of Obinne (2007); Reuben and Barau (2012) who reported that yam farmers spent over 94% of the total cost of production on variable inputs. The production of yam generated gross margin, net farm income, mean net farm income and net return on investment values respectively of N152, 685, 340; N147, 384, 681; N921, 154.26 and 0.92. Thus, in the study area, yam farming having recorded a positive net farm income and return on investment values was a profitable enterprise. Yam farming has equally been adjudged a profitable enterprise in the previous studies conducted in South Western Nigeria, Edo and Taraba States of Nigeria by Adekayode (2004); Eyitayo et al. (2010); Izekor and Olumeze (2010) and Reuben and Baran (2012) respectively. Net return on investment was 0.92 implying that the farmers returned

N0.92 for every N1.00 invested in the business.

Distribution of the respondents according to problems militating against yam production in the area is shown in Table 3. The result indicated that lack of capital with a mean score of 3.62 constituted the major constraints to yam production in the area. This was followed by scarcity/high cost of quality seed yams (2.92), high cost of labour (2.89), pests and diseases infestation (2.85), high cost of transportation (2.69), lack of modern technology (2.66), poor storage facilities (2.60) and poor market prices (2.33). The result contradicts the findings of Ugwumba and Omojola (2012), who noted that seed yams constituted a minor constraint to yam production in Ekiti State.

Lack of capital was indicated as the most serious constraints to yam production with a mean score of 3.62. Reuben and Baram (2012) also noted inadequate fund as one of the serious problems facing yam problem in Taraba State. This could be because most of the farmers depended on their personal savings (Table 1) to finance yam production activities. The second serious problem was the problem of scarcity and high cost of quality seed yams. Yam farming is dependent upon the availability of quality seed yams. Ayanwuyi et al. (2011) in their study on yam production in Orire Local Government Area of Oyo State, Nigeria reported lack of improved yam sets as a major constraint in the study area. This could be due to lack of awareness of the several research works done on the profitability of yam production through yam minisett techniques (Adekayode, 2004; Eyitayo et al., 2010; Gbegeh and Akubuilo, 2013). High cost of labor had a mean score of 2.89 in order to become the third serious problem encountered by the respondents. This is in

Table 2. Estimated profit for yam production in Osun State.

Variable	Amount (₦)	Percentage
Total Revenue	307,613,255	
Variable cost		
Yam seedlings	67,329,052	42.02
Herbicides	3,590,300	2.24
Labour	58,000,828.20	36.20
Fertilizer	20,084,272	12.50
Transportation	3,144,300	1.96
Storage	2,829,11.80	1.77
Total Variable Cost (TVC)	154,927,864	96.69
Fixed cost		
Dep on Machete	1,350,370	0.84
Hoe	1,150,380	0.72
Basket/Head Pan	896,460	0.56
Dep. On Bicycle/ Head Pan	1,021,000	0.64
Interest on Loan	882,500	0.55
Total Fixed Cost	5,300,710	3.31
Total Cost (TC = TVC + TFC)	160,228,574	100
Gross Margin (GM = TR – TVC)	152,685,341	
Net Farm Income (NFI = TR – TC)	147,384,681	
Mean Net Farm Income (MNFI = NFI/n	921,154.26	
Net Return on Investment (NROI = NFI/TC)	0.92	

Source: Field Survey, 2013. Note: Dep. = Depreciation.

Table 3. Constraints to yam production.

Variable	Score	Ranking
Lack of capital	3.62	1st
Scarcity/high cost of seed yam	2.92	2nd
High cost of labour	2.89	3rd
Pest and disease infestation	2.85	4th
High coat transportation	2.69	5th
Lack of modern technology	2.66	6th
Poor storage facilities	2.60	7th
Poor market prices	2.33	8th

consonance with Tetteh and Soakwa (2004) who reported that the constraints to yam production in Ghana included high labour demand for most cultural practices. Other serious problems of yam production in the area were pests and diseases infestation (2.85), high cost of transportation (2.69), lack of modern technology (2.66), and poor storage facilities (2.60). This agrees with Ironkwe (2010) who noted serious constraints to yam production to include pests and diseases, perish ability of tubers because of poor storage facilities and high cost of planting materials.

CONCLUSION AND RECOMMENDATION

Yam production in Osun State was a profitable enterprise

given positive values of gross margin, net farm income and net return on investment. Production was majorly constrained by lack of capital, scarcity/high cost of quality seed yam, high cost of labour, pests and diseases infestation, high cost of transportation, lack of modern technology and poor storage facilities. Production output could increase through the formulation of policy that would mitigate the problems of lack of capital, scarcity of quality seed yams, high cost of labour and pests and diseases infestation identified by the study as the most serious constraints to yam production in the area.

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