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Research Article

Socio-Economic Analysis of SweetPotato (*Ipomoea batatas (L.) Lam*) Production in Oyo State, Nigeria

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Abstract

Sweetpotato is a remarkable food crop that is grown under agro-geographic conditions that vary widely in the tropical and sub-tropics environment. It is one of the staple crops that effectively combat hunger, malnutrition, alleviate poverty, and significantly promote food security in Nigeria. In order to examine the profitability of sweet potato farming, there is a need to study the economic analysis of its production in Oyo state. A multistage sampling technique was used to randomly select 120 farmers from 10 communities in 6 LGAs in the 3 agricultural zones of the state. A structured interview schedule was used to collect data on socio-economic characteristics, cost of production, revenue generated, etc. from the respondents. The data collected were subjected to descriptive statistics, profitability analyses, etc. The results showed that the majority (40.0%) of the farmers are between 41-50 years with a mean age of 47 years; 57.5% were males with 66.7% married; most of them (79%) of the respondents were educated with a minimum of 6 years of farming experience which indicates that the farmers are highly experienced in sweet potato farming. The majority (60%) had a household/family size of 5-12 members while 45.8 % sourced their funds from personal savings. The study further revealed that sweet potato production is profitable at a high-profit margin of N70, 839.60/Ha. The study further recommended measures to increase root yields and scale of farmer's operation. In other to mitigate the constraints, the Government should provide micro-credits at low-interest rates as well as put in place a sustainable buy-back policy that would guarantee price stabilization.

Keywords: Sweetpotato, profitability analyses, economic analysis, Oyo state.

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INTRODUCTION

Since the 1970s, when crude oil became the major export earner, Nigerian agriculture began to take a downward turn, which failed to provide sufficient employment opportunities for those who engaged in agricultural production (NISER, 2000). However, in the second quarter of the year 2011(CBN, 2011), the agricultural sector contributed 41.59% to the Gross Domestic Product (GDP) of the Nigeria economy. The primary aim of agriculture is the provision of food for the population. It's also the main source of raw materials for industrial use, income, poverty reduction and foreign exchange (NISER, 2000). According to Amaza and Olayemi, 2002; the agricultural sector plays a significant role in food security, poverty alleviation and human development.

Raemaekers (2001) reported that sweet potato is one of the world's most important food crops due to its high yield and nutritive value. The crop requires low inputs, less management and it does well on non-marginal soils which gives reasonable yields. Sweetpotato is an important staple food crop in Nigeria due to its high agronomic potentials.

Sweet potato as a traditional crop of the poor, expanding its processing enterprises can bring direct economic benefits to the farmer, investors and increase investment in the downstream sector of the commodity system.

Ojeniyi (2001) also confirmed that sweetpotato has some advantage over other root and tuber crops which includes low demand for soil nutrient, tolerant to drought, capable of providing reasonable yield where other crops would fail, low requirements for external input such as fertilizer and flexibility in planting and harvesting. It is a short duration crop (3-4months) that could be cropped more than once in a year (Nwauzor *et. al*, 2005). It is extensively cultivated in the tropical zones; such as North-Central (Benue, Plateau, Kwara and Kogi States), South-South (Delta and Cross River States) and South-West (Osun, Ogun, Oyo and Ondo States) in Nigeria.

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Globally, Nigeria is the second largest producer of sweetpotato in the world and largest producer of sweet potato in Africa (FAO, 2008). The local varieties of sweet potato are scattered all over Nigeria which were introduced by the early colonial masters and Christian missionaries before the introduction of the improved variety. Although, Nigerian Agriculture has been variously described as being characterized by low farm incomes, low levels of capacity to satisfy the food needs of the population and low productivity because primitive techniques of production are still being used by the farmers (Ohajianya, D and Onyenweaku, 2011; Obasi, 2005).

The improved varieties were developed by National Root Crops Research Institute, (NRCRI), Umudike and International Institute for Tropical Agriculture (IITA), Ibadan. In spite of these improved varieties that were developed with desirable traits such as high yielding potential, most rural farmers in Nigeria are conservative and still cultivate the local varieties (Woolfe, 1992).

However, the problems of food production and hunger in Africa have been seen essentially as a colonial creation (Swendhen: 1972, Eirlkhaneh: 1975, Hughor: 1999, Brendhem: 2004 and more recently Stranseer: 2010). One staple crop that has the potential to effectively combat hunger, malnutrition, alleviate poverty and significantly promote food security is sweet potato. It is rank as the fifth most important food crop on a fresh weight basis after wheat, maize, cassava and rice. It is cultivated in over 100 developing countries and annual production figures exceed 135 million tons (FAO, 1998). It should be noted that this excludes production figures from Nigeria which FAO (2007) puts at 3.49 million tonnes produced on 1.03 million hectares of land. Yet, some rural farmers are not recording sweetpotato production, processing and marketing. This could lead to improper accounting at the end of its production cycle (Agbo and Ene, 1999). There is a need to document sweetpotato production, processing, distribution channels, marketing strategy and

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factors militating against it. However, these factors are used to determine the profit margin of sweet potato (Odebode et.al, 2008).

Sweetpotato is nutritive and it can be consumed boiled, roasted or fried. It prevents several disease conditions. The crop serves as cover crops which prevent soil run-off and a source of carbohydrate that is used as supplement to yam, cocoyam and cassava. The leaves and vines of sweetpotato are also used in the fresh or sun dried forms to feed sheep and goats (Odebode *et. al,* 2008).

Sweetpotato is among the world's most important, versatile and under exploited food crops in terms of global production. Despite the adaptable potential of the crop to most cropping systems and ecologies as well as the low investment cost. Hence, sweetpotato production has not grown appreciably in Nigeria.

Oyo State as a case study like the rest of Nigeria (Kupoluyi, 2009) has inefficient allocation of inputs/ vines, low returns on farmer's investment and government's support. Therefore, Socio-economic analysis of sweetpotato production in Oyo State has to be examined.

Objectives of the Study

The objectives of this study are highlighted as follows as to:

- Describe the socio-economic characteristics of sweetpotato farmers in the study area;
- Determine the cost and returns of sweetpotato farmers and their profitability in the study area;
- Outline the constraints in sweetpotato production in the study area; and
- Recommend useful information based on the findings of the study.

METHODOLOGY

A multistage sampling technique was used to select the studied farmers. In the first stage, twelve (12) communities in 6 LGA's of the state namely Ogbomosho, Oyo and Ibadan were purposively

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selected. The second stage involved random selection of 10 sweet potato farmers from the 12 communities; making a total of 120 farmers selected for the study. A well-structured interview schedule questionnaire was used to collect data from the farmers. Simple descriptive statistics such as mean, frequency, distribution, table and percentage were used to analyze the socio-economic characteristics of the respondents such as education, age of the famers, farming experience; farm and households (family) sizes, primary occupation, etc. Gross margin analysis was used to determine the sweet potato profitability; hence, sweet potato production is profitable in the study area. The constraints to sweetpotato production were rated on a 4-point Likert type scale to determine their severity.

Gross Margin

$$G.M = TR - TVC$$

Where,

G.M= Gross Margin (₦/ha)

RESULTS AND DISCUSSION

In assessing the economic analysis of sweetpotato farming in Oyo State, it was observed that like in most agricultural commodities, the farming population for sweetpotato is ageing. The average age of sweetpotato farmers was discovered to be around 47 years' in the study area as shown in table 1. In table 1, Out of the 120 respondents, seven (7) of them fall within 21-30 years of age, twenty (20) were between 31-40 years old while the bulk of producers (93 of them) were between the ages of 41 and 65 years. Most of the farmers were illiterate to semi-illiterate; i.e they had at least one form of education. This implies that closed to half of the farmer's population has formal education as reported by Abiola and Omoabugan (2001). Majority of the farmers are married (66.6%) with over five (5) years of farming experience. (50.8%) engaged in family labour with less than 0.5 ha of land utilized for production activities in the study area; Less than 10 % of the farmers (10 out of 120) only assessed bank loans to produce sweetpotato.

Table 1: Socio-Economic Characteristics of sweet potato production

Variable	Frequency	Percentage
Age		
21– 30	7	5.80

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31 – 40	20	16.67
41 – 50	48	40.00
51 – 60	32	26.67
>60	13	10.83
Total	**120**	**100.0**
Mean = 47yrs		
Gender		
Male	69	57.50
Female	51	42.50
Total	**120**	**100.0**
Marital status		
Single	20	16.67
Married	80	66.67
Widowed	15	12.50
Divorced	5	4.16
Total	**120**	**100.0**
Educational level		
No formal education	25	20.83
Primary education	40	33.33
Secondary education	35	29.16
Tertiary education	20	16.66
Total	**120**	**100.0**
Experience in production		
<5	10	8.33
6-9	60	50.00
>10	50	41.67
Total	**120**	**100.0**
Household size		
1 – 4	41	34.20
5 -12	72	60.00

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>12	7	5.80
Total	**120**	**100.0**
Source of fund		
Personal savings	55	45.83
Money lenders	35	29.17
Cooperative groups/societies	17	14.17
Bank loan	10	8.33
Others	3	2.50
Total	**120**	**100.0**
Farm size (ha)		
>1	63	52.50
1-2.99	34	28.33
3-4.99	20	16.67
< 5	3	2.50
Total	**120**	**100.0**
Kinds of Labour (mandays)		
Family labour	61	50.83
Hired labour	14	11.67
Family and hired labour	45	37.50
Total	**120**	**100.0**

Source: Field survey, 2008.

Table 2 shows the analysis of the cost and returns of sweet potato production which revealed that the bulk of the cost of producing one hectare of sweet potato was incurred on labour and capital inputs which formed 78.2% of the total variable cost (#98,560 out of #125,960.40). The return on investment on sweet potato production is about 48% which is considerably high. This means for every one #1,000, a farmer invests in sweet potato production; he makes a profit of #480 within 4 months which is the average production cycle of sweetpotato. As shown in the GM in figure 1; gross income of # 217, 800.00 was made from a hectare of sweetpotato; a total of # 146,960.00 was invested, thus giving a Net Farm Income of # 70,839.60. A similar study conducted by

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Anyaegbunam et.al, (2006) showed that the Net Farm Income (NFI) in sweet potato production was #124,698.80 giving a return on investment (ROI) of 83%. However, it should be noted that this result was obtained in a research institute (NRCRI, Umudike). Fertilizer application and other optimum conditions were provided to achieve this ROI which differ markedly from what obtains on resource-poor farmer's fields.

Table 2: Cost and Returns Analysis of sweet potato production

Resource Quantity/ Ha	No. of Person(s)/₦	Total Cost (₦)	Percentage
A. Landing Operation			
Slashing	1	5,500.00	
Ploughing	1	6,000.00	
Ridging	1	5,500.00	
Variable Cost (A)		**17,000.00**	13.49
B. Labour/ Capital Inputs			
Planting	10 @800	8,000.00	6.35
Weeding	30 @800	24,000.00	19.05
Rogueing	4 @800	3,200.00	2.54
Harvesting	10 @800	8,000.00	6.35
Sweetpotato vines (bundle)	333 @120	39,960.00	31.72
Transport/fuel (litres)	40 @100	4,000.00	2.06
Interest on Capital (9%)	-	10,400.40	8.25
Variable Cost (B)	-	98,560.00	78.24
Total VC (A+B)	-	125,960.40	100.00
C. Owner's Resources			
Land (rent) (ha)		7,500.00	35.72
Depreciation (cutlass, basket, hoes, sacs, etc)		1,500.00	7.14

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Family	labour	12,000.00	57.14
(harvesting of vines)			
Total fixed cost (TFC)		21,000.00	100.00

Source: Field Survey, 2008.

N.B: If capital for production is from farmer's savings, then interest on capital (9%) will not apply. It can equally be safely assumed that the farmer may not need to borrow all the capital he expended in production.

Table 3: Profitability results in sweetpotato production

Budget	**Yield (t/ha)**	**Unit price (₦/t)**	**Cost/Return (₦)**
Costs	-	-	
Total variable cost (TVC)	-	-	125,960.40
Total fixed cost (TFC)	-	-	21,000.00
Total cost (TVC + TFC)			146,960.40
Returns			
High Price Roots HPR (>0.005kg)	7.5	17,000.00	127,500.00
Low Price Roots (LPR) (<0.005kg)	4.2	11,500.00	48,300.00
Sales of Sweet potato	350	120.00	42,000.00
Vines (bundle)			
Land Productivity	11.70	-	-
Gross Income	-	-	217,800.00
Net Farm Income			70,839.60
Return per Naira			48.20%

Source: Field Survey, 2008.

N.B: The Return per Naira will be much higher due to higher Net Farm Income, if the assumption on farmer's capital holds.

Gross Margin

$$G.M = TR - TVC$$

Where,

G.M= Gross Margin (N/ha)

T.R =Total Revenue (N /ha) = N146, 960.40

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TVC=Total Variable Cost (N /ha) = N147, 542.40

Therefore; TR-TVC

= N217, 800- N146, 960.40

G.M = N70, 839.60

Table 4 shows analysis of the severity of constraints to sweetpotato production in the study area using a 4-point Likert-type scale. It was computed by summing the scores (frequency multiplied by magnitude of constraint(s) and determining the mean ($\bar{x}$) which were then ranked accordingly. However, the results in table 3 revealed that lack of credit, high cost of transportation and high cost of labour fall in the category of "very severe" with respective mean scores of 3.51, 3.46, and 3.37. Poor pricing on sweetpotato roots (products), poor extension services, poor storage infrastructure, pests and diseases with mean scores of 3.21, 3.13, 3.05 and 2.98 were in the category of "severe" while poor production experience, high cost of inputs and inconsistent in government policies were considered "not severe" with mean scores of 2.97, 2.92 and 2.83 respectively. The response as regards impact of extension services in table 3 poses a surprise as extension; farmer's ratio in Nigeria is noted to be as high as 1: 2,500 (Ilevbaoje, 2004). In the Table 4 listed below, the farmer's may have underestimated the importance of extension or improved technologies in increasing their productivity.

Table 4: Analysis of constraints in sweet potato production (N=120)

Types of constraints	4 Very severe	3 Severe	2 Not severe	1 Indifferent	Σ		Rank
Poor extension Services	61(50.83)	40(33.33)	2(1.67)	17(14.17)	385	3.21	4
Pests and diseases	55(45.83)	23(19.17)	35(29.17)	7(5.83)	366	3.05	6
High transportation cost	80(66.67)	21(17.50)	5(4.17)	14(11.67)	416	3.46	2
High cost of labour	50(41.67)	33(27.50)	22(18.33)	15(12.50)	358	2.98	7
Poor pricing of the Products	56(46.67)	55(45.83)	7(5.83)	2(1.70)	405	3.37	3

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Lack of (fund) capital	69(57.50)	45(37.50)	2(1.70)	4(3.33)	419	3.49	1
Poor storage Infrastructure	60(50.00)	19(15.83)	38(31.67)	3(2.50)	376	3.13	5
Inconsistent in Government policies	45(37.50)	31(25.83)	40(33.33)	4(3.33)	357	2.97	8
Poor in production Experience	51(42.50)	25(20.83)	27(22.50)	17(14.17)	350	2.92	9
High cost of inputs	29(24.16)	49(40.83)	35(29.17)	7(5.83)	340	2.83	10

Source: Field survey, 2008. Parentheses are in percentage.

CONCLUSION AND RECOMMENDATIONS

Sweetpotato production is a highly profitable agricultural enterprise going by the results obtained from this study. Farmers (would-be farmers'), especially the "young ones" should be encouraged to go into sweetpotato production since the low profitability of many agricultural enterprises seem to be one of the main disincentives to this young people. Within four months, a return on investment of 48% is very high, not only in agriculture, but in other business endeavour's Moreover, the following recommendations are made;

- Government should boost extension delivery in order to increase uptake, innovations, and utilization of high-yielding varieties of sweetpotato vines and tubers in order to make the products more attractive at the local and international market.
- Government and Non-governmental groups (NGOs) in production, processing, storage, packaging, marketing, pricing formulator/ implementers (policy makers) should put in place a sustainable buy-back policy to encourage sweetpotato production, distribution and price stabilization.
- Farmers should be encouraged to form themselves into viable cooperative groups or associations/ societies in order to facilitate access to farm inputs and microcredits or loans facilities.
- Tractors and other inputs should be made available to farmers at subsidized or affordable prices.

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- Farmers should be encouraged to access micro-credit in order to increase their scale of production.

Therefore, government and research institutes should endeavor to embark on enlightenment campaign for more sweetpotato production, utilization and marketing.

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