
ANALYSIS OF SWEET POTATO PRODUCTION IN OFFA AND OYUN LOCAL GOVERNMENT AREAS OF KWARA STATE, NIGERIA.

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ABSTRACT

The study examines production of sweet potato in Offa and Oyun Local Government Areas of Kwara State, Nigeria. The study stemmed from the need to achieve food security in the country through market-oriented production. Specifically, the study describes the socio-economic characteristics of sweet potato farmers, determines the level of commercialization of the crop and ascertains factors influencing its level of commercialization in the study area. Primary data obtained from 114 farm household were used for the study. Data collected were analyzed with descriptive statistics, household commercialization index function and regression analysis. The results show sweet potato production in the study area is mostly undertaken by male farmers (98.2%) who are still in their active age (25 – 54 years) but have low level of formal education and small farm size (mean = 1.66ha). The result of the commercialization index function indicates that the household commercialization index of sweet potato production is 85% implying that production of the crop is oriented towards commercialization. The results of the regression analysis show that farm size, farming experience and educational status of the households positively and significantly influence the degree of commercialization while the age of the household head negatively influences it. The study therefore recommends education of the farmers by government and development agencies, encouragement of the youth to actively participate in farming and expansion of farm land put to cultivation of sweet potato by the farmers.

Key Words: food security, sweet potato, commercialization, factors.

INTRODUCTION

Ensuring adequate food supply to sustain rural and urban livelihood is one of the fundamental challenges in Nigeria Government today. However, food sufficiency can only be attained in a country where there is a well developed agriculture with good commercial outlook which include increase in farm productivity and good marketing network. In Nigeria there is a wide gap between domestic food supply and demand of most food crops. This is partly because agricultural production in many parts of the country have remained at subsistence oriented level despite comparative advantage of producing in large quantity for commercialization. Agricultural commercialization may be defined as the proportion of agricultural production that is marketed. It involves the deliberate action on the part of agricultural producer to use factors of production in a way that a greater part of the crops produced is for exchanged or sale (Okezie, 2006). Commercialization of agriculture also involves a transition from subsistence-oriented to increasingly market-oriented patterns of production and input use. The underlying premise is that markets allow household to increase their incomes by producing that which provide the highest returns to land and labor and then use the cash to buy household consumption items, rather than be constrained to produce all the various goods that the household needs to consume (Timmer, 1997; Pingali, 1997).

Studies have shown that food crop farming in developing countries generally and Nigeria in particular is most practiced at subsistence level. However, farming in general can be practiced at commercial level by enhancing their techniques and educating them on the need for commercialization so as to ensure food security in the nation. Most farmers in Nigeria operate small farm holdings. For this reason, their production target to meet the food needs of their family and little or nothing is left for the market. Given the fact that Nigeria is witnessing increasing rate in population growth commercialization of agricultural production becomes imperative. One of the crops whose potentials have not been fully harnessed in Nigeria is sweet potato (*Ipomoea batatas*). Sweet potato belongs to the morning glory family (Convolvulaceae). The crop originated from Central America and was spread rapidly to Asia and Africa during the 17th and 18th centuries respectively (Van An 2004). Sweet potato is an important crop in many areas of the world being cultivated in over 100 countries (Van An, 2004). It ranks among important food crops in the tropical area where a high population of the world's poorest people live (Woolfe, 1992; Van An 2004). However, it ranks fourth in terms of world's most important food crops after rice, wheat and corn (Babatunde *et al.*, 2007). Also of the world's root and tuber crops, sweet potato ranked third after Irish potato and cassava (Ikeorgu, 2003). In Nigeria, it is still restricted to a few states and its production is mainly for local consumption. Tewe *et al.* (2003) reported that sweet potato is only a minor food crops in tropical Africa despite its potentials as indicated by its growth in terms of production. Sweet potato is the only crop among the root and tubers that has positions per capital annual rate of increase in production in sub-saharan African (Tewe *et al.*, 2003). It has a high yield potential that may be realized within a short growing season and is adaptable to a wide ecological conditions. Sweet potato is the only member of the genus *Ipomoea* whose root is edible and is one of the world's most important food crops due to its high yield and nutrition value. As a crop that requires low inputs of land, labour, capital and less management in its production; it does well on marginal soil given reasonable yield than most other crops (Islam *et al.*, 2002; Attairu and Langantilleke, 2007).

In Nigeria, there is a wide gap between domestic food supply and demand of most food crops (Ajibefun, 2003). This is because agricultural production in many parts of Nigeria have remained at subsistence level despite the comparative advantage of producing in large quantities for commercialization. Hence, this study tends to answer the following questions:

- i. Who are the sweet potato farmers?
- ii. To what extent is sweet potato production market-oriented?
- iii. What determine level of commercialization of sweet potato production?

From the foregoing, this study examines commercialization of sweet potato in Offa and Oyun Local Government Areas of Kwara State, Nigeria. Specifically, the study describes the socio-economic characteristics of the sweet potato farmers, determines the level of commercialization of the crop and ascertains the factors influencing commercialization of sweet potato production in the study area. The findings of this study are expected to modestly contribute to the literature on a new agenda for the development of commercial agriculture in Nigeria.

METHODOLOGY

This study was carried out in Offa and Oyun Local Government Area (LGAs) of Kwara State, Nigeria. Offa is located on latitude 8N13' East of the Greenwich Meridian and is about 56km from Ilorin, the state capital. It is located about 600m above sea level and covers about 14,922km² with a population of about five hundred thousand people (500, 000). Oyun Local Government Area, on the

other hand, is located in the southern eastern part of Kwara State. Its headquarters are in Ilemona. It has an area of 476 km² and a population of 94,253 at the 2006 census. The population of the study area is made up of the Yoruba and other groups. A humid tropical climate prevails over the area and it has two distinct seasons; the rainy and dry seasons. The rainy season lasts between April and October and the dry season between November and March. The rainfall ranges between 50.8mm during the driest months to 2413.3mm in the wettest period. The mean annual rainfall is about 1500mm. The minimum average temperature ranges between 21.1°C and 25.0°C while, maximum averages temperature ranges from 30°C to 35°C.

The study area is primarily agrarian with great expanse of arable land and rich fertile soils. Agricultural production in the area is largely peasant, relying heavily on the use of manual labour equipped with crude implements, while fertilizers, mechanical implement, improved seeds and agrochemicals are also used to some extent. The major crops cultivated in the study area include sweet potato, maize, cassava, yam, okra, pepper and some leafy vegetables. As regards sweet potato production, Offa and Oyun LGAs account for 80% of the output of sweet potato in the state (Kwara State Diary, 2011). Two-stage sampling technique was used for the study. The first stage involved random selection of six farm communities from each of the two LGAs. This was followed by purposive selection 10 sweet potato farm households in each of the LGAs making a total of 120 respondents. 120 questionnaires were administered but only 114 questionnaires contained relevant information and were used for analysis.

Data obtained were analyzed with descriptive statistics, household commercialization index and regression analysis. Descriptive statistics was used to describe the relevant socio-economic characteristics of the respondents. Household commercialization index was used to determine the level of market-oriented production by the respondents. According to Onyebinama (2000) and (2006) commercialization index is the ratio of gross value of farm output to the value sold. The value ranges from 0 to 100%. The closer the index is to 100 the higher the degree of commercialization. A value of zero is an indication that the respondent is operating under subsistence agriculture. The model as used by Okezie (2006) is specified as

$$HCI = \frac{GVS}{GVP} \times 100\%$$

HCI = household commercialization index

GVS = Gross value of sweet potato sold

GVP = Gross value of sweet potato produced

Factors influencing commercialization were ascertained with regression model. The implicit functional form of the regression analysis is expressed as follows;

$$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, U) \dots \dots \dots (2)$$

Where

Y = Household commercialization index

X₁ = Age of household head (Years)

X₂ = House hold size

X₃ = Educational level (years)

X₄ = Farming experience (years)

X₅ = Farm size (ha)

X₆ = Major occupation of the household head (farming = 1, others = 0)

X₇ = Cooperative membership (yes = 1, No = 0)

X₈ = Extension services (yes = 1, No = 0)

U = Error term

Since economic theory does not indicate the precise mathematical form of the relationship among the variables, different functional forms of the above models including the linear, semi-logarithm, logarithm and exponential functions were fitted. However, the lead equations was chosen on the bases of economic, statistical as well as econometric criteria (Gujarati and Sangeetha, 2007; Koutsoyiannis, 2003; Olayemi, 1998).

RESULTS AND DISCUSSION

Socio- Economic Characteristic of the Respondents

The socio-economic characteristics of an individual are relevant factors in determining the level of production in agriculture. Table 1 presents an analysis on the data collected during the field survey on the relevant socio-economic profile of the respondent.

Table 1: Socio-economic Profile of the Respondents

Variables	Frequency	Percentage
Age		
25 – 34	14	12.30
35 – 44	49	43.00
45 – 54	37	32.50
55 – 64	13	11.3
≥ 65	1	0.90
Total	114	100.00
Mean	44	
Minimum	25	
Maximum	67	
Gender		
Male	112	98.20
Female	2	1.80
Total	114	100.00
Marital Status		
Married	109	98.20
Single	5	4.40
Total	114	100.00
Major occupation		
Farming	105	92.10
Non-formal	9	7.90
Total	114	100.00
Educational Status		
No formal education	54	47.40
Primary Education	52	45.60
Secondary Education	8	7.00
Total	114	100.00

Household size		
1 – 5	37	32.40
6 – 10	56	49.10
11 – 15	13	11.30
16 – 20	8	7.20
Total	114	100.00
Mean	6	
Minimum	1	
Maximum	17	
Farming Experience (years)		
0 – 10	46	40.10
11 – 20	48	42.10
21 – 30	16	14.20
31 – 40	4	3.60
Total	114	100.00
Mean	15.04	
Minimum	3	
Maximum	38	
Membership of cooperative		
Yes	31	27.20
No	83	72.80
Total	114	100.00
Method of Land acquisition		
Inherited	88	77.20
Purchased	5	4.40
Leased	16	14.00
Community owned	3	2.60
Borrowed	2	1.80
Total	114	100.00
Sources of Input		
Open Market	3	2.60
Owned Farm	68	60.50
Other farmers	33	28.90
ADP	1	0.90
Fadama	8	7.00
Total	114	100.00
Access to Extension Service		
Yes	84	73.70
No	20	17.50
Total	114	100.00
Source of Income for farming		
Owned Fund	105	92.10
Friends and Family	9	7.80
Total	114	100.00
Source of Labour		
Family	5	4.40
Hired	61	53.50
Family and hired	48	42.10
Total	114	100
Average Monthly Income		
0 – 7000	106	93.00
7001 – 14000	2	1.80
14001 – 20000	6	5.20
Total	114	100
Mean	1122.80	

Source; Field survey data, 2012.

Table 1 shows that a higher number of respondents are still in their active age. This implies that majority of the farm households are still in their productive years to effectively cope with the rigor of commercialized farming. A great number of the respondents were married and male. This indicates that the farmers were made up of energetic individuals and children to support them in farming.

Distribution of the respondents according to household size shows that a higher percentage of the respondents had a few number of household members. The implication is that farmers with small household size need to depend on hired labour. As such, this can increase cost of production and may result in decrease in commercialization level due to high cost of production. Education is an important ingredient towards acquisition of knowledge on improving scale of production. Table 1 shows that ninety-three percent of the respondents did not have more than primary educational level. This implies that the skills of the farm households are low and can lead to low commercial production of the crop. Most of the respondents had access to extension services. As regards membership of cooperative society however, only a few number of the respondents belonged to a cooperative society.

Farming is the major occupation of the respondents. A mean of about 15 years of farming experience was recorded in the study. This implies that the farmers' skills would have improved over time.

The study revealed that most of the land for sweet potato farming was inherited. This implies the land has been in use for sweet potato farming for a very long time and continues usage without crop rotation could decrease commercialization level.

As regards farm input characteristics of the respondents, a mean farm size of 1.66 hectares was obtained in the study area. The major source of planting material available to the farmers was owned. Also, owned fund and fund from friends and relatives are the sources of fund available to the farmers.

Determination of Level of Commercialization of Sweet Potato Production by the Respondents

Table 2 shows the results of sweet potato production and the level of commercialization of the crop by the respondents. A mean of 3.32 tonnes of sweet potato was produced by the farmers. An average of 0.345 tonne was consumed while 0.039 tonne was given out as gifts, giving an average of 2.937 tonnes sold.

Table 2: Distribution of Respondents by Commercialization Index

Variables	Frequency	Percentage	Min	Max	Mean
Quantity Produced (tonnes) [A]					
0.500 - 1.499	18	15.80	0.576	1.440	3.321
1.50 - 2.499	61	54.10	1.584	2.496	
2.5 - 3.499	23	20.30	2.455	3.456	
3.5 - 4.499	10	9.00	3.552	4.320	
>4.5	2	1.80	4.560	4.608	
Sample	114	100.00	0.576	4.608	
Quantity consumed (tonnes) [B]					
0 - 0.299	106	93.1	0.048	0.288	0.345
0.300 - 0.599	6	93.1	0.336	0.432	
0.600 - 0.899	1	5.10	0.892	0.892	
0.900 - 1.199	-	-	-	-	
1.200 - 1.499	1	0.90	1.248	1.248	
Sample	114	100	0.048	1.248	
Quantity used as gift (tonnes) [C]					
0 - 0.05	102	89.5	0	0.048	0.039
0.051 - 0.100	6	5.30	0.096	0.096	
0.101 - 0.150	3	2.60	0.144	0.144	
0.151 - 0.200	1	0.90	0.192	0.192	
0.201 - 0.250	1	0.90	0.240	0.288	
0.251 - 0.300	1	0.90	0.288	0.288	
Sample	114	100	0	0.288	
Quantity Sold (tonnes) [D]					
< 1.0	12	10.70	0.384	0.960	2.937
1.0 - 1.99	41	36.5	1.008	1.968	
2.0 - 2.99	47	41.20	2.016	2.928	
3.0 - 3.99	13	11.70	3.024	3.936	
4.0 - 4.99	1	0.90	4.176	4.176	
Sample	114	100	0.384	4.176	
Household commercialization index					
0.61 - 0.70	3	2.70	0.064	0.067	0.847
0.71 - 0.80	20	17.90	0.072	0.080	
0.81 - 0.90	67	56.10	0.081	0.090	
0.91 - 1.0	22	21.50	0.091	0.094	
Sample	114	100.00	0.058	0.094	

Source: Field Survey, 2012.

Analysis of the data obtained reveals a mean commercialization index of 85%. This implies that sweet potato production in the study area is well oriented towards the market. However, the results indicate that a gap of 15% still exists for the crop to reach full commercialization.

Factors influencing Commercialization of Sweet Potato Production**Table 3: Regression Results on Factors Influencing Commercialization of Sweet Potato Production in the Study Area**

Variables	*Linear	Semi -log	Double log	Exponential
Constant	0.8419 (19.31)	1.0268 (7.10)	0.0213 (.25)	-0.0773 (3.4)
Age of household head(years)	-0.0020 (1.88)*	0.1155 (1.12)	-0.0599 (1.06)	-0.0010 (1.82)*
Household size	-0.0023 (1.35)	-0.0474 (1.59)	-0.0239 (1.46)	-0.0012 (1.26)
Educational status	0.0149 (1.92)*	0.0432 (0.50)	0.0186 (0.39)	0.0105 (1.91)*
Farming experience	0.0019 (1.89)*	0.0339 (1.05)	0.0161 (.91)	0.0010 (1.78)*
Farm size	0.0463 (4.81)***	.1799 (5.25)***	1.0969 (5.17)***	0.0249 (4.67)***
Major occupation	-0.267 (1.14)	-0.369 (1.45)	-.0206 (1.48)	-0.0146 (1.41)
Cooperative membership	0.0204 (1.39)	0.0190 (1.34)	0.0100 (1.30)	0.0168 (1.33)
Extension services	0.0192 (1.34)	0.0096 (0.68)	0.0059 (0.76)	0.0111 (1.43)
R ²	0.7302	0.6251	0.6367	0.5234
Adjusted R ²	0.6938	0.6052	0.6152	0.4924
F-value	9.620	5.060	4.79	4.360

Notes: ***, **, * - variable is significant at 1%, 5% and 10% respectively. *Lead equation

Source: Computed from survey data, 2012.

Table 3 presents the results of the four functional forms used to analyse the factors influencing the commercialization level of sweet potato production in the study area. The table shows that the linear functional form gave the best fit for the regression result. The functional form was chosen based on the values of R² (coefficient of multiple determination), F-statistics, the signs of the coefficients of the regression. The coefficient of multiple determinations (R²) was 0.730 indicating that the explanatory variables in the model explain 73% of the total variations in commercialization level of the crop. Farm size had positive coefficient and statistically significant. The implication is that farmers who have more farm land under cultivation produces more sweet potato crop for the market. On the other hand limited access to farm land reduces the ability of farmers to engage in commercial agricultural production.

The relationship between the level of education and commercialization was positive and significant too. This result implies that the more farmers acquire formal education, the more the productions are commercially oriented towards market. This finding tend to agree with theoretical knowledge given the fact that education acquisition is a measure of skill, as the result offers people the opportunity to do well in career. Farming experience had direct relationship with commercialization of sweet potato. This result suggests that farmers who have more farm experience produce more of sweet potato on commercial account. Experience offers the farmers opportunity to be acquainted with input source and the right time to engage in production. Experience lead to good skill management.

The age of the respondent had negative coefficient and is statistically significant. The implication of this is that more farmers grow older, the less active they become and the less oriented they are towards the market. This would lead to reduction in the commercialization level of the crop.

CONCLUSION AND RECOMMENDATIONS

It can be inferred from the study that sweet potato production is mostly undertaken by male farmers who are still in their active age but have low level of formal education. The results of commercialization index revealed that sweet potato production is market-oriented in the study area. There is, however, a gap to be filled-in in order to achieve full commercialization of the crop. Results of the regression analysis shows that farm size, level of education and farming experience positively and significantly affect level of commercialization of the crop while age of the farmer affects it negatively. Thus, full commercialization of sweet potato production in the study area can be achieved if efforts are directed towards addressing the challenges faced in market-oriented production of the crop.

Therefore, based on the findings of the study, it is recommended that well educated people should be encouraged to participate in farming. In this respect, farming should not be viewed as a profession that is meant for the illertae and the low educated people alone but for all. Also, more farm lands should be put into use by the farmers. Besides, government and agricultural development agencies should encourage the youth to actively participate in farming. This could be through provision of inputs and other incentives that will encourage them.

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