



Research Paper

Economic Analysis of Sweet Potato Marketing in Benue State, Nigeria

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ABSTRACT: The study examined the economic analysis of sweet potato marketing in Benue State, Nigeria. The study analyzed the sweet potato market in the study area. Specifically, the study estimated the marketing margin, marketing efficiency and also examined the constraints to sweet potatoes marketing. The study made use of primary data obtained from 240 sweet potato traders through a well structured questionnaire. Descriptive statistics, Marketing margin analysis, Shepherd's marketing efficiency index and the Gini coefficient were the major analytical tools employed for the study. The results of the study showed that sweet potato marketing in the study area is competitive and that there is a relatively high level of inequality among the traders. Lack of credit facilities, inadequate capital and poor infrastructural facilities were identified as the major factors militating against sweet potato marketing in the study area. The study therefore recommended that the government as well as non governmental agencies should empower the marketers through the provision of micro credit facilities to encourage more people to go into sweet potato marketing.

Keywords: Sweet Potato; Marketing efficiency; Marketing Margin; Gini Coefficient; Benue State and Traders

I. INTRODUCTION

Sweet potato (*Ipomoea batata* (L) Lam) is an important tropical root crop. It belongs to the Morning-glory family known as convolvulaceae and is originated from Latin America (Low et al., 2009). It is the sixth most important world food crop after rice, wheat, potatoes, maize and cassava and the fifth most important food crop in developing countries after rice, wheat, maize and cassava (FAOSTAT, 2010). The crop can be considered promoting nutritional security particularly in agriculturally backward areas. Besides carbohydrates, it is a rich source of lipid, protein, carotene and calcium.

In Nigeria, meeting the food nutrients need of the ever increasing population has been a huge task for every successful government. How well this objective is achieved is used to judge the performance of every successful government. In its effort to meet this objective, government of Nigeria in 2002 commissioned the National Special Programme on Food Security (SPFS) in partnership with the Food and Agricultural Organization (FAO). As a complement of this programme, presidential initiative on cassava, rice and oil palm was set up and three commodity development and marketing companies were established. Among them, the Arable Crops Development and Marketing Company (ACDMC), has the mandate to ensure increased cultivation and marketing of root and tuber crops including sweet potato (Idachaba, 2004). The inclusion of sweet potato on the mandate of the ACDMC in addition to other food crops was considered appropriate, because it has been reported that sweet potatoes has a long history as a food security crop in Nigeria. For example Teweet et al., (2003) reported that sweet potato is capable of meeting the consumption need of the house hold as well as generating income for them to enable them buy other food crops.

Despite the demographic pressure on land, there has been an increase in the production of sweet potato in Nigeria. Sweet potato production rose from 2.516 million metric tones in 2006 to 3.4 million metric tones in 2007 (Akoroda 2009, Srinvas 2009). These increase were attributed to improved technological inputs, International and National research efforts. Teweet et al., (2003) asserted that an increased sweet potato production that is not matched by adequate promotion and marketing to absorb surplus from increased yield has been detrimental to the sustainability of sweet potato production in Nigeria.

Sweet potato is seasonal and does not store for a long time. Poor storability of sweet potato is mainly due to sprouting, dehydration and attack by pathogenic organism (Ukpabi, 2004). These storage problems and others have led to losses by marketers in the course of performing their marketing functions.

In most cases, poor storability and seasonality lead to market variation in quantity and quality of roots and its associated price swing (Lowet al., 2009). The rising consumer price for sweet potato may be an indication of market inefficiency.

Marketing in developing countries like Nigeria is beset with a lot of problems, which constitute a bottleneck to the flow of goods and services. Such problems include seasonal variations, transportation of harvested produce, storage, processing, grading and communication (Ikechi et al., 2006). These problems notwithstanding, sweet potato production has been found to be profitable (Ogbonna et al., 2007).

The objective of this study is to carry out an economic analysis of potato marketing in Benue State, Nigeria.

The specific objectives are to:

- identify the socio economic characteristics of sweet potato marketers in the study area.
- estimate the marketing margin of sweet potato.
- examine the structure of potato market in the study area.
- examine the marketing efficiency of sweet potato.
- determine the constraint faced by the traders in marketing the crop.

II. METHODOLOGY

Area of study

The area of this study is Benue State of Nigeria. Benue state was created in 1976 and is located in the middle belt region of Nigeria with the capital at Makurdi. Benue state lies approximately between latitudes 6°30'N and 8°10'N of the equator and longitudes 6°35'E and 8°10'E of the Greenwich meridian, [Benue State Agricultural and Rural Development Authority, (BNARDA), 2005. Benue state is considered as one of the hottest States in Nigeria with an average minimum and maximum temperature of 21°C and 38°C respectively. It is in the southern guinea savannah ecological zone, which has a typical climate with the clearly marked seasons of dry season (late October to March) and wet season (April to early October). The main annual rainfall in the state is 1500mm. The important feature of the state is the river in which the state derived its name from. The state shares boundaries with five States, Nassarawa to the North, Taraba to the East, Cross-River to the Southeast, Enugu to the Southwest and Kogi to the west. The southern part of the state is also bounded with the Republic of Cameroon. Benue State has a land mass of about 33,955km² with 23 local government areas. Geographically and agriculturally, Benue State is divided into three zones, Zone A (Katsina-Ala, Ukum, Ushongo, Vandiekya, Logo, Kwande and Konshisha local government areas), Zone B (Gboko, Tarka, Buruku, Gwer East, Gwer West, Guma and Makurdi Local government areas), Zone C (Ado, Agatu, Apa, Otukpo, Ohimini, Okpokwu, Ogbadibo, Obi and Oju local government areas).

The state has a total population of 4,219,244 million people (National Population Commission 2006). About 80% of the state population is directly involved in agriculture. The state is also called the food basket of the nation, because the state produces agricultural products in large quantities.

Sampling Techniques

Both purposive and random sampling techniques were employed in selecting respondents for the study. The first stage was the purposive selection of 6 major sweet potato markets in the study area. The markets are Adikpo, Jato-Aka, Ihugh, Achia, Korinya and Ushongo markets. Random sampling technique was used in the selection of 150 retailers and 90 wholesalers from each of the markets in the study area. On the overall, a total of 240 respondents were selected and interviewed for the study using a well structured questionnaire.

Analytical Techniques

The study made use of descriptive statistics such as, mean, frequency distribution and percentages in analyzing the socioeconomic characteristics of the respondent and the constraints to sweet potato marketing in the study area. The study also used Gross marketing margin analysis and the shepherd's index in analyzing the gross marketing margin and the marketing efficiency respectively for the various marketing channels. The gini coefficient was employed to measure the degree of seller concentration of the various traders in the study area.

III. MODEL SPECIFICATION

Marketing Margin Analysis

The gross marketing margin for the wholesalers and retailers of sweet potato were estimated separately using the formula given below.

$$GM = SP - CP \dots\dots\dots (1)$$

Where:

GM = Gross marketing margin

SP = Selling price per bag of sweet potato
CP = Cost Price of per bag of sweet potato
Net marketing margin was estimated using following formula.
 $NM = GM - MC$ (2)
NM = Net marketing margin
GM = Gross marketing margin
MC = Total marketing cost
1 bag of sweet potato is equivalent to 50Kg.

Marketing Efficiency Analysis

To estimate the marketing efficiency for the wholesalers and retailers, the Shepherd’s index formula developed by (Shepherd, 1965) was employed. The formula is given by:

$$ME = \frac{GM}{MC} - 1$$
 (3)

Where:

ME = Marketing Efficiency index
GM = Gross marketing margin in Naira/50Kg of sweet potato
MC = Total marketing cost in Naira/50Kg of sweet potato
The higher the ratio, implies the higher the marketing efficiency and vice versa.

Market structure

To measure the degree of seller concentration of the traders the gini-coefficient was used through the use of total value of monthly sales as an index measurement of the market share. The Gini coefficient (G) was computed as follows:

$$G = 1 - \sum_{i=1}^k X_i Y_i$$
 (4)

Where:

Xi = percentage of sellers in the ith class of traders,
Yi = cumulative percentage of sellers in the ith class traders,
K = number of classes`

The Gini coefficient ranges from 0 to 1, where 0 implies perfect equality in the distribution (perfect market) and 1 implies perfect inequality (imperfect market). The closer the Gini coefficient is to zero, the greater the degree of equality and the lower the level of concentration and the more competitive are the markets.

IV. RESULTS AND DISCUSSION

Socio-economic Characteristics of Sweet Potato Marketers:

Table 1. The result showed that about 65.6% and 72.0% respectively of the sweet potato wholesalers and retailers were females. The dominance of the females in the sweet potato marketing activities particularly at the retail level may be due to small capital base required to start the business. This finding is in agreement with Fadipeet al., (2015) that majority of cocoyam wholesalers and retailers were females. More so, the study revealed that 66.7% and 44.0% respectively of the sweet potato wholesalers and retailers were married. This may have a positive effect on the availability of family labour. Similarly the result shows that 36.7% and 40.0% of the sweet potato marketers wholesalers and retailers were between the age grades of 41-50 years old. This age distribution can have negative impact on the business aggressiveness of the respondents.

Analysis also reveals that 36.7% and 40.0% of the sweet potato marketers wholesalers and retailers had no formal education. This can have negative effect on sweet potato business since the respondents are not literate enough to adopt new innovation or understand latest information on marketing if given to them by extension workers. This result contradicts the finding of Akpokodjeet.al. (2003) that majority of Sweet potato farmers in Nigeria could read and write. The main source of income for the traders was personal savings 34.4% and 30% respectively for the wholesalers and retailers. This finding is in consonance with earlier finding by Abahet al., (2015) who found that majority of paddy rice marketers in Benue state depends on personal or family funding for their business. More so 84% of both the wholesalers and retailers had household size of 4-6. This means that family labour could be available for the business. Furthermore, 72.9% of both the wholesalers and retailers have 11-15 years experience in sweet potato trade. This finding is in agreement with that of Bakoliet al., who found that considerable number of soyabeans marketers had about 10-19 years of marketing experience.

Table 1. Socio-economic Characteristic of Sweet Potato Marketers

Variables	Wholesalers		Retailers	
	frequency	percentages	frequency	percentages
Gender				
Male	31	34.4	42	28.0
Female	59	65.6	108	72.0
Total	90	100.0	150	100.0
Marital status				
Single	10	11.1	24	16.0
Married	60	66.7	66	44.0
Divorced/separated	16	17.8	36	24.0
Widow	4	4.4	24	16.0
Total	90	100.0	150	100.0
Age (Years)				
≤ 30	11	12.2	18	12.0
31-40	28	31.1	36	24.0
41-50	33	36.7	63	42.0
>50	18	20.0	33	22.0
Total	90	100.0	150	100.0
Educational level				
No formal education	33	36.7	60	40.0
Primary	29	32.2	45	30.0
Secondary	24	26.7	39	26.0
Tertiary	4	4.4	6	4.0
Total	90	100.0	150	100.0
Household size				
1-3	9	10.0	15	10.0
4-6	36	40.0	66	44.0
7-9	33	36.7	42	28.0
>9	12	13.3	27	18.0
Total	90	100.0	150	100.0
Source of capital				
Friends and relative	14	15.6	24	16.0
Money lenders	21	23.3	30	20.0
Cooperatives	19	21.1	33	22.0
Micro finance banks	5	5.6	18	12.0
Personal savings	31	34.4	45	30.0
Total	90	100.0	150	100.0
Marketing experience				
≤5	8	8.9	18	12.0
6-10	18	20.0	36	24.0
11-15	35	38.9	51	34.0
16-20	12	13.3	24	16.0
>20	17	18.9	21	14.0
Total	90	100.0	150	100.0

Source: Field Survey, 2017

Marketing Margin and Marketing Efficiency

The marketing of sweet potato in the study area is characterized by two channels:

- i. Farmer Wholesaler Retailer Final Consumer
- ii. Farmer Retailer Final Consumer

The result of the marketing margin and marketing efficiency analysis is given in table 2. The result shows that the gross marketing margin and net marketing margin for channel i (wholesalers) were ₦6100.00 and ₦2810.68 respectively with a marketing efficiency of 0.85 while for channel ii, (retailers) the gross marketing margin and net marketing margin were ₦6040.00 and ₦ 2972.08 respectively with a marketing efficiency of 0.97. This result is slightly above the finding of Gremaet al., (2015) who found that at the wholesaling and retailing levels, the cost of onion marketing in the peak period was N1, 597.24 with value added of N7,108.82

which yield an efficiency of N 446.19 .Similarly, retailing in the peak period recorded a marketing cost of N336.52 and value added of N3,806.06 with efficiency of N 1,131.01. In their study of onion marketing in Bade and Geidam Local Government Areas of Yobe State.

Table 2:Marketing Margin and Marketing Efficiency of Sweet Potatoe Marketers

Parameters (₦)	i	ii
Purchase price of sweet potatoes	9000	10500.00
Marketing cost		
Transport cost	1330.38	772.50
Storage cost	762.24	839.16
Labour cost	1040.60	1276.70
Sanitation fees	156.10	179.56
Total marketing cost	3289.32	3067.92
Total cost	12289.32	13567.92
Selling price	15100.00	16540.00
Gross marketing margin	6100.00	6040.00
Net marketing margin	2810.68	2972.08
Marketing efficiency	0.85	0.94

Source:Field Survey, 2017.

Market Structure of Sweet Potato Marketers

The result of the market structure analysis of sweet potato for wholesalers and retailers is presented in Table 3 and 4respectively. The results of the Gini coefficient of 0.41 and 0.49 for the wholesalers and retailers respectively showed that sweet potato trade among wholesalers and retailers is a competitive enterprise in the study area. Such that the action of a single participant does not affect the price of the crop.This result is slightly below the findings of Fadipeet al., (2015) who found a Gini-coefficeintof 0.43 and 0.51 for wholesalers and retailers respectively in their study of cocoyam marketing inShagamulocal government area ofOgunState, Nigeria.

Table 3:Result of Gini Coefficient Analysis for the Wholesalers

Weekly Sales (₦)	Frequency	% of wholesalers (X _i)	Total value of weekly sales	% value of weekly sales	Cumulative % of total weekly sales (Y _i)	∑X _i Y _i
50001-10000	12	13.3	900,000	7.0	7.0	0.0093
100001-150000	43	47.8	5,375,000	41.7	48.7	0.2328
150001-200000	25	27.8	4,375,000	33.9	82.6	0.2296
>200000	10	11.1	2,250,000	17.4	100	0.1110
Total	90	100	12,900,000	100		0.5827
Gini Coefficient	0.4173					

Source: Field Survey, 2017.

Table 4: Result of Gin Coefficient Analysis for the Retailers

Weekly Sales (₦)	Frequency	% of retailers (X _i)	Total value of weekly sales	% value of weekly sales	Cumulative % of total weekly sales (Y _i)	∑X _i Y _i
1-50000	48	32.0	1,200,000	11.0	11.0	0.0352
50001-100000	72	48.0	5,400,000	49.3	60.3	0.2894
100001-150000	21	14.0	2,625,000	24.0	84.3	0.1180
1500001-200000	6	4.0	1,050,000	9.6	93.9	0.0376
>200000	3	2.0	675,000	6.1	100	0.0200
Total	150	100	10,950,000	100		0.5002
GiniCoefficient	0.4998					

Source: Field Survey, 2017.

Constraints Associated with Sweet Potato Marketing

As contained in table 5 below which indicated theproblems associated with sweet potato marketing for both wholesalers and retailers in the studyarea, it reveals that,inadequate storage facilities value 70.0% and 84.0% for wholesalers and retailers respectively, lack of uniform measures 75.6% for wholesalers and 80.0% for retailers, bad roads with the value of 80.0% for wholesalers and 94.0% for retailers, inadequate capital with the value 73.3% for wholesalers and 66.0% for retailers, high transportation cost with the value of76.7% wholesalers and 68.0% for retailers, seasonality with the value 60.0% for wholesalers and 56.0% for retailers, unstable price with the value of 66.7% for wholesalers and 64.0% for retailers and high tax value 66.3%

wholesalers and 50.0% for retailers. The combineeffect of these problems on the marketing system couldbring about a distortion in the structure, conduct andperformance of the marketing process. Hence,lead to the reduction in profit margin of the marketers. These findings were in agreement with that of Gireiet al., (2013) in their study of cowpea marketing inYolaNorth and Yola South local government areas in Adamawa State, Nigeria.

Table 5. Constraint faced by Sweet PotatoMarketers

Variables	Wholesalers		Retailers	
	frequency	percentages	frequency	percentages
Inadequate storage facilities	63	70.0	126	84.0
Lack of uniform measure	68	75.6	120	80.0
Bad roads	72	80.0	141	94.0
High transport cost	69	76.7	102	68.0
Inadequate capital	66	73.3	99	66.0
Seasonality	54	60.0	84	56.0
Unstable price	60	66.7	96	64.0
High tax	57	63.3	75	50.0

Source: Field Survey, 2017.

V. CONCLUSION AND RECOMMENDATIONS

Sweetpotato marketing is a profitable business with attractivenet returnand investment in Benue state.

The research into the marketing of sweet potato in Benue State showed, that the sweet potato market in the area is competitive with a relatively high level of inequality among the traders.. The study was also able to show that considerable numbers of factors militate against an efficient marketing system of the crop. Based on the findings of this study, it is recommended that:

- i. Sweetpotato marketers should form cooperative groupin order to obtainloans from financialinstitutions to increase their capitalbase; loans will be easily acquired from these cooperatives without bottlenecks.
- ii. Also, government should provide an enabling environment through the provision of needed infrastructural facilities especially good roads.
- iii. The government as well as non governmental agencies should empower the marketers through the provision of micro credit facilities to encourage more people to go into sweet potato marketing.

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