

ECONOMIC ANALYSIS OF SWEET POTATO (*IPOMOEA BATATAS*) MARKETING IN ABIA STATE, NIGERIA

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ABSTRACT

*The study investigated economic analysis of sweet potato (*Ipomoea batatas*) marketing in Abia State, Nigeria. Specifically, the study estimated the marketing margin, marketing efficiency and the constraints to sweet potato marketing. Data for the study were collected with the aid of a well structured questionnaire to obtain data from 240 sweet potato marketers. Data were analyzed using descriptive statistics, Marketing margin analysis, Shepherd's marketing efficiency index and the Gini coefficient. The socio-economic characteristics of sweet potato marketers in table 1 showed that 72.0% of the sweet potato marketers were females. The majority of the marketers were married (66.7%) with a household size of 4-6. Result also showed that 40.0% of the sweet potato marketers 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 latest information on marketing of their crop. Furthermore, 72.9% of both the wholesalers and retailers have 11-15 years experience in sweet potato business. Marketing margin and marketing efficiency result in table 2, shows that the gross marketing margin and net marketing margin for the wholesalers were N6100.00 and N2810.68 respectively with a marketing efficiency of 0.85 while retailers' gross marketing margin and net marketing margin were N6040.00 and N 2972.08 respectively with a marketing efficiency of 0.97 which yielded an efficiency of N 446.19. However, the closer the Gini coefficient to zero, the greater the degree of equality and the lower the level of concentration and the markets becomes more competitive. Inadequate storage facilities value, lack of uniform measures, bad roads, inadequate capital, high transportation cost, seasonality, unstable price and high tax were identified as the major factors militating against sweet potato marketing in the study area. However, based on the findings of this study, it is therefore recommended that the sweet potato marketers should form cooperative or farmers association in order to obtain loans from financial institutions. However, policies geared towards the provision of an enabling environment and infrastructural facilities especially good access roads be made available.*

Keywords: Sweet Potato, Economic, Analysis, Marketing, Margin

Introduction

Sweet potato is an important staple food in Africa, especially in Nigeria where it plays a major role in the food economy and has traditionally been a subsistence crop of predominantly low-income families in rural and urban areas of Nigeria (Adebayo *et al.*, 2009). Sweet potato is the fifth most important food crop on a fresh weight basis in developing countries after rice, maize, cassava and wheat (Okeke *et al.*, 2019). Sweet potato is high in nutritive value, outranking most carbohydrate foods in vitamins, minerals, protein and energy content (Okeke *et al.*, 2019). Depending on the cultivar, it is high in carotenoids, particularly, the hydrogen carotenoid, and the B-carotenoid which is a potent pro-vitamin A which is very important in nutrition and health of humans. 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. 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) (Mazza *et al.*, 2017). 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 (Ocholi *et al.*, 2017). 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. Tewe *et al.*, (2003) reported that sweet potato is capable of meeting the

consumption need of the house hold as well as generating income.

In Abia state in particular, smallholder farmers are faced with numerous complex challenges including Inadequate storage facilities value, lack of uniform measures, bad roads, inadequate capital, high transportation cost, seasonality, unstable price and high tax, which act to increase transaction costs of accessing the input and output markets (Bernard, *et al.*, 2010; Mojo *et al.*, 2017; Abdul-Rahaman and Abdulai, 2018). These problems hinder the growth of competitive markets and limit the opportunity of farmers to raise their incomes and improve their livelihoods. Consequently, addressing these myriads of constraints in order to encourage the emergence of well-structured and efficiently organized marketing systems is particularly important. To increase the competitiveness of sweetpotato in the domestic and international markets, there is a need for public-private efforts to be intensified in ensuring efficiency in the marketing system. An efficient marketing system increases producers' share in consumer price, improves rural incomes and revenue generation for both producers and marketers, and significantly contributes to sustainable agricultural development (Enibe *et al.*, 2008; Kumar, 2014; Ruttoh *et al.*, 2018). Through various policies and initiatives, the government of Nigeria has expressed its determination in developing sweetpotato value chain and creating efficient markets for farmers. However, smallholder sweetpotato farmers in Abia state have continued to face problems in the marketing of their produce due to widespread inefficiencies within the marketing system, resulting in significant differential between consumer and producer prices. In most cases, poor storability and seasonality leads to market variation in quantity and quality of roots and its associated price swing (Low *et al.*, 2009). The rising consumer price for sweetpotato may be an indication of market inefficiency. Marketing in developing countries like Nigeria is seen 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 (Ikechiet *et al.*, 2006). These problems notwithstanding, sweet potato production has been found to be profitable (Ogbonna *et al.*, 2007). However, the objective of this study is to carry out an economic analysis of potato marketing in Abia State, Nigeria. The specific objectives are to: examine the socioeconomic characteristics of sweetpotato marketers in the study area, estimate the marketing margin of sweet potato, ascertain the structure of sweetpotato market in the study area, examine the marketing efficiency of sweet potato and identify the constraint faced by the traders in marketing the crop.

This study provides some evidence that may help in understanding the structure under which sweetpotato marketing is promoted. By analyzing the structure and

efficiency of sweetpotato marketing, we hope that the findings of this study will help in the design of effective policies and strategies towards improving efficient marketing systems.

Methodology

The study was carried out in Abia State, Nigeria. Abia state lies between longitudes 7.5247 and latitude 5.4309. It is bounded by Imo State on the West, Ebonyi and Enugu States on the North, Cross Rivers and Akwalbom States on the East and Rivers State on the South. Its population density is 777.1/km² and a population of 3,727,347 persons (NPC, 2016). Structured questionnaire was used to get information from the respondents. Both purposive and random sampling techniques were employed in selecting respondents for the study. The first stage was the purposive selection of two agricultural zones (Umuahia and Ohafia). In the second stage, three local government areas were randomly selected. In the third stage involved selection of 6 major sweet potato markets; they are: Ikwuano LGA-(Ariam and Ngoro markets), Isukwuato LGA (AhiaUkwuAkara and Uzuakoli main markets) and Umuahia North (Ubani and Oriugba markets), The choice of purposive sampling technique was as a result of large sales of sweetpotato roots in the 6 markets. The respondents were randomly selected from list of registered sweetpotato marketers from their market unions. Also Random sampling technique was used in the selection of 15 wholesalers and 25 retail marketers from each of the market in the two Agricultural zones purposively selected, making a total of 90 wholesalers and 150 retail marketers. On the overall, a total of 240 respondents were selected and interviewed for the study using a well structured questionnaire. Descriptive statistics such as, mean, frequency distribution and percentages was used to analyze the socioeconomic characteristics of the respondent and the constraints to sweet potato marketing in the study areas. Gross marketing margin analysis and the shepherd's index was also used to analyze the gross marketing margin and the marketing efficiency respectively for the various marketing channels. Gross margin is important and simple because it shows whether your sales are sufficient to cover your costs. However, Gini coefficient was employed to measure the degree of seller concentration of the various marketers in the study area. Gini coefficient is a measure of inequality, not a measure of average income or some other variable which is unrepresentative of most of the population, such as gross domestic product, Gini index < 0.2 represents perfect income equality, 0.2–0.3 relative equality, 0.3–0.4 adequate equality, 0.4–0.5 big income gap, and above 0.5 represents severe income gap.

The models are specified thus:

Market structure using Gini coefficient to measure the degree of seller concentration of the various sweetpotato marketers in the study area

To measure the degree of seller concentration of the traders in sweetpotato marketing 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:

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

Where:

X_i = percentage of sellers in the i th class of marketers,

Y_i = cumulative percentage of sellers in the i th class marketers,

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.

Marketing Margin Analysis of Sweetpotato Marketers in the study area

The gross marketing margin of sweet potato marketers were estimated separately using the formula given below.

$$GM = SP - CP \quad (2)$$

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.

$$NM = GM - MC \quad (3)$$

NM = Net marketing margin

GM = Gross marketing margin

MC = Total marketing cost

(1 bag of sweet potato is equivalent to 50Kg

Shepherd's Index Analysis was used to analyse estimate marketing efficiency of sweetpotato marketers

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:

$$ME = \frac{GM}{MC} - 1 \quad (4)$$

(4)

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

Results and Discussion

Socio-economic Characteristics of Sweet Potato Marketers

Table 1. The result showed that about 72.0% of the sweet potato marketers were females. The result however, showed that women are the major marketers of sweet potato with small capital. This finding is in agreement with Fadipe *et al.* (2015), who opined that majority of sweetpotatomarketers were females. The study also pointed out that majority of the marketers were married (66.7%) for wholesalers and (44.0%) for the retailers. The household size 4-6 showed that large household size is attributed to the need for cheap and dependable labour derivable for off-farm activities. This findings is in agreement with the findings of Onubuogu *et al.* (2014) reported the most families have large household size between 4 to 10 persons with mean of 6 persons, 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 were between the age grades of 41-50 years old. This implies that majority of the respondents were young and are ready to accept innovations. This is in line with Enwelu *et al.* (2014) who noted that the respondents involved in marketing of sweetpotato were in their active years and could meet the market demand of their households. This further strengthens the findings of Abur (2014) who said that most active group among rural marketers fell within 39-50 years of age. Result also showed that 36.7% and 40.0% of the sweet potatomarketers 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 latest information on marketing of their crop. Furthermore, 72.9% of both the wholesalers and retailers have 11-15 years experience in sweet potato business. This implies that they were experienced and knowledgeable in sweetpotato business and this agrees with the findings of Omonona *et al.*, (2010) who reported that marketers level of experience in marketing a particular commodity is one of the determinants of their ability to maximize profit.

Table 1.Socio-economic Characteristic of Sweetpotato 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
Married Status				
Single	10	11.1	24	16.0
Married	60	66.7	66	44.0
Divorced	16	17.8	36	24.0
Widow	4	4.4	24	16.0
Total	90	100	150	100
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	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				
Personal Savings	14	15.6	24	16.0
Friends and relative	21	23.3	30	20.0
Money lenders	19	21.1	33	22.0
Cooperative	5	5.6	18	12.0
Micro Finance Banks	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

*Multiple response

Source: Field Survey, 2020

Marketing Margin and Marketing Efficiency

The result of the marketing margin and marketing efficiency analysis in table 2, shows that the gross marketing margin and net marketing margin for the wholesalers were N6100.00 and N2810.68

respectively with a marketing efficiency of 0.85 while retailers the gross marketing margin and net marketing margin were N6040.00 and N 2972.08 respectively with a marketing efficiency of 0.97. which yield an efficiency of N 446.19.

Table 2: Marketing Margin and Marketing Efficiency of Sweet Potato Marketer

Parameters (₦)	Wholesalers (₦)	Retailers (₦)
Purchase Price of Sweetpotato	9000	10500.00
Market cost		
Transport cost	1330.38	772.50
Storage	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 2020

Market Structure of Sweet Potato Marketers

The result of the market structure of sweet potato for wholesalers and retailers as shown in table 3 and 4 revealed that Gini coefficient of 0.41 and 0.49 respectively. It was observed that sweet potato trade among wholesalers and retailers is a competitive

enterprise in the study area. This result is also in agreement with the findings of Fadipeet *al.*, (2015) who found a Gini-coefficeintof 0.43 and 0.51 for wholesalers and retailers respectively in the study of cocoyam marketing.

Table 3: Result of Gini Coefficient analysis the Wholesalers

Weekly Sales (₦)	Fr eq.	% of Wholesaler X_i	Total Value of weekly sales	% of weekly Sales	Cumulative of total weekly sales Y_i	$\sum_i^n X_i Y_i$
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	4,375,00	33.9	82.6	0.2296
200000 and above	10	11.1	2,250,00	17.4	100	0.1110
Total	90	100	12,900,00	100		0.5827
Gini coefficient	0.4173					

Table 4: Result of Gini Coefficient analysis the Retailers

Weekly Sales (₦)	Freq .	% of Wholesaler X_i	Total Value of weekly sales	% of weekly Sales	Cumulative of total weekly sales Y_i	$\sum_i^n X_i Y_i$
1 – 50000	48	32.0	1,200,00	11.0	11.0	0.0352
50001 – 10000	72	48.0	5,400,00	49.3	60.3	0.2894
100001 – 150000	21	14.0	2,625,000	24.0	84.3	0.1180
150001 – 200000	6	4.0	1,050,000	9.6	93.9	0.0376
200000 and above	3	2.0	675,000	6.1	100	0.0200
Total	150	100.0	10,950,00	100.0		0.5002
Gini Coefficient	0.4998					

Source: Survey data, 2020

Constraints militating against Sweetpotato marketing

Table 5 shows constraints militating against sweetpotato marketing in the area studied. However, the following problems such as; 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 of 76.7% for 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% for wholesalers and 50.0% for retailers were

found. These constraints identified could bring about a distortion in the structure, conduct and performance of the marketing process. Hence, may lead to the reduction in profit margin of the marketers. These findings were in agreement with that of Girei *et al.* (2013).

Table 5: Constraints militating against Sweetpotato marketing

Variables	Wholesalers		Retailers	
	frequency	percentages	Frequency	percentages
Inadequate Storage Fac.	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
As a seasonal crop (measured in months)	54	60.0	84	56.0
Unstable price (price fluctuations measured in naira)	60	66.7	96	64.0
High tax	57	63.3	75	50.0

Conclusion and Recommendations

Sweetpotato marketing is a profitable business with attractive net return and investment in Abia State. However, based on the findings of this study, it is recommended that sweetpotato marketers should form cooperative or farmers association in order to obtain loans from financial institutions. However, policies geared towards the provision of an enabling environment and infrastructural facilities especially good access roads be made available.

References

Abur, C. C. (2014) Assessment of food security status among rural farming households in Guma Local Government Area of Benue State. *Nigeria. International Journal of Research in Humanities and Social Studies*,1(2): 34 – 42.

Adebayo, K., Lamboll, R. and Westby, A. (2009). Social implications of the development of cassava postharvest systems in Africa. Expert Consultation at the Natural Resource Institute. Retrieved from Available:(http://www.nri.org/projects/GCPMD/files/2_Adebayo_paper.pdf). University of Greenwich, United Kingdom.

Abdul-Raham A., and Abdulai, A. (2018) Do farmer group impact on farm yield and efficiency of smallholder farmers? Evidence from rice farmers in Northern Ghana. *Food Policy*, Elsevier, 81(3): 95-105.

Bernard, J. K. ; Castro, J. J. ; Mullis, N. A. ; Adesogan, A. T. ; West, J. W. ; Morantes, G. (2010) Effect of feeding alfalfa hay or Tifton 85 bermudagrass haylage with or without a

cellulase enzyme on performance of Holstein cows. *J. Dairy Sci.*, 93 (11): 5280–5285.

Enwelu, L.A., Asogwa, N.P., Nwaheji H.U., Ezeano C.I., (2014) Assessment of Constraints to Cocoyam Consumption in selected communities of Enugu State, Nigeria. *International Journal of Research in Applied Natural and Social Sciences* 2(3): 31-40.

Enibe, D.O., Nwobodo, E.C., Nworji, M.J and Okonkwo, C.A. (2019) Economic Analysis Cocoyam Marketing in Anambra Agricultural Zone of Anambra State, Nigeria. *Asian Journal of Agricultural Extension, Economic and Sociology*, 29(3):1-10.

Fadipe A. E. A., Adenuga A. H. and Ilori, T.E (2015). Analysis of cocoa marketing in sagamu Local Government Area of Ogun State, Nigeria, *Trakia Journal of Sciences*, No 3, pp. 208-213.

Girei, A.A. Dire, B. Salihu M. and Iliya M. M. (2013). Assessment of Problems Affecting the Structure, Conduct and Performance of Cowpea Marketing in Yola North and Yola South Local Government Areas in Adamawa State, Nigeria, *British Journal of Marketing Studies* Vol.1, No.4, pp.41-50.

Ikechi, K (2006). The performance of vegetable production and marketing in Aba area, Abia State. Proceedings of the 40th conference of Agricultural Society of Nigeria, held in Umudike. Abia State, 133-134.

Kumar, S. (2014). Marketing efficiency analysis: A case of broiler marketing in Anand district

- of Gujarat. *Int. J. Comm. & Bus. Manage*,7(1):186-190.
- Low J, Lynam J, Lemaga B, Crissman C, Barker I, Thiele G, Namanda S, Wheatley C. Andrade, M (2009). Sweetpotato in SubSaharan Africa. 359-390 pp. In Loebenstein G., and Thottappilly G., (eds), *The Sweetpotato. Springer Science+Business Media B.VNPC* (2006).The New partnership for Africa's development food summit. 8-12 September, Abuja, Nigeria. 25-33.
- Mazza M., Agbarevo M.N. and Ifenkwe, S.E. (2017) Effect of National Special Programme on Food Security (NSPFS) on the Productivity of Smallholder Cassava Farmers in South Eastern Nigeria. *African Journal Online (AJOL.)*, 21(1):
- Mojo, D., Fischer, C., &Degefa, T. (2017). The determinants and economic impacts of coffee farmer cooperatives: Recent evidence from rural Ethiopia. *Journal of Rural Studies*,50(1): 84–94.
- Ocholi A., Zcharias, T.N., Udeh, M. (2017) Economic Analysis of Sweetpotato Marketing in Benue State, Nigeria. *Journal of Research in Business and Management*, 5(7)41-47.
- Ogbonna M.C, Korieocha D. S., Anyaegbunam HN, Njoku D, Okoye B, Akinpelu OA, Nwokocho C.C (2007). Profitability in the use of sweet potato as soil conservation strategy in Umudike, Abia State, Nigeria. *Scientific Research and Essays* 2(10):462-464.
- Okeke,D.C,Okeke,C.C,Udeora,S.N.(2019)Economic determinants of seed yam production in Oyi Local Government Area, Anambra State, Nigeria. *Asian Journal of Agriculture and Rural Development*.2013;3(3):35-153.
- Omonona, B. T., (2010) Efficiency of resource - use in cassava production in Kogi State, Nigeria: implications for food security and environmental degradation. Retrieved on 27th April, 2009 from <http://www.cababstractsplus.org/abstracts/ResearchResults>.
- Onubuogu G.C., Esiobu N.S., Nwosu C.S., and Okereke C.N. (2014) Resource use efficiency of smallholder Cassava Farmers in Owerri Agricultural Zone, Imo State, Nigeria. *Scholarly Journal of Agricultural Science* 4(6): 306-318
- Ruttoh, J.K., Bett, E. K. and Nyairo, N. (2018).Empirical analysis of structure and conduct of tomato marketing in Loitokitok, Kajiado County, Kenya. *International Journal of Agricultural Extension and Rural Development*, 6(4):628-638
- Tewe, O.O., Ojeniyi, F.E. and Abu, O.A. (2003). Sweet Potato Production, Utilization and marketing in Nigeria. LimaPeru. International Potato centre (CIP)and the University of Ibadan. 54p.Vol. 1, No. 2, pp. 70-78