

Higher Margin or Loss? Orange-Fleshed Sweet Potato (OFSP) Marketing in Abia State, Nigeria

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ABSTRACT:

The study estimated the determinants of orange-fleshed sweet potato (OFSP) marketing in Abia State, Nigeria. A multi-stage random sampling procedure was used to select 40 OFSP marketers. Primary data were collected with the aid of a structured questionnaire, oral interview, and personal observation. Data collected were analyzed using descriptive statistics, marketing margin, and ordinary least square regression model. The results from the study showed that the mean age, household size, marketing experience, and income of the respondents were 50.55 years, 6 persons, 8.30 years, and ₦159,137.50, respectively. Also, 52.5%, 95.0%, 60.0 and 55.0% were female, married, cooperative membership, and had no access to credit, respectively. The marketing margin of marketers was 61.63%. Regression results show that a reduction in age (10%), agent cost (1%), transportation cost (1%), and an increasing purchase cost (1%), labor cost (10%), and marketing levies (1%) all affect OFSP marketing margin. Difficulty in entering the market, long distances, high cost of transportation, and low demand for the product were the major factors that constrained the marketing of OFSP in the study area. The study recommends that marketers should leverage the incentives provided by the cooperative associations. The government should provide infrastructures such as a good road network to rural areas where OFSP farms are located for easy access. Finally, measures should be put in place to create awareness of the nutritional benefits and importance of OFSP as a food security crop.

KEYWORDS: *Determinants, Orange-Fleshed Sweet-Potato, Marketing, Abia*

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INTRODUCTION

Orange-Fleshed Sweet Potato (OFSP) is an improved variety of sweet potato (*Ipomoea batatas*), cultivated in tropical and semi-tropical regions of the world for food and source of income, especially among the rural dwellers (Padmaja, 2009; Mitra, 2012). It can be grown in a wide range of agro-ecologies and soil types. OFSP is a crop with immense ability to grow in marginal fields, is easy to cultivate (Afuape, 2014), and has a short maturity period compared to other root and tuber crops. These characteristics make OFSP an excellent food security crop in Sub-Saharan Africa (Low *et al.*, 2007).

Despite the potential of OFSP to contribute to Nigeria's food security, its market systems have remained unstructured, with poor market integration (Obetta *et al.*, 2022) and infrastructure (Avanenge, 2015) limiting producers from exploiting economic opportunities in high-income markets. Therefore, the need for its marketing system to be well structured and efficiently organized (Wang *et al.*, 2020) in order to succeed cannot be over-emphasized. Marketing has a dynamic role to play in stimulating output and consumption, which are essential for economic development (Olukosi *et al.*, 2005). Hence, a well-organized and efficient marketing system enhances the pace of economic development by encouraging specialization, generation of foreign exchange earnings, development of an exchange economy, provision of income and employment opportunities, and increased social demand for goods and services (Sodimu *et al.*, 2017; Adegbe et al.,

2022). In performing the role of marketing, products pass through various marketing agents or intermediaries called market channels. These market intermediaries are the wholesalers and retailers, and both play important roles in the marketing system (Girei *et al.*, 2013).

Challenges of Marketing of Agrifood Products in Nigeria

Marketing can be described as an economic activity that stimulates further production and, if efficiently carried out, benefits both the producer and consumer in the sense that the former gets a sufficiently remunerative price for the product to continue production while the latter gets it at an affordable price that maximized satisfaction and consumption (Mafimisebi, 2012). Agricultural markets in Africa are inefficient and poorly integrated, with bad performance in Nigeria in particular (Philip *et al.*, 2009; Adeoye *et al.*, 2013). Marketing in developing countries like Nigeria is beset with a lot of problems, which constitute a bottleneck to the flow of goods and services. Consequently, marketers and consumers both suffer as a result of inefficient marketing. This condition may significantly increase the market price of agricultural enterprises, reducing the marketing margins allotted to farmers. The poor performance can be attributed to various factors such as underdevelopment, lack of market-oriented production, seasonal variations, lack of standard processing and storage facilities, insufficient information on OFSP resources and facilities, absence of innovative marketing approach, lack of transportation, inadequate access to finance, insecurity, ineffective infrastructure and institutions, disease prevalence, illegal trade and insufficient market information (internal and external) (Ikechi *et al.*, 2006; Adamu *et al.*, 2020; Obetta *et al.*, 2022; Bari *et al.*, 2023). Moreso, inefficient agricultural marketing systems hinder agricultural expansion which inadvertently leads to poor price transmission and fluctuation in food prices. In the same vein, a poor marketing strategy for agrifood products leads to post-harvest loss and spoiling due to their perishable nature (Obetta *et al.*, 2022). So, immediate and efficient agricultural marketing is necessary. The marketing process makes the delivery of goods or services to the buyers in the form, place, and time needed possible.

According to Masunda and Chiweshe (2015), the performance of a good marketing system positively contributes to improved production efficiency. Hence, whenever farmers are faced with market-related challenges, questions over their production and marketing efficiency are raised. OFSP marketing can, however, be a lucrative venture, notwithstanding the aforementioned challenges.

Effects of Market Systems on Agrifood Products-OFSP

The agricultural market system determines a number of things, including the quality of agricultural products on our tables, the livelihood, socio-economic stability, and financial strength of all individuals involved in the processes from farm to fork (Ikore, 2022). Governments and states regulate agriculture and agrifood markets. The government has a crucial role in improving market structure, infrastructure, and services through institutional and policy investments (Vermeulen *et al.*, 2008). Noteworthy is the fact that inadequate market conditions and public policies can prevent poor and smallholders from fully participating in the agrifood sector (Mendoza & Thelen, 2008). Market participation has a positive impact on farmer's food security according to multiple research (Montalbano *et al.*, 2018; Haggblade *et al.*, 2017). Food security relies on the free market to optimize resource allocation and improve food production/agriculture efficiency. This leads to economic growth, employment, and income, ultimately improving food availability and access. (Borsellino *et al.*, 2020). Today's agrifood markets and value chains rely heavily on vertical coordination and multinational enterprises for domination (Sexton, 2013; Saitone & Sexton, 2017). Hence, improving and integrating market mechanisms is crucial for encouraging farmers to increase production/output and rural incomes, providing incentives for traders and better meeting consumer needs in terms of supply type, quality, and Quantity (Borsellino *et al.*, 2020). These market mechanisms benefit producers, traders, exporters, and other market participants, as well as the overall national economy

Orange-fleshed sweet potato (OFSP) is an improved breed of sweet potato (*Ipomoea batatas* [L.] Lam.) cultivated in tropical and semi-tropical regions of the world for food and source of income (Mitra, 2012), especially among rural dwellers (Padmaja *et al.*, 2009). The crop is fortified with beta carotene that can be used to curb vitamin A deficiency (Harvest Plus, 2009). According to Njoku and Umoh (2013), the first variety of OFSP was released in December 2012, and the second variety was released in June 2013 in Nigeria by "Reaching Agents of Change Organization". Over 20,000 farmers have since received at least one bundle of OFSP vines to plant and access its roots for either consumption or commercialization (Olapeju, 2015). Like other crops, OFSP is not yet well distributed by marketers, and many people are not aware of its numerous benefits. Orange-fleshed sweet potato farmers, particularly subsistence farmers, are sensitive to price risk and are frequently driven to limit costs by cutting inputs, which impacts farmers' yields and income. Meanwhile, most marketers are unable to mark up their efforts due to transportation, storage, perishability, poor pricing, returns, and cum margins, resulting in delays and difficulties in getting produce to consumers at the right time and place. Narayanan and Gulati (2002) opined that smallholders have significant transaction costs due to structural and institutional issues limiting their ability to capitalize on trade

opportunities. Hence, there is a need to assess the effect of marketing costs on the profitability of OFSP marketing in Abia state. A similar study was carried out by (Onogwu *et al.*, 2018), who determined the effects of transportation costs, marketing infrastructure costs, storage costs, costs due to perishability, and cost of capital on the gross margin of guinea corn retailers in Wukari, Taraba state, Nigeria. The authors also affirmed that the socio-economic characteristics of the retailers can also affect them. This is especially true for those with rapid stock turnover, who typically apply lower gross margins than others.

In view of the synthesized information, this study examined the determinants of orange-fleshed sweet potato (OFSP) marketing in Abia State, Nigeria. The objectives were to estimate the marketing margin of OFSP and its determinants and identify the constraints to OFSP marketing in the study area.

RESEARCH METHODS

This study focused on orange-fleshed sweet potato marketers in Abia State, South-East Nigeria. The state is significant in the Nigerian, orange-fleshed sweet potato master plan due to the presence of the National Root Crop Research Institute (NRCRI), Umudike. The institute was responsible for field trials of pro-vitamin A and biofortified iron crops, and it is also one of the multipliers charged with coordinating OFSP dissemination in the zone by the Reaching Agents of Change Organization (Njoku & Umoh, 2013).

Sampling procedure

Abia state is divided into 17 local government areas, grouped into three agricultural zones, namely, Aba, Umuahia, and Ohafia zone. The study adopted a multi-stage sampling procedure. In the first stage, two agricultural zones (Ohafia and Umuahia) were purposively selected. In the second stage, two Local Government Areas (LGAs) were randomly selected from each of the zones. The third stage involved a random selection of two communities, each from the selected 4 LGAs. In the final stage, five (5) marketers were randomly selected from a list compiled with the assistance of the Extension officers of the ADPs, research institute, and the state's Ministry of Agriculture, giving a sample size of forty (40) marketers. The data for this study were obtained from primary sources using a structured questionnaire and through oral interviews and personal observations.

Method of Data Analysis

The data were analyzed using econometric models and descriptive statistical tools such as mean, percentage, and frequency distribution. The socio-economic characteristics of the respondents and the constraints militating against OFSP marketing in the study area were analyzed using descriptive tools. The cost items, revenue, and factors influencing OFSP marketing were analyzed using marketing margin and multiple regression models, respectively. Also, the constraints militating against OFSP marketing in the study area were analyzed using the mean Likert scale.

Model Specification

Marketing Margin (MM) Model:

$$MM = \frac{\text{Selling price} - \text{Purchase price}}{\text{Selling price}} \times 100 \quad \dots\dots 1$$

Where MM = marketing margin

Multiple Regression Model;

The implicit form of the model is:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9) + e \quad \dots\dots\dots 2$$

Where:

Y = Marketing margin of ith marketer (as defined in equation 1)

X₁ = Age (Year)

X₂ = Level of education (year)

X₃ = Purchase cost (₦)

X₄ = Quantity (kg)

X₅ = Transportation cost (₦)

X₆ = Agent cost (₦)

X₇ = Labour cost (₦)

X₈ = Marketing levies (₦)

X₉ = Storage cost (₦)

e_i = error term

Mean Count:

5-point rating scale of Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), Strongly Disagree (1) was used to achieve the mean (\bar{X}). Variables with a mean score of 3.0 (which is the average mean score of the rating level) and above imply that they are positive and, in affirmative to the objective being measured, while factors with a mean score of less than 3.0 have no influence on the variable being measured.

To determine the mean Likert scale $[\sum X/N]$, the mean of each item was computed by multiplying the frequency of each response with its appropriate nominal value and dividing the sum with the number of respondents to the item. This can be given thus:

$$\text{Mean} = \frac{\sum fn}{N}$$

Where Mean = Likert mean score

E = Summation

f = frequency

n = Likert nominal scale

N = number of respondents

$$\text{Mean} = \frac{1+2+3+4+5}{5}$$

$$= 3.0$$

RESULTS AND DISCUSSION

Socio-economic characteristics of OFSP marketers

Table 1 presents the socio-economic characteristics of the OFSP marketers. The features examined include age, sex, marital status, education, household size, access to credit, marketing experience, cooperatives, and income. The survey information showed that the mean age of the marketers was 50.55 years. This implies that the OFSP marketers were adults, mature, energetic, and would have acquired some good level of experience (Bassey *et al.*, 2013), thereby making them reasonably enterprising.

The majority of the respondents (52.5%) were women, though a good number of males (47.5%) were also involved, indicating that the enterprise is not really gender sensitive and should really be encouraged. From the study, most (95.0%) of the respondents were married. This implies that the contribution of the marketers in the study area towards agricultural development (in terms of the supply of family labor) should be favorable as a reasonable number of them were married. The supply of family labor would be more where the household heads are married. This is in consonance with the findings of Zalkuwi *et al.* (2014).

The result of the educational status evidently indicated that most (52%) of the respondents had the requisite basic education. Undoubtedly, a high level of education is necessary because it provides a favourable atmosphere for awareness, adoption of innovation, and utilization of financial services (Siyanbola, 2012). The mean household size was 6 persons. The economic implication is that it will provide the OFSP marketer's household with family labor to reduce the cost of marketing and increase their revenue. This is desirable, consistency, and of great importance and corroborates with the findings of Ayuya *et al.* (2011), who opined that a large household can relax the labor constraints required during the introduction of new technology. The majority (55%) of the OFSP marketers had no access to credit. The implication of this is that their capacity to be efficient and generate more income, savings, and investment for better welfare is highly reduced, corroborating the findings of Diagne and Zeller (2011). The respondents had an average marketing experience of 8.3 years, indicating an average participation in agricultural marketing in the area. Nwaru (2004) noted that the number of years spent in business may indicate the practical knowledge he has acquired regarding ways of overcoming certain inherent agribusiness enterprise challenges.

The higher percentage (60.0 %) of cooperative membership implies that the OFSP marketers have access to requisite information on efficient marketing (evident by the low cost of marketing activities), thereby enhancing their socio-economic welfare. The average income of the respondents was ₦159137.50, showing that the business was profitable. The relatively high-income status of the OFSP marketers has implications for household food security.

Table 2: Marketing Margins of OFSP Marketers

Item	Measurement	Amount (₦)
Purchase price	One bag (25kg)	7300.
Selling Price	1 bag (25kg)	11,800.50
Marketing Margin (%)		61.63%

Source: Authors computations from field survey

The marketing margin of OFSP marketers in the study area is presented in Table 2. The result shows that the purchase price from the producer and the selling price of marketers per bag were ₦7300.8 and ₦11,800.50, respectively. The marketing margin was 61.63%, which is quite high. This indicates that the marketers exercise a higher economic power on price (by selling the product to urban dwellers/markets) at the expense of producers who sell at farm gate prices. This result is not consistent with the findings of Nduka & Udah (2015), who stated that the producer's marketing margin is highest when compared with others.

Table 1: Frequency Distributions of Respondents according to their Socio-economic Characteristics.

Variables	Frequency	Percentage
Age		
25-34	4	10.0
35-44	6	15.0
45-54	5	12.5
55-64	25	62.5
Mean	50.55	
Sex		
Male	19	47.5
Female	21	52.5
Marital status		
Married	38	95.0
Single	2	5.0
Education		
Primary	21	52.5
Secondary	19	47.5
Tertiary	0	00.0
Household Size		
1-4	9	22.5
5-8	8	20.0
9-12	23	57.5
Mean	6.00	
Access to credit		
No	22	55.0
Yes	18	45.0
Marketing Experience		
1-5	8	20.0
6-10	17	42.5
11-15	15	37.5
Mean	8.30	
Cooperatives		
No	16	40.0
Yes	24	60.0
Income		
10000-100000	13	32.5
110000-200000	23	57.5
210000-300000	2	5
310000-400000	2	5
Mean	159137.50	
Total	40	100.0

Source: Authors computation from field survey

Marketing margin of Orange Fleshed Sweet Potato Marketers

The marketing margin of OFSP marketers in the study area is presented in Table 2.

Determinants of Marketing Margin of the Orange Fleshed Sweet Potato Marketers

The estimated parameters of the factors that influenced the marketing margin of OFSP marketers in the study area are presented in Table 3. The double log functional form produced the best fit and hence was chosen as the lead equation. The choice is based on the premise that it has the highest number of significant variables, the magnitude of the coefficient of multiple determinations (R^2), the conformity of variables to a priori expectation, as well as the significance F-ratio. The coefficient of multiple determination (R^2) was 0.451, which implies that 45.1% of the marketer's margin was explained by the explanatory variables included in the model.

Table 3: Multiple Regression result on factors affecting the net margin of OFSP marketers

Variables	Linear	Exponential	Double log+	Semi log
Intercept	95892.958 (-1.163)	10.824 (16.893)***	9.997 (8.802)***	20413.222 (.249)
Age	-16274.777 (2.185)**	-0.279 (-1.136)	-0.320 (-1.641)*	-19230.609 (-1.367)
Level of education	-9321.898 (-1.174)	-0.086 (-0.738)	-0.130 (-0.581)	-18823.398 (-1.170)
Purchased cost of OFSP	-3031.326 (-1.907)*	-0.049 (-2.091)**	0.555 (3.151)***	-34417.412 (2.004)*
Quantity of OFSP sold	3568.585 (1.362)	0.055 (1.142)	0.268 (1.549)	15532.035 (1.245)
Transportation cost	5278.337 (1.926)*	0.079 (1.985)*	-0.267 (-15.449)***	17896.444 (1.437)
Agent cost	562.276 (-1.174)	0.006 (0.759)	-0.366 (-13.187)***	31318.640 (1.564)
Labour cost	-13415.160 (-2.006)**	-0.100 (-1.028)	0.024 (1.846)*	-22384.520 (-1.290)
Marketing levies	42770.132 (2.988)**	0.687 (3.285)***	0.748 (3.780)***	44727.778 (3.132)***
Storage rent	4969.770 (0.350)	0.094 (0.454)	-0.033 (-0.163)	-148.807 (-0.010)
R ²	0.402	0.388	0.451	0.417
R ⁻²	0.294	0.278	0.350	0.310
F-ratio	3.736***	3.523***	4.468***	3.4897***

Source: Authors computation from field survey *** = 1%, ** = 5%, * = 10%

The result shows that age was significant but negatively related to OFSP marketing margin at the 10% level. This implies that the age of the marketers had an inverse relationship with OFSP marketing margin and that the older marketers seem to be less receptive to innovative ideas, which could affect their efficiency negatively. Also, older marketers are not always agile, innovative, or willing to adopt new technologies, leading to an increase in overhead cost, which, in turn, affects efficiency negatively. This result is contrary to the findings of Efedua and Ugochukwu (2021) that older people are more experienced and thus can make good marketing decisions.

The coefficients of agent and transportation costs were negative and statistically significant at 1%, implying that an increase in any of these variables will reduce the marketing margin of the OFSP marketers. However, the coefficients of purchase cost, labor cost, and marketing levies were positive and significant at 1%, 10%, and 1%, respectively. This shows a direct relationship between marketing margin and purchase cost, labor cost, and marketing levies. The implication is that an increase in any of these variables will increase the marketing margin of the OFSP marketers since the marketers usually add the costs incurred to the price offered to consumers. This agrees with the findings of Ibitoye (2014).

Constraints to Orange-Fleshed Sweet Potato Marketing

The constraints of OFSP marketing in the study area are presented in Table 4. The marketers in the study area encountered some challenges that hindered them from maximizing their profit. Major constraints faced by the marketers were difficulty in entering the market (\bar{X} = 4.58), long distance (\bar{X} = 4.58), high cost of transportation (\bar{X} = 3.96), and low demand for products (\bar{X} = 3.66). The result of the difficulty in entering the market is expected due to the location of OFSP farms, especially in the wetlands. This hinders marketers' access, coupled with long distance to the market, which is ranked second. Also, most marketers find it difficult to enter the market since the product is new and the people belong to their association. The result of a high cost of transportation is also expected because OFSPs are sold at the raw state, which is weightier and attracts more transportation costs. The low demand for OFSP calls for the creation of awareness of its importance as one of the crops developed for food security (Low *et al.*, 2007). The result equally showed a grand mean score of 3.31, indicating that the problems listed above actually affected the OFSP marketers in the study area.

Table 4: Distribution of respondents based on the problem encountered

Problems faced	Mean	Std deviation
Difficulty in entering market	4.58	0.0975
Poor access road to market	2.22	0.1246
Inadequate capital	2.93	0.1609
Long distance	4.58	0.1344
Low demand for products	3.66	0.1388
Poor awareness of the product	2.69	0.1222
Too much damage due to heat/peat	2.32	0.0795
High cost of transportation	3.96	0.0708
Price Instability	3.11	0.1325
Poor storage factors	3.00	0.1214
Grand mean	3.31	

Source: Authors computations from field survey

CONCLUSION, IMPLICATION AND POLICY DIRECTION

The result of the study showed that OFSP marketing is not gender sensitive. Majority of the marketers are within the active, productive age and efficient in maximizing their profit. The study, therefore, concludes that OFSP marketers in the study area are adults; most of them were female, married, cooperative members, and had no access to credit. Also, difficulty in entering the market, long distances, high cost of transportation, and low demand for the product were the major factors that constrained the marketing of OFSP in the study area. Based on the findings, it was recommended that the OFSP marketers should take advantage of their cooperative membership to reduce the cost of marketing services through bulk purchases, transportation, and sales, among others, as these will help to ensure efficient marketing. Government should provide infrastructures such as a good road network to rural areas where OFSP farms are located for easy access. Finally, measures should be put in place to create awareness of the nutritional benefits and importance of OFSP as a food security crop. This will go a long way in alleviating the problems of difficulty in entering the market and the low demand for the product.

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