

Exploring the Constraints and Economic Potential of Pumpkin Marketing Among Small-Scale Farmers in Ekiti State, Nigeria

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Abstract

*This study investigates the economic potential and challenges of pumpkin leaf marketing among small-scale marketers in Ekiti State, Nigeria. Given the nutritional and economic value of fluted pumpkin (*Telfairia occidentalis*), it plays a vital role in local diets and serves as a primary source of income for smallholder marketers. Data were collected through structured questionnaires administered to 120 pumpkin leaf marketers across selected marketplaces within three Local Government Areas. Using budgetary techniques, descriptive statistics, and multiple regression analysis, the study analyzed the costs, returns, and socioeconomic factors influencing marketing performance. Results indicated that pumpkin leaf marketing is profitable, with a return on investment (ROI) of 2.28, implying a viable economic opportunity. However, marketers face considerable constraints, including seasonal supply fluctuations, price instability, lack of financial support, high transportation costs, and poor infrastructure. Seasonal variation and price volatility were identified as the most severe challenges, attributed to inadequate storage facilities and limited market access. Key socioeconomic factors such as access to credit, family size, education level, and marketing experience significantly influenced profitability. The study recommends improving access to credit, developing community-based storage facilities, enhancing transportation infrastructure, and implementing market access programs to support small-scale marketers. Addressing these challenges could improve profitability, support market resilience, and promote sustainable income generation for smallholder marketers. This research contributes to understanding the dynamics of vegetable marketing in Nigeria, emphasizing the need for targeted interventions to optimize the economic potential of perishable crops like pumpkin leaves.*

Keywords: Constraints, marketers, pumpkin marketing, profitability analysis, vegetable, Nigeria

Introduction

Agriculture in Nigeria is largely driven by small-scale farmers who produce the majority of the nation's food. A key crop among these is the fluted pumpkin, which is widely valued for its nutritional and economic contributions. As a common component of the Nigerian diet, fluted pumpkin is a significant crop in local agriculture and serves as an important food source across various regions (Okoro and Omodamiro, 2020). Agriculture represents the largest sector in Nigeria's economy, employing about 70% of the labour force, contributing significantly to the country's GDP, and forming a substantial part of non-oil export earnings (Adesina and Eze, 2021). Fluted pumpkin, a vital leafy vegetable throughout West Africa, belongs to the *Telfairia occidentalis* family. Known for its leaves, edible seeds, and fruit, it is commonly used to enrich the quality of traditional soups, with its seeds being especially appreciated for their high protein content (Ogunlakin et al., 2021). The crop's rich nutritional profile and oil content make it both a dietary staple and a valued source of cooking oil. Given that most Nigerian meals are carbohydrate-rich, fluted pumpkin is an affordable means to add essential vitamins and minerals, enhancing overall diet quality (Idowu et al., 2021). The fluted pumpkin is extensively cultivated as a food and income-generating crop in Africa, with many small-scale farmers relying on it as a primary livelihood source (Akpan and Udoh, 2022). Its affordability, combined with its nutrient value, makes it highly popular in Nigerian households. Furthermore, recent studies indicate that the crop's high yield per unit area provides substantial income, making it an economically attractive crop for smallholders (Olaiya et al., 2022). Marketing is an essential aspect of agricultural production, connecting goods from farms to consumers and enhancing the reach and economic viability of crops (Lawal and Ogundipe, 2020). Effective marketing begins with production planning that aligns with specific market demands and influences pricing dynamics (Oguntade et al., 2021). Market information empowers farmers to make informed production and sales decisions, helping them to optimize both output and income (Ogundare et al., 2020). In the absence of reliable market information, farmers often face static pricing, which disrupts the supply-demand balance and limits market competitiveness (Soyinka et al., 2022). For smallholder farmers, well-organized marketing can support broader goals, including economic development, food security, and sustainable agriculture (Awolola and Oyewole, 2021). However, limitations in rural infrastructure often hinder effective market integration, affecting both price dynamics and overall competitiveness (Suleiman and Musa, 2022).

Recent research has highlighted the need to focus on the value chain in vegetable production, particularly marketing, which has received less attention compared to crop production and utilization studies (Balogun et al., 2021). The perishable nature of crops like fluted pumpkin adds a layer of complexity to their marketing, as they require adequate preservation and timely distribution to maintain economic value. Despite the crop's economic potential, there is limited research on the marketing of fluted pumpkins, particularly in areas such as Nasarawa State, Nigeria (Usman and Adedeji, 2021). Vegetables, often viewed as minor crops, are commonly overlooked in marketing studies despite their high nutritional and economic value. This neglect has created challenges in vegetable marketing, given the crops' perishability, seasonality, and standardization requirements (Omole et al., 2023). In Nigeria, studies on vegetable production often focus on ecological and socioeconomic factors, but little information exists on how socioeconomic variables impact the marketing of crops like fluted pumpkins. Enhancing value addition and improving access to markets can significantly affect the profitability of fluted

pumpkin production. Additionally, understanding the factors influencing both production and marketing could improve linkages between farmers and market actors.

Therefore, this study aims to investigate the socioeconomic factors affecting pumpkin marketing in Ekiti State, Nigeria. The specific objectives include:

1. Determining the profitability of pumpkin marketing;
2. Examining the socioeconomic factors influencing pumpkin marketing; and
3. Identifying the constraints to effective pumpkin marketing.

Materials and Methods

This study focuses on Ekiti State, Nigeria, located in the southwestern region of the country. Known for its hilly terrain and rich agricultural resources, Ekiti State is situated within the tropical rainforest zone, which transitions to savanna in some northern areas. The state experiences a bimodal rainfall pattern with two distinct seasons: the rainy season from April to October and the dry season from November to March. Average annual rainfall ranges between 1,200 mm and 1,600 mm, supporting diverse crop cultivation, including the fluted pumpkin, which thrives under these climatic conditions. Ekiti State comprises 16 local government areas (LGAs), with an estimated population of over 3 million people, predominantly engaged in agriculture. Farming in Ekiti is mainly at the smallholder level, focusing on food crops such as yam, cassava, maize, and various vegetables, including fluted pumpkin. The state's economy is largely agrarian, with most households depending on subsistence farming for food and income. This makes Ekiti an ideal location for studying the socioeconomic factors affecting vegetable crop marketing, particularly fluted pumpkin, which plays a vital role in the local diet and economy.

The data for this study were collected from primary sources, specifically through structured questionnaires administered to fluted pumpkin marketers within Ekiti State, Nigeria. The questionnaire was designed to capture key information on the socioeconomic characteristics of marketers, their marketing practices, profitability, and the challenges they encounter. A sample size of 120 fluted pumpkin marketers was used for this study. The study employed a multi-stage sampling technique to ensure a representative selection of fluted pumpkin marketers. In the first stage, three Local Government Areas (LGAs) were purposively selected being the largest producer of vegetables in the State. In the second stage, key marketplaces known for vegetable marketing from three communities, particularly fluted pumpkin, were purposively selected from each LGA. Finally, within each selected marketplace, 20 marketers were randomly selected for inclusion in the study, making 120 marketers.

Analytical Tools and Model Specification: Descriptive statistics, budgetary techniques, and multiple regression were used as analytical techniques for the study.

Budgetary techniques: Budgetary technique was employed to estimate the performance of the enterprise such as profit, gross margin, and returns on investment. These indicators determine the worthiness of an investment.

$$NFI = TR - TC \dots\dots\dots(i)$$

Where:

NFI= Net Farm Income (Naira/ha)

TR= Total Revenue (Naira/ha)

TC= Total Cost of Production (Naira/ha)

TC= TVC+TFC

Total Cost (TC) = Total Variable Cost (TVC) + Total Fixed Cost (TFC)

TVC = (cost of vegetable leaf, labour, transportation, water, bucket, sack)

TFC = (Table and knife).

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Return on Investment (ROI) was obtained by dividing the Gross Revenue (TR) by the Total Cost (TC).

Multiple Regression Analysis

Multiple regression analysis will be employed to estimate the socio-economic factors influencing the profitability of pumpkin marketers in the study area., Data generated will be analyzed using a multiple regression model specified as the relationship between the income sold (Y) in Naira and the explanatory variables is

Stated implicitly as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, e_i) \dots \dots \dots (ii)$$

Where: Y = Naira Value of Fluted Pumpkin Leaf;

X₁ = Age (years); X₂ = Credit access (Dummy: yes = 1, and 0, otherwise); X₃ = Marital status (Dummy: married=1, unmarried =0); X₄ = Sex (Dummy: male=1, female =0); X₅ = Household size (number of person); X₆ = Education (years); X₇ = Marketing experience (years); X₈ = Market space (Meter square; and e_i = Error term.

Four functional forms namely linear, exponential, double logarithm and semi-logarithm functions were tried to determine the form that best fits the data.

Explicitly, the models are represented as follows:

Linear regression form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \mu$$

Semi log regression form:

$$Y = \beta_0 + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + \beta_5 \log X_5 + \beta_6 \log X_6 + \beta_7 \log X_7 + \beta_8 \log X_8 + \mu$$

Exponential regression form:

$$\log Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \mu$$

Double log regression form:

$$\log Y = \beta_0 + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + \beta_5 \log X_5 + \beta_6 \log X_6 + \beta_7 \log X_7 + \beta_8 \log X_8 + \mu$$

Results and Discussion

Costs and Returns of Pumpkin Marketing

Table 1 illustrates the average costs and returns associated with pumpkin marketing in the study area. The findings reveal that marketers generated an annual total revenue of ₦162,000 from pumpkin marketing. The total cost incurred per marketer was ₦70,846, with variable costs comprising approximately 92% (₦66,878) of the total expenses in pumpkin marketing. A closer examination of the variable cost components indicates that the cost of purchasing pumpkins represented the largest portion, accounting for 47% of total costs. Marketspace fees made up 38%, while transport and association membership fees each contributed 2%, and labour expenses accounted for 3%. Fixed costs, though a smaller proportion at 8% of total costs, amounted to ₦3,968 annually. Among these, the cost of baskets constituted 4.6%, tables 2.5%, and knives 0.9% of the total fixed costs. Overall, the annual profit from pumpkin marketing was ₦91,154, yielding a revenue of ₦162,000. This positive profit outcome suggests that pumpkin marketing is a viable and profitable venture within the study area. The estimated return on investment (ROI) was 2.28, meaning that for every naira invested in pumpkin marketing, marketers gained a return of ₦2.28. This demonstrates that pumpkin marketing offers a lucrative opportunity, providing a reliable income source and a potential avenue for employment, particularly for young school leavers and the broader population.

Table 1: Results of Costs and Returns of Pumpkin Marketing in the Area.

Items	Value (₦)	Percentage (%)
The purchase price of a pumpkin	33,783	47.0
Transport	1,986	2.0
Labour (head loaders, wheelbarrow pushers).	2,598	3.0
Membership due	1,428	2.0
Marketspace	27,083	38.0
Total Variable cost	66,878	92.0
Knife	656	0.9
Basket	3,312	4.6
Table	1, 824	2.5
Total Fixed cost	3,968	8.0
Marketing Cost=TVC+TFC	70,846	
Total Revenue (TR)=Price*Qty	162,000	
Profit =TR-TCM	91,154	
ROI=TR/TCM	2.28	

Socioeconomic Determinants of Pumpkin Vegetable Performance in the Area

The Double-Log Regression analysis in Table 2 identifies the key determinants of pumpkin marketing performance in the study area. The model presents an R-squared value of 0.981, indicating that 98.1% of the variability in pumpkin marketing performance can be explained by the included variables. The F-value of 212.45 and the associated p-value (0.000) further confirm that the model is statistically significant at the 1% level, suggesting a robust fit. The coefficient of age negatively influences pumpkin marketing performance, with a statistically significant effect at the 1% level. This result suggests that younger marketers tend to perform better in pumpkin marketing compared to 33% of older marketers. This indicates that younger individuals, who are potentially more adaptable and physically active, have an advantage in handling the dynamic and sometimes labour-intensive nature of marketing activities. This was also reported in some studies in the area such as Olubunmi-Ajayi et al. (2023), Oladoyin et al. (2023) and Adegoroye et al. (2024). Access to credit has a positive and highly significant impact on Pumpkin's performance. The coefficient of 0.451 suggests that marketers with access to credit can enhance their performance by investing in larger quantities of pumpkins, improving their logistics, or expanding their marketing reach. Marital status shows a small but significant positive effect on pumpkin performance, suggesting that married marketers may benefit from additional household support or motivation to succeed in their business by 2.3%. Although the impact is modest, the result implies that family support structures could play a role in enhancing market efficiency and resilience. The negative coefficient for sex implies a statistically significant difference in performance between male and female marketers by 20%, with male marketers potentially facing fewer barriers or challenges compared to their female counterparts. This could reflect gender-based differences in market access, physical demands, or social support within the marketing environment. Family size positively and significantly affects performance in pumpkin marketing, with a coefficient of 0.111. Larger family size may contribute positively to pumpkin marketing by providing labour support for various marketing

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tasks, such as transportation, packaging, and selling, thereby enhancing productivity and efficiency as also noted by Adegoroye et al. (2021) and Ogunyemi et al. (2022). Education level has a positive and statistically significant effect on pumpkin marketing performance. The coefficient (0.019) suggests that marketers with more years of formal education likely possess better management skills, market understanding, and negotiation abilities, which contribute to improved marketing outcomes. Marketing experience shows a strong positive impact on pumpkin performance, with the highest coefficient among all variables (0.234) and statistical significance at the 1% level. This highlights that seasoned marketers are more knowledgeable about market trends, consumer preferences, and effective sales strategies, which can significantly enhance their marketing success (Adegoroye et al., 2023). Although market space has a relatively high positive coefficient (0.891), it is not statistically significant (p-value = 0.234), indicating that variations in market space size do not have a consistent impact on performance in this context. This result suggests that while larger market spaces may offer greater display capacity, they are not a decisive factor in influencing pumpkin marketing performance. These results underscore the critical role of socioeconomic factors in determining the performance of pumpkin marketers. Access to credit, family support, education, and experience are particularly influential, suggesting that targeted interventions to improve financial access, family engagement, and education in agricultural practices could significantly enhance market outcomes. Moreover, the results highlight potential gender disparities in marketing performance, which may require policies to address barriers faced by female marketers.

Table 2: Results of Double-Log Regression for the Determinants of Pumpkin Performance

Variable	Coefficient	Std error	t-vale	p-value
Constant	10.371	0.673	15.47	0.000
Age (years)	-0.332	0.081	3.88	0.000
Credit access	0.451	0.099	4.56	0.000
Marital status	0.023	0.012	1.98	0.050
Sex	-0.200	0.094	2.12	0.043
Family size	0.111	0.022	5.01	0.000
Years of Education	0.019	0.004	4.50	0.000
Marketing experience	0.234	0.029	7.98	0.000
Market space (M ²)	0.891	0.571	1.56	0.234
R-square	0.981			
F-value	212.45			
Prob.	0.000			

Constraints to Pumpkin Leaf Marketing Among Vegetable Marketers in the Area

Table 3 presents the key constraints faced by pumpkin leaf marketers in the study area. The results indicate that pumpkin leaf marketing is challenged by several critical issues affecting its profitability and sustainability. The most severe constraints identified were low vegetable supply due to seasonal variations (100%), price fluctuations (100%), lack of financial support (98.3%), limited capital for initial investment (97.5%), high transportation costs (96.7%), and high shop rental costs (91.7%). Additionally, poor access roads (76.7%), inadequate storage facilities (75.0%), and rapid deterioration in product quality (56.7%) posed significant

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challenges for marketers. Less severe issues included pest and disease outbreaks (46.7%), heavy taxation (46.7%), and insecurity concerns (28.3%). It could be discussed as the following. Seasonal variation leading to inconsistent supply, coupled with price fluctuations, was ranked as the highest constraint. This issue is common among perishable agricultural products, which experience significant price and supply instability due to seasonal production patterns. The lack of storage facilities exacerbates this problem, as marketers are unable to store vegetables for off-season sales, leading to price drops during high supply periods and spikes during scarcity. Matsane and Oyekale (2014) similarly reported that poor pricing structures and inadequate storage facilities are critical issues in vegetable marketing. Again, the lack of financial support ranked third among the constraints, highlighting the limited access to credit or financial assistance available to vegetable marketers. Most marketers do not belong to cooperative societies or financial groups that could provide funding or pooled resources. Without access to financial support, marketers face difficulties in expanding their businesses or managing the high operational costs associated with vegetable marketing. This finding aligns with Matsane and Oyekale (2014), who also identified financial limitations as a major barrier to effective vegetable marketing. Low initial capital ranked fourth among the constraints, likely due to the absence of credit facilities accessible to vegetable marketers. This lack of capital restricts the ability of marketers to invest in necessary resources and infrastructure, which would improve marketing efficiency and profitability. Transportation costs were another significant constraint, consistent with findings by Obeta et al. (2020), who noted that poor infrastructure, such as inadequate road networks, disrupts efficient market functions. In the study area, bad roads and the long distances required to transport pumpkin leaves from production to sales points increase the cost and complexity of distribution, affecting profitability. The high cost of shop rentals ranked sixth among the major issues, likely due to increased competition for limited market space. With a growing number of vegetable marketers, demand for shop space has surged, driving up rental prices and limiting access to suitable selling locations within the market area.

Table 3: Results of Constraints to Pumpkin Marketing in the Area

Constraints	Frequency	Percentage	Rank
High cost of shop rent	110	91.7	6 th
High cost of transportation	116	96.7	5 th
Price fluctuation	120	100.0	1 st
Low capital /Initial investment	117	97.5	4 th
Lack of financial support	118	98.3	3 rd
Low supply of vegetables due to seasonal variation	120	100.0	1 st
Poor storage facilities	90	75.0	8 th
Pest and Disease	56	46.7	10 th
Heavy imposition of tax	56	46.7	10 th
The rapid deterioration in quality	68	56.7	9 th
Poor access road	92	76.7	7 th
Insecurity.	34	28.3	11 th

Conclusion and Recommendations

This study analyzed the economic potential and constraints of pumpkin leaf marketing among small-scale marketers in Ekiti State, Nigeria. The findings revealed that pumpkin marketing offers significant profitability, contributing to local incomes and providing an affordable nutritional source within the region. Key socioeconomic factors, such as access to credit, family support, education level, and marketing experience, were shown to strongly influence

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marketers' performance. However, the study also highlighted critical challenges, including seasonal supply fluctuations, price volatility, limited financial support, high transportation and rental costs, poor infrastructure, and inadequate storage facilities. These constraints significantly limit the efficiency and profitability of pumpkin leaf marketing, affecting marketers' ability to operate sustainably. The insights gained emphasize the importance of addressing both financial and infrastructural challenges to optimize the marketing of perishable crops like pumpkins. Addressing these barriers can strengthen the vegetable supply chain, enhance market integration, and improve income stability for small-scale marketers in Ekiti State. Based on the findings, the following recommendations are proposed. Government agencies, financial institutions, and non-governmental organizations (NGOs) should provide accessible and affordable credit facilities tailored for small-scale marketers. Creating credit programs or partnerships with cooperative societies would enable marketers to pool resources, reduce financial constraints, and invest in operational improvements. Establishing community-based or cooperative-managed storage facilities would help reduce the impact of seasonal supply variations and price fluctuations. Proper storage infrastructure could also decrease post-harvest losses, allowing marketers to sell pumpkin leaves off-season and achieve stable prices. Investment in rural road networks and transport infrastructure is crucial. Better road conditions would reduce transportation costs and time, making it easier for marketers to move products from farms to markets. Such infrastructure development would not only benefit pumpkin marketers but also support broader agricultural productivity in the region. Implementing training programs on market access strategies, including digital marketing platforms and pricing information tools, would benefit marketers. Access to reliable market information could improve price negotiation power and help marketers plan sales more effectively, reducing the adverse effects of price volatility. Since gender disparities were identified, targeted interventions to support female marketers would be beneficial. This could include creating women-focused market cooperatives, enhancing their access to credit, and providing skills training to support their success in the vegetable marketing sector. Encouraging value-added processing, such as drying or packaging pumpkin leaves, could increase their shelf life and reduce post-harvest losses. This would create additional income opportunities and allow marketers to enter new markets with processed pumpkin products. These constraints were also observed in Adegoroye et al. (2023) on dried melon vegetable in the area.

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