



PROFITABILITY ANALYSIS OF YAM MARKETING IN BAUCHI STATE, NIGERIA

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ABSTRACT

The study analysed the profitability, marketing efficiency, and constraints of yam marketing in Bauchi State, a non-producing area in northeastern Nigeria. A multi-stage sampling procedure was used to select 280 yam marketers (120 wholesalers and 160 retailers) across five Local Government Areas. Data collected through structured questionnaires were analysed using descriptive statistics, marketing margin analysis, and Shepherd's marketing efficiency ratio. Results revealed that yam marketers were predominantly male (100%), with mean ages of 36 years for retailers and 39 years for wholesalers. Profitability varied by tuber size and age; small-sized new yams yielded the highest rate of return (0.31 for retailers; 0.26 for wholesalers), while large old yams recorded lower returns (0.20 and 0.15 respectively). Purchase cost constituted over 70% of total expenses for wholesalers and over 92% for retailers. Marketing efficiency was higher in the retail subsector (efficiency index: 6.10) compared to wholesale (2.11) using the conventional method, while Shepherd's overall marketing efficiency index was 5.6. Major constraints included inadequate marketing capital (92.5% retailers; 85% wholesalers), high transportation costs (48% retailers; 100% wholesalers), poor market infrastructure (78.1% retailers; 70.8% wholesalers), and insecurity affecting supply chains (80.8% wholesalers). The study concludes that yam marketing in Bauchi State is profitable but constrained by infrastructural, financial, and security challenges. Smaller tubers offer better investment returns due to consumer preference and affordability. To enhance marketing efficiency and sustainability, the study recommends improving rural road networks, establishing targeted credit schemes for marketers, promoting cooperative formation, and strengthening security along supply routes from major yam-producing states. These interventions are essential for ensuring stable yam supply and food security in non-producing regions.

Keywords: Yam, Marketing, Profitability, Efficiency, Constraints

INTRODUCTION

Agricultural marketing plays a critical role in enhancing food security and ensuring equitable distribution of food commodities, particularly those that are not universally cultivated but are widely consumed (Njonjo *et al.*, 2022). Food security remains a pressing global challenge, defined by the availability of sufficient, safe, and nutritious food to meet the dietary needs of individuals for an active and healthy life (Mishra *et al.*, 2024). In this context, agricultural marketing is a key mechanism for achieving food security by improving the movement, accessibility, and affordability of food items across regions. Empirical studies by Mishra *et al.* (2024), the United Nations (2023), and Nwanmuoh *et al.* (2024) have shown that targeted marketing interventions such as community-supported agriculture, direct-to-consumer sales, and digital e-commerce platforms, have significantly enhanced food accessibility, stability, and consumption levels. These interventions underscore the importance of effective marketing systems in bridging the gap between producers and consumers, and in improving the overall efficiency of food distribution (Kevela *et al.*, 2024).

Nigeria, characterized by its diverse agro-ecological zones, exemplifies a country where marketing systems are essential for linking production-surplus regions to consumption-deficient areas (Idisi *et al.*, 2019). In this setting, agricultural marketing serves as a strategic instrument for ensuring that food commodities are available where they are most needed. Among the key food crops in Nigeria is yam (*Dioscorea spp.*), which holds dual importance as both a dietary staple; providing over 200 kilocalories per person per day across West Africa and a culturally significant crop embedded in traditional practices (Onwuatuegwu, 2024; Degla & Sourokou, 2020; Akinbo & Opara, 2019). Given the spatial unevenness of yam production in Nigeria, efficient marketing systems have been



instrumental in meeting demand in non-producing areas (Igbawuaa *et al.*, 2022). According to Nwanmuoh *et al.* (2024) and Offor *et al.* (2016), factors such as functional transportation networks and access to credit significantly reduce marketing costs and enhance yam availability to end-users. These findings emphasize the indispensable role of agricultural marketing in overcoming production-consumption imbalances and promoting food security.

Nigeria is the world's largest producer of yam, accounting for approximately 70 – 76% of global output (Obi-Egbedi & Ifoga, 2023; Fasusi *et al.*, 2022). However, yam production within the country is unevenly distributed (Igbawuaa *et al.*, 2022). Major producing states such as Benue, Nasarawa and Taraba dominate national supply (Fasusi *et al.*, 2022), while others like Bauchi State, located in the northeastern savanna, remain largely non-commercial producers (Ameh & Danladi, 2024). These non-producing areas depend heavily on marketing channels to meet local consumption needs. In such contexts, yam marketers play a critical role in facilitating the movement of this staple crop from surplus to deficit regions, thereby underpinning food availability and access. Recent empirical studies have extensively examined the profitability and efficiency of yam marketing in key commercial production zones, including Benue, Taraba, Enugu, and Niger States (Nomor & Tersugh, 2024; Ogaji *et al.*, 2022; Akintunde *et al.*, 2022; Amaefula, 2021). For example, Akura *et al.* (2023) reported low marketing efficiency and narrow profit margins among yam marketers in Benue State, primarily due to high transportation costs and limited access to credit. Similarly, Sam *et al.* (2024), in their analysis of marketing efficiency in Southern Taraba State, recorded a marketing efficiency of 635.60%, indicating that marketers not only recovered their costs but also realized significant profits. The study identified age, marital status, and household size as key socioeconomic factors influencing marketing efficiency in the area.

These findings suggest that even in commercial yam-producing states with relatively better infrastructure and logistics, profitability remains constrained. This highlights the importance of efficient marketing systems in ensuring both sustainable earnings for marketers and a stable supply of yam to consumers. However, a notable gap exists in the literature regarding yam marketing dynamics in non-producing regions such as Bauchi State. In areas where local yam production is minimal and supply relies predominantly on external sources, efficient marketing and profitability become even more critical for ensuring food security. Without viable marketing operations, these regions face heightened risks of reduced supply, price volatility, and food insecurity, especially during periods of supply disruptions or elevated production costs. Against this backdrop, the present study focuses on Bauchi State with the aim of addressing this research gap. Specifically, the study seeks to:

- i. describe the socioeconomic characteristics of the respondents
- ii. determine the profitability of yam marketing in the study area.
- iii. assess marketing efficiency
- iv. and identify the key constraints affecting yam marketing in the area.

METHODOLOGY

The Study Area

The study was conducted in Bauchi State, located in the North-East geopolitical zone of Nigeria. The State lies between latitude 9°03'–12°03' N and longitude 8°50'–11°00' E, occupying a land area of approximately 49,119 km², which represents about 5 % of Nigeria's total land mass (Nuhu *et al.*, 2020). It shares boundaries with Kano and Jigawa States to the north, Kaduna to the west, Plateau and Taraba to the south, and Gombe and Yobe to the east, positioning it strategically as a regional hub for agricultural production and inter-state trade (Ndukwe *et al.*, 2025; Nationalqoc, 2022). The State has an estimated population size of 6,537,314 in 2016 (NBS, 2017). This growing population provides both labour for agricultural enterprises and a strong local demand for livestock and crop products. The climate is tropical wet-and-dry, with annual rainfall ranging from 700 to 1,300 mm, concentrated between May and October, and mean temperatures often exceeding 30 – 35 °C during the dry season, while relative humidity varies markedly across seasons (Climate Data, 2024). Vegetation consists of Sudan and Sahel savannah zones, characterised by grasslands with scattered trees and drought-tolerant shrubs that favour mixed crop–livestock systems and natural grazing. The economy is predominantly



agrarian, with widespread cultivation of millet, maize, rice, sorghum, groundnut, cowpea, and guinea corn, and supports active inter-state agricultural trade (Tama *et al.*, 2025; Sakariyau *et al.*, 2023). Yam marketing is an emerging and economically important activity in the state, with no cultural or religious constraints to its consumption. .

Methods of Data Collection

Primary data for the study were obtained from yam marketers through the administration of a well-structured questionnaire during face-to-face interviews. The instrument was organised into three sections covering: (i) respondents’ socioeconomic characteristics, (ii) marketing and cost–return information for profitability analysis, and (iii) identification and ranking of marketing constraints encountered in the study area. Secondary data were sourced from relevant published literature, including academic journals, textbooks, periodicals, government reports, official websites, and other credible documentary sources to complement and validate the primary information.

Sampling Procedure and Sample size

A multi-stage sampling technique was adopted for the selection of respondents from the study area. In the first stage, five Local Government Areas; Alkaleri, Bauchi, Darazo, Ganjuwa, and Katagum were purposively selected due to their high concentration of yam marketing activities. In the second stage, official registers obtained from Yam Marketers’ Associations constituted the sampling frame. Marketers were stratified into wholesalers and retailers, after which 25% of respondents in each stratum were selected using simple random sampling. This procedure resulted in a total sample size of 280 yam marketers, comprising 120 wholesalers and 160 retailers. Data were collected on marketing practices and price information for old and new yam varieties, as well as small, medium, and large tuber sizes, to adequately capture market heterogeneity and structural differences across the study area.

Table 1: Sampling Frame and Sample Size

LGA	Sampling frame		Sample size	
	Wholesalers	Retailers	Wholesaler	Retailers
Alkaleri	60	60	15	15
Bauchi	300	440	75	110
Darazo	40	60	10	15
Ganjuwa	50	40	12	10
Katagum	30	40	8	10
Total	480	640	120	160

Methods of Data Analysis

The data collected for the study were analysed using a combination of descriptive and quantitative analytical techniques. Descriptive statistics were employed to summarise respondents’ socioeconomic characteristics and identify major marketing constraints, while marketing margin analysis was used to evaluate profitability across marketing categories. In addition, Shepherd’s marketing efficiency ratio was applied to assess the operational efficiency of the yam marketing system.

Descriptive Statistics

Descriptive statistics which including frequencies, percentages and means, were used to summarize respondents’ socioeconomic characteristics and identify the constraints to yam marketing in the study area.

Marketing Margin Analysis

Marketing margin analysis was employed to assess profitability among wholesalers and retailers. The gross marketing margin was estimated as the difference between the selling price and the purchase price of yam, while the net margin accounted for associated marketing costs. The percentage marketing margin was computed to determine the proportion of the final selling price retained by marketers. These measures provided an indication of the profitability and performance of the marketing enterprise.

Formula:

$$\text{Gross Margin (GM)} = \text{Total Revenue (TR)} - \text{Purchase Price (PP)}$$



$$\text{Net Margin (NM)} = \text{Total Revenue (TR)} - [\text{Purchase Price (PP)} + \text{Marketing Cost (MC)}]$$

$$\text{Percent Marketing Margin} = \frac{\text{Total Revenue (TR)} - \text{Purchase Price (PP)}}{\text{Total Revenue (TR)}} \times 100$$

Shepherd Marketing Efficiency

Shepherd's Marketing Efficiency (ME) ratio, originally proposed by Geoffrey Shepherd in 1965, is widely used to evaluate the performance of agricultural marketing systems by relating the value of goods sold to the total marketing cost incurred. The index measures how efficiently marketing services transform costs into consumer value and is expressed as the ratio of the total value of goods marketed to the aggregate marketing cost, with higher values indicating greater marketing efficiency (Olugbire *et al.*, 2021; Shubha *et al.*, 2024). In this study, the consumer price served as a proxy for the total value of goods sold, while the total marketing cost comprised the combined wholesale and retail marketing expenses. Consequently, Shepherd's marketing efficiency was estimated as:

$$\text{Shepherd Marketing Efficiency} = \frac{\text{Value of goods purchased}}{\text{Total Marketing Cost}} - 1$$

where ME >1 indicates an efficient marketing system, ME = 1 denotes break-even performance, and ME < 1 reflects inefficiency.

RESULTS AND DISCUSSION

Socioeconomic Characteristics of Yam Marketers in Bauchi State

The study revealed that yam marketers in Bauchi State are predominantly young and middle-aged. About 67% of retailers and 53.3% of wholesalers fall within the 20 – 39 age range, while mean ages were 36 and 39 years for retailers and wholesalers, respectively. This younger demographic aligns with the physically demanding nature of yam marketing in the region and agrees with Sam *et al.* (2024) who reported younger marketers in Southern Taraba with a mean age of 42 years, and also Iroegbute *et al.* (2022) who recorded a mean age of 39 years in Nasarawa State. Most respondents were married, 52.5% of retailers and 75.8% of wholesalers indicating that yam marketing provides sufficient income to support family life. All respondents were male, aligning with Bekun (2017) but contrasting with Kassali *et al.* (2018), who found female dominance in the trade. This male dominance is likely influenced by cultural and religious norms in Bauchi, a predominantly Muslim region, as noted by Iroegbute *et al.* (2022). Retailers had an average household size of 5, while wholesalers averaged 8, suggesting access to family labour but also higher dependency burdens. In terms of education, 81.2% of retailers and 74.2% of wholesalers had at least primary education, enabling them to access market information and adopt innovations. Experience levels varied: 76.9% of retailers had less than 10 years in the business, while wholesalers were more experienced, 57.5% had 11 – 20 years, and 13.3% had over 20 years, indicating a progression from retailing to wholesaling as capital and experience accumulate. Capital investment also differed. Most retailers (80%) operated with less than ₦200,000, whereas wholesalers invested more: 64.2% had ₦200,000 – ₦500,000, and 31.6% over ₦500,000. This reflects the high cost of yam procurement and transport, with 100-tuber units ("Kwarya") costing ₦15,000 – ₦70,000.

Table 2: Distribution of Respondents based on the Socio-economic Characteristics

Parameters	Frequency		Percentage	
	Retailers	Wholesalers	Retailers	Wholesalers
Age group (yrs)				
20 – 29	45	19	28.1	15.8
30 – 39	63	45	39.4	37.5
40 – 49	37	36	23.1	30.0
50 – 59	12	15	7.5	12.5
60 and above	3	5	1.9	4.2
Mean	36	39		
Marital status				
Married	84	91	52.5	75.8
Single	76	29	47.5	24.2
Sex				
Male	160	120	100	100
Household size				
1 – 5	92	38	57.5	31.7
6 – 10	53	51	33.1	42.5
11 – 15	12	18	7.5	15
16 – 20	3	12	1.9	10
21 and above	0	1	0	0.8
Mean	5	8		
Educational Level				
Primary	61	50	38.1	41.7
Secondary	44	29	27.5	24.2
Tertiary	25	10	15.6	8.3
No-formal education	30	31	18.8	25.8
Marketing Experience (yrs)				
0 – 5	28	3	17.5	2.5
6 – 10	95	32	59.4	26.7
11 – 15	26	40	16.2	33.3
16 – 20	11	29	6.9	24.2
21 and above	0	16	0	13.3
Mean	9	15		
Capital Investment Level (₦)				
< 200,000	128	5	80	4.2
200,000 – 500,000	32	77	20	64.2
> 500,000	-	38	-	31.6
Mean	155,250	334,583		
Total	160	120	100	100

Source: Field survey, 2019.

Profitability Analysis for Wholesalers

Wholesale yam pricing is shaped by factors such as seasonality, location, yam variety and size, age (new or old), market demand, and transport costs (MEDA, 2011). This study confirms these variables significantly influence profit margins. Per 100 tubers, total marketing costs for new yam were ₦16,756 (small), ₦28,702 (medium), and ₦42,848 (large), with respective returns of ₦21,177, ₦34,544, and ₦49,760. For old yam, costs increased to ₦25,014 (small), ₦37,580 (medium), and ₦50,247 (large), with returns of ₦30,010, ₦42,994, and ₦57,977. Marketing margins for new yam ranged from ₦9,427 to ₦11,918; for old yam, ₦10,618 to ₦13,352. Percentage margins were highest in small-sized yams; 44.5% (new) and 35.4% (old) compared to 24.0% and 23.0% in large yams. ROI followed a similar trend, highest in small new yam (0.26) and lowest in large old yam (0.15), reflecting diminishing returns with larger tuber sizes. Over 70% of total costs were spent on yam purchase, highlighting the high capital intensity of the trade. Old yams attracted more transport and storage costs due to off-season scarcity and preservation needs, reducing overall profitability despite higher prices.



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These findings align with Bergh *et al.* (2012), who noted that wholesale margins typically constitute one-third of sale price, and with Amegbeto *et al.* (2008), who observed diminishing returns with increasing tuber size.



Table 3: Profitability Analysis for Wholesaler (100 tubers)

Parameters	New Yam			Old Yam		
	Small (0.8 - 2.3kg)	Medium (2.8 - 4.1kg)	Large (4.5 - 8kg)	Small (0.6 - 2kg)	Medium (2.5 - 3.8kg)	Large (4 - 6.5kg)
Revenue (R) (₦)	21,177	34,544	49,760	30,010	42,994	57,977
Cost (₦)						
Purchase	11,750(70.0) *	23,696(82.6) *	37,842(88.3) *	19,392(77.5) *	31,958(85) *	44,625(88.8) *
Transport	3,244(19.4)	3,244(11.3)	3,244(7.6)	3,860(15.4)	3,860(10.3)	3,860(7.7)
Loading/off-loading	164(1.0)	164(0.6)	164(0.4)	164(0.7)	164(0.4)	164(0.3)
Agent fee	358(2.1)	358(1.2)	358(0.9)	358(1.4)	358(1.0)	358(0.7)
Market fee	611(3.7)	611(2.1)	611(1.4)	611(2.4)	611(1.6)	611(1.2)
Labour	269(1.6)	269(1.0)	269(0.6)	269(1.1)	269(0.7)	269(0.5)
Packaging material	178(1.1)	178(0.6)	178(0.4)	178(0.8)	178(0.5)	178(0.4)
Security cost	30(0.2)	30(0.1)	30(0.1)	30(0.1)	30(0.1)	30(0.1)
Rents of store and equipment	152 (0.9)	152(0.5)	152(0.3)	152(0.6)	152(0.4)	152(0.3)
Total Cost (TC) (₦)	16,756	28,702	42,848	25,014	37,580	50,247
Gross margin	9,427	10,848	11,918	10,618	11,036	13,352
Percent Marketing Margin (%)	44.5	31.4	24.0	35.4	25.7	23.0
Net Margin	4,421	5,842	6,912	4,996	5,414	7,730
Rate of Return	0.26	0.20	0.16	0.20	0.14	0.15

Source: Field survey, 2019.

*Percentage in parenthesis



Profitability Analysis for Retailers

The profitability analysis of retail yam marketing in Bauchi State reveals that costs and returns vary significantly by yam size and age (new or old). For *new yam*, the total costs incurred per 100 tubers were ₦19,792 for small sizes (0.8 – 2.3 kg), ₦32,788 for medium sizes (2.8 – 4.1 kg), and ₦47,222 for large sizes (4.5 – 8 kg). The corresponding total returns were ₦25,921, ₦39,763, and ₦56,458, respectively. For *old yam*, retailing costs were higher at ₦28,364, ₦40,600, and ₦55,843 for small (0.6 – 2 kg), medium (2.5 – 3.8 kg), and large (4 – 6.5 kg) sizes, with returns of ₦34,579, ₦48,788, and ₦67,163, respectively. The retail marketing margins ranged from ₦7,704 to ₦10,811 for new yam, and ₦7,790 to ₦12,895 for old yam across increasing sizes. In percentage terms, margins for new yam were 29.7%, 21.5%, and 19.2% for small, medium, and large sizes respectively, while old yam margins stood at 22.5%, 20.0%, and 19.2% respectively. The rate of return on investment (ROI) shows a decline with increasing tuber size: 0.31, 0.21, and 0.19 for new yam; and 0.22, 0.20, and 0.20 for old yam, for small, medium, and large sizes respectively. The findings showed that purchase cost accounts for over 92% of total expenses across all categories, underscoring why capital remains the primary constraint for retail yam marketers. Retailers incur relatively low marketing expenses, which may suggest operational efficiency but also points to a possible need for improved marketing strategies. Interestingly, while net profit margins tend to increase with tuber size, the ROI is higher for smaller yams. This suggests that smaller yam sizes offer better turnover, likely driven by stronger consumer demand due to affordability and preference for smaller, easy-to-use tubers.



Table 4: Profitability Analysis for Retailer (100 tubers)

Parameters	New Yam			Old Yam		
	Small (0.8 - 2.3kg)	Medium (2.8 - 4.1kg)	Large (4.5 - 8kg)	Small (0.6 - 2kg)	Medium (2.5 - 3.8kg)	Large (4 - 6.5kg)
Revenue (R) (₦)	25,921	39,763	56,458	34,579	48,788	67,163
Cost						
Purchase	18,217(92.0) *	31,213(95.2) *	45,647(96.6) *	26,789(94.5) *	39,025(96.1) *	54,268(97.2) *
Transport	780 (3.9)	780 (2.4)	780 (1.6)	780 (2.8)	780(1.9)	780 (1.4)
Loading/off-loading	80 (0.4)	80 (0.2)	80 (0.2)	80 (0.3)	80 (0.2)	80 (0.1)
Market fee	225 (1.1)	225 (0.7)	225 (0.5)	225 (0.8)	225 (0.6)	225 (0.4)
Labour	120 (0.6)	120 (0.4)	120 (0.3)	120 (0.4)	120 (0.3)	120 (0.2)
Packaging material	150 (0.8)	150 (0.5)	150 (0.3)	150 (0.5)	150 (0.4)	150 (0.3)
Security cost	40 (0.2)	40 (0.1)	40 (0.1)	40 (0.1)	40 (0.1)	40 (0.1)
Rents of Store and equipment	180 (1.0)	180 (0.5)	180 (0.4)	180 (0.6)	180 (0.4)	180 (0.3)
Total Cost (TC) (₦)	19,792	32,788	47,222	28,364	40,600	55,843
Market margin	7,704	8,550	10,811	7,790	9,763	12,895
Percent Marketing Margin (%)	29.7	21.5	19.2	22.5	20.0	19.2
Net Margin/Profit	6,129	6,975	9,236	6,215	8,188	11,320
Rate of Return	0.31	0.21	0.19	0.22	0.20	0.20

Source: Field survey, 2019.

*Percentage in parenthesis



Marketing Efficiency Analysis

The marketing efficiency analysis estimates how effectively the yam market performs its functions. Using both the conventional and Shepherd’s methods, the study compared wholesale and retail efficiency. Unlike the conventional method, Shepherd’s approach uses consumer prices to avoid the challenge of measuring added value. Based on the average marketing cost and selling price per 100 yam tubers, results show that the retail market is more efficient, with a conventional efficiency index of 6.1 compared to 2.11 for the wholesale market largely due to lower marketing costs, particularly in transportation. Shepherd’s index also indicates a relatively high marketing efficiency at 5.4 for yam marketing in the study area.

Table 5: Analysis of yam marketing efficiency

Parameters	Wholesaler (₦)	Retailer (₦)
Selling price	39,410	45,445
Purchase	28,211	35,860
Transport	3,552	780
Loading/off-loading	164	80
Agent fee	358	-
Market fee	611	225
Labour	269	120
Packaging material	178	150
Security cost	30	40
Rents of store and equipment	152	180
Total marketing cost	5,314	1,575
Marketing efficiency index		
Shepherd’s method	5.6	
Conventional method	2.11	6.10

Source: Field Survey, 2019

Constraints to Wholesale Yam Marketing

Wholesale yam marketers in the study area identified several key constraints. The most critical were high transportation costs (100%), inadequate marketing capital (85%), and insecurity (80.8%). Other notable challenges included poor market infrastructure (70.8%), seasonality (65%), storage issues (62.5%), low patronage (50%), lack of marketing information (43.3%), theft (37.5%), and absence of uniform measurement standards (28.3%). High transport costs stem from long distances between yam-producing areas and Bauchi, coupled with the bulky nature of yam, poor road conditions, and poorly maintained vehicles. This supports Akerele and Obafunso (2019), who found transportation to account for over 70% of wholesale marketing costs. The high-cost burden also limits working capital, exacerbated by poor access to formal credit. Insecurity, particularly in key yam-producing states like Plateau, Taraba, Kaduna, and Benue, has further disrupted supply chains. Issues such as insurgency, farmer-herder conflicts, and kidnapping have led to increased transportation risks, delayed deliveries, spoilage, and overall market scarcity, compounding the challenges faced by marketers in the region.



Table 6: Constraints to Wholesale Yam Marketing

Constraints	Frequency*	Percentage	Rank
High Transportation Cost	120	100	1
Inadequate Marketing Capital	102	85	2
Poor Market Infrastructure	80	70.8	4
Storage Problem	75	62.5	6
Seasonality Problem	78	65	5
Poor Patronage	60	50	7
Inadequate Marketing Information	52	43.3	8
Insecurity	97	80.8	3
Theft	45	37.5	9
Lack of Uniform	34	28.3	10

Source: Field survey, 2019.

* Multiple choice

Constraints to Retail Yam Marketing

Table 6 presents the major constraints affecting retail yam marketers in the study area. The most significant challenge is inadequate marketing capital (92.5%), followed by poor market infrastructure (78.1%) and storage problems (66.3%). Additional constraints include poor patronage (57.5%) and seasonality (55%), while insecurity (35%), theft (20%), and lack of uniform measurement standards (12.5%) were less frequently reported. The prominence of capital constraints supports Bergh *et al.* (2012), who noted that limited access to capital hinders business growth and entry into wholesale trade. Poor infrastructure also exacerbates challenges, with many retailers resorting to roadside trading, hawking, or head-loading due to restricted access to formal market spaces. This aligns with Anueibunwa (2002), who observed that wholesalers' control 85% of market infrastructure, leaving only 15% accessible to retailers.

Table 7: Constraints to Retail Yam Marketing

Constraints	Frequency	Percentage	Rank
High Transportation Cost	48	48	6
Inadequate Marketing Capital	148	92.5	1
Poor Market Infrastructure	125	78.1	2
Storage Problem	106	66.3	3
Seasonality Problem	88	55	5
Poor Patronage	92	57.5	4
Inadequate Marketing Information	64	40	7
Insecurity	56	35	8
Theft	32	20	9
Lack of Uniform Measure	20	12.5	10

Source: Field survey, 2019.

* Multiple choice

CONCLUSION AND RECOMMENDATION

This study assessed the profitability, efficiency, and constraints of yam marketing in Bauchi State, focusing on wholesalers and retailers across yam sizes and types. Results show that yam marketing is profitable, with higher returns on investment (ROI) for smaller tubers, particularly among retailers driven by consumer preference and affordability. Wholesalers, despite larger capital and experience, recorded slightly lower ROI due to higher costs, especially for transport. Marketing efficiency was higher among retailers, as revealed by the Shepherd's index, largely due to lower overheads. Key constraints include high transport costs, limited capital, insecurity (for wholesalers), and poor infrastructure and storage (for retailers). Yam marketing remains vital for food access in Bauchi, a non-producing state, but its long-term viability depends on addressing these infrastructural, financial, and security challenges.

To enhance yam marketing efficiency and profitability in Bauchi State, the following are recommended:



- i. Government and stakeholders should upgrade rural and inter-state roads to reduce transportation costs, particularly benefiting wholesalers.
- ii. Introduce targeted credit schemes for yam marketers through cooperatives, microfinance institutions, or agricultural credit programs.
- iii. Support the use of affordable and durable storage technologies to reduce post-harvest losses, especially for old yam.
- iv. Encourage the formation and empowerment of yam marketing cooperatives for bulk purchasing, collective bargaining, and shared resources.
- v. Improve security in key supplying states (e.g., Plateau, Benue, Taraba, Kaduna) to ensure a stable and safe yam supply to Bauchi markets.

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