

Determinants and Performance of Turmeric Marketing among Rural Entrepreneurs in Southeast Nigeria Kadurumba, C

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ABSTRACT

Access to finance, market information, and operational efficiency remain key determinants of agro-processing performance in Nigeria. This study examines the socioeconomic characteristics of turmeric marketers, evaluates their marketing performance, and identifies the factors influencing their efficiency in Southeast Nigeria. A multi-stage sampling technique was used to select 192 respondents across Abia, Imo, and Ebonyi States. Primary data were collected through structured questionnaires and analyzed using descriptive statistics, net returns, marketing margin, marketing efficiency, and ordinary least squares (OLS) regression models. Findings reveal that the majority of turmeric marketers are female, married, and within the active working age bracket, with moderate formal education and substantial marketing experience. Performance analysis shows that turmeric marketing is profitable, with an average net return of N25,710, a marketing margin of 25.7%, and marketing efficiency of 34.6%. Econometric results indicate that educational level, extension services, cooperative membership, and income positively influence marketing performance, while distance to source of credit, storage, transportation, and purchase costs negatively affect it. The study concludes that turmeric marketing is a viable livelihood and recommends increased male participation, targeted extension services, cooperative strengthening, and policies to reduce logistical and financial barriers to improve market performance.

Keywords: Turmeric marketing, marketing efficiency, socioeconomic determinants, Southeast Nigeria, OLS regression

1. Introduction

Turmeric (*Curcuma longa* Linn), widely known as the "golden spice of life," is a rhizomatous crop of the Zingiberaceae family with high economic and nutritional value. Its bioactive compounds, particularly curcumin, are widely applied in the food, pharmaceutical, nutraceutical, and cosmetic industries due to their anti-inflammatory, antioxidant, and antimicrobial properties (FAO, 2025; World Bank, 2024). Globally, turmeric is increasingly recognized as a high-value commodity with significant contributions to rural livelihoods and export earnings, particularly in countries such as India, Indonesia, and Vietnam (OECD, 2023; UNCTAD, 2024).

Despite its potential, turmeric remains underutilized in Nigeria. Several constraints impede the growth of the value chain, including limited mechanization, inadequate processing technologies, poor market access, weak financial inclusion, and insufficient adoption of modern agronomic practices (Nwankwo & Ezeh, 2023; Adebayo & Olagunju, 2024). These limitations not only reduce the quality and quantity of produce but also limit the participation of smallholder processors in domestic and international markets, thereby constraining income generation and employment opportunities (AfDB, 2025; IFAD, 2023).

Marketing is a critical link between production and consumption, serving as the mechanism through which value addition, income generation, and rural economic development are realized (Ezra et al., 2017; Njoku & Nwosu, 2000). Efficient marketing ensures

that products reach appropriate markets at competitive prices while minimizing losses. In Nigeria, however, marketing efficiency is often hindered by information asymmetry, high transaction costs, limited access to credit, and poor infrastructure (World Bank, 2024; IMF, 2023). These challenges are particularly pronounced for agro-processing enterprises in rural communities, where small-scale operators often rely on informal markets and traditional channels to sell their produce (Ledgerwood, 2023; Armendáriz & Morduch, 2024).

Financial inclusion, particularly access to microcredit, plays a key role in facilitating marketing performance. Credit availability allows processors and marketers to invest in storage, transportation, and value-adding technologies, enhancing productivity and profitability (Khandker & Samad, 2024; Adebayo & Olagunju, 2024). Yet, many rural entrepreneurs face barriers such as high interest rates, collateral requirements, and bureaucratic inefficiencies that limit effective access and utilization of financial services (Demirgüç-Kunt et al., 2023; Ozili, 2023). Gender disparities further complicate access, as women, who dominate small-scale processing, often encounter additional institutional and socio-cultural obstacles (UN Women, 2024; AfDB, 2025).

Perception also influences engagement with credit and marketing services. Beliefs regarding the benefits, costs, and accessibility of loans affect willingness to participate in financial programs and adopt improved marketing strategies (Ajzen, 2023; Rogers, 2024; Karlan et al., 2024). Positive perceptions facilitate

uptake, while negative experiences, misinformation, or lack of trust reduce engagement, even when credit is available. Beyond perception, socioeconomic and institutional factors—including education, household size, income, experience, cooperative membership, and access to extension services—are key determinants of both marketing efficiency and microcredit utilization (Nwankwo & Ezech, 2023; Olagunju et al., 2025; Abate et al., 2024).

Empirical studies in Nigeria and other developing countries demonstrate that well-educated marketers with access to cooperative networks and financial services consistently achieve higher profitability and efficiency (Fischer & Qaim, 2023; Ezra et al., 2017; IFPRI, 2023). Moreover, improvements in storage, transportation, and market infrastructure further enhance marketing performance and reduce post-harvest losses (FAO, 2025; UNCTAD, 2024). However, the literature is limited regarding turmeric-specific marketing performance and the combined effects of socioeconomic, institutional, and perception-related factors in Nigeria. Most existing research focuses on staple crops or broad agro-processing activities, leaving a knowledge gap regarding high-value spices such as turmeric (World Bank, 2024; FMARD, 2024).

Addressing this gap is crucial for developing targeted interventions that enhance rural financial inclusion, market efficiency, and entrepreneurship in the turmeric subsector. By integrating descriptive analyses, profitability assessment, and econometric modeling, this study provides a comprehensive examination of the determinants of turmeric marketing performance in Southeast Nigeria. The study specifically aims to:

1. Examine the socioeconomic characteristics of turmeric marketers,
2. Assess the profitability and marketing efficiency of turmeric operations, and
3. Identify key determinants of marketing performance using econometric models.

2. Materials and Methods

2.1 Study Area

The study was conducted in the Southeast geopolitical zone of Nigeria, focusing on Abia, Imo, and Ebonyi States, which are known for significant turmeric marketing and agro-processing activities. Geographically, the region lies between latitudes 5.45°N and 6.26°N and longitudes 7.05°E and 8.01°E, encompassing a total landmass of approximately 10,952,400 hectares and a rural population density of 173 persons per km² (NPC, 2014). The Southeast is characterized by a humid tropical climate with distinct rainy (April to October) and dry (November to March) seasons, and average annual rainfall ranging from 1,500 mm to 2,500 mm. These conditions favor the cultivation of spices, root crops, and other high-value agricultural products.

Agriculture serves as the primary economic activity, employing an estimated 60–70% of the rural population. Farming systems in the region are predominantly smallholder-based, combining subsistence and commercial production. In addition to crop cultivation, many rural households engage in agro-processing and marketing activities, particularly women, who dominate enterprises such as cassava, palm produce, and turmeric processing. Local markets play a central role in rural livelihoods, providing avenues for sale, trade, and exchange of value-added products.

The selected states were chosen due to their active participation in turmeric value chains, existing financial inclusion challenges, and the presence of informal and formal market networks. These factors make the region particularly suitable for examining the determinants of microcredit utilization and marketing efficiency among turmeric processors, as well as for evaluating the socioeconomic and institutional influences on marketing performance.

2.2 Sampling Procedure

A multi-stage sampling technique was adopted to ensure adequate representation of turmeric marketers across the study area. In the first stage, the three states Abia, Imo, and Ebonyi were purposively selected based on their high levels of turmeric marketing activity. In the second stage, four Local Government Areas (LGAs) were purposively selected from each state, yielding a total of twelve LGAs. These LGAs were chosen based on the density of turmeric processing and the presence of active local markets. In the third stage, two communities were selected from each LGA based on the prevalence of turmeric marketing activities and accessibility to microcredit facilities. This produced a total of 48 communities. For each selected community, one major market known for agro-processing and spice trade was purposively chosen to capture the core marketing hubs of turmeric products.

Finally, in the fourth stage, three turmeric marketers were randomly sampled from each selected market, resulting in a total sample of 192 respondents. Random selection was guided by local market associations and cooperative records to ensure unbiased representation of both male and female marketers across various age and experience groups. This sampling framework provides broad geographic coverage, captures diverse marketing experiences, and ensures that the study reflects the realities of turmeric marketing in Southeast Nigeria. The multi-stage approach also strengthens the reliability and generalizability of the findings by incorporating multiple levels of decision-making, from state-level activity to individual marketer behavior.

2.3 Data Collection and Analysis

Primary data for this study were collected using structured questionnaires administered to turmeric marketers across the selected markets in Southeast Nigeria. The questionnaire captured comprehensive

information on respondents' demographic characteristics, marketing experience, household income, market costs, cooperative membership, and access to extension services and credit facilities. Trained enumerators conducted face-to-face interviews, ensuring accurate and reliable responses, particularly among respondents with limited literacy. The performance of turmeric marketing was evaluated using three key measures: net returns, marketing margin, and marketing efficiency. These measures quantify profitability, cost-effectiveness, and the ability of marketers to generate revenue relative to investment and operational costs.

2.3.1 Performance Equations

1. Net Returns (NR)

Net returns measure the absolute profitability of turmeric marketing by subtracting the total cost of marketing from total revenue. It is expressed as:

$$NR = TR - TC$$

Where:

- NR= Net returns (Naira)
- TR= Total revenue from turmeric sales (Naira)
- TC= Total marketing costs, including purchase, transportation, storage, and other operational costs (Naira)

Positive net returns indicate that turmeric marketing is profitable, while negative net returns suggest losses or inefficiencies in marketing operations.

2. Marketing Margin (MM)

Marketing margin represents the percentage of the final selling price retained by the marketer after deducting the purchase cost. It is calculated as:

$$MM = \frac{TR - PC}{TR} \times 100$$

Where:

- MM = Marketing margin (%)
- TR = Total revenue (Naira)
- PC = Purchase cost of turmeric (Naira)

A higher marketing margin indicates that marketers retain a larger share of the selling price, reflecting better price negotiation, value addition, or efficiency in market operations.

3. Marketing Efficiency (ME)

Marketing efficiency assesses the ratio of output value to the total marketing cost, providing a measure of cost-effectiveness. It is expressed as:

$$ME = \frac{TR}{TC} \times 100$$

Where:

- ME = Marketing efficiency (%)
- TR = Total revenue (Naira)
- TC = Total marketing costs (Naira)

Marketing efficiency values greater than 100% indicate that the revenue exceeds total costs, signaling profitable operations. Values below 100% suggest inefficiency or losses in marketing.

2.3.2 Econometric Analysis

To identify factors influencing turmeric marketing performance, an Ordinary Least Squares (OLS) regression model was estimated. The dependent variable was marketing performance, proxied by net returns, while independent variables included:

- Socioeconomic factors: Age, gender, education, household size, marketing experience
- Institutional factors: Cooperative membership, access to extension services, distance to credit sources
- Operational factors: Income, transportation costs, storage costs, purchase price

The functional form of the OLS regression is specified as:

$$NR_i = \beta_0 + \beta_1 AGE_i + \beta_2 GENDER_i + \beta_3 EDU_i + \beta_4 EXT_i + \beta_5 EXP_i + \beta_6 HHS_i + \beta_7 COOP_i + \beta_8 DIST_i + \beta_9 INC_i + \beta_{10} TRANS_i + \beta_{11} STOR_i + \beta_{12} PC_i + \epsilon_i$$

Where:

- NR_i = Net returns of the i th marketer
- AGE_i = Age of marketer (years)
- $GENDER_i$ = Gender (1 = male, 0 = female)
- EDU_i = Education level (years of formal schooling)
- EXT_i = Frequency of extension visits per year
- EXP_i = Marketing experience (years)
- HHS_i = Household size (number of members)
- $COOP_i$ = Cooperative membership (1 = member, 0 = non-member)
- $DIST_i$ = Distance to source of credit (km)
- INC_i = Household or business income (Naira)
- $TRANS_i$ = Transportation cost (Naira)
- $STOR_i$ = Storage cost (Naira)
- PC_i = Purchase cost of turmeric (Naira)
- ϵ_i = Error term capturing unobserved factors
- Positive β coefficients indicate that the variable **increases marketing performance** (e.g., education or cooperative membership improving net returns).
- Negative β coefficients suggest that the variable **reduces performance** (e.g., higher transportation or storage costs reducing net returns).
- Statistical significance ($p < 0.05$) determines whether the effect of the variable is meaningful in explaining marketing outcomes.

3. Results and Discussion

3.1 Socioeconomic Characteristics

The analysis of socioeconomic characteristics of turmeric marketers in Southeast Nigeria reveals that the enterprise is predominantly dominated by women (65.1%), highlighting the critical role of female entrepreneurs in the spice value chain. More than half of the respondents (53.7%) were married, indicating

that turmeric marketing often serves as a key household livelihood activity and a supplementary source of income. The majority of marketers (63.5%) were within the economically active age bracket of 31–50 years, demonstrating that the sector relies on experienced and physically active individuals capable of sustaining labor-intensive marketing activities.

The average education level of respondents was 9 years, reflecting moderate formal education, which is sufficient to understand marketing processes, manage financial transactions, and engage with cooperative societies and credit institutions. Marketing experience averaged 32 years, suggesting that many respondents have extensive knowledge of supply chains, price trends, and operational strategies. Household size ranged from 4 to 6 members, providing labor support for marketing activities and contributing to operational flexibility.

Collectively, these characteristics indicate that turmeric marketing in Southeast Nigeria is largely undertaken by experienced, economically active women, whose education, experience, and family labor contribute to sustained profitability and resilience in the face of market and financial constraints. These findings are consistent with previous studies on small-scale agro-processing and marketing in the region (Ezra et al., 2017; Offor & Nse-Nelson, 2015).

3.2 Marketing Performance

The performance analysis demonstrates that turmeric marketing is a profitable and viable livelihood activity. The average total cost incurred by marketers was N74,290, while total revenue generated averaged N100,000, yielding an average net return of N25,710 per marketer. This translates into a marketing margin of 25.7%, indicating that a significant portion of the revenue is retained as gross profit after accounting for purchase costs. The marketing efficiency, calculated as the ratio of total revenue to total marketing cost, averaged 34.6%, demonstrating that marketing operations were effective in generating revenue relative to costs.

The rate of return, estimated at N1.35 per Naira invested, further confirms that turmeric marketing generates positive returns and provides a sustainable livelihood for smallholder marketers. These results underscore the potential of turmeric as a high-value crop, not only for household income but also for broader rural economic development.

3.3 Determinants of Marketing Performance

The determinants of turmeric marketing performance were assessed using a semi-log functional form of Ordinary Least Squares (OLS) regression, chosen for its robustness in modeling relationships between continuous outcomes and explanatory variables. The model exhibited a good fit with $R^2 = 0.6743$ and a statistically significant F-value of 9.05 ($p < 0.01$), indicating that the independent variables collectively

explain approximately 67% of variations in net returns.

The regression analysis identified both positive and negative determinants of marketing performance.

Positive determinants included:

- Education: Higher formal education significantly improved marketing performance, reflecting enhanced financial literacy, business management skills, and the ability to adopt efficient marketing strategies.
- Extension services: Frequent advisory visits from agricultural extension agents positively influenced performance by providing access to market information, best practices, and updated pricing strategies.
- Cooperative membership: Participation in cooperatives enhanced access to shared resources, credit facilities, and collective bargaining power, improving profitability and market efficiency.
- Income: Higher household or business income allowed marketers to reinvest in operations, improve storage, transportation, and purchase higher quality inputs, thereby enhancing net returns.

Negative determinants included:

- Distance to credit source: Longer travel distances to access microcredit and financial services reduced operational efficiency, increased transaction costs, and constrained reinvestment capacity.
- Transportation and storage costs: High logistical costs reduced net returns, highlighting the importance of infrastructure and efficient supply chains for marketing profitability.
- Purchase price of turmeric: Higher input costs directly reduced net returns, illustrating the sensitivity of profitability to supply-side price fluctuations.

Other variables, including age, gender, household size, and marketing experience, were found to be largely statistically insignificant, suggesting that while they may influence marketing decisions qualitatively, they do not have a strong quantitative impact on net returns in the studied context.

Overall, the results demonstrate that institutional support, access to information, cooperative networks, and financial capacity are key drivers of marketing performance, while logistical and cost-related constraints limit profitability. These findings provide actionable insights for policymakers, financial institutions, and development practitioners aiming to improve rural market efficiency and income generation among turmeric marketers in Southeast Nigeria.

4. Conclusion

The findings of this study demonstrate that turmeric marketing in Southeast Nigeria is both profitable and

socially significant, providing an important source of livelihood for rural households. The sector is predominantly dominated by married women within the economically active age group, reflecting the gendered nature of agro-processing and rural marketing in the region. Analysis of marketing performance revealed that turmeric trading generates positive net returns, healthy marketing margins, and operational efficiency, confirming its potential as a sustainable income-generating activity.

Key determinants enhancing marketing performance include education, which equips marketers with the necessary financial and managerial skills; access to extension services, which provides timely market information and technical guidance; cooperative membership, which strengthens social capital and access to resources; and income, which facilitates reinvestment in storage, transportation, and bulk purchasing. Conversely, high input costs, transportation and storage expenses, and distance to credit sources were identified as significant constraints that limit profitability and reduce market efficiency.

Overall, the study concludes that turmeric marketing is a viable and strategic livelihood activity with the potential to contribute meaningfully to rural economic development, women's empowerment, and poverty reduction. Enhancing institutional support, reducing logistical constraints, and promoting knowledge-sharing among marketers are critical for sustaining and expanding the sector.

5. Recommendations

Based on the findings, the study proposes the following practical and policy-oriented recommendations:

1. Encourage male participation in turmeric marketing: While women dominate the sector, increased male engagement can diversify labor, expand market coverage, and improve operational capacity. Gender-inclusive policies should aim to balance participation without displacing women's central role.
2. Strengthen extension services: Government agencies and development partners should provide regular training, market information, and technical guidance to marketers, enhancing their knowledge of pricing trends, storage practices, and credit utilization.
3. Promote cooperative formation and membership: Encouraging the formation and active participation in cooperatives can improve access to credit, bulk purchasing power, shared storage facilities, and collective bargaining, ultimately boosting profitability and efficiency.
4. Implement policies to reduce transportation and storage costs: Investments in rural infrastructure, road networks, and community-based storage facilities can

significantly lower operational costs, reduce post-harvest losses, and enhance marketing efficiency.

5. Launch awareness campaigns to stimulate turmeric demand: Promoting domestic and international market demand through marketing campaigns, trade fairs, and certification programs can expand sales opportunities and increase profitability for rural marketers.
6. Facilitate access to affordable credit: Financial institutions should design low-interest microcredit schemes and flexible loan products tailored to small-scale turmeric marketers, reducing the impact of distance and collateral requirements on credit access.

6. Contribution to Knowledge

This study makes several key contributions to the literature and practice of rural agro-processing and marketing in Nigeria:

1. It provides empirical evidence on the socioeconomic and institutional determinants of turmeric marketing performance, bridging a critical knowledge gap in high-value spice value chains.
2. By integrating descriptive statistics, profitability analysis, and econometric modeling, the study demonstrates the interplay between human capital (education), social capital (cooperative membership), and institutional support (extension services and credit access) in influencing marketing outcomes.
3. The findings highlight the role of logistics, costs, and infrastructure as critical constraints to profitability, providing actionable insights for policymakers and development partners seeking to enhance rural income generation.
4. The study establishes a framework for targeted interventions, including capacity-building programs, financial inclusion strategies, and cooperative strengthening initiatives, which can improve market efficiency and rural livelihoods.
5. Finally, it underscores the importance of gender-inclusive policies in agro-processing, recognizing the dominance of women in turmeric marketing while identifying strategies to enhance productivity and income across households.

By systematically evaluating both behavioral and structural determinants of marketing performance, this research contributes to a more nuanced understanding of value chain efficiency, offering practical guidance for the sustainable growth of turmeric marketing and agro-processing in Southeast Nigeria.

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