

Farmers' Perceptions of Marketing Functions Rendered by Cooperative Marketing Societies: A Five-Factor Model for Understanding Multi-Dimensional Service Quality

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Abstract- — This study examines farmers' perceptions of marketing functions and services rendered by Cooperative Marketing Societies (CMS) through comprehensive exploratory factor analysis of data from 620 farm-members. Principal Components Analysis with Varimax rotation identifies five distinct dimensions of CMS marketing functions: Market Operations and Transaction Efficiency, Pricing and Bargaining Effectiveness, Market Access and Infrastructure Support, Post-Harvest and Quality Support Services, and Information and Financial Support Services. The findings reveal that farmers rate infrastructure support (mean = 4.30) and storage facilities (mean = 4.23) most favorably, while expressing moderate satisfaction with pricing transparency (mean = 2.69) and income impact (mean = 3.28). Cluster analysis segments farmers into three groups: 62.4% highly satisfied, 23.2% moderately satisfied, and 14.4% less satisfied with CMS functions. The five-factor model explains 64.183% of cumulative variance, establishing a robust framework for understanding CMS service quality and performance. The study provides evidence-based insights for strengthening cooperative marketing functions and designing targeted interventions to enhance farmer satisfaction across service dimensions.

Key Words: Cooperative Marketing Societies, Marketing Functions, Service Quality, Five-Factor Model, Farmer Satisfaction, Post-Harvest Support, Market Infrastructure.

I. INTRODUCTION

Agricultural marketing encompasses a diverse set of functions and services essential for connecting farmers to consumers and capturing value along the supply chain. Smallholder farmers in developing economies typically face substantial challenges in accessing these marketing functions independently, including weak market infrastructure, limited access to grading and standardization services, inadequate storage facilities, information asymmetries, and constraints in financing marketing activities. These deficiencies result in post-harvest losses, price volatility exposure, and limited ability to meet buyer quality specifications.

Cooperative Marketing Societies have developed as organizational platforms for delivering integrated marketing functions and services. CMS typically provide procurement services, facilitate price discovery and negotiation, manage storage and transportation logistics, implement grading and standardization protocols, supply market information, and deliver credit services for marketing activities. The effectiveness of CMS depends critically on the quality and

comprehensiveness of these functions and how well they address farmer needs.

Understanding farmers' perceptions of CMS marketing functions is essential for several reasons. First, farmer satisfaction with specific services directly influences member participation and loyalty to cooperative institutions. Second, farmers' evaluations reflect the practical utility and reliability of services from user perspectives.

Third, identifying which functions are performing well and which require improvement provides guidance for CMS strengthening and performance improvement initiatives.

This study addresses three research questions: (1) What are the underlying dimensions of CMS marketing functions as perceived by farmers? (2) How do farmers evaluate CMS performance across different service dimensions? (3) What distinct farmer satisfaction segments exist, and what are their characteristic perception profiles?

II. LITERATURE REVIEW

1. Marketing Functions and Supply Chain Efficiency

Efficient marketing functions are foundational to agricultural value chain development. Marketing functions encompass a broad range of activities including product aggregation, quality assurance, market information provision, logistics coordination, and transactional facilitation. Bhuyan (2007) demonstrates that farmer satisfaction with cooperative marketing services depends on the breadth and quality of functions delivered, with integrated service provision outperforming single-function cooperatives. Poulton et al. (2010) document that effective marketing function delivery requires institutional coordination, technical capacity, and market linkages that individual smallholders cannot achieve independently. Post-harvest handling and logistics represent critical marketing functions in agricultural systems. Affognon et al. (2015) estimate that post-harvest losses account for 5-30% of agricultural production value in sub-Saharan Africa, with significant variation by crop and production system. They emphasize that improved post-harvest infrastructure, including storage facilities and transportation networks, can reduce losses and improve market access.

Recent literature highlights the importance of procurement efficiency and timeliness in agricultural marketing. Jooste et al. (2017) analyze fresh produce supply chains and find that timely procurement and product handling are critical success factors affecting both product quality and farmer satisfaction. They demonstrate that cooperatives with systematic procurement protocols achieve 20-25% better product quality retention and higher farmer satisfaction than informal arrangements. Transportation services represent another essential function shaping farmer experiences. Holden (2018) documents that reliable transportation infrastructure and services significantly reduce transaction costs and enable farmers to access higher-value markets.

2. Quality Assurance and Standardization Functions

Grading and standardization services represent critical marketing functions that enhance product marketability and enable price premiums. Holloway et al. (2000) find that farmers with access to standardization and grading services realize 15-25% higher prices than those selling ungraded produce. Standardization reduces buyer uncertainty, facilitates bulk transactions, and enables market expansion to institutional and export buyers. Kerembera et al. (2015) demonstrate that improved product quality through standardization increases market access and reduces marketing margins, benefiting both farmers and buyers. Packaging and handling practices are interrelated with quality maintenance. Ntabe et al. (2017)

analyze vegetable marketing supply chains and find that appropriate packaging materials and techniques reduce post-harvest losses by 30-40% and improve product acceptance in urban markets. These functions are particularly important for perishable products where quality degradation occurs rapidly.

3. Pricing Mechanisms and Bargaining Effectiveness

Transparent pricing mechanisms represent fundamental requirements for farmer satisfaction and sustainable cooperative marketing. Reardon and Barrett (2000) establish that information asymmetries regarding prices and market conditions create opportunities for middlemen exploitation. Cooperatives that implement transparent auction or competitive bidding systems can increase farmer prices by 10-20% relative to private traders (Develtere et al., 2008). Farmer bargaining power is strengthened through collective marketing arrangements that aggregate supply and enable direct buyer negotiations. Bijman et al. (2012) demonstrate that cooperatives with stronger negotiating positions achieve better contract terms and more stable price relationships with buyers. However, they emphasize that bargaining effectiveness depends on supply consistency, product quality standardization, and institutional credibility.

4. Payment Systems and Financial Services

Timely payment is a critical marketing function affecting farmer cash flow and agricultural productivity. Prompt payment enables farmers to invest in farm inputs, manage household expenses, and participate in subsequent marketing cycles. Chirwa and Dorward (2013) find that delayed payment by agricultural buyers constrains farmer production planning and input adoption. They demonstrate that cooperatives providing prompt payment mechanisms strengthen member attachment and participation. Marketing credit services enable farmers to finance input purchases and access improved production technologies. Nagarajan and Meyer (2005) document that effective agricultural credit services, particularly input credit linked to cooperative marketing arrangements, improve farm productivity by 20-30% and increase agricultural marketed surplus. However, Mersland and Ø. Strøm (2009) emphasize that credit service effectiveness depends on appropriate design, transparent interest rates, and effective repayment enforcement.

5. Market Information and Knowledge Services

Access to timely and accurate market information is essential for farmer marketing decisions. Goyal (2010) demonstrates that farmers with access to market price information achieve 8-15% higher prices by timing market sales more effectively and avoiding sales during harvest peaks. Information services reduce search costs, enable better market identification, and

facilitate demand-responsive production. Information technology innovations have expanded CMS capacity to deliver market information services. Mwalukasa and Kiiza (2016) document that mobile phone-based agricultural information services improve farmer knowledge of market prices, buyer requirements, and emerging opportunities. They find that farmers utilizing mobile information services increase marketed surplus by 25-35% and improve product quality alignment with buyer preferences. However, Munyua et al. (2015) emphasize that information service effectiveness requires content reliability, accessibility to disadvantaged farmers, and integration with other marketing services.

6. Farmer Satisfaction with Cooperative Marketing Services

Farmer satisfaction with cooperative marketing services reflects the perceived value and performance of delivered functions. Guthiga and Onsando (2006) demonstrate that farmers with access to multiple integrated marketing services through cooperatives express significantly higher satisfaction than those relying on informal markets. They identify service reliability, payment timeliness, and price competitiveness as primary satisfaction drivers. Baser and Morgan (2008) emphasize that satisfaction with cooperative services depends on farmers' expectation levels, prior experiences, and comparisons to alternative marketing channels. They find that farmer satisfaction is heterogeneous—some members value operational efficiency and payment systems highly, while others prioritize infrastructure access and quality support. Deng et al. (2010) demonstrate that satisfaction is positively correlated with membership duration, suggesting that long-term experience with cooperative services leads to more nuanced and realistic satisfaction assessments.

III. METHODOLOGY

1. Study Design and Sampling

This study employed a cross-sectional quantitative research design utilizing exploratory factor analysis and cluster analysis. Data were collected from 620 farm-members participating in CMS, selected through systematic stratified sampling proportionate to membership distribution across participating cooperatives. The sample was drawn from multiple CMS member institutions, ensuring representation across diverse cooperative contexts and geographic locations.

2. Measurement of Marketing Functions

Farmers' perceptions of CMS marketing functions were assessed through 14 indicator variables measured on 5-point Likert scales: (1) Timeliness of produce procurement, (2) Fairness and transparency in pricing, (3) Accessibility to

market yards and facilities, (4) Effectiveness of auction/tender sale processes, (5) Transportation services for produce, (6) Availability of grading and standardization services, (7) Availability and use of packaging materials, (8) Adequacy of storage/godown facilities, (9) Price competitiveness versus private traders, (10) Promptness in payment after sale, (11) Access to marketing-related information, (12) Effectiveness of marketing loans and financial support, (13) CMS role in improving farmer bargaining power, and (14) Impact of marketing practices on overall farm income. These items were designed to comprehensively capture operational, infrastructure, quality, pricing, information, and financial dimensions of CMS marketing functions.

3. Data Analysis Procedures

Data analysis proceeded through four sequential stages. First, Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity assessed appropriateness for factor analysis. Second, Principal Components Analysis with Varimax rotation identified underlying dimensions of marketing functions. The Kaiser criterion (eigenvalues > 1.0) guided factor retention. Third, descriptive statistics and one-sample t-tests examined mean perceptions and statistical significance. Fourth, K-means cluster analysis using extracted factor scores identified distinct farmer satisfaction segments. Cluster analysis employed iterative algorithms to minimize within-cluster variance and maximize between-cluster separation, with optimal cluster number determined through examination of cluster centers, sizes, and interpretability.

IV. RESULTS

1. Factor Analysis Appropriateness Assessment

The Kaiser-Meyer-Olkin value of 0.684 exceeded the minimum acceptable threshold of 0.60, indicating moderate sampling adequacy. Bartlett's Test of Sphericity yielded $\chi^2 = 2420.363$ (df = 91, $p = 0.000$), confirming significant inter-correlations among variables and justifying factor analysis. These results provided robust statistical foundation for exploring underlying factor structure.

2. Five-Factor Solution and Factor Interpretations

Principal Components Analysis with Varimax rotation yielded five factors explaining 64.183% of cumulative variance. The Kaiser criterion (eigenvalues > 1.0) guided retention of these five components. Before rotation, factors explained 24.774%, 12.915%, 10.045%, 8.721%, and 7.728% of variance respectively. After rotation, variance was more evenly distributed (16.658%, 14.250%, 11.640%, 11.578%, and 10.057%), enhancing interpretability while maintaining cumulative explanation of 64.183%.

Factor 1: Market Operations and Transaction Efficiency (16.658% variance). This dimension encompassed timeliness of procurement (loading = 0.809), effectiveness of auction processes (0.797), promptness of payment (0.628), and income impact (0.524). The factor captured operational aspects of CMS marketing functions.

Factor 2: Pricing and Bargaining Effectiveness (14.250% variance). This factor included fairness and transparency in pricing (0.767), price competitiveness versus traders (0.672), and bargaining power improvement (0.586). It reflected pricing mechanisms and collective negotiation effectiveness.

Factor 3: Market Access and Infrastructure Support (11.640% variance). This dimension encompassed accessibility to market facilities (0.812), transportation services (0.618), and storage facility adequacy (0.593). It captured physical and logistical support functions.

Factor 4: Post-Harvest and Quality Support Services (11.578% variance). This factor included grading and standardization availability (0.749) and packaging material availability (0.612). It reflected quality assurance and product enhancement functions.

Factor 5: Information and Financial Support Services (10.057% variance). This dimension encompassed access to marketing information (0.738) and effectiveness of marketing loans (0.634). It captured knowledge and credit-related marketing support functions.

Note: F1 = Market Operations and Transaction Efficiency; F2 = Pricing and Bargaining Effectiveness; F3 = Market Access and Infrastructure Support; F4 = Post-Harvest and Quality Support; F5 = Information and Financial Support

3. Descriptive Analysis of Marketing Function Perceptions

All 14 marketing function variables demonstrated statistically significant mean values ($p < 0.001$), indicating non-neutral farmer opinions. Infrastructure-related functions received the highest ratings: accessibility to market facilities ($M = 4.30, \sigma = 1.066, t = 30.290$) and storage adequacy ($M = 4.23, \sigma = 1.094, t = 27.908$). Operational functions were also favorably rated: promptness of payment ($M = 3.93, \sigma = 1.030$), transportation services ($M = 3.86, \sigma = 0.913$), and procurement timeliness ($M = 3.65, \sigma = 0.855$). However, pricing transparency ($M = 2.69, \sigma = 1.134$) and income impact ($M = 3.28, \sigma = 1.621$) received notably lower ratings, suggesting limitations in price communication and perceived income benefits.

4. Farmer Segmentation by Marketing Function Satisfaction

K-means cluster analysis identified three distinct farmer satisfaction segments. Cluster 1 ($n = 144, 23.2\%$) represented moderately satisfied farmers with mean scores ranging from 3.57 to 3.79 across the five dimensions. Cluster 2 ($n = 89, 14.4\%$) comprised the least satisfied segment with consistently low scores (2.64-2.83), particularly regarding information and financial services ($M = 2.64$) and pricing effectiveness ($M = 2.65$). Cluster 3 ($n = 387, 62.4\%$) represented the highly satisfied group with strong ratings across all dimensions, particularly for market infrastructure support ($M = 4.57$) and post-harvest services ($M = 4.39$).

Table 1. Rotated Component Matrix: CMS Marketing Functions

Variables	F1	F2	F3	F4, F5
Timeliness of produce procurement	0.809			
Effectiveness of auction/tender sale	0.797			
Fairness and transparency in pricing		0.767		
Accessibility to market yards/facilities			0.812	
Transportation services for produce			0.618	
Grading and standardization services				0.749
Access to marketing information				0.738

Table 2. Cluster Centers: Farmer Satisfaction Segments

Dimensions	C1 (n=144)	C2 (n=89)	C3 (n=387)
Operations & Transaction	3.79	2.74	4.25
Pricing & Bargaining	3.70	2.65	4.14
Market Access & Infrastructure	3.66	2.83	4.57
Post-Harvest & Quality	3.62	2.79	4.39
Information & Financial	3.57	2.64	4.17

V. DISCUSSION

1. The Five-Factor Model of CMS Marketing Functions

The identification of five distinct dimensions of CMS marketing functions reflects the multifaceted and integrated nature of cooperative marketing services. The factor structure reveals that farmers do not evaluate CMS as a monolithic entity, but rather assess different functional areas according to specific performance criteria (Baser and Morgan, 2008). The Market Operations and Transaction Efficiency factor captures farmers' focus on operational reliability and timely execution, aligning with findings by Jooste et al. (2017) that procurement timeliness and payment promptness are critical determinants of farmer satisfaction. The Pricing and Bargaining Effectiveness factor underscores farmers' persistent concerns about price realization and fair treatment in pricing mechanisms, consistent with research by Reardon and Barrett (2000) showing that information transparency and competitive pricing are fundamental requirements for farmer trust in cooperative arrangements.

The Market Access and Infrastructure Support factor reflects the critical importance of physical infrastructure and logistics services emphasized in recent literature. Affognon et al. (2015) document that access to appropriate storage, transportation, and market facilities is essential for reducing post-harvest losses and enabling market participation. The Post-Harvest and Quality Support Services factor validates findings by Holloway et al. (2000) and Kerembera et al. (2015) that grading, standardization, and quality enhancement services significantly improve market access and price realization. The Information and Financial Support Services factor reflects the integrated knowledge and credit services increasingly recognized as essential for enabling farmer market participation and productivity improvement (Goyal, 2010; Mwalukasa and Kiiza, 2016).

2. Asymmetric Satisfaction Across Service Dimensions

A notable finding is the asymmetric pattern of farmer satisfaction across different CMS marketing functions. Infrastructure services (accessibility and storage) received the highest satisfaction ratings, while pricing transparency received significantly lower ratings. This pattern aligns with research by Deng et al. (2010) suggesting that farmers distinguish between concrete, measurable benefits (infrastructure access) and more abstract or subjective dimensions (pricing fairness). The particularly low rating for pricing transparency ($M = 2.69$) raises concerns about CMS communication effectiveness. Bijman et al. (2012) emphasize that transparent pricing mechanisms are essential for farmer confidence and satisfaction. The moderate ratings for information and financial

services suggest that CMS face challenges in knowledge dissemination and credit service quality, findings consistent with Munyua et al. (2015) regarding the complexity of delivering effective information services.

3. Farmer Segmentation and Service Improvement Opportunities

The three-cluster segmentation reveals heterogeneous farmer satisfaction with distinct improvement opportunities for each segment. The highly satisfied majority (62.4%) demonstrates that a substantial portion of farmers perceive CMS marketing functions as effective across multiple dimensions. This group provides opportunities for identifying best practices and service strengths that can be systematized and scaled. The moderately satisfied segment (23.2%) represents an important opportunity group—farmers whose satisfaction could potentially be elevated through targeted improvements in specific functions, particularly pricing communication and financial services. The less satisfied segment (14.4%), while smaller, points to systemic service gaps that must be addressed to prevent cooperative defection and maintain institutional viability. Guthiga and Onsando (2006) note that even small dissatisfied farmer segments can undermine cooperative sustainability through negative word-of-mouth and reduced participation.

4. Strategic Implications for CMS Strengthening

The findings suggest several strategic priorities for CMS service improvement. First, CMS should strengthen pricing communication and transparency mechanisms, given the consistently low satisfaction with pricing fairness. Implementation of automated pricing information systems and improved transparency in auction mechanisms, as recommended by Holden (2018), could enhance farmer confidence. Second, CMS should expand financial services capacity, particularly marketing credit services, which Nagarajan and Meyer (2005) demonstrate can substantially increase farmer productivity and marketed surplus. Third, CMS should invest in information technology infrastructure to improve market information accessibility and timeliness, utilizing approaches documented by Mwalukasa and Kiiza (2016). Fourth, while infrastructure services are performing well, maintenance and capacity expansion remain important to sustain farmer satisfaction. Finally, differentiated service strategies addressing distinct farmer segments could improve overall effectiveness—offering enhanced credit and information services to moderately satisfied farmers while investigating specific service gaps affecting less satisfied farmers.

VI. CONCLUSION

This study establishes that farmers' perceptions of Cooperative Marketing Society marketing functions are multidimensional, encompassing five distinct but interrelated service areas: Market Operations and Transaction Efficiency, Pricing and Bargaining Effectiveness, Market Access and Infrastructure Support, Post-Harvest and Quality Support Services, and Information and Financial Support Services. The five-factor model explains 64.183% of cumulative variance in farmer opinions, providing a robust framework for understanding CMS performance from farmer perspectives.

Farmers express highest satisfaction with infrastructure services and operational reliability but demonstrate notable dissatisfaction with pricing transparency and perceived income impacts. The identification of three distinct satisfaction segments indicates heterogeneous farmer experiences and needs, suggesting that one-size-fits-all service strategies are inappropriate. Instead, CMS should pursue differentiated approaches that strengthen weak service areas while capitalizing on functional areas of strength.

Future research should conduct comparative institutional analysis to identify characteristics of high-performing CMS across service dimensions, employ qualitative methodologies to understand specific barriers facing less satisfied farmers, and examine longitudinal changes in farmer satisfaction following CMS service improvements. Such investigations will contribute to evidence-based strategies for strengthening cooperative marketing functions and enhancing farmer livelihoods through more effective institutional arrangements.

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