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Development of A Standardized Scale to Assess Marketing Effectiveness of Farmer-Producer Organisations (FPOs)

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HIGHLIGHTS

- The scale consists of 48 items across nine dimensions assessing the marketing effectiveness of FPOs.
- Relevancy testing, item analysis, EFA, split-half reliability, Cronbach's alpha, composite reliability and convergent validity together confirmed validity of the scale.
- The scale can be further used to assess, compare, and improve FPO marketing performance across regions and interventions.

ARTICLE INFO

Keywords: Farmer Producer Organizations (FPOs), Marketing effectiveness, Exploratory Factor Analysis (EFA), Average Variance Extracted (AVE), Composite Reliability (CR), Convergent validity, Scale development.

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ABSTRACT

The study was undertaken to develop a standardized instrument capable of accurately assessing the marketing effectiveness of Farmer-Producer Organisations (FPOs) through the summated rating technique. Initially, 18 dimensions were identified through literature review and expert consultation. Nine dimensions were chosen based on an Item–Content Validity Index of ≥ 0.80. Based on a comprehensive review of literature and consultations with stakeholders of FPOs, 156 statements related to marketing effectiveness were identified. Following extensive editing, 112 statements were selected, out of which 82 statements with relevancy scores greater than 0.85 were retained. Based on the t-test results, 48 statistically significant statements ($t > 2.145$, $p < 0.05$) were retained for scale development. A nine-dimensional structure with factor loadings greater than 0.60 was verified by exploratory factor analysis. With a strong split-half reliability coefficient (0.941) and Cronbach's alpha (0.944), the completed instrument demonstrated excellent reliability. The instrument exhibited strong convergent validity, as evidenced by a high overall Average Variance Extracted of 0.864 and an excellent Composite Reliability value of 0.996. The final 48 items were grouped under nine dimensions. For positive items, scores ranged from 5 (Strongly Agree) to 1 (Strongly Disagree), whereas negative items were evaluated using reverse scoring.

INTRODUCTION

Farmer-Producer Organisations have emerged as an important institutional innovation that enables marginal and small-scale growers in India to strengthen their involvement in agricultural markets. They function as member-owned collectives that enable farmers to aggregate produce, improve bargaining power, access input and output markets, and engage in value addition activities (Trebbin, 2014). Government organisations like the NABARD & SFAC have promoted FPOs as a critical strategy over the past ten years to combat the information gap, diversified landholdings, and poor market connections that have socially excluded smallholders

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(Government of India, 2013; Mitra, 2015). As a result, FPOs are now viewed as critical institutional mechanisms for enhancing market participation, improving price realization, and fostering rural entrepreneurship.

A key determinant of the success and sustainability of FPOs is their marketing effectiveness, which refers to their ability to optimise resources, expand market reach, secure better prices, and enhance member satisfaction (Kumari et al., 2022; Kumar et al., 2023; Singh et al., 2023). Studies have shown that FPOs engaged in diversified activities–including production, processing, manufacturing, and marketing–tend to exhibit higher levels of effectiveness compared to organizations focusing on a single function. For example, research indicates that FPOs involved in integrated operations demonstrate an effectiveness rate of 68.40%, emphasizing the importance of comprehensive strategies in achieving market performance (Anand et al., 2023). By aggregating produce and streamlining supply chains, FPOs not only facilitate better access to institutional buyers and retail markets but also improve overall market efficiency, reduce wastage, and foster sustainable agri-entrepreneurship (Parthiban et al., 2015; Waghmode et al., 2025).

Despite these achievements, FPOs face multiple challenges that hinder their marketing effectiveness. Structural issues such as inadequate storage and transport facilities, limited access to credit, and gaps in technical marketing expertise continue to constrain growth (Ghadge et al., 2023). Moreover, the absence of a centralized monitoring and tracking system for FPO operations has led to inefficiencies and uneven performance across regions. The organizational efficiency of FPOs, financial literacy among members, adoption of branding and packaging strategies, and utilization of digital marketing tools also play a crucial role in determining marketing success. Evidence suggests that FPOs with structured marketing plans, strong member engagement mechanisms, and effective negotiation strategies achieve higher financial sustainability and market competitiveness (Muniyoor & Pandey, 2024).

Evaluating the marketing effectiveness of FPOs through a standardized scale is therefore critical for both research and policy-making. Such an assessment provides measurable insights into operational strengths and weaknesses, identifies areas for improvement, and informs targeted interventions aimed at enhancing market outcomes for smallholder farmers (Jose et al., 2023). Ultimately, improving marketing effectiveness not only elevates the incomes and livelihoods of farmer members but also strengthens India's agricultural supply chain by ensuring quality, reducing wastage, and promoting efficient resource utilization. Developing and applying a robust marketing effectiveness scale is thus essential for supporting FPOs in realizing their full potential as drivers of agri-entrepreneurship and rural economic development.

The present study was undertaken with the objective of developing a standardized scale to assess the marketing effectiveness of Farmer Producer Organizations (FPOs).

METHODOLOGY

The present study was conducted during the period 2024-2025 with the objective of developing and standardizing a scale to measure the marketing effectiveness of FPOs. The scale was constructed using the summated rating technique proposed by Likert (1932) and Edwards (1969), a widely accepted method for developing reliable measurement instruments. Initially, eighteen dimensions related to the marketing effectiveness of FPOs were identified through an extensive review of literature and consultation with subject matter experts. These dimensions were circulated among 120 experts through a Google Form using a five-point continuum ranging from strongly agree to strongly disagree. Within two months, 64 responses were received. Based on a relevancy score criterion of ≥0.80, nine dimensions were retained.

$$\text{Relevance score (\%)} = \frac{\text{Total scores obtained on each items}}{\text{Maximum possible score}} \times 100$$

Subsequently, 156 statements corresponding to the nine dimensions were generated through literature review and expert consultation. Following the guidelines suggested by Likert (1932) and Edwards (1969), these statements were refined and reduced to 112 items. The refined statements were again circulated to the same group of experts through Google Forms, and 64 responses were obtained. Applying the relevancy threshold of ≥ 0.80, a total of 82 statements were selected for further analysis.

Item analysis was carried out using the Index of Discrimination (t-value) method suggested by Edwards (1969). The 82 statements were pre-tested with 60 Board of Directors (BOD) members from non-sample FPOs in Kerala and Odisha. Using purposive sampling, 10 FPOs from each state were selected based on the criterion that the organizations had completed at least three years since registration. From each selected FPO, three Board of Directors (BOD) members were randomly chosen as respondents, resulting in a total sample of 30 respondents from Kerala and 30 from Odisha. Each statement was measured on a five-point Likert scale, where positive statements were scored from 5 (strongly agree) to 1 (strongly disagree) and negative statements were reverse scored. Based on the discrimination analysis, 48 statements with significant t-values ($t > 2.145$, $p < 0.05$) were retained for the final scale. The reliability of the standardized scale was assessed using Cronbach's alpha and split-half reliability (Spearman–Brown coefficient), while convergent validity was used to establish the validity of the instrument. The results indicated that the developed scale possesses acceptable reliability and validity for measuring the marketing effectiveness of FPOs.

RESULTS

Determination of key dimensions

Based on the assessment of content validity, the key dimensions underlying the marketing effectiveness of FPOs were identified. This was carried out using the summated rating approach, which was designed by Likert (1932) and Edwards (1969). Based on an extensive review of relevant literature and consultations with professionals working with FPOs, eighteen dimensions related to the marketing effectiveness of FPOs were initially identified. To examine their relevance, a Google Form was circulated to 120 subject-matter experts from Deemed Universities, State Agricultural Universities, and national institutions such as ICAR and MANAGE. The experts were requested to rate each dimension using a five-point scale. Within

a period of two months, responses were received from 64 experts, and their feedback was analyzed to evaluate the relevance and reliability of each dimension. Dimensions that showed low reliability or poor relevance were excluded, and only those with a relevancy score of 0.80 or higher were retained following the criteria suggested by Polit and Beck (2006). Based on the relevancy score result nine key dimensions were finally identified for assessing the marketing effectiveness of FPOs: Production Scheduling, Procurement and Aggregation, Marketing Channel, Marketing Costs, Value Addition, Branding, Grading, Product Promotion, and Market Access.

Relevancy of the statements

Based on nine identified dimensions, a total of 156 statements related to the marketing effectiveness of Farmer-Producer Organisations (FPOs) were initially generated through an extensive review of literature and consultations with FPO experts. These statements were then carefully examined and refined using the 14 criteria suggested by Likert (1932) and Edwards (1969) for scale construction. During this preliminary editing process, repetitive and unclear statements were removed or modified. As a result, 112 statements that were clear & relevant were retained for further analysis.

The refined pool of 112 statements was then assessed to determine their significance in accurately representing the marketing effectiveness of FPOs across the nine dimensions. A Google Form was used to score each topic on a five-point relevance scale by 120 topic-specific experts from Deemed Universities, State Agricultural Universities, and national institutions like ICAR and MANAGE. Within a period of two months, responses were received from 64 experts, and their feedback was analyzed to evaluate the relevancy of each statement. Statements that demonstrated low reliability or limited relevance were removed. Only those items with a relevancy score of 0.80 or above were retained, following the guidelines suggested by (Polit & Beck, 2006; Edwards, 1969; Raj & Thomas, 2022) and followed in similar cases (Kumar et al., 2016; Shitu et al., 2018; Gupta et al., 2022: Kademani et al., 2025). Following this validation process, 82 statements were finalized and organized under nine dimensions for further analysis.

Item analysis (Index of discrimination)

The Index of Discrimination reflects how well an item distinguishes high- and low-effectiveness entrepreneurs. To analyze the discriminatory power of the items, the critical ratio (t-value) method recommended by Edwards (1969) was employed. A total of 82 statements developed to measure the marketing effectiveness of Farmer Producer Organizations (FPOs) were pre-tested with 60 Board of Directors (BOD) members from non-sample FPOs in Kerala and Odisha. The respondents were equally divided between the two states, with 30 BOD members from each. Through purposive sampling, 10 FPOs were selected in each state, and three BOD members from each FPO participated in the pre-test, making a total of 30 respondents per state. Each statement was rated on a five-point Likert scale, with positive statements scored from 5 to 1 and negative statements reverse-scored. After arranging respondents' total scores from highest to lowest, the upper 25 per cent and lower 25 per cent were selected for statement discrimination. These extreme groups offer a clearer contrast, enabling more precise identification of statements that effectively distinguish between high and low marketing effectiveness. The middle 50 per cent was excluded because their overlapping scores reduce sensitivity and weaken discrimination. To identify statements that effectively differentiated between higher- and lower-scoring respondents, t-values were computed for each statement using the standard critical ratio formula. After statistical analysis, 48 statements with t-values exceeding 2.145 at the 0.05 significance level were retained under nine key dimensions of FPO marketing effectiveness.

Scale standardization

To standardize the scale, both its validity and reliability were systematically tested and confirmed. Reliability of the scale was established to ensure consistency and stability of measurement. Internal consistency was assessed using Cronbach's Alpha, indicating the extent to which items measured the same construct. Additionally, split-half reliability was computed using the Spearman–Brown coefficient, confirming the dependability and reproducibility of the instrument. The results demonstrated that the instrument exhibited exceptional reliability. The measurement tool displayed remarkable internal consistency, with a Cronbach's alpha of 0.944. This finding is further supported by impressive split-half reliability coefficients, including Spearman–Brown at 0.941 and Guttmann at 0.930.

Validity is important for ensuring that a research instrument reliably measures the desired construct, allowing for meaningful and consistent outcomes (Singh, 2019). Convergent validity was established by conducting exploratory factor analysis using principal component extraction with varimax rotation, which clearly confirmed the underlying dimensions of marketing effectiveness among FPO members. Convergent validity, which is an important aspect of construct validity, refers to how well the items intended to measure the same concept are related to one another, showing that they reflect a common underlying idea. The scale is considered adequate when items show strong factor loadings ($\geq$0.50, preferably $\geq$0.70), AVE (Average Variance Extracted) exceeds 0.50, and CR is above 0.70, indicating reliable measurement of the construct (Cronbach & Meehl, 1955; Campbell & Fiske, 1959; Fornell & Larcker, 1981). The statements showed strong factor loadings (>0.70), with an Average Variance Extracted (AVE) of 0.864 and composite reliability of 0.996, exceeding the recommended thresholds for convergent validity (Hair et al., 2020). Therefore, the results confirmed good convergent validity, and the scale was finalised with 48 statements.

The bar chart shows the AVE scores over all of this nine dimensions of marketing effectiveness in FPOs, and all dimensions cross the 0.60 benchmark, which indicates that the scale has excellent convergent validity.

DISCUSSION

Strong validity and reliability has been demonstrated by the instrument. An excessive Cronbach's Alpha value of 0.944

Table 1. Descriptive statistics on FPOs' marketing effectiveness

S. No.	Statements	t-value	Extra-ction	R^2	AVE
I.	Production Scheduling (Planning and organizing the timing and quantity of agricultural production to optimize output and meet market demands efficiently.)				
1.	The production schedule is prepared before each crop season.	5.196*	.964	0.930	
2.	I believe that through effective production scheduling, our market competitiveness has increased.	5.000*	.961	0.923	
3.	Through advance production scheduling, we are able to seize the market opportunities.	3.655*	.990	0.979	0.931
4.	Our FPO undertakes regular scheduling of production activities.	5.000*	.969	0.939	
5.	The members of our FPO have received training in production scheduling.	4.898*	.940	0.883	
II	Procurement and Aggregation (The process of sourcing agricultural products from individual farmers and consolidating them into larger quantities for sale or distribution by Farmer Producer Organisations.)				
1.	I believe that aggregation helps our FPO negotiate better prices.	5.196*	.948	0.898	
2.	Our FPO has been able to provide timely payments to the farmers.	4.898*	.963	0.928	
3.	Our FPO has developed its own infrastructure for procurement and aggregation.	3.576*	.889	0.790	0.842
4.	Our FPO has designated collection centers.	3.576*	.866	0.749	
5.	Our FPO has a systematic mechanism for procurement of produce from the farmers.	3.655*	.929	0.863	
6.	Shared storage facilities provided by the FPO helps in reducing post-harvest losses.	3.464*	.908	0.824	
III	Marketing Channels (A marketing channel is the pathway through which goods or services flow from producers to consumers, encompassing various intermediaries such as wholesalers, retailers, and agents.)				
1.	The number of intermediaries in the marketing channel is few in our FPO.	5.196*	.900	0.810	
2.	Our FPO actively undertakes online marketing of the produce.	3.666*	.976	0.953	
3.	Our FPO employs multi-channel marketing strategies.	3.666*	.953	0.909	0.896
4.	Our FPO usually participates in exhibitions and trade fairs for marketing.	3.665*	.936	0.877	
5.	Our FPO undertakes door-to-door selling of produce.	4.898*	.964	0.929	
IV	Marketing Costs (The expenses incurred in promoting and selling products or services to customers by a FPO.)				
1.	I believe that the marketing costs incurred by our FPO are high.	4.700*	.870	0.756	
2.	Our FPO provides trainings for improving the marketing skills.	3.655*	.963	0.928	
3.	We collaborate with retail chains and wholesalers which cut our marketing costs.	5.000*	.989	0.978	0.896
4.	My FPOs allocate marketing budgets based on the anticipated sales.	5.000*	.967	0.935	
5.	Marketing budgets for our FPO is determined by assessing the market competition.	4.898*	.940	0.883	
V	Value addition (The numbers & types of value added products marketed by the FPOs.)				
1.	We undertake the production of value added products on a large scale.	3.665*	.874	0.764	
2.	Value added products have increased the profitability of the members.	3.576*	.963	0.928	
3.	I feel that value added products helps FPOs to meet specific market demands and preferences.	6.000**	.937	0.877	0.868
4.	The value added products helps us in capturing higher margins in competitive markets.	3.576*	.954	0.911	
5.	Value addition has enhanced the overall resilience of our FPO against market shocks.	4.898*	.936	0.876	
6.	Value addition has helped us in reducing post-harvest losses.	4.898*	.923	0.852	
VI	Branding (Creating a distinct identity for FPO products to differentiate them from competitors.)				
1.	Through a brand name, we are able to stand differentiated in the competitive market.	7.00**	.925	0.855	
2.	Branding facilitates effective communication of the FPO's mission and goals.	4.898*	.954	0.911	
3.	Branding has helped to command better pricing and improve our profitability.	3.655*	.936	0.875	0.810
4.	Branding has helped us in navigating many regulatory challenges and gaining government support.	3.665*	.914	0.835	
5.	Branding has fostered our collaboration with other stakeholders and industry partners.	3.665*	.756	0.572	
VII	Grading (Classifying farm products based on quality standards to meet consumer preferences and market requirements.)				
1.	Grading has enabled us to secure various certifications.	5.000*	.868	0.754	
2.	The pooled products are sorted and graded before marketing.	5.000*	.946	0.894	
3.	Grading has helped in maintaining consistency in quality, which builds trust with consumers.	5.196*	.964	0.930	0.862
4.	Grading has helped us in securing better prices for our produce in the market.	7.000**	.946	0.894	
5.	Grading has incentivized us to produce better quality produce.	4.898*	.915	0.837	
VIII	Product promotion (Promoting FPO products through various activities to increase awareness and drive sales.)				
1.	We undertake promotional activities to increase the visibility of the FPO products in the market.	3.655*	.861	0.741	
2.	We have been able to retain customers and ensure repeat purchases.	5.196*	.959	0.919	
3.	Through the promotional events, we have been able to gather feedback and insights from consumers.	4.898*	.936	0.876	0.830
4.	We align the promotional events with seasonal of high demand thereby maximizing the sales opportunities.	5.196*	.957	0.915	
5.	I believe that product promotion undertaken in our FPO has contributed to its marketing effectiveness.	4.898*	.837	0.701	

Table 1 contd...

S. No.	Statements	t-value	Extra-ction	R^2	AVE
IX	Market access (Availability of transportation and distribution facilities to ensure that the FPO products reach the target market efficiently.)				
1.	Access to different markets helps us to negotiate better terms with buyers and wholesalers.	5.196*	.900	0.811	
2.	Good market access has enabled us in achieving economies of scale.	4.898*	.911	0.830	
3.	Access to multiple markets provides us with real-time market intelligence and trends.	5.196*	.889	0.790	0.837
4.	Online marketing has expanded our market beyond local boundaries.	5.000*	.934	0.873	
5.	Online marketing is cost-effective marketing compared to the traditional methods.	5.196*	.940	0.884	
6.	We also use online platforms for product promotion and advertising.	4.370*	.900	0.811	
	Overall AVE = (0.931+0.842+0.896+0.896+0.868+0.810+0.862+0.830+0.837)/9 = 0.864				

Table 2. Reliability Statistics

Reliability Statistics			
Cronbach's Alpha	Part 1	Value	.927
		N of Items	24[a]
	Part 2	Value	.962
		N of Items	24[b]
	Total N of Items		48
Correlation Between Forms			.888
Spearman-Brown Coefficient		Equal Length	.941
	Unequal Length		.941
Guttman Split-Half Coefficient			.930

a. The items are: V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8, V_9, V_{10}, V_{11}, V_{12}, V_{13}, V_{14}, V_{15}, V_{16}, V_{17}, V_{18}, V_{19}, V_{20}, V_{21}, V_{22}, V_{23}, V_{24}.
b. The items are: V_{25}, V_{26}, V_{27}, V_{28}, V_{29}, V_{30}, V_{31}, V_{32}, V_{33}, V_{34}, V_{35}, V_{36}, V_{37}, V_{38}, V_{39}, V_{40}, V_{41}, V_{42}, V_{43}, V_{44}, V_{45}, V_{46}, V_{47}, V_{48}.

demonstrated its outstanding internal consistency, indicating that the items cooperate to capture the desired construct. Split-half reliability showed remarkable internal consistency, with Spearman-Brown (0.941) and Guttman coefficients (0.930) well above the established benchmarks (DeVellis, 2017). These results align with recent studies (Lade et al., 2024), adding further confidence to the robustness of the instrument. The factor analysis confirmed meaningful item-dimension relationships across nine factors, with loadings consistently above 0.60. The AVE value for each dimension was as follows: Production Scheduling (0.931), Procurement and Aggregation (0.842), Marketing Channels (0.896), Marketing Costs (0.896), Value Addition (0.868), Branding (0.810), Grading (0.862), Product Promotion (0.830), and Market Access (0.837). All dimensions demonstrated strong convergent validity, as indicated by loadings of factors above 0.70, an aggregate AVE of 0.864, & a CR of 0.996, exceeding recommended benchmarks & aligning with the findings of Meethal and Thomas (2024).

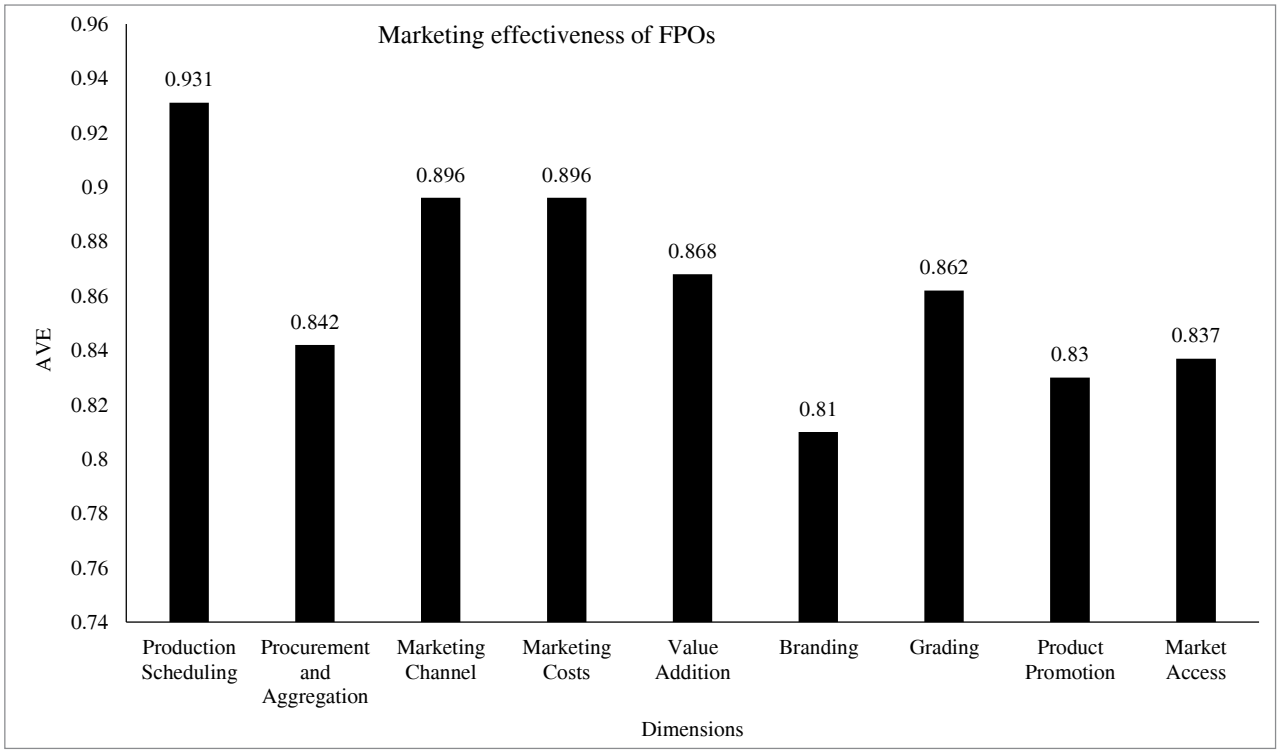

Figure 1. AVE values reflecting all nine dimensions associated with the marketing effectiveness of FPOs.

The final instrument consists of 48 carefully developed items designed to measure the marketing effectiveness of FPOs across nine key dimensions: Production Scheduling (5 items), Procurement and Aggregation (6 items), Marketing Channels (5 items), Marketing Costs (5 items), Value Addition (6 items), Branding (5 items), Grading (5 items), Product Promotion (5 items), and Market Access (6 items). The items were carefully validated using factor analysis, expert judgment, and reliability and validity tests, ensuring the scale is conceptually meaningful and empirically strong.

The designed instrument used to evaluate the marketing effectiveness of Farmer Producer Organizations (FPOs) is a useful tool for systematically reviewing and improving their marketing performance. By capturing members' experiences and perceptions in a structured manner, it enables researchers, policymakers, and FPO leaders to assess the efficiency and effectiveness of marketing practices, identify strengths and weaknesses, and make informed, data-driven decisions. The standardised measure allows for benchmarking across different FPOs, monitoring progress over time, and comparing results across regions, while also highlighting areas for improvement. Moreover, it supports the evaluation of training programs, capacity-building initiatives, and policy interventions aimed at strengthening FPOs' marketing capabilities. By keeping farmers' perspectives at the centre, the scale not only facilitates research but also provides practical insights to guide organisational development, improve competitiveness, and enhance the sustainability of FPOs in the agricultural market.

CONCLUSION

The study was carefully designed and validated to evaluate the marketing effectiveness of Farmer-Producer Organisations (FPOs). The developed scale covers nine key dimensions, namely Production Scheduling, Procurement and Aggregation, Marketing Channels, Marketing Costs, Value Addition, Branding, Grading, Product Promotion, and Market Access, providing a comprehensive assessment of FPO marketing functions. The results indicate that the measurement instrument demonstrates very high internal consistency, with a Cronbach's Alpha of 0.944 and strong split-half reliability coefficients (0.941 using the Spearman–Brown formula and 0.930 using the Guttmann method). In addition, the scale exhibits excellent convergent validity, supported by high factor loadings (above 0.70), a strong Average Variance Extracted (AVE = 0.864), and Composite Reliability (CR = 0.996). Among the dimensions, Production Scheduling, Marketing Channels, and Marketing Costs emerged as particularly influential. Overall, the validated scale serves as a reliable and practical tool to assess marketing performance, supporting policy decisions, organizational improvements, and member-focused strategies to strengthen FPO sustainability.

DECLARATION

Ethical approval and consent to participate: Informed consent was sought from the respondents.

Competing interests: No competing interests were declared.

Conflict of interest: No conflicts of interest among the authors.

The authors declare that during the preparation of this work, thoroughly reviewed, revised, and edited the content as needed. The authors take full responsibility for the final content of this publication.

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