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Determinants of Smallholder Oil Palm Farmer's Participation in The KBMJ Cooperative, Bosar Maligas

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ABSTRACT

Indonesia is the world's largest palm oil producer, where smallholder farmers play a strategic role in sustaining production and the global supply chain. The effectiveness of smallholder plantation management largely depends on the cooperative institutional performance, particularly in terms of the participation of cooperative members. This study aims to analyze the influence of service quality, motivation, and knowledge on cooperative members' participation in the Konsumen Bersatu Makmur Jaya Cooperative (KBMJ). The data were collected from 86 respondents selected through simple random sampling and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicate that service quality and knowledge have a positive and significant effect on cooperative members' participation, whereas motivation does not. These findings suggest that improving cooperative service performance and strengthening the knowledge of cooperative members regarding institutional benefits are more effective in enhancing their participation than relying solely on individual motivational factors

1. Introduction

Indonesia is the world's largest producer of crude palm oil (CPO), contributing 58% of global palm oil production in 2023 (Food and Agriculture Organization, 2024). This achievement underscores Indonesia's strategic role as a major supplier of vegetable oil in the international market. The export value of 21.64 million tons, equivalent to USD 20.65 billion, reflects national production capacity. The large production capacity is supported, among other things, by Indonesia's oil palm plantation area, which reaches approximately 15.17 million hectares (Kementerian Pertanian Republik Indonesia, 2024).

North Sumatra province is one of the regions that contributes significantly to national production with a total output of 5.02 million tons (BPS, 2024). Simalungun Regency is recorded as the center of oil palm plantations, covering approximately 39.168 hectares, or 7.99% of the province's total (BPS Sumatera Utara, 2024). One of the sub-districts in Simalungun Regency with relatively high area and productivity of smallholder plantations is Bosar Maligas Sub-district, with a total area of 3,564.12 hectares and production reaching 65,357.86 tons (BPS Kabupaten Simalungun, 2024).

The land ownership structure for oil palm in Indonesia comprises three main groups: state-owned large plantations, privately owned large plantations, and smallholder plantations. Among these three groups, smallholder plantations have the largest land area, totaling approximately 6.74 hectares, or 42.3% of the total national oil palm plantations (Direktorat Jenderal Perkebunan, 2024). This dominance in land ownership makes smallholder farmers a strategically important player in the palm oil supply chain and the sustainability of palm oil production in Indonesia.

Despite having dominant land ownership, smallholder farmers still face various constraints in increasing productivity. The average productivity of smallholder farmers is only 2.5 – 3 tons of CPO per hectare per year, which is still below the national average of 3.6–4 tons/ha/year (Direktorat Jenderal Perkebunan, 2024). This condition indicates the need for sustainable efforts to increase palm oil productivity.

One effort is the implementation of the Roundtable on Sustainable Palm Oil (RSPO) standard. RSPO is a global initiative involving many stakeholders regarding the sustainable production and use of palm oil (Roundtable on Sustainable Palm Oil, 2025). The implementation of RSPO can help reduce socioeconomic disparities between smallholder farmers and large companies by providing more equitable opportunities in a just palm oil supply chain (Pareira, 2021). Rahutomo *et al*., (2025) research also shows that smallholder farmers certified by RSPO achieve higher palm oil productivity than non-certified farmers.

The successful implementation of RSPO for smallholder farmers heavily relies on organizing them into institutions such as farmer groups or cooperatives. This institution plays an important role in providing technical assistance, training, and more efficient and coordinated group certification mechanisms. According to Brandi *et al*., (2015), cooperatives play an important role in managing the RSPO group certification scheme process, from training and compliance monitoring to the distribution of economic benefits to members.

The existence of cooperatives not only strengthens farmers' social and economic networks but also enhances their capacity to manage plantation businesses sustainably. Rahayu & Harahap (2018) show that cooperatives strengthen farmers' competitiveness by providing access to capital, market information, and technical assistance, enabling them to improve cultivation efficiency and product quality. Additionally, Saputra & Ardiansyah (2023) also emphasize that strengthening cooperative institutions is necessary for these various services to operate more effectively and provide optimal economic benefits for all members.

One of the cooperatives actively implementing the RSPO standards is the Bersatu Makmur Jaya Consumer Cooperative (KBMJ). This cooperative is located in Bosar Maligas Sub-district, Simalungun Regency, and was established in 2020 as a platform for independent oil palm smallholders to implement RSPO standards. The establishment and development of this cooperative were initiated by Unilever as part of efforts to promote the implementation of sustainable palm oil practices among independent smallholders. Currently, KBMJ has 1,277 members, with the largest number in Bosar Maligas Sub-district, totaling 585. Based on cooperative data, the total area of RSPO-certified land managed by members reaches 2,276.14 hectares.

The success of cooperatives depends heavily on the level of participation by cooperative member farmers, which reflects their sense of ownership and responsibility for organizational sustainability. Participation theory and social capital theory suggest that cooperative member farmers' involvement is shaped by trust, interaction quality, and perceived benefits (Putnam *et al*., 1994). Meanwhile, the Theory of Planned Behavior explains that participatory behavior

is influenced by attitudes, motivation, and knowledge (Ajzen, 1991). In cooperative settings, service quality enhances cooperative members' satisfaction and trust, motivation drives their willingness to participate actively, and cooperative knowledge strengthens their understanding of their rights, obligations, and institutional benefits. Empirical studies by Umiyati & Ristiyanti (2020); Anggraeny *et al*., (2021) confirm that service quality, motivation, and knowledge significantly influence cooperative members' participation.

However, previous studies on cooperative participation have generally been broad, rather than specifically focused on the RSPO context within independent smallholder oil palm cooperatives. The RSPO context is rarely positioned as the main analytical framework, resulting in a limited understanding of the key factors driving cooperative members' participation in fulfilling sustainability requirements. Based on this background, this study aims to analyze the influence of service quality, cooperative members' motivation, and their knowledge of cooperatives on the level of participation in the Konsumen Bersatu Makmur Jaya Cooperative (KBMJ). Additionally, this study identifies the most dominant factors driving cooperative members' participation. The results of this research are expected to provide an empirical overview and practical recommendations for smallholder palm oil cooperatives in increasing the participation of cooperative members, so that palm oil management can be more effective and sustainable.

2. Methodology

Location Determination Method. This research was conducted at the Bersatu Makmur Jaya Consumer Cooperative (KBMJ), located in Bosar Maligas Sub-district, Simalungun Regency, North Sumatra Province. The location was chosen intentionally, considering that this cooperative is the institution overseeing members in the RSPO certification process. This research activity was conducted in July 2025.

Respondent Determination Method: The population in this study consists of members of KBMJ Cooperative in Bosar Maligas Sub-district, totaling 585 people. The sample size was determined using Slovin's formula with a 10% (0.1) margin of error. Arizal & Agus (2019), state that a 10% error level is still acceptable in social research involving relatively large and homogeneous populations. In this study, the population consists of cooperative members who share relatively similar characteristics in terms of type of farming activities, production systems, and institutional affiliation within the same cooperative. Therefore, a 10% margin of error is considered adequate to obtain representative data while accounting for research time and resource limitations. The Slovin formula is expressed as follows:

$$n=\frac{N}{1+N(e)^2}$$

Explanation:
n = Number of Samples
N = Population Size
e =Tolerated error rate (margin of error)

By substituting the values into the formula, we get:

$$n=\frac{585}{1+585(0.1)^2}=\frac{585}{1+5.85}=\frac{585}{6.85}=85.40\approx 86.$$

Based on the calculation using Slovin's formula, the sample size for this study was set at 86 people. This number is considered sufficient to adequately represent the population and obtain accurate analysis results. The sample was selected using simple random sampling, in which each member of the population has an equal chance of being selected (Sugiyono, 2022).

This research used primary and secondary data. Primary data were obtained through observation and interviews using a questionnaire. Secondary data was obtained from scientific articles, reports, and relevant documents from the KBMJ Cooperative. The research instrument is a closed questionnaire using a five-point Likert scale, with answer ranges from a score of 1 (strongly disagree) to 5 (agree). This scale was chosen because it effectively captures respondents' perceptions (Sugiyono, 2022). Additionally, a five-point scale is considered efficient and reliable for social research because it can adequately capture response variations (Kusmaryono *et al.,* 2022).

Data analysis in this study was conducted using the Partial Least Squares–Structural Equation Modeling (PLS-SEM) method with the assistance of SmartPLS version 4.0 software. This method was chosen because it can analyze the relationships between latent variables simultaneously, does not require normal data distribution, and is suitable for use with relatively small sample sizes (Hair *et al.,* 2019). In this study, service quality, motivation, and knowledge are conceptualized as independent exogenous constructs that directly influence the participation of cooperative members, without the inclusion of mediation or moderation effects.

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2.1 Conceptual Model

The selection of variables in this study is based on theoretical foundations and previous empirical findings that explain the factors influencing cooperative member participation. According to Azizah *et al*., (2024) and Sholekhah *et al*., (2024), service quality has a positive and significant effect on cooperative members' participation, as responsive and professional

services increase member satisfaction and engagement in cooperative activities. Arini & Setiaji (2020) found that member motivation has a positive and significant effect on participation in cooperative activities, as intrinsic motivation, the need for achievement, and the need for affiliation enhance organizational involvement. Furthermore, member knowledge (X3) regarding cooperative principles and mechanisms also influences participation, as adequate understanding fosters awareness of the importance of active contribution within the organization. Musfiroh & Kurniawan (2016) found that knowledge of cooperative principles and mechanisms has a positive and significant effect on member participation, since a better understanding increases awareness of members' rights and obligations. Based on these findings, it is hypothesized that service quality, motivation, and member knowledge positively influence cooperative member participation.

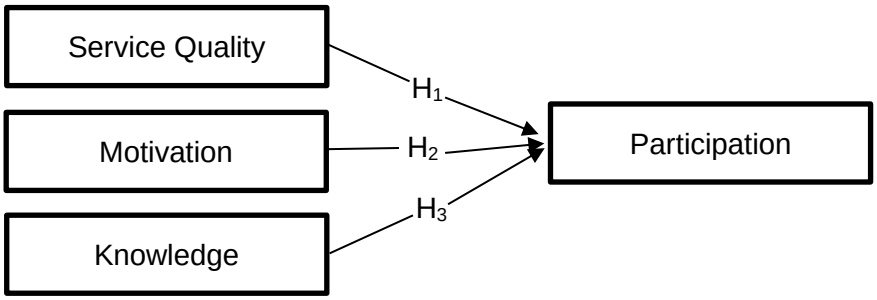

Figure 1. Conceptual Model

Based on the conceptual model above, the following hypotheses can be formulated:

H_1: Service quality has a positive and significant influence on the participation of members of the United Consumer Cooperative Makmur Jaya (KBMJ) in Bosar Maligas Sub-district.

H_2: Motivation has a positive and significant influence on the participation of members of the United Consumer Cooperative Makmur Jaya (KBMJ) in Bosar Maligas Sub-district.

H_3: Knowledge has a positive and significant influence on the participation of members of the United Consumer Cooperative Makmur Jaya (KBMJ) in Bosar Maligas Sub-district.

To ensure clear operationalization of each variable, each construct in this study is further elaborated into several measurable indicators derived from relevant theories and prior empirical studies. These indicators serve as the basis for developing the research questionnaire, enabling the measurement of service quality, motivation, knowledge, and member participation systematically and objectively among KBMJ members. The measurement indicators for each variable are presented in Table 1.

Table 1. Latent Variable Indicator

Variable	Indicators	Source
Service Quality (X1)	X1.1. Reliability X1.2. Responsiveness X1.3. Assurance X1.4. Empathy X1.5. Tangibles	Parasuraman *et al* (1991)
Motivation (X2)	X2.1. Need for Achievement X2.2. Need for Power X2.3. Need for Affiliation	McClelland (1987)
Knowledge (X3)	X3.1. Members' Understanding of Cooperatives X3.2. Benefits of Cooperatives X3.3. Rights and Obligations of Members	Damayanti (2020);Halim (2024)
Participation (Y)	Y1.1. Member Participation in the Annual Members' Meeting (RAT) Y1.2. Member Participation in Capitalization Y1.3. Member Participation in Using Cooperative Services	Sa'adah & Kamalia (2023)

2.2 Instrument Test

To ensure the feasibility of the research instrument, a pilot test was conducted involving 30 cooperative members. The results of the preliminary outer model evaluation are presented in Figure 2 below.

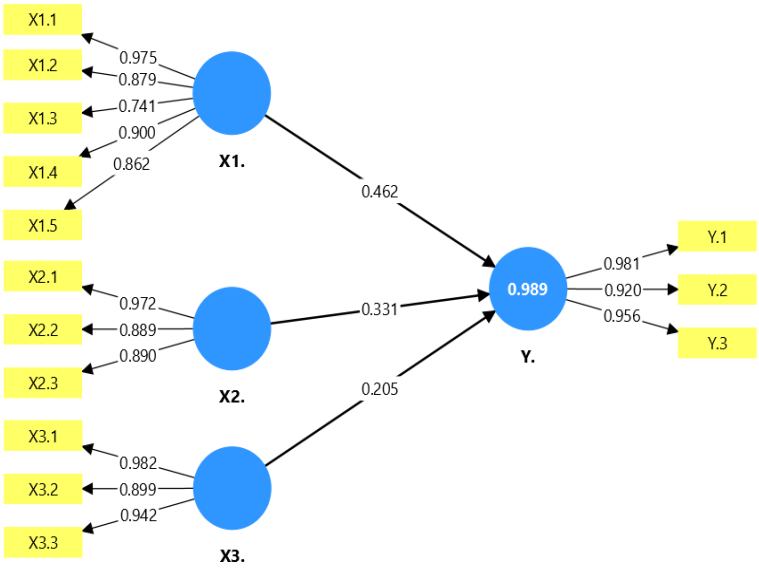

Figure 2. Factor Loadings (Validity Test)

Prior to the main survey, a pilot test was conducted involving 30 cooperative members to assess the validity and reliability of the research instrument. The PLS analysis shows that

all indicators of service quality (X1), motivation (X2), knowledge (X3), and participation (Y) have loading factor values above 0.70, indicating good convergent validity. These results confirm that each indicator adequately represents its respective construct and that the questionnaire is statistically appropriate for use in the main data collection involving 86 respondents.

2.3 Evaluation of the Measurement Model (Outer Model)

2.3.1 *Validity Test*

The validity test aims to assess the extent to which the indicators are able to measure the latent constructs under study. In this research, validity testing was conducted through convergent validity and discriminant validity.

a. Convergent validity was evaluated using factor loadings and Average Variance Extracted (AVE) values. An indicator is considered valid if its factor loading is at least 0.70, indicating a strong relationship between the indicator and the latent construct it measures (Hair *et al*., 2019). However, according to Cheung *et al*., (2024), factor loadings of 0.50 or higher remain acceptable, as they indicate a positive and sufficiently strong relationship between the indicator and the latent construct, particularly in social science research. Furthermore, a latent construct is considered to have good convergent validity if its AVE is at least 0.50, indicating that more than 50% of the indicators' variance is explained by the construct.
b. Discriminant validity was assessed using cross-loading values, in which each indicator should have the highest loading on the construct it is intended to measure relative to other constructs. This indicates that the indicator adequately represents its corresponding construct and does not measure other latent constructs more strongly (Ghozali & Hengky, 2015).

2.3.2 Reliability Test

A reliability test is used to assess the internal consistency of indicators within a latent variable, ensuring measurement results are trustworthy and stable. The research instrument is considered reliable if the Composite Reliability values are greater than 0.70 (Fauzi, 2022)

2.4 Structural Model Evaluation (Inner Model)

The purpose of analyzing the inner model is to assess the relationships between latent variables and the overall strength and predictive power of the model (Hair *et al*., 2017). The R-Square (R2) value describes how much of the variance in the endogenous variable is explained by the exogenous variables, with values of 0.75 (strong), 0.50 (moderate), and 0.25 (weak) (Fauzi, 2022). Next, the Q-Square (Q2) or Stone-Geisser test is used to assess the predictive relevance of the model; a Q^2 value > 0 indicates predictive relevance, with values of 0.02 weak, 0.15 moderate, and 0.35 strong (Mariani *et al*., 2024).

3. Results and Discussion

3.1. Respondent Characteristics

The characteristics of the respondents include age, gender, education level, land area, and length of cooperative membership. Respondent characteristics describe the basic social-demographic conditions relevant to the research analysis process (Putra *et al*., 2020). Table 2 presents the characteristics of the respondents in this study.

Table 2. Respondent Classification

Classification	Number (People)	Percentage (%)
Age (Years)		
20-29 (Early Young)	2	2.23
30-39 (Late Young)	14	16.28
40-49 (Old)	14	16.28
50> (Very Old)	56	65.11
Amount	86	100
Gender		
Male	53	61.63
Female	33	38.37
Amount	86	100
Education Level		
No Formal Education	9	10.47
Elementary School (SD)	33	38.37
Junior High School (SMP)	17	19.77
Senior High School (SMA)	24	27.91
Associate Degree (D3)	1	1.16
Bachelor's Degree (S1)	2	2.33
Amount	86	100
Land Area (Ha)		
<0,5	14	16.28
0,5-1	38	44.19
1,01-2	25	29.07
>2	9	10.46
Amount	86	100
Membership Duration (Years)		
<3	22	25.58
3-5	48	55.81
>5	16	18.61
Amount	86	100

Source: Primary data analysis, (2025)

Table 2 shows that most members of the KBMJ cooperative are >50 years old (65.11%) or are categorized as the very old group (Rani *et al*., 2020). This result indicates low farmer regeneration, which could potentially affect the sustainability of agricultural operations (Sukma & Ruslan, 2024). Based on gender characteristics, it is evident that male farmers dominate KBMJ cooperative (61.63%) compared to women (38.37%), indicating male dominance in farming and cooperative decision-making. This is because the smallholder oil palm sector tends to be dominated by men, where men are more involved in the technical and managerial aspects (Reich *et al*., 2025).

The education level indicates the highest level of education completed by the research respondents. Hidayati *et al*., (2025) showed that educational level positively influences technology adoption and increased agricultural productivity. Based on Table 2, almost 50% of respondents have a low level of education, meaning they did not attend school or completed only primary education. According to Badan Pusat Statistik (2022), a person is considered to have a low level of education if the respondent did not complete schooling, completed only primary school, or completed primary school at most.

The distribution of land area shows that the majority of KBMJ cooperative members have very small landholdings, ranging from 0.5 to 1 hectare (44.19%). This category is based

on the land area classification by Samarpitha *et al*., (2016), namely very small (<1 ha), small (1-1.99 ha), semi-medium (2-3.99 ha), medium (4-9.99 ha), and large (>10 ha). Most respondents have been members of the KBMJ cooperative for a considerable amount of time, specifically 3-5 years (55.81%).

3.2 Evaluation of the Measurement Model (Outer Model)

3.2.1 *Convergent Validity*

Convergent validity is assessed using factor loadings to ensure that each indicator adequately represents the latent construct. The results of the factor loading test are presented in Figure 3 below.

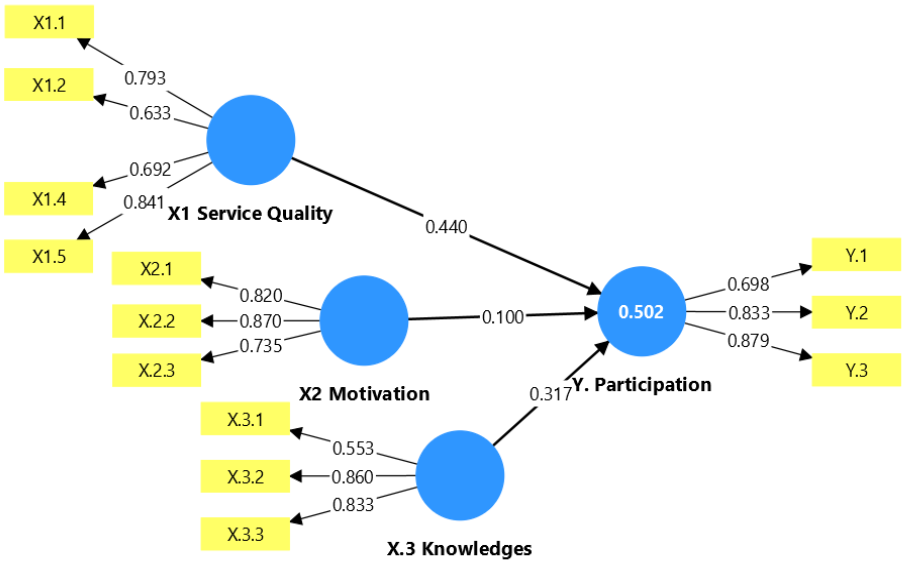

Figure 3. Output Loading Factor Modeling

Indicators are considered to have strong convergent validity when the outer loading is ≥ 0.70, as this indicates that the latent construct explains more than 50% of the indicator's variance (Hair *et al*., 2019). Outer loading values between 0.50 and 0.70 may still be retained, provided that the construct meets the required reliability and validity criteria (Cheung *et al*., 2024). Indicators with loading values < 0.50 should be excluded because they do not meet the convergent validity criterion. As shown in Figure 3, although all indicators were declared valid during the pilot test stage, the outer model evaluation using SEM-PLS on the main sample (n = 86) revealed that indicator X1.3 (assurance) had a factor loading below 0.50. Therefore, this indicator was removed from the final model to improve construct validity. Based on the highest factor loading values, the most dominant indicators are tangibles (X1.5) for service quality (0.841), need for power (X2.2) for motivation (0.870), benefits of cooperatives (X3.2) for members' knowledge (0.860), and the use of cooperative services (Y.3) for member participation (0.879). These findings indicate that these indicators provide the strongest representation of each latent construct in the structural model.

Table 3. Average Variance Extracted (AVE) Values

Variable	*Average variance extracted* (AVE)	Description
Service Quality	0.554	Valid
Motivation	0.656	Valid
Knowledge	0.580	Valid
Participation	0.651	Valid

Source: Primary data analysis, (2025)

Based on Table 3, the results of the Average Variance Extracted (AVE) calculation show that all constructs have values above 0.5. This indicates that more than half of the indicator variance can be explained by the latent construct, thus stating that the construct is valid.

3.2.3 *Discriminant Validity*

The next validity test is discriminant validity, which is assessed through cross-loading values to ensure each construct is clearly distinct. The results of the cross-loading value test can be seen in the following table 4. The next validity test is discriminant validity, which is assessed through cross-loading values to ensure each construct is clearly distinct. The results of the cross-loading value test are shown in Table 4.

Table 4. Cross Loading Value

Indicator	X1 Service Quality	X2 Motivation	X3 Knowledge	Y Participation
X1.1	**0.793**	0.402	0.500	0.542
X1.2	**0.633**	0.510	0.365	0.488
X1.4	**0.692**	0.214	0.051	0.284
X1.5	**0.841**	0.205	0.224	0.459
X2.1	0.433	**0.820**	0.418	0.413
X2.2	0.385	**0.870**	0.622	0.476
X2.3	0.316	**0.735**	0.346	0.270
X3.1	0.153	0.154	**0.553**	0.280
X3.2	0.392	0.511	**0.860**	0.517
X3.3	0.382	0.596	**0.833**	0.454
Y.1	0.492	0.531	0.526	**0.698**
Y.2	0.446	0.244	0.418	**0.833**
Y.3	0.548	0.380	0.399	**0.879**

Source: Primary data analysis, (2025)

Based on the cross-loading test results in Table 4, each indicator shows the highest loading on its respective construct. Therefore, all indicators are declared valid and capable of representing each variable well.

3.2.3 *Reliability Test*

Reliability testing ensures that the indicators within a construct are consistent and reliable. The construct is considered reliable if the Cronbach's alpha value and composite reliability meet the criteria (>0.7), as shown in Table 5.

Table 5. Reliability Test Results

Variable	*Composite Reliability*	Description
Service Quality	0.740	Reliable
Motivation	0.785	Reliable
Knowledge	0.699	Reliable
Participation	0.722	Reliable

Source: Primary data analysis, (2025)

Based on Table 5, the Composite Reliability values for all constructs fall within the acceptable category. Most variables have values above 0.70, while the Knowledge variable has a value of 0.699, which is very close to the recommended threshold and still acceptable in social research. These results indicate that all constructs have adequate internal consistency

3.3. Structural Model Evaluation (Inner Model)

Evaluating the inner model is a step toward assessing the quality of the structural relationships among latent variables in the research model. This test was conducted to assess the model's ability to explain and predict endogenous variables. The results of the Inner Model evaluation are shown in Table 6.

Table 6. Inner Model Evaluation Results

Variable	R-square	Q-square
Participation	0.502	0.427

Source: Primary data analysis, (2025)

Based on Table 6, it can be concluded that the variables of service quality, motivation, and knowledge to explain 50.2% of the variation in the participation variable, while the remaining 49.8% is influenced by other factors outside the research model. Based on the evaluation criteria from Hair & Alamer (2022) the R2 value of 0.502 falls into the moderate category, indicating that the model has fairly good explanatory power.

Furthermore, the Q-Square (Q^2) value of 0.427 indicates that the model has strong predictive relevance for the participation variable. Referring to the criteria suggested by Mariani *et al*., (2024), Q^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large predictive relevance, respectively. The obtained Q^2 value exceeds the threshold for large predictive relevance, confirming that the structural model demonstrates a strong ability to predict member participation.

3.4. *Hypothesis Testing*

Hypothesis testing is conducted to determine whether the independent variable has a significant influence on the dependent variable. The results of this testing can be seen in Table 7.

Table 7. Hypothesis Test Results

Variable	Path Coeffients	T statistics (|O/STDEV|)	P values
Service Quality -> Participation	0.440	4.864	0.000
Motivation -> Participation	0.100	1.128	0.260
Knowledge -> Participation	0.317	3.763	0.000

Source: Primary data analysis, (2025)

Based on the results of the hypothesis test, service quality and knowledge are variables that have a significant influence. However, motivation did not have a significant influence on the participation of KBMJ Cooperative member in Bosar Maligas Sub-district. The influence of each variable is detailed as follows.

3.4.1 *The Influence of Service Quality on the Level of Participation*

Based on the analysis results, the obtained t-statistic value is 4.864 > 1.96 and the p-value is 0.000 < 0.05, which indicates that service quality has a positive and significantly influence members' participation which means hypothesis (H1) is accepted. This result aligns with research conducted by Azizah *et al*., (2024) and Rachman & Nissa (2024) who found that good service quality can encourage members to become more involved in cooperative activities.

The service quality indicator most considered by respondents is indicator X1.5, with a value of 0.841. This indicator refers to the adequacy, availability, and cleanliness of cooperative facilities that support administrative processes and member services. KBMJ Cooperative provides adequate administrative facilities, including computers and printing equipment that can be used by members for cooperative-related purposes. The cooperative also provides a designated meeting space for member gatherings, socialization activities, and training sessions. These tangible facilities strengthen members' perceptions of professional service delivery and institutional credibility. This result aligns with the research by Ruslani *et al*., (2025) who found that the cleanliness and tidiness of cooperative office facilities are important factors that increase member satisfaction because they reflect the institution's professional image and strengthen farmers' trust in cooperative services. Additionally, Marhamah *et al*., (2020) also explained that adequate physical facilities, such as service rooms and administrative equipment, support the effectiveness of farmer group services and comfort in interacting within the cooperative environment.

3.4.2 *The Influence of Motivation on Participation Levels*

Based on the results of the structural analysis, the t-statistic value of 1.128 (< 1.96) and the p-value (> 0.05) indicate that motivation does not have a significant effect on member participation, thus H2 is rejected. The previous studies conducted by Sandi *et al*., (2022) and Sutiknjo (2017), conclude that participation in agricultural organizations and cooperatives is more influenced by institutional arrangements and perceived benefits rather than individual motivation factors.

In the context of KBMJ Cooperative, member participation in RSPO-related activities tends to be structural and inherent to the cooperative's mechanisms and policies. Members are primarily involved for the economic and administrative benefits, not solely for intrinsic motivation. Although the indicator of the need for power (X2.2) has the highest loading (0.870), reflecting the members' desire to expand the positive impact of RSPO implementation, this motivational dimension has not been statistically shown to influence participation.

3.4.3 *The Influence of Knowledge on the Level of Participation*

Analysis of the influence of knowledge on the participation show the t-statistic value 3.763 > 1.96 and a p-value of 0.000 < 0.05. This means that the knowledge variable has a positive and significant influence on participation, so the third hypothesis (H3) is accepted. Research by Agustin *et al.,* (2020) showed that an increase in cooperative member knowledge is directly proportional to their tendency to actively participate in various cooperative activities. Similar evidence from Indonesian agricultural institutions also suggests

that farmers' understanding of organizational rules, rights, and benefits significantly encourages their participation in collective programs (Prasetyo *et al.,* 2021)**.**This confirms that adequate knowledge of cooperative functions and mechanisms is a crucial driving factor for member participation.

Based on the outer model loading factor values in Figure 3, the highest value is obtained for indicator X3.2 with a loading of 0.860. This indicates that the statement, "I understand that the cooperative helps market harvest products in accordance with RSPO standards," is the strongest indicator in representing the knowledge construct. Cooperative members are free to sell their Fresh Fruit Bunches (FFB) to any collection point (ram). However, the sales receipt must be reported to cooperative officers for the record. From these recorded sales, an incentive of IDR 30 per kilogram of FFB is accumulated. At the end of the year, the total incentive is converted into fertilizer and distributed to cooperative members. This system shows that members clearly understand the cooperative's role in supporting marketing mechanisms aligned with RSPO standards, particularly through transparent recording and benefit-sharing arrangements. Such practical and experience-based knowledge strengthens members' trust in the cooperative and significantly contributes to their participation in the certified smallholder program.

3.5. Managerial Implications

The findings of this study indicate that enhancing member participation is more effectively achieved by strengthening service quality and improving members' knowledge than by relying solely on individual motivation. Therefore, cooperative management should prioritize improving service systems, ensuring administrative transparency, and conducting regular cooperative education and socialization programs. Although motivation does not have a statistically significant effect, cooperatives should continue to facilitate interaction spaces and discussion forums among members to support existing social motivation and encourage more active member engagement.

4. Conclusion

This study concludes that service quality (X1) and member knowledge (X3) have a positive and significant effect on member participation (Y) in the KBMJ Cooperative, whereas motivation (X2) does not. The tangible dimension of service quality (X1.5) and knowledge regarding the cooperative's role in marketing Fresh Fruit Bunches (FFB) in accordance with RSPO standards (X3.2) are the strongest indicators influencing participation. These findings suggest that member participation is primarily driven by tangible service performance and a clear understanding of institutional benefits rather than individual motivational factors. Future research is recommended to incorporate external motivational aspects, such as economic incentives and institutional regulations, to better explain participation behavior in cooperative-based sustainability programs.

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