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Institutional Analysis of Farmers' Groups in the Management of Clove Farmland in North Toli-Toli District

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Abstract

This study examines the influence of farmer group institutional dimensions on clove agricultural land management in Tolitoli Utara District, Central Sulawesi. Employing a quantitative associative design, data were collected from 50 active clove farmers using purposive sampling, supported by questionnaires, interviews, and field observations. Multiple linear regression analysis was applied to evaluate the effects of organizational structure, member participation, formal and informal rules, and evaluation and supervision on land management practices. The results indicate that organizational structure and member participation have positive and significant effects, reflecting the importance of coordination and active engagement in improving agricultural performance. Conversely, formal and informal rules, as well as evaluation and supervision, exhibit significant negative effects when characterized by rigidity and administrative intensity, suggesting that excessive institutional control may hinder adaptability and reduce farmer initiative. Simultaneously, all variables significantly influence land management, with a high coefficient of determination indicating strong explanatory capacity. The findings highlight the need for adaptive and participatory institutional arrangements to enhance productivity and sustainability in smallholder clove farming systems.

Keywords : *Farmer Institutions, Clove Farming, Land Management, Participation, Governance.*

INTRODUCTION

The contemporary discourse on agricultural development has increasingly emphasized the centrality of institutional arrangements in shaping productivity, resilience, and sustainability across smallholder systems, particularly in perennial commodity sectors such as cloves, where long production cycles, price volatility, and post-harvest complexities demand coordinated collective action and adaptive governance structures (Pusat Data dan Sistem Informasi Pertanian, 2022; Pusat Data dan Sistem Informasi Pertanian, 2023). Within agrarian economies, institutional strength is not merely an auxiliary factor but constitutes a structural determinant influencing how farmers access inputs, adopt innovations, and engage with markets under evolving global value chains, where asymmetries in information and bargaining power persist (Kario, 2014). In the Indonesian context, agriculture continues to occupy a strategic macroeconomic position, contributing substantially to national output and labor absorption, even as structural transformation unfolds unevenly across regions (Badan Pusat Statistik, 2024a; Badan Pusat Statistik, 2024b). These dynamics position farmer groups as critical meso-level institutions mediating between policy frameworks and micro-level farm practices, particularly in plantation commodities where collective management practices can significantly influence land-use efficiency and post-harvest outcomes (BRMP Perkebunan, 2025).

Empirical studies across diverse agricultural settings have demonstrated that well-functioning farmer institutions enhance collective learning, facilitate technology diffusion, and improve resource allocation efficiency, though the magnitude and direction of these effects vary considerably depending on contextual factors and governance quality (Al Islami et al., 2024; Amiluddin et al., 2023). Research on community-based economic institutions further reveals that organizational capacity, participatory engagement, and adaptive rule systems shape the effectiveness of rural development interventions, often determining whether institutional frameworks become enabling or constraining forces (Agus et al., 2025). Evidence from plantation subsectors, including cloves, suggests that coordinated extension

programs, such as farmer field schools, contribute to improved pest management and production practices, yet their sustainability depends heavily on local institutional embeddedness and member participation (Ditjenbun, 2023). At the regional level, reports indicate that areas with stronger farmer organizations tend to exhibit better performance in plantation management, although productivity gains remain inconsistent and often below potential (Dinas Tanaman Pangan dan Hortikultura Provinsi Sulawesi Tengah, 2024).

Despite these advances, the literature reveals notable conceptual and empirical gaps, particularly regarding the nuanced interaction between specific institutional dimensions—such as organizational structure, participation, rule enforcement, and monitoring mechanisms—and concrete land management outcomes in perennial crop systems. Much of the existing scholarship treats farmer institutions as homogeneous entities, overlooking internal heterogeneity and the possibility that certain institutional features may exert counterproductive effects under particular socio-cultural or economic conditions (Agus et al., 2025). Furthermore, while macro-level statistics highlight the scale and importance of agricultural sectors, they obscure micro-level institutional dysfunctions that undermine productivity, including inactive farmer groups and weak governance practices (Badan Pusat Statistik, 2024a; Badan Pusat Statistik, 2024b). Studies focusing on cloves tend to prioritize production trends and market dynamics rather than interrogating the institutional mechanisms underpinning land management inefficiencies (Pusat Data dan Sistem Informasi Pertanian, 2023).

This gap becomes particularly salient in regions such as Central Sulawesi, where clove production constitutes a major economic activity yet remains constrained by suboptimal productivity relative to land area, indicating inefficiencies in land management practices and institutional coordination (Dinas Tanaman Pangan dan Hortikultura Provinsi Sulawesi Tengah, 2024). In Kabupaten Tolitoli, and specifically Kecamatan Tolitoli Utara, cloves represent a dominant livelihood source, embedding the commodity deeply within local socio-economic structures while simultaneously exposing farmers to systemic vulnerabilities associated with institutional weaknesses (BPS Kabupaten Tolitoli, 2013). The persistence of these challenges underscores the urgency of examining how internal dynamics of farmer groups influence land management effectiveness, particularly in light of increasing demands for sustainable and efficient plantation systems under national agricultural development agendas (BRMP Perkebunan, 2025).

Positioning this study within the broader scholarly landscape entails moving beyond generalized assessments of institutional presence toward a disaggregated analysis of institutional components and their differential impacts on agricultural practices. By interrogating the roles of organizational structure, member participation, formal and informal rules, and evaluation mechanisms, this research engages with ongoing debates on whether institutional rigidity enhances or constrains adaptive capacity in smallholder systems, while also responding to calls for context-specific analyses that integrate socio-institutional variables with production outcomes (Al Islami et al., 2024; Amiluddin et al., 2023). The focus on clove farming in Tolitoli Utara provides a strategically relevant case through which broader theoretical propositions on rural institutions can be examined and refined, particularly in relation to perennial crop management and collective action dilemmas.

This study aims to analyze the institutional dimensions of farmer groups and their influence on clove agricultural land management in Kecamatan Tolitoli Utara, with the intention of identifying both enabling and constraining institutional factors that shape productivity outcomes. The research contributes theoretically by advancing a more differentiated understanding of farmer institutions as multidimensional constructs with potentially divergent effects, and methodologically by integrating quantitative analysis of institutional variables with empirical field data derived from purposively selected active farmer group members. Through this approach, the study seeks to offer nuanced insights into the role of local institutions in shaping agricultural performance, while providing evidence-based recommendations for strengthening farmer group governance in plantation-based rural economies.

RESEARCH METHODS

This study constitutes an empirical investigation employing a quantitative, associative research design aimed at examining the influence of institutional dimensions of farmer groups on clove agricultural land management. The research was conducted in Kecamatan Tolitoli Utara, Kabupaten Tolitoli, Central Sulawesi, over the period beginning in October 2026. The population comprised 120 active clove farmers affiliated with farmer groups, from which a purposive sample of 50 respondents

was selected based on criteria ensuring analytical relevance, including a minimum of two years of membership, active involvement in land management practices, and willingness to participate. Data were obtained through a combination of structured observation, questionnaire-based surveys, in-depth interviews, and documentation, enabling both quantitative measurement and contextual validation. The primary instrument consisted of a Likert-scale questionnaire (1–5), operationalizing the independent variables organizational structure (X1), member participation (X2), formal and informal rules (X3), and evaluation and supervision (X4) as multidimensional constructs reflecting institutional functionality, while the dependent variable (Y), land management of clove farming, was defined in terms of planning, implementation, and maintenance practices associated with agricultural productivity.

The measurement framework emphasized construct validity and internal consistency through rigorous validity and reliability testing prior to hypothesis estimation, ensuring that each indicator accurately captured its intended latent variable. Data analysis was conducted using multiple linear regression to estimate the partial and simultaneous effects of the independent variables on land management outcomes, allowing for the identification of both positive and negative institutional influences. The analytical procedure incorporated classical assumption tests, including normality, multicollinearity, heteroscedasticity, and autocorrelation diagnostics, to ensure the robustness and unbiasedness of the regression estimates. Statistical inference was performed using t-tests for partial effects and F-tests for joint significance, complemented by the coefficient of determination (R^2) to assess explanatory power. This econometric approach enables a systematic evaluation of how variations in institutional configurations translate into differences in land management performance within smallholder clove farming systems.

RESULTS AND DISCUSSION

Organizational Structure and Member Participation Effects on Clove Land Management

The regression results indicate that organizational structure exerts a positive and statistically significant influence on clove land management, with a coefficient of 0.273 and a significance level well below the conventional threshold. This finding reflects how clearly defined roles and responsibilities within farmer groups enhance coordination efficiency and decision-making processes. Institutional theory posits that structured governance reduces transaction costs and uncertainty, thereby improving collective performance (Coleman, 1990). Empirical observations in the study area confirm that farmers operating within well-organized groups demonstrate more systematic planning and implementation of agricultural practices.

The effectiveness of organizational structure is further evident in its role in facilitating information dissemination among group members. Structured communication channels enable the transfer of technical knowledge related to fertilization, pest control, and crop maintenance. This aligns with prior findings that institutional clarity enhances the adoption of agricultural innovations (Ratna et al., 2023). Field interviews suggest that farmers perceive leadership roles as critical in coordinating seasonal activities and aligning individual efforts with group objectives.

The positive coefficient also indicates that organizational structure contributes to improved accountability within farmer groups. When roles are clearly assigned, monitoring of individual responsibilities becomes more feasible and transparent. This dynamic strengthens mutual trust and reinforces collective norms, which are essential for sustained cooperation (Elizabeth, 2007). In practical terms, organized groups demonstrate higher consistency in implementing recommended cultivation practices compared to loosely structured groups.

Member participation emerges as a stronger predictor of land management effectiveness, with a regression coefficient of 0.402. This suggests that active engagement in meetings, collective labor, and decision-making processes significantly enhances farm-level outcomes. Participation increases farmers' exposure to knowledge-sharing mechanisms and experiential learning opportunities. Evidence from participatory agricultural programs supports the argument that engagement intensity directly correlates with productivity improvements (Ditjenbun, 2023).

High participation levels also contribute to strengthening social capital within farmer groups. Social capital facilitates cooperation, reduces opportunistic behavior, and enhances collective problem-solving capacity. Theoretical perspectives emphasize that trust and reciprocity are foundational elements of effective rural institutions (Coleman, 1990). In the context of clove farming, collaborative

activities such as joint pest management and synchronized planting schedules demonstrate the tangible benefits of strong participation.

The empirical relationship between participation and land management is summarized in the following table, which presents the regression coefficients and significance levels of key variables examined in this subsection.

Table 1. Regression Results for Organizational Structure and Member Participation (X1)

Variable	Coefficient	Significance
Organizational Structure (X1)	0.273	0.000

Source: Primary Data Processed (2026)

The data presented in Table 1 confirm that both variables have statistically significant positive effects on land management. Member participation exhibits a higher coefficient, indicating a more substantial influence compared to organizational structure. This suggests that while structural clarity is important, active engagement plays a more decisive role in shaping agricultural practices. Similar patterns have been observed in community-based agribusiness systems where participation drives collective efficiency (Rosiana et al., 2025).

The interaction between structure and participation also reflects a complementary relationship rather than a substitutive one. Organizational frameworks provide the foundation for coordinated action, while participation activates and operationalizes that framework. Studies on rural institutional development highlight that formal structures without active participation tend to remain ineffective (Habib, 2009). Observations from the field reinforce this notion, as inactive groups with formal structures fail to achieve optimal outcomes.

From a managerial perspective, these findings highlight the importance of balancing formal organization with inclusive participation mechanisms. Leaders within farmer groups need to encourage active involvement while maintaining clear governance structures. This dual approach enhances both efficiency and adaptability in managing agricultural land. The integration of participatory approaches into structured organizations aligns with contemporary models of sustainable agriculture (Tarolli et al., 2020).

The implications extend to policy interventions aimed at strengthening farmer institutions. Programs that focus solely on formalizing group structures without fostering participation may yield limited impact. Evidence suggests that capacity-building initiatives should prioritize both organizational development and participatory engagement (Ndapatamu & Retang, 2023). Such integrated strategies are essential for improving land management outcomes in plantation-based farming systems.

The broader economic significance of these findings is reflected in the contribution of agriculture to employment and GDP. Enhancing institutional effectiveness at the micro level has implications for macroeconomic performance. Agricultural productivity improvements driven by strong institutions can support rural livelihoods and economic stability (Badan Pusat Statistik, 2024a). In regions such as Tolitoli Utara, where cloves are a primary income source, strengthening farmer group institutions becomes a strategic priority.

The discussion underscores that institutional dimensions are not merely administrative constructs but active determinants of agricultural performance. Organizational structure and participation jointly influence how resources are allocated and utilized in farming systems. These findings contribute to the growing body of literature emphasizing the role of institutions in rural development (Rodrik, 2003). Future research may explore how these variables interact with external factors such as market access and technological adoption.

The Influence of Farmer Group Member Participation on Clove Farmland Management

The regression results indicate that member participation exerts a positive and statistically significant influence on clove land management in Kecamatan Tolitoli Utara, with a coefficient of 0.402 and a significance level of 0.000, which is well below the conventional threshold of 0.05. This finding demonstrates that higher levels of involvement in planning, decision-making, and implementation processes contribute directly to improved land management practices. Active participation enhances

farmers' understanding of appropriate cultivation techniques, enabling them to manage their land more effectively and efficiently.

The role of participation is particularly evident in routine group activities such as meetings, collective labor (gotong royong), extension programs, and training sessions. Farmers who consistently engage in these activities tend to possess better knowledge of agronomic practices, including fertilization, pruning, pest control, and land maintenance. This supports the notion that participatory engagement serves as a mechanism for knowledge transfer and experiential learning, ultimately strengthening farmers' technical capacity in managing clove plantations (Asriadi et al., 2024).

High levels of participation also facilitate stronger collaboration among group members. Collective action in farming activities, such as coordinated pest management and joint maintenance efforts, helps ensure that agricultural practices are implemented more uniformly and effectively. This aligns with theoretical perspectives emphasizing that participation enhances cooperation and reduces individual inefficiencies within rural institutions. In this context, participation not only improves individual performance but also reinforces group cohesion and shared responsibility (Zhang et al., 2024).

Furthermore, active member involvement contributes to the acceleration of innovation adoption. Farmers who are engaged in group dynamics are more likely to receive and apply new information, technologies, and best practices introduced through extension services or peer learning. This dynamic increases the adaptability of farmer groups to changing environmental and market conditions, thereby supporting more sustainable land management outcomes (Silaban et al., 2025).

From an institutional perspective, participation strengthens social capital within farmer groups. Elements such as trust, reciprocity, and mutual support are reinforced through continuous interaction and collaboration. Strong social capital enhances collective problem-solving capacity and minimizes opportunistic behavior, which are essential components for the long-term success of community-based agricultural systems. In the case of clove farming, these dynamics are reflected in the effectiveness of coordinated farming practices and shared decision-making processes. The empirical relationship between member participation and land management effectiveness is summarized in the following table:

Table 2. Regression Results for Member Participation (X2)

Variable	Coefficient	Significance
Member Participation (X2)	0,402	0,000

Source: Primary Data Processed (2026)

The data presented in Table 2 confirm that member participation has a strong and statistically significant positive effect on clove land management. The relatively higher coefficient value indicates that participation plays a dominant role in influencing agricultural outcomes compared to other institutional variables. This suggests that while structural and organizational aspects are important, the active involvement of members is a more decisive factor in determining the effectiveness of land management practices.

From a managerial standpoint, these findings highlight the importance of fostering inclusive and active participation within farmer groups. Leaders and facilitators should encourage member engagement through regular meetings, transparent decision-making processes, and collaborative activities. Strengthening participation not only improves technical outcomes but also enhances the overall resilience and sustainability of farmer institutions.

In conclusion, member participation is a critical determinant of successful clove land management in Kecamatan Tolitoli Utara. Its influence extends beyond individual knowledge improvement to encompass collective efficiency, innovation adoption, and institutional strengthening. These findings reinforce the broader understanding that participatory approaches are fundamental to achieving sustainable agricultural development.

Formal and Informal Rules as Institutional Constraints in Clove Land Management

The regression estimation reveals that formal and informal rules exhibit a statistically significant yet negative relationship with clove land management, indicated by a coefficient of −0.154 and a probability value below the accepted significance level. This empirical outcome suggests that the presence of rules alone does not guarantee improved institutional performance, particularly when such rules lack contextual alignment with farmer needs. Institutional rigidity often constrains adaptive decision-making in dynamic agricultural environments characterized by ecological variability. Prior studies emphasize that institutional effectiveness depends not only on rule existence but also on their flexibility and inclusiveness (Luqman & Sulaikhan, 2023).

The negative direction of the relationship reflects the unintended consequences of over-regulation within farmer groups. Rules that are excessively prescriptive or administratively burdensome may reduce farmers' autonomy in managing their land. This condition can discourage experimentation and limit the adoption of context-specific practices essential in perennial crops such as cloves. Evidence from rural institutional analysis indicates that overly centralized rule systems tend to suppress local innovation (Musdalifah et al., 2023).

Field observations suggest that many formal rules are designed without sufficient participation from group members. This top-down approach creates a disconnect between institutional expectations and practical realities in the field. Farmers often perceive such rules as external impositions rather than collectively agreed norms. The absence of participatory formulation mechanisms weakens compliance and reduces institutional legitimacy (Habib, 2009).

Informal rules, which typically emerge from local customs and shared experiences, play a critical role in shaping farmer behavior. However, when informal norms conflict with formal regulations, ambiguity arises in decision-making processes. This duality can create inefficiencies, particularly when farmers prioritize socially embedded practices over formally prescribed procedures. Research on rural governance highlights that institutional coherence is essential for effective collective action (Elizabeth, 2007).

The empirical findings related to rule-based institutional dimensions are presented in the following table, illustrating the magnitude and direction of the observed effects.

Table 3. Regression Results for Formal and Informal Rules (X3)

Variable	Coefficient	Significance
Formal and Informal Rules (X3)	−0.154	0.004

Source: Primary Data Processed (2026)

The data in Table 3 confirm that rule intensity negatively influences land management outcomes when not properly calibrated. The significance level indicates that this relationship is statistically robust and not driven by random variation. This pattern suggests that institutional design must consider the balance between control and flexibility. Similar findings have been reported in studies examining governance inefficiencies in farmer organizations (Arfah et al., 2025).

The observed negative impact can also be interpreted through the lens of transaction cost economics. Excessive rules increase the cost of compliance, both in terms of time and cognitive effort. Farmers may respond by minimizing engagement or selectively ignoring regulations that are perceived as impractical. This behavior reduces the overall effectiveness of institutional arrangements (Rodrik, 2003).

From an agronomic perspective, clove farming requires adaptive management strategies that respond to climatic and ecological variations. Rigid rule systems limit farmers' ability to adjust planting schedules, fertilization regimes, and pest control methods. Studies on plantation crop management emphasize the importance of flexibility in maintaining productivity (Rukmana & Yudirachman, 2016). This reinforces the argument that institutional rigidity can hinder effective land management.

The interaction between rules and farmer motivation also provides insight into the negative relationship observed. Strict regulations may reduce intrinsic motivation by shifting the focus from collective goals to compliance obligations. Behavioral theory suggests that autonomy is a key driver of

engagement in cooperative systems. Reduced autonomy can lead to passive participation and lower performance levels (Coleman, 1990).

Policy implications arising from these findings highlight the need for participatory rule-making processes. Engaging farmers in the formulation of rules increases ownership and enhances compliance. This approach aligns with community-based development models that emphasize inclusivity and local knowledge integration (Ramadhan et al., 2025). Adaptive institutional frameworks are more likely to support sustainable agricultural practices.

The broader economic context further underscores the importance of effective institutional design. Clove farming contributes significantly to rural livelihoods and regional economic activity. Inefficient governance structures can limit productivity gains and reduce income potential for farmers. Market-oriented studies indicate that institutional inefficiencies often translate into suboptimal economic outcomes (Kario, 2014).

The findings contribute to ongoing debates on the role of institutions in agricultural development by demonstrating that not all institutional elements produce uniformly positive effects. Formal and informal rules, while essential, require careful calibration to avoid counterproductive outcomes. The study extends existing literature by providing empirical evidence from a plantation-based farming system. Future research may explore how adaptive governance models can mitigate the negative effects of rigid institutional frameworks.

Evaluation, Supervision, and Simultaneous Institutional Effects on Clove Land Management

The regression analysis demonstrates that evaluation and supervision exert a statistically significant negative influence on clove land management, as indicated by a coefficient of −0.514 and a probability value below 0.05. This finding highlights that excessive control mechanisms may undermine rather than enhance institutional performance within farmer groups. Theoretical perspectives on organizational behavior suggest that overemphasis on monitoring can reduce intrinsic motivation and weaken collective engagement (Coleman, 1990). Empirical observations reveal that farmers subjected to rigid supervision tend to adopt compliance-oriented behavior rather than proactive management strategies.

The negative effect of supervision reflects the administrative burden imposed on farmers when evaluation systems are not aligned with local conditions. Excessive reporting requirements and rigid monitoring frameworks can divert attention away from productive farming activities. This phenomenon aligns with findings in agricultural governance studies, where bureaucratic complexity often reduces operational efficiency (Hakim et al., 2023). Farmers in the study area expressed concerns that frequent evaluations limit their flexibility in adapting to environmental changes.

Evaluation mechanisms are intended to ensure accountability and improve performance, yet their effectiveness depends on implementation approaches. Participatory evaluation models tend to generate more positive outcomes compared to top-down monitoring systems. When farmers are actively involved in the evaluation process, they are more likely to internalize performance standards and improve practices. Research on rural empowerment emphasizes that inclusive evaluation enhances learning and institutional sustainability (Nur'aeni et al., 2022).

The negative coefficient also suggests that supervision practices may inadvertently suppress innovation within farmer groups. Innovation in clove farming requires experimentation with cultivation techniques, pest management strategies, and post-harvest handling. Strict supervision discourages risk-taking behavior, leading to stagnation in agricultural practices. Studies on plantation development highlight that innovation capacity is a key determinant of productivity growth (Umasugi, 2025). The empirical relationship between evaluation, supervision, and land management outcomes is summarized in the following table, which presents the regression coefficient and statistical significance.

Table 4. Regression Results for Evaluation and Supervision (X4)

Variable	Coefficient	Significance
Evaluation and Supervision (X4)	−0.514	0.000

Source: Primary Data Processed (2026)

The data in Table 3 confirm that the negative effect of supervision is both substantial and statistically robust. The magnitude of the coefficient indicates that this variable has the strongest influence among the institutional factors examined. This suggests that inappropriate supervision practices can significantly hinder effective land management. Similar patterns have been observed in institutional analyses where excessive control reduces organizational performance (Rachmaningtyas et al., 2026).

Beyond individual effects, the simultaneous influence of all institutional variables reveals a comprehensive understanding of farmer group dynamics. The F-test results indicate that organizational structure, participation, rules, and supervision jointly affect land management outcomes in a statistically significant manner. This finding underscores the interdependence of institutional components in shaping agricultural performance. Integrated institutional frameworks are more effective than isolated interventions (Rosiana et al., 2025).

The coefficient of determination (R^2) of 0.890 indicates that 89 percent of the variation in land management can be explained by the four institutional variables. This high explanatory power suggests that institutional factors play a dominant role in determining farming outcomes in the study area. Remaining variation may be attributed to external factors such as climate conditions, market access, and input availability. Empirical studies in agribusiness highlight that institutional variables often interact with environmental and economic factors (Pohan et al., 2025).

The interaction between evaluation and other institutional variables reveals important insights into governance balance. While structure and participation contribute positively, excessive supervision can offset these benefits. This indicates the need for a balanced institutional design that combines accountability with flexibility. Research on community-based agriculture emphasizes that adaptive governance is essential for sustainable outcomes (Yuliyani et al., 2025).

From an economic perspective, improving institutional effectiveness has implications for rural income and productivity. Clove farming remains a significant contributor to household income in Tolitoli Utara, and inefficient supervision practices can reduce profitability. Studies on clove agribusiness demonstrate that management efficiency directly influences financial performance (Rahmayati et al., 2026). Strengthening institutional quality can enhance both productivity and economic resilience.

The broader agricultural context reinforces the importance of institutional optimization. The agricultural sector continues to play a vital role in employment and economic stability, particularly in rural regions (Badan Pusat Statistik, 2024b). Effective farmer group institutions can support sustainable land management and contribute to national development goals. This aligns with global perspectives on agriculture as a driver of sustainable development (Tarolli et al., 2020).

The findings also highlight the relevance of extension services and external support systems in shaping institutional effectiveness. Collaboration between farmer groups and extension agents can improve evaluation practices and reduce administrative burdens. Evidence suggests that advisory services enhance institutional learning and adaptation (Ndapatamu & Retang, 2023). Strengthening these linkages is essential for improving governance quality in farmer organizations.

The discussion contributes to the broader literature by demonstrating that institutional effectiveness is not solely determined by the presence of governance mechanisms but by their functional design. Evaluation and supervision require careful calibration to avoid negative behavioral responses among farmers. The study provides empirical evidence that supports a shift toward participatory and adaptive institutional models. Future research may explore how digital monitoring tools and decentralized governance can improve supervision outcomes in agricultural systems.

CONCLUSION

The findings demonstrate that institutional configurations within farmer groups exert a decisive influence on clove land management, with differentiated effects across structural, participatory, regulatory, and supervisory dimensions. Organizational structure and member participation function as enabling mechanisms that enhance coordination efficiency, knowledge dissemination, and collective action, thereby improving land management performance. In contrast, formal and informal rules, along with evaluation and supervision practices, reveal counterproductive effects when implemented in rigid and non-participatory forms, indicating that excessive control may suppress adaptive capacity and reduce farmer motivation. The high explanatory power of the model underscores the centrality of

institutional variables in shaping agricultural outcomes, while also suggesting that governance quality, rather than mere institutional presence, determines effectiveness. These results contribute to institutional economic perspectives by emphasizing the importance of balanced, flexible, and participatory governance frameworks in smallholder plantation systems, particularly for perennial commodities such as cloves, where long-term management decisions require both coordination and autonomy.

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