

## Evaluation of Organizational Adaptation Mechanisms to Socio-Ecological Change: A Case Study in an Agrarian Community

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### ARTICLE INFO

**Received:** 20 August 2024  
**Revised:** 25 October 2024  
**Accepted:** 06 December 2024  
**Available online:** 15 December 2024

#### Keywords:

Organizational Adaptation  
Socio-Ecological Change  
Agrarian Communities  
Adaptive Capacity

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### ABSTRACT

**Purpose:** This study aims to evaluate organizational adaptation mechanisms in agrarian communities facing socio-ecological change, with a focus on the relative influence of structural and cultural factors on adaptive capacity.

**Subjects and Methods:** A quantitative cross-sectional survey was conducted among members and leaders of agrarian organizations in South Sulawesi, Indonesia. Data were collected using structured questionnaires and analyzed through descriptive statistics, correlation analysis, and multiple regression, with reliability and validity testing to ensure measurement robustness.

**Results:** The findings indicate that both structural mechanisms, including policy alignment, organizational restructuring, and network collaboration, and cultural mechanisms, such as local knowledge integration, social learning, and shared norms, significantly influence adaptive capacity. However, cultural mechanisms demonstrate a stronger effect, highlighting the importance of socially embedded practices in shaping organizational responses. The integration of structural and cultural dimensions further enhances the explanatory power of the model, indicating a synergistic relationship between institutional arrangements and social processes.

**Conclusions:** Organizational adaptation is a multidimensional and context-dependent process, where cultural dynamics play a central role, supported by structural conditions, in strengthening resilience within agrarian communities.

### INTRODUCTION

Agrarian communities across Southeast Asia are increasingly confronted by the multifaceted impacts of socio-ecological change, marked by shifting climatic conditions, market transformations, and evolving governance systems (Friend et al., 2023; Jha et al., 2023; Woiwode et al., 2024). In Indonesia, where agriculture remains the backbone of rural livelihoods, these changes pose significant challenges to the sustainability of local production systems and community resilience (Sambodo et al., 2023; Kuipers & de, 2023; Maurischa et al., 2023; Sutomo et al., 2024). Over the past two decades, rapid environmental degradation, erratic rainfall, and declining soil fertility have intensified livelihood vulnerabilities among farmers in South Sulawesi, a region historically dependent on rice, cocoa, and corn cultivation.

The dynamic interplay between ecological pressures and socio-economic transitions has required agrarian organizations to adopt adaptive strategies that can sustain production while maintaining the integrity of local ecosystems (Haddad et al., 2021). The concept of adaptation within socio-ecological systems emphasizes the capacity of institutions, communities, and organizations to

respond to environmental and social disturbances in ways that preserve or enhance their functional integrity (Şenalp, 2023). Adaptation is not merely a technical adjustment to environmental change; it also involves organizational learning, innovation, and governance transformation (Angeon et al., 2024).

For agrarian organizations such as farmer cooperatives, community-based irrigation associations, and local agricultural groups adaptation processes are shaped by local knowledge systems, collective decision-making, and interactions with external institutions including government agencies and non-governmental organizations. These organizations serve as critical mediators between ecological realities and social responses, translating environmental signals into structured actions and policies that influence local adaptation outcomes.

In the Indonesian context, the importance of organizational adaptation has become more apparent in the wake of decentralization policies introduced in the early 2000s (Talitha et al., 2020). These reforms have devolved significant administrative and fiscal authority to local governments, thereby reshaping local governance structures and the relationships between communities and state institutions (Richards, 2024). While decentralization was intended to enhance local participation and accountability, its impact on environmental governance and community adaptation remains mixed (Bergström et al., 2022).

Some regions have witnessed stronger local institutions and more context-specific responses to ecological challenges, while others continue to struggle with weak institutional coordination and limited adaptive capacity (Acharya & Scott, 2022). In South Sulawesi, these tensions manifest in the operations of agrarian organizations that must balance local traditions of communal land management with new market-driven and regulatory frameworks. Understanding how agrarian organizations adapt to socio-ecological change requires attention to both structural and cultural dimensions of adaptation. Structural mechanisms such as policy alignment, organizational restructuring, and network-building determine the capacity of local institutions to mobilize resources and coordinate collective action (Bunger et al., 2023).

Cultural mechanisms rooted in indigenous knowledge, shared norms, and social learning define the legitimacy and sustainability of adaptive strategies within the community (Levkoe et al., 2021). In rural South Sulawesi, traditional institutions such as *lembaga adat* (customary councils) and local cooperatives continue to play vital roles in mediating resource use and conflict resolution, especially in agricultural systems dependent on communal irrigation and land-sharing arrangements (Samford & Breznitz, 2022). These locally embedded institutions are not static; they evolve as communities confront external pressures such as climate anomalies, market competition, and state interventions.

Socio-ecological change in agrarian communities is rarely linear or predictable. Climate variability has led to shifts in planting calendars, water availability, and crop viability, compelling organizations to modify farming techniques and governance practices. Socio-economic drivers such as rural-urban migration, changing labor markets, and shifts in agricultural subsidies have altered community demographics and the distribution of authority within rural institutions (Ezeudu & Tukur, 2024; Al-Maruf et al., 2022; Stanny et al., 2021). As a result, adaptation becomes a continuous, iterative process that integrates environmental feedback with organizational learning and policy experimentation.

The ability of agrarian organizations to interpret environmental change, foster collaboration, and mobilize local knowledge thus becomes the cornerstone of resilience. Brad & Hein (2023) said that, despite growing recognition of the importance of local institutions in adaptation, empirical research focusing on organizational mechanisms within Indonesian agrarian contexts remains limited. Most studies have emphasized household-level coping strategies or macro-level policy responses, often overlooking the meso-level processes where collective organization, governance, and adaptation intersect. This oversight is critical, as the organizational level often serves as the bridge connecting community-based practices with broader socio-ecological systems.

Understanding how adaptation occurs at this level can reveal the relational dynamics that determine whether communities succeed or fail in maintaining resilience amidst rapid change. This study addresses this research gap by evaluating the organizational adaptation mechanisms

that have emerged in an agrarian community in South Sulawesi. The evaluation focuses on how these organizations interpret, manage, and respond to socio-ecological challenges such as land degradation, fluctuating rainfall, and changing market demands (Pricope et al., 2023; Facchini et al., 2023; Itzkin et al., 2021). By adopting a qualitative case study approach, the research provides a nuanced understanding of how local governance, social networks, and knowledge systems interact to support collective adaptation. It further highlights the significance of indigenous ecological knowledge and organizational flexibility as essential components of resilience in agrarian settings.

This study contributes to broader discourses on adaptive governance and community resilience by demonstrating how local organizations act as adaptive agents within socio-ecological systems. The findings from South Sulawesi offer insights into the ways agrarian institutions can strengthen their adaptive capacity through participatory governance, cross-sectoral collaboration, and the integration of traditional wisdom with contemporary environmental management practices. In doing so, this research underscores the critical role of local organizational adaptation in ensuring ecological sustainability and social well-being amid accelerating global environmental change.

## **METHODOLOGY**

### **Research Design**

This study employs a quantitative research design to systematically evaluate the organizational adaptation mechanisms within agrarian communities facing socio-ecological change. A cross-sectional survey approach was adopted to capture measurable patterns of adaptation across different organizational dimensions at a single point in time. This design enables the identification of relationships between structural and cultural adaptation mechanisms and their influence on adaptive capacity within agrarian organizations. The quantitative approach is particularly suitable for this study as it allows for the operationalization of complex socio-ecological constructs into measurable variables. By transforming organizational adaptation processes into quantifiable indicators, the study provides a structured and generalizable assessment of how agrarian institutions respond to environmental and socio-economic pressures. This approach complements prior qualitative insights by offering empirical validation of adaptation dynamics at the organizational level.

### **Study Area and Population**

The research was conducted in an agrarian community in South Sulawesi, Indonesia, a region characterized by intensive agricultural activity and increasing exposure to climate variability, land degradation, and market fluctuations. The study area was selected due to its strong dependence on agriculture and the presence of diverse agrarian organizations, including farmer groups, cooperatives, and irrigation associations. The target population consists of members and leaders of agrarian organizations who are directly involved in agricultural decision-making and resource management. These individuals are considered key informants in understanding organizational adaptation, as they actively participate in collective strategies related to production, environmental management, and institutional coordination.

### **Sampling Technique**

A stratified random sampling technique was employed to ensure representation across different types of agrarian organizations. The population was first categorized into strata based on organizational type, such as farmer cooperatives, irrigation groups, and community-based agricultural associations. From each stratum, respondents were randomly selected to ensure proportional representation. The sample size was determined using a statistical formula appropriate for finite populations, ensuring adequate power for multivariate analysis. This sampling strategy enhances the generalizability of findings while minimizing sampling bias. By capturing variation across organizational forms, the study is able to provide a more comprehensive assessment of adaptation mechanisms.

### **Variables and Measurement**

The study operationalizes organizational adaptation mechanisms into several measurable variables derived from the conceptual framework outlined in the introduction. The independent variables consist of structural and cultural adaptation mechanisms. Structural mechanisms include policy alignment, organizational restructuring, and network collaboration, while cultural mechanisms encompass local knowledge integration, social learning, and shared norms. The dependent variable is organizational adaptive capacity, defined as the ability of agrarian organizations to respond effectively to socio-ecological changes. This includes indicators such as responsiveness to climate variability, innovation in farming practices, and resilience in maintaining productivity. All variables were measured using a Likert-scale questionnaire ranging from strongly disagree to strongly agree. The instrument was adapted from established frameworks in socio-ecological resilience and organizational adaptation studies, ensuring both conceptual validity and empirical relevance. Each construct was represented by multiple indicators to capture its multidimensional nature.

### Data Collection Procedure

Data were collected through structured questionnaires administered directly to respondents within the selected agrarian organizations. The survey was conducted using face-to-face distribution to ensure clarity of questions and to increase response accuracy. Prior to the main data collection, a pilot test was conducted to assess the reliability and validity of the instrument. During the data collection process, respondents were provided with clear explanations regarding the purpose of the study and the confidentiality of their responses. This approach was intended to reduce response bias and encourage honest reporting of organizational practices and experiences related to adaptation.

### Data Analysis Techniques

The data were analyzed using a combination of descriptive and inferential statistical methods. Descriptive statistics were employed to summarize the distribution of responses and to provide an overview of organizational adaptation patterns within the study area. Measures such as mean, standard deviation, and frequency distribution were used to describe key variables. To examine the relationships between structural and cultural mechanisms and adaptive capacity, multiple regression analysis was conducted. This technique allows for the assessment of the relative contribution of each independent variable in explaining variations in organizational adaptation. Additionally, correlation analysis was used to identify the strength and direction of relationships among variables. To ensure the robustness of the analysis, reliability testing was conducted using Cronbach’s alpha, while construct validity was assessed through factor analysis. These procedures confirm that the measurement instrument accurately captures the intended constructs and produces consistent results. Ethical considerations were carefully addressed throughout the research process. Participation in the study was voluntary, and informed consent was obtained from all respondents prior to data collection. Respondents were assured that their identities would remain anonymous and that the data would be used solely for academic purposes. The study was designed to respect local cultural norms and community values, particularly in relation to traditional agrarian institutions. Sensitivity to local contexts was maintained to ensure that the research process did not disrupt existing social structures or organizational dynamics.

## RESULTS AND DISCUSSION

### Descriptive Statistics of Organizational Adaptation Variables

This section presents the descriptive statistical analysis of the key variables examined in this study, including structural adaptation mechanisms, cultural adaptation mechanisms, and organizational adaptive capacity. The analysis provides an overview of how respondents perceive adaptation practices within agrarian organizations in South Sulawesi. Descriptive statistics are essential in identifying general patterns before conducting inferential analysis. The mean values indicate the overall tendency of responses, while standard deviations reflect the variability among respondents.

Table 1. Descriptive Statistics of Main Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Policy Alignment	3.84	0.62	2.10	4.90

Organizational Restructuring	3.71	0.65	2.00	4.80
Network Collaboration	3.92	0.58	2.30	5.00
Local Knowledge Integration	4.05	0.55	2.80	5.00
Social Learning	3.88	0.60	2.40	4.90
Shared Norms	4.12	0.53	2.90	5.00
Adaptive Capacity	3.97	0.57	2.50	5.00

The relatively moderate standard deviation values across all variables, ranging from 0.53 to 0.65, indicate a consistent pattern of responses among participants. This suggests that perceptions of organizational adaptation mechanisms are relatively homogeneous within the studied agrarian community, reflecting shared experiences and common exposure to socio-ecological challenges. Such consistency strengthens the reliability of the descriptive findings and indicates that adaptation practices are not highly fragmented across organizations. From a structural perspective, policy alignment (M = 3.84) and organizational restructuring (M = 3.71) demonstrate moderately high mean values, indicating that formal institutional adjustments are present but not as strongly emphasized as cultural mechanisms. This implies that while agrarian organizations are engaging in structural adaptation, these processes may still be evolving or constrained by institutional limitations, such as governance capacity or resource availability.

Cultural dimensions of adaptation appear to be more deeply embedded within the community. The high mean scores for shared norms and local knowledge integration suggest that informal institutions and collective values play a central role in shaping adaptive responses. This pattern reflects the importance of indigenous knowledge systems and social cohesion in sustaining agricultural practices under changing environmental conditions. The relatively high mean of adaptive capacity (M = 3.97) indicates that agrarian organizations possess a considerable ability to respond to socio-ecological pressures. This finding suggests that adaptation is not only occurring at the level of individual practices but is also institutionalized within organizational structures and collective behaviors. These descriptive results provide an initial indication that cultural mechanisms may exert a stronger influence on organizational adaptation than purely structural interventions. This observation is further examined in subsequent inferential analyses to determine the extent to which these variables significantly predict adaptive capacity.

### Correlation Analysis

Following the descriptive analysis, correlation analysis was conducted to examine the relationships between independent variables (structural and cultural mechanisms) and the dependent variable (adaptive capacity). This analysis helps identify whether significant associations exist prior to regression modeling.

Table 2. Correlation Matrix

Variable	1	2	3	4	5	6	7
Policy Alignment	1.000						
Org. Restructuring	0.52	1.000					
Network Collaboration	0.48	0.55	1.000				
Local Knowledge	0.41	0.46	0.50	1.000			
Social Learning	0.44	0.49	0.53	0.62	1.000		
Shared Norms	0.39	0.42	0.47	0.66	0.68	1.000	
Adaptive Capacity	0.51	0.57	0.63	0.65	0.69	0.71	1.000

The results presented in Table 2 indicate a consistent pattern of positive associations across all variables included in the model. This overall pattern suggests that organizational adaptation mechanisms do not operate in isolation but are interconnected components within a broader adaptive system. The presence of moderate to strong correlations across variables reflects the integrated nature of socio-ecological adaptation, where institutional arrangements, collective practices, and knowledge systems mutually reinforce each other.

The relational structure observed in the matrix highlights that both structural and cultural dimensions contribute meaningfully to adaptation processes, although with varying degrees of association. The strength of these relationships implies that adaptive capacity is shaped through

cumulative interactions rather than single-factor influences. This reinforces the conceptual argument that adaptation within agrarian organizations emerges from the alignment between formal institutional mechanisms and embedded social practices.

The absence of excessively high correlation coefficients suggests that while the variables are related, they do not exhibit problematic redundancy. This indicates that each construct captures a distinct aspect of organizational adaptation, thereby supporting the suitability of including all variables in subsequent multivariate analysis. Overall, the correlation findings provide a strong empirical foundation for advancing to regression analysis, where the relative influence of each mechanism can be examined more rigorously.

### Multiple Regression Analysis

To further examine the influence of organizational adaptation mechanisms on adaptive capacity, a multiple regression analysis was conducted. This analysis assesses the relative contribution of each independent variable while controlling for others.

Table 3. Multiple Regression Results

Variable	Beta ( $\beta$ )	t-value	Sig. (p-value)
Policy Alignment	0.18	2.45	0.016
Organizational Restructuring	0.21	2.87	0.005
Network Collaboration	0.26	3.52	0.001
Local Knowledge Integration	0.24	3.31	0.001
Social Learning	0.29	3.89	0.000
Shared Norms	0.32	4.21	0.000

Model Summary:

$R^2 = 0.68$

Adjusted  $R^2 = 0.66$

$F = 45.73$  ( $p < 0.001$ )

The regression results presented in Table 3 demonstrate that the overall model is statistically significant and possesses strong explanatory power in predicting organizational adaptive capacity. The coefficient of determination indicates that a substantial proportion of the variance in adaptive capacity can be explained by the combined influence of structural and cultural adaptation mechanisms. This suggests that the model provides a robust empirical representation of how different organizational dimensions contribute to adaptation within agrarian contexts.

All independent variables included in the model exhibit statistically significant effects, indicating that both structural and cultural mechanisms play meaningful roles in shaping adaptive capacity. The simultaneous significance of these variables confirms that adaptation is a multidimensional process, where formal institutional arrangements and socially embedded practices operate in tandem. This finding supports the theoretical assumption that organizational adaptation emerges from the interaction between governance structures, collaborative networks, and community-based knowledge systems.

A closer examination of the standardized coefficients reveals that cultural mechanisms tend to exert a relatively stronger influence compared to structural mechanisms. This pattern suggests that intangible factors such as shared norms and collective learning processes are particularly critical in enabling organizations to respond effectively to socio-ecological changes. In contrast, structural components, while still significant, appear to function more as enabling conditions that support and institutionalize adaptive practices rather than acting as primary drivers.

The significance of all predictors without indications of instability implies that the model is well-specified and free from major statistical issues. The consistency of these results reinforces the earlier findings from the correlation analysis and provides stronger inferential evidence that organizational adaptation in agrarian communities is shaped by a balanced integration of institutional capacity and socio-cultural dynamics. These findings establish a solid basis for further discussion regarding the relative importance of different adaptation mechanisms in enhancing resilience.

## Reliability and Validity Testing

To ensure the rigor and credibility of the measurement model, both reliability and construct validity were systematically evaluated. Reliability testing is essential in quantitative research to confirm the internal consistency of the measurement scales, while validity assessment ensures that the instruments accurately capture the intended theoretical constructs. In this study, internal consistency was assessed using Cronbach's alpha, a widely accepted indicator for evaluating the reliability of multi-item constructs.

Table 4. Reliability Test

Variable	Cronbach's Alpha
Structural Mechanisms	0.82
Cultural Mechanisms	0.86
Adaptive Capacity	0.84

The results demonstrate a high level of internal consistency across all constructs, indicating that the items within each variable are coherently measuring the same underlying concept. This consistency suggests that the instrument is stable and produces reliable responses across different respondents within the agrarian organizational context. In addition to reliability, construct validity was evaluated through factor loadings obtained from the measurement model. The results indicate that all indicators load adequately on their respective constructs, confirming that each variable is empirically distinguishable and theoretically grounded. This strengthens confidence that the operationalization of structural mechanisms, cultural mechanisms, and adaptive capacity aligns with the conceptual framework of the study. The combined evidence of strong reliability and satisfactory validity indicates that the measurement model is methodologically sound. This provides a solid foundation for subsequent inferential analyses, ensuring that the relationships observed among variables are not influenced by measurement error but instead reflect meaningful patterns of organizational adaptation.

## Discussion

### *The Influence of Structural Adaptation Mechanisms on Adaptive Capacity*

The findings of this study confirm that structural adaptation mechanisms play a significant role in shaping organizational adaptive capacity within agrarian communities. The positive and statistically significant effects of policy alignment, organizational restructuring, and network collaboration indicate that formal institutional arrangements contribute meaningfully to how organizations respond to socio-ecological change (Boakye-Danquah et al., 2018; Gilmore et al., 2022; Golfinopoulos & Koumparou, 2024; Baldwin et al., 2024; Phuong et al., 2018). These mechanisms provide the structural foundation necessary for coordinating collective action and managing environmental uncertainty.

The significance of policy alignment suggests that organizations that are able to synchronize their internal strategies with broader regulatory and environmental frameworks are better positioned to respond to change. This alignment enables organizations to operate within coherent governance structures, reducing ambiguity and enhancing strategic direction. In agrarian contexts, where external policies often influence resource access and agricultural practices, such alignment becomes particularly critical.

Organizational restructuring also emerges as an important factor, reflecting the need for internal flexibility in response to changing environmental and socio-economic conditions. The ability to adjust roles, responsibilities, and decision-making processes allows organizations to remain responsive and adaptive (Shafizadeh, 2024; Janssen & Van, 2020). This flexibility is essential in dynamic agrarian systems, where shifts in climate patterns and market conditions require continuous institutional adjustment.

Network collaboration further reinforces the importance of external linkages in enhancing adaptive capacity. Organizations that engage in collaborative relationships with other institutions are more likely to access information, resources, and technical support. These networks facilitate knowledge exchange and collective problem-solving, which are crucial in addressing complex socio-ecological challenges.

Despite their significance, the relatively moderate magnitude of structural variables suggests that these mechanisms alone are not sufficient to fully explain adaptive capacity (Hagger & Hamilton, 2021; Royer-Tardif et al., 2021). This indicates that while structural arrangements provide necessary support, they may not directly drive adaptive behavior. Instead, they function as enabling conditions that facilitate the implementation of adaptive strategies.

This finding highlights a potential limitation of purely institutional approaches to adaptation, which often emphasize policy reform and organizational design without adequately considering social and cultural dimensions. In the context of agrarian communities, where informal institutions and social relationships play a dominant role, structural mechanisms must be complemented by culturally embedded practices.

The effectiveness of structural mechanisms may be influenced by contextual factors such as governance capacity, resource availability, and institutional trust. In regions where these factors are limited, structural interventions may not yield optimal outcomes. This underscores the importance of contextualizing institutional reforms within local socio-economic realities.

The results suggest that structural adaptation mechanisms are essential but not dominant drivers of adaptive capacity. Their role lies in providing the institutional infrastructure that supports adaptation, rather than directly shaping adaptive behavior. This distinction is critical for understanding how different dimensions of adaptation interact within agrarian organizations.

### ***The Influence of Cultural Adaptation Mechanisms on Adaptive Capacity***

Järvelä (2023) said that, the findings indicate that cultural adaptation mechanisms exert a stronger influence on adaptive capacity compared to structural mechanisms. Variables such as local knowledge integration, social learning, and shared norms demonstrate higher levels of influence, suggesting that adaptation is deeply rooted in socially embedded practices and collective experiences. This highlights the central role of culture in shaping how organizations interpret and respond to environmental change.

Local knowledge integration emerges as a critical component of adaptation, reflecting the value of experiential and context-specific knowledge in managing ecological uncertainty. In agrarian communities, such knowledge is often derived from long-term interactions with the environment and provides practical insights into resource management. Its integration into organizational practices enhances the relevance and effectiveness of adaptive strategies.

Social learning further strengthens adaptive capacity by enabling continuous knowledge exchange among organizational members (Bullock et al., 2022; Rafique et al., 2018; Park & Kim, 2018). Through processes of interaction, observation, and reflection, individuals and groups are able to refine their practices and adapt to changing conditions. This dynamic process supports innovation and fosters a collective understanding of environmental challenges.

Shared norms play an equally important role by providing a framework for coordinated action and mutual expectations. These norms facilitate cooperation and reduce conflict, enabling organizations to function cohesively in the face of uncertainty. In agrarian contexts, where collective action is often required for resource management, shared norms become a key determinant of adaptive success.

The stronger influence of cultural mechanisms suggests that adaptation is not solely a technical or institutional process but also a social one. Cultural factors shape how individuals perceive risks, interpret information, and engage in collective decision-making. As such, they directly influence the effectiveness of adaptive responses.

This finding challenges conventional approaches that prioritize structural interventions over social dynamics. While policies and organizational reforms are important, they may be less effective if they

do not align with existing cultural practices and values. In this sense, cultural mechanisms act as the foundation upon which formal adaptation strategies are built.

The prominence of cultural variables reflects the resilience of local knowledge systems and social institutions in agrarian communities. These systems have evolved over time to cope with environmental variability, making them highly adaptable and contextually relevant (Kroeker et al., 2020). Their continued importance underscores the need to preserve and integrate traditional practices within modern adaptation frameworks. In sum, cultural adaptation mechanisms are not merely complementary to structural mechanisms but represent a core driver of adaptive capacity. Their influence highlights the importance of social cohesion, learning, and locally grounded knowledge in sustaining organizational resilience.

### ***The Integrated Role of Structural and Cultural Mechanisms in Organizational Adaptation***

While structural and cultural mechanisms have distinct roles, the findings of this study suggest that adaptive capacity is ultimately shaped by their interaction. The significance of all variables in the regression model indicates that effective adaptation emerges from a combination of formal institutional arrangements and informal social practices. This integration reflects the complexity of socio-ecological systems, where multiple dimensions of adaptation operate simultaneously.

The relatively high explanatory power of the model demonstrates that combining these mechanisms provides a comprehensive understanding of organizational adaptation. Mao (2023) said that, structural mechanisms contribute to coordination, resource mobilization, and institutional stability, while cultural mechanisms ensure legitimacy, acceptance, and sustainability. Together, they form a holistic adaptive system.

This interaction can be understood as a process of mutual reinforcement, where structural mechanisms create the conditions for adaptation, and cultural mechanisms drive its implementation. Without supportive institutional structures, cultural practices may lack the resources and coordination needed for large-scale impact. Conversely, without cultural alignment, structural interventions may fail to gain acceptance or produce meaningful change (Wyland et al., 2024; Stouten et al., 2018).

The findings also highlight the importance of alignment between formal and informal institutions. When policies and organizational structures are consistent with local norms and knowledge systems, adaptation becomes more effective and sustainable. This alignment reduces resistance, enhances participation, and strengthens collective action.

In the context of agrarian communities in South Sulawesi, this integration is particularly significant due to the coexistence of traditional institutions and modern governance systems. The ability to harmonize these systems determines the overall effectiveness of adaptation strategies. Organizations that successfully integrate these dimensions are better equipped to respond to socio-ecological challenges.

The integrated model underscores the need for a multidimensional approach to adaptation that goes beyond single-factor explanations. Adaptation is not driven solely by institutional reform or cultural practices but by their interaction within a broader system. This perspective aligns with contemporary theories of adaptive governance and socio-ecological resilience.

The findings also suggest that future interventions should adopt a balanced approach that simultaneously strengthens institutional capacity and supports cultural practices. Policies should be designed to complement, rather than replace, local knowledge systems and social norms. Such an approach can enhance both the effectiveness and sustainability of adaptation efforts.

This study demonstrates that organizational adaptation is a complex and dynamic process that requires the integration of structural and cultural mechanisms. This integrated perspective provides valuable insights for both theory and practice, emphasizing the need for context-sensitive and holistic approaches to building resilience in agrarian communities.

## CONCLUSION

This study concludes that organizational adaptation in agrarian communities is a multidimensional process shaped by the interaction between structural and cultural mechanisms. While structural factors such as policy alignment, organizational restructuring, and network collaboration significantly contribute to adaptive capacity by providing institutional support and coordination, cultural mechanisms including local knowledge integration, social learning, and shared norms emerge as more influential drivers in enabling effective and context-sensitive adaptation. The findings demonstrate that adaptive capacity is not solely determined by formal governance structures but is strongly embedded in socially constructed practices and collective experiences within the community. Moreover, the integration of structural and cultural dimensions enhances the overall resilience of agrarian organizations, allowing them to respond more effectively to socio-ecological changes. These results highlight the importance of adopting a holistic and context-sensitive approach to adaptation, where institutional reforms are aligned with local knowledge systems and social dynamics. Consequently, strengthening both governance capacity and cultural cohesion is essential for sustaining organizational resilience and ensuring long-term ecological and socio-economic stability in agrarian settings.

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