



COMPARATIVE ANALYSIS OF COST EFFICIENCY IN SMALLHOLDER AND LARGE-SCALE AGRICULTURAL COOPERATIVES

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Abstract

Agricultural cooperatives operate across a spectrum of sizes, from smallholder-based organizations serving dozens of farmers to large-scale enterprises managing thousands of members. The relationship between cooperative size and cost efficiency has profound implications for rural development policy, cooperative governance, and the economic sustainability of smallholder agriculture. This comprehensive literature review synthesizes recent empirical evidence on the comparative cost efficiency of smallholder versus large-scale agricultural cooperatives, drawing exclusively on peer-reviewed literature published between 2019 and 2026. The review critically examines theoretical frameworks explaining scale economies in cooperative organizations, evaluates methodological approaches employed in empirical studies, and synthesizes findings across diverse geographical contexts including Ethiopia, China, Türkiye, Spain, and Papua New Guinea. The analysis reveals that while large-scale cooperatives consistently demonstrate cost advantages through economies of scale, the relationship between size and efficiency is more complex than simple linear models suggest. Smallholder cooperatives exhibit distinct advantages in allocative efficiency, member engagement, and social value creation that may offset their cost disadvantages. Furthermore, the evidence indicates an inverted U-shaped relationship between cooperative size and efficiency, with optimal scale varying by sector, institutional context, and governance quality. This review identifies critical gaps in longitudinal research, standardized measurement frameworks, and investigation of the mechanisms through which scale affects cost efficiency, providing actionable recommendations for cooperative practitioners, policymakers, and future researchers.

Keywords: *Agricultural cooperatives, cost efficiency, economies of scale, smallholder farmers, cooperative size, technical efficiency, scale economies*

Introduction

Agricultural cooperatives occupy a distinctive organizational space between private enterprise and collective action, uniquely positioned to address the market failures and coordination challenges that characterize smallholder agriculture (Meliá-Martí et al., 2024; Oufkiri & Elkorchi, 2025). Yet, a persistent question confronting cooperative practitioners, policymakers, and researchers concerns the optimal scale of cooperative organization: do larger cooperatives achieve superior cost efficiency through economies of scale, or do smallholder-based cooperatives realize advantages in member engagement, allocative precision, and social cohesion that outweigh their cost disadvantages?

This question has gained renewed urgency in light of several converging developments. First, the global cooperative sector has witnessed a trend toward consolidation and merger activity, driven by competitive pressures and the pursuit of scale economies (Gezahegn et al., 2019). Second, digital technologies have created new possibilities for coordinating smallholder activities, potentially altering the scale–efficiency relationship (Altman et al., 2025). Third, the COVID-19 pandemic exposed vulnerabilities in supply chains, prompting renewed interest in the resilience characteristics of cooperatives of different sizes (Mangan & Ward, 2024).

Despite the practical importance of understanding the scale–efficiency relationship, the empirical evidence base remains fragmented and, at times, contradictory. Studies from Ethiopia demonstrate substantial cost advantages for larger cooperatives, with potential cost reductions of 78% to 181% through consolidation (Gezahegn et al., 2019). Yet evidence from China suggests that cooperative members exhibit lower cost efficiency than non-members, despite achieving higher technical efficiency (Chen et al., 2025). Research from Türkiye indicates that non-member dairy farms are more efficient than members, while also finding that small-scale farms benefit more from cooperative membership than large farms (Yercan & Malkoc, 2025). These seemingly contradictory findings suggest that the relationship between cooperative size and cost efficiency is more complex than simple scale economies models would predict.

This review aims to address these complexities by providing a comprehensive and critical synthesis of recent empirical evidence on the comparative cost efficiency of smallholder versus large-scale agricultural cooperatives. Drawing on studies published, with particular emphasis on research appearing since 2024, the review addresses the following questions: (1) What theoretical frameworks explain the relationship between cooperative size and cost efficiency? (2) What does the empirical evidence reveal about comparative cost efficiency across cooperative scales? (3) What factors moderate the scale–efficiency relationship? (4) What methodological challenges complicate the measurement and comparison of cost efficiency across cooperative sizes? and (5) What implications do the findings have for cooperative policy, governance, and practice?

Defining Cost Efficiency in Cooperative Contexts

Cost efficiency in agricultural cooperatives encompasses multiple dimensions that extend beyond conventional measures applied to investor-owned firms. Following the conceptual framework advanced by Oufkiri and Elkorchi (2025), cooperative performance measurement must account for the dual objectives of economic viability and social purpose, making conventional efficiency metrics insufficient when applied without contextual adaptation.

Within the cooperative literature, cost efficiency is typically decomposed into two analytically distinct components. Technical efficiency refers to the ability of a cooperative to produce maximum output from a given set of inputs, reflecting productive capability (Chen et al., 2025;

Yercan & Malkoc, 2025). Allocative efficiency refers to the ability to combine inputs in optimal proportions given their relative prices, reflecting managerial capacity to respond to market signals (Gezahegn et al., 2019). Scale efficiency refers to the ability to operate at the optimal scale of production, where long-run average costs are minimized (Meliá-Martí et al., 2024).

The distinction among these dimensions is critical for understanding the scale–efficiency relationship. A cooperative may achieve high technical efficiency—producing efficiently given its chosen input mix, while exhibiting low allocative efficiency if input prices are not appropriately reflected in production decisions. Alternatively, a cooperative may operate at suboptimal scale while maintaining high technical efficiency given that scale.

Effect of Cooperative Scale on Cost Efficiency

The theoretical literature identifies several mechanisms through which cooperative scale may affect cost efficiency. Table 1 synthesizes these mechanisms with supporting evidence from recent empirical studies.

Table 1. *Theoretical Mechanisms Linking Cooperative Scale to Cost Efficiency*

Mechanism	Description	Effect on Cost Efficiency	Representative References
Economies of Scale	Fixed costs spread over larger output volumes; bulk purchasing discounts; specialized management	Positive for larger cooperatives	Gezahegn et al. (2019); Altman et al. (2025)
Scope Economies	Joint production or multiple activities reduce average costs through shared inputs	Positive for diversified, larger cooperatives	Key (2019)
Transaction Cost Reduction	Larger membership enables internalization of transactions that would otherwise incur market costs	Positive for larger cooperatives	Chen et al. (2025)
Member Heterogeneity	Diverse member interests complicate decision-making and increase coordination costs	Negative for larger cooperatives	Grashuis & Cook (2021); Meliá-Martí et al. (2024)
Agency Problems	Separation between members and management increases with scale, enabling managerial opportunism	Negative for larger cooperatives	Gezahegn et al. (2019)
Allocative Precision	Small-scale operations may better tailor input combinations to specific member needs	Positive for smaller cooperatives	Chen et al. (2025)

Source: *Authors' Tabulation*

The relationship between scale and cost efficiency is theoretically ambiguous. While conventional industrial organization theory predicts declining average costs with increased scale (Gezahegn et al., 2019), cooperative governance structures introduce countervailing forces. As Meliá-Martí et al. (2024) demonstrate, the relative performance of cooperatives and investor-owned firms varies by size, with cooperatives demonstrating superior efficiency at smaller scales but losing this advantage as they grow.

Recent theoretical and empirical work suggests that the relationship between cooperative size and cost efficiency may follow an inverted U-shaped pattern. Altman et al. (2025), examining coffee cooperatives in Papua New Guinea, found a strong positive correlation between size and productivity up to a threshold, beyond which diminishing returns set in. This finding aligns with the broader literature on organizational economics, which recognizes that the benefits of scale are eventually offset by coordination costs, agency problems, and member heterogeneity (Grashuis & Cook, 2021).

Key (2019) provides complementary evidence from the United States, demonstrating that many agricultural cooperatives experience economies of scale, but product-specific scale economies for individual outputs are close to one, indicating that operations are close to constant returns to scale. This finding suggests that while overall cooperative operations may benefit from scale, individual activities may not, complicating simple prescriptions for cooperative consolidation.

Comparative Cost Efficiency Across Cooperative Scales

Evidence from Developing Countries

The relationship between cooperative size and cost efficiency has been extensively studied in developing country contexts where agricultural cooperatives play critical roles in smallholder market integration. Table 2 summarizes recent empirical findings from key geographical contexts.

Table 2. *Recent Empirical Evidence on Cooperative Size and Cost Efficiency by Region*

Region	Sample	Key Findings (Keywords)	Method	References
Ethiopia	Agricultural coops	Cost drop 78–181% from larger coops; strong economies of scale	Cost subadditivity	Gezahegn et al. (2019)
China	Herders (Xizang); Coops (Gansu)	Members: higher TE (0.705 vs 0.685) but lower CE (0.250 vs 0.323); low pure technical efficiency main constraint	Two-stage DEA-Tobit; DEA + Tobit	Chen et al. (2025); Bai et al. (2025)
Türkiye	Dairy farms (Izmir)	Non-members more efficient; large farms more efficient; small efficient farms = coop members	DEA + Tobit	Yercan & Malkoc (2025)
Papua New Guinea	Coffee coops	Size-productivity positive up to threshold; diminishing returns beyond	Threshold analysis	Altman et al. (2025)
Spain	Olive oil coops & IOFs	Coops outperform IOFs at small scale; advantage disappears with size	DEA + probit	Meliá-Martí et al. (2024)

Source: *Authors' Tabulation*

The Ethiopian evidence provides the most compelling case for scale economies in agricultural cooperatives. Gezahegn et al. (2019) employed the concept of cost subadditivity to compare the cost efficiency of large versus small cooperatives, finding that costs would drop by 78% to 181% if farmers joined together in relatively large rather than small cooperatives. This finding suggests substantial returns to consolidation, with implications for cooperative policy in Ethiopia and similar contexts. However, the authors note that these estimates derive from cross-sectional data

and may not capture dynamic effects or the potential for diminishing returns beyond observed scale ranges.

In contrast, evidence from China presents a more nuanced picture. Chen et al. (2025) examined livestock production efficiency among herders in Xizang, comparing cooperative members and non-members across multiple efficiency dimensions. Their findings reveal a striking pattern: cooperative members exhibit higher technical efficiency (0.705 vs. 0.685) and scale efficiency (0.297 vs. 0.206) but lower cost efficiency (0.250 vs. 0.323) compared to non-members. This pattern suggests that while cooperatives enable members to achieve better technical performance and operate at more efficient scales, they may introduce allocative inefficiencies in cost management. The authors attribute this finding to potential rigidities in cooperative input procurement and member heterogeneity in production conditions.

Complementing these findings, Bai et al. (2025) examined cooperative efficiency in Gansu Province, China, analyzing 282 agricultural cooperatives across five types. Their results indicate that cooperative comprehensive efficiency is generally low, with pure technical efficiency, rather than scale efficiency, identified as the primary constraint. This finding is significant because it suggests that improvements in management quality may yield greater efficiency gains than expansion of scale alone. Among cooperative types, procurement/sales/processing cooperatives achieved the highest comprehensive and scale efficiency, while agricultural machinery/technical service cooperatives achieved the highest pure technical efficiency.

Evidence from Transition and Developed Country Contexts

Research from transition and developed country contexts provides additional insights into the scale–efficiency relationship. Meliá-Martí et al. (2024) conducted a comparative analysis of efficiency and profitability between cooperatives and investor-owned firms (IOFs) in the Spanish olive oil sector. Their findings are particularly instructive for understanding size effects: cooperatives demonstrated superiority in both efficiency and overall profitability compared to IOFs, but this superiority disappeared as cooperatives gained dimension. This pattern supports the inverted U-shape hypothesis, suggesting that the governance advantages of cooperatives relative to IOFs are most pronounced at smaller scales and may erode with growth.

The Spanish study also introduced a methodological innovation of particular relevance to this review. The authors developed a cooperative global profitability indicator that accounts for the duality of investor-supplier members in cooperatives, recognizing that conventional profitability measures may misrepresent cooperative performance by failing to capture benefits distributed to members through patronage refunds and other mechanisms. This insight has important implications for comparative efficiency analyses across cooperative sizes, as larger cooperatives may distribute value through different mechanisms than smaller organizations.

Key (2019) provides complementary evidence from the United States, estimating multiproduct and product-specific scale economies using nonparametric approaches. The analysis reveals that many agricultural cooperatives experience economies of scale, indicating that variable returns to scale rather than constant returns to scale is the appropriate technology for modeling cooperative production. Critically, product-specific scale economies for all outputs are close to one, suggesting that individual outputs are operating close to constant returns to scale. This finding implies that while overall cooperative operations may benefit from scale, individual activities may not, complicating the case for consolidation based on single-output efficiency measures.

Comparative Synthesis: Smallholder vs. Large-Scale Cooperatives

The evidence reviewed reveals several consistent patterns across geographical contexts. Table 3 presents a comparative synthesis of the relative advantages and disadvantages of smallholder and large-scale cooperatives based on recent empirical findings.

Table 3. *Comparative Analysis: Smallholder vs. Large-Scale Agricultural Cooperatives*

Dimension	Smallholder Cooperatives	Large-Scale Cooperatives	Evidence Strength	Representative References
Cost Efficiency	Lower (mixed evidence)	Higher (consistent)	Strong	Gezahegn et al. (2019); Chen et al. (2025)
Technical Efficiency	Variable; may be lower	Generally higher	Moderate	Chen et al. (2025); Yercan & Malkoc (2025)
Allocative Efficiency	Potentially higher	May be constrained by rigidity	Moderate	Chen et al. (2025)
Member Engagement	Higher participation rates	Lower; free-rider problems	Strong	Grashuis & Cook (2021); Bai et al. (2025)
Governance Quality	More direct member oversight	Agency problems more pronounced	Moderate	Gezahegn et al. (2019); Oufkiri & Elkorchi (2025)
Social Value Creation	Stronger community embeddedness	May prioritize commercial objectives	Moderate	Meliá-Martí et al. (2024)
Market Power	Limited	Substantial bargaining power	Strong	Gezahegn et al. (2019); Altman et al. (2025)
Resilience	Variable; may be more vulnerable	Generally more resilient	Emerging	Mangan & Ward (2024)

Source: *Authors' Tabulation*

Moderating Factors and Contextual Influences

Sectoral Differences

The relationship between cooperative size and cost efficiency varies significantly across agricultural sectors. Evidence from livestock systems suggests distinct patterns compared to crop-based cooperatives. Chen et al. (2025) found that herders in pastoral systems face unique constraints, including grassland degradation, climate vulnerabilities, and nomadic traditions, that shape how cooperative scale affects efficiency. In these contexts, small-scale cooperatives may be better positioned to accommodate the mobility requirements of pastoral production systems. In contrast, evidence from crop-based systems, particularly in olive oil, coffee, and grains, suggests stronger scale economies and more consistent benefits of consolidation (Meliá-Martí et al., 2024; Altman et al., 2025). This sectoral variation likely reflects differences in production technologies, input requirements, and market structures across agricultural subsectors.

Governance Quality and Institutional Context

The efficiency effects of cooperative scale are mediated by governance quality. Bai et al. (2025) identified surplus distribution mechanisms, access to policy support, and regional economic development levels as significant determinants of cooperative efficiency in Gansu, China. These factors operate independently of cooperative size, suggesting that governance improvements may offset some of the efficiency disadvantages of small-scale operations. Gezahegn et al. (2019) note that in Ethiopia, the establishment of cooperatives has historically paid little attention to organizational size, resulting in a proliferation of small-scale organizations that may not capture potential scale economies. This observation underscores the importance of policy frameworks that support appropriate scale formation rather than simply promoting cooperative establishment without consideration of size effects.

Member Heterogeneity and Social Dynamics

The efficiency consequences of cooperative scale are also mediated by member heterogeneity. Grashuis and Cook (2021) demonstrated that cooperatives with more heterogeneous membership experience lower member satisfaction, which may translate into reduced participation and diminished efficiency outcomes. This finding has direct implications for the scale–efficiency relationship, as larger cooperatives are more likely to encompass diverse member interests, production systems, and market orientations. Smallholder cooperatives, by virtue of their more homogeneous membership, may benefit from stronger social cohesion, shared norms, and mutual monitoring that reduce transaction costs and enhance allocative precision (Chen et al., 2025). These advantages may offset the cost disadvantages of smaller scale, particularly in contexts where trust and collective action are critical to cooperative function.

Methodological Approaches to Measuring Cooperative Cost Efficiency

Efficiency Measurement Techniques

The literature employs diverse methodological approaches to measure cooperative cost efficiency, each with distinct strengths and limitations. Table 4 summarizes the primary techniques and their applications.

Table 4. *Methodological Approaches to Measuring Cooperative Cost Efficiency*

Method	Description	Strengths	Limitations	References
Data Envelopment Analysis (DEA)	Nonparametric LP; production frontier	No functional form; multi-input/output	Outlier-sensitive; deterministic	Chen et al. (2025); Bai et al. (2025); Yercan & Malkoc (2025)
Stochastic Frontier Analysis (SFA)	Parametric with error term	Accounts for noise & shocks	Functional form & distribution assumptions	Mangoejane & Christian (2025)
Cost Subadditivity Analysis	Tests cost savings from joint vs. separate production	Directly tests scale economies	Requires detailed cost data; constant tech assumption	Gezahegn et al. (2019)
Tobit Regression	Censored regression for DEA efficiency scores	Handles bounded dependent variable	First-stage DEA scores are estimated with error	Chen et al. (2025); Bai et al. (2025)

Source: *Authors' Tabulation*

The two-stage DEA-Tobit approach employed by Chen et al. (2025) and Bai et al. (2025) represents a particularly common methodological framework. In this approach, efficiency scores are first estimated using DEA, then regressed on explanatory variables using Tobit regression to account for the censored nature of efficiency scores (bounded between 0 and 1). This approach enables identification of factors associated with efficiency variation while acknowledging the statistical properties of the dependent variable.

Challenges in Comparative Analysis

Several methodological challenges complicate comparative analysis of cost efficiency across cooperative sizes. First, sample selection bias arises when comparing members and non-members, as unobserved characteristics may influence both membership decisions and efficiency outcomes. Studies employing propensity score matching (Swe & Lee, 2025) or instrumental variables approaches (Gezahegn et al., 2019) address this concern, though such approaches remain relatively rare in the cooperative efficiency literature.

Second, measurement consistency challenges arise from the heterogeneous definitions of cooperative size across studies. Some studies employ membership counts as the primary size indicator (Gezahegn et al., 2019; Altman et al., 2025), while others use output volume (Meliá-Martí et al., 2024) or asset value (Bai et al., 2025). These different metrics may capture different dimensions of scale and are not perfectly correlated, complicating cross-study comparison.

Third, temporal dynamics are poorly captured in the predominantly cross-sectional literature. Key (2019) demonstrates that annual frontier estimates show cooperatives have become less cost efficient over time, but scale and scope economies remain relatively consistent across years. This finding suggests that static efficiency measures may mask important temporal variation in the scale–efficiency relationship.

Fourth, counterfactual construction poses challenges for evaluating the efficiency implications of scale changes. Gezahegn et al. (2019) employ cost subadditivity to compare actual cooperative configurations with hypothetical alternatives, providing insights into the potential benefits of consolidation. However, such counterfactual approaches rely on strong assumptions about the constancy of production technology across scales.

Critical Insights and Discussion

The evidence reviewed reveals apparent contradictions that merit critical examination. On one hand, studies from Ethiopia (Gezahegn et al., 2019) demonstrate substantial cost advantages for larger cooperatives, with potential cost reductions exceeding 78% through consolidation. On the other hand, evidence from China (Chen et al., 2025) shows that cooperative members exhibit lower cost efficiency than non-members, while evidence from Spain (Meliá-Martí et al., 2024) indicates that cooperative efficiency advantages over investor-owned firms disappear at larger scales.

These apparent contradictions can be reconciled through several lenses. First, the measurement of cost efficiency differs across studies. The Ethiopian study focuses on cost efficiency at the cooperative level, comparing large and small cooperatives directly. The Chinese study compares cost efficiency of individual farmers (members vs. non-members), which captures a different unit of analysis. The Spanish study compares cooperative efficiency to investor-owned firms, addressing a different comparative question.

Second, contextual factors vary substantially. The Ethiopian study examines agricultural cooperatives in a context characterized by nascent cooperative development and substantial opportunities for consolidation. The Chinese study examines pastoral livestock systems with unique ecological and cultural constraints that may favor smaller-scale organization. The Spanish study examines a mature olive oil sector with established cooperative and investor-owned forms competing on relatively equal footing.

Third, the distinction between technical and allocative efficiency is critical. The Chinese finding that members exhibit higher technical efficiency but lower cost efficiency suggests that cooperatives improve productive capability while introducing allocative inefficiencies. This pattern may reflect cooperative governance structures that prioritize member interests over cost minimization in input selection, a trade-off that is obscured when examining aggregate efficiency measures.

Implications for Theory

The evidence reviewed has important implications for theories of cooperative organization. First, the inverted U-shape relationship between cooperative size and efficiency (Altman et al., 2025; Meliá-Martí et al., 2024) suggests that the search for an optimal cooperative scale must account for both the benefits of scale economies and the costs of increased complexity. This finding challenges both the naive advocacy of cooperative consolidation and the romanticization of small-scale cooperative organization.

Second, the persistent finding that cooperatives achieve higher technical efficiency while sometimes exhibiting lower cost efficiency (Chen et al., 2025) suggests that efficiency measurement frameworks must account for the distinctive objective functions of cooperative organizations. As Oufkiri and Elkorchi (2025) argue, conventional efficiency metrics developed for investor-owned firms may inadequately capture the dual economic and social missions of cooperatives.

Third, the sectoral variation in scale–efficiency relationships underscore the importance of context-sensitive analysis. Findings from crop-based systems in Ethiopia and Spain may not generalize to pastoral systems in China or dairy systems in Türkiye, and vice versa. This heterogeneity calls for theoretical frameworks that incorporate sectoral and institutional specificities rather than seeking universal principles.

Implications for Cooperative Practice

The evidence reviewed has several implications for cooperative practitioners. The finding that smallholder cooperatives can achieve efficiency advantages through allocative precision, member engagement, and social cohesion suggests that scale is not determinative. Cooperatives of all sizes can improve efficiency through attention to governance, member participation, and management quality.

The mediating role of governance in the scale–efficiency relationship underscores the importance of investing in governance structures, regardless of cooperative size. As Bai et al. (2025) demonstrate, pure technical efficiency, which is closely linked to management quality, is a more binding constraint than scale efficiency in many contexts.

The absence of a universal optimal scale suggests that cooperative practitioners should consider sectoral conditions, member characteristics, and institutional contexts when making decisions about consolidation or expansion.

The trade-off between technical and allocative efficiency observed in some contexts suggests that cost minimization may not always align with member value maximization. Cooperatives should consider how efficiency improvements affect member welfare, particularly for smallholder members who may prioritize stable market access and input quality over cost minimization.

Conclusion

This comprehensive literature review has critically examined recent empirical evidence on the comparative cost efficiency of smallholder versus large-scale agricultural cooperatives. The synthesis of studies published between 2019 and 2026 reveals that while large-scale cooperatives consistently demonstrate cost advantages through economies of scale, the relationship between cooperative size and efficiency is more complex than simple linear models suggest. The evidence supports the existence of substantial economies of scale in agricultural cooperatives, with potential cost reductions of 78% to 181% through consolidation in some contexts (Gezahegn et al., 2019). However, these scale economies are not universal, and the relationship between size and efficiency appears to follow an inverted U-shaped pattern, with diminishing returns beyond optimal scale (Altman et al., 2025; Meliá-Martí et al., 2024). Moreover, smallholder cooperatives exhibit distinct advantages in allocative efficiency, member engagement, and social value creation that may offset their cost disadvantages (Chen et al., 2025; Oufkiri & Elkorchi, 2025).

The evidence reviewed has important implications for cooperative practitioners, policymakers, and researchers. For practitioners, the findings underscore the importance of governance quality, member engagement, and context-sensitive approaches to scale. For policymakers, the evidence suggests that policies supporting cooperative governance capacity and appropriate scale formation may yield efficiency benefits. For researchers, the review identifies critical gaps in longitudinal research, standardized measurement frameworks, and investigation of the mechanisms through which scale affects efficiency.

As agricultural systems continue to evolve in response to climate change, digital transformation, and shifting market structures, the question of optimal cooperative scale will remain pressing. The evidence synthesized in this review provides a foundation for addressing this question while highlighting the need for continued investigation of the mechanisms, moderators, and manifestations of the scale–efficiency relationship in agricultural cooperatives.

Recommendations

The study makes the following recommendations:

1. Given the importance of governance quality for efficiency outcomes, policies that strengthen cooperative governance—including training programs, transparency requirements, and accountability mechanisms—may yield efficiency benefits independent of scale.
2. The sectoral and contextual variation in scale–efficiency relationships suggests that policies promoting cooperative consolidation should be tailored to specific subsectors and contexts rather than applied uniformly.
3. Rather than simply promoting cooperative establishment, policies should support the formation of cooperatives at scales appropriate to their operating context, sector, and member base.
4. The COVID-19 pandemic highlighted the importance of organizational resilience alongside efficiency (Mangan & Ward, 2024). Policies should consider how scale affects resilience characteristics, not simply cost efficiency.

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