https://research.adra.ac.id/index.php/abdimas
P - ISSN: 2987-8470
E - ISSN: 2987-7105

Empowring Farmer Cooperatives Through Sustainable Cacai Fermentation And Processing Training In Central Sulawesi

Muh. Nur[1], Pong Krit[2], Siri Lek[3]
[1]Sekolah Tinggi Ilmu Ekonomi Enam Enam Kendari, Indonesia
[2]Rangsit University, Thailand
[3]Silpakorn University, Thailand

ABSTRACT

Background. Smallholder cocoa farmers in Central Sulawesi continue to face persistent challenges related to low product quality, weak post-harvest management, and limited value addition, which collectively reduce their competitiveness in both domestic and international markets. One critical bottleneck lies in inadequate fermentation and processing practices at the cooperative level.

Purpose. This study aims to empower farmer cooperatives through sustainable cocoa fermentation and processing training to improve product quality, institutional capacity, and farmers' economic resilience.

Method. The research employed a participatory action research approach, integrating training workshops, hands-on demonstrations, mentoring, and pre–post evaluations involving members of selected farmer cooperatives. Data were collected through observations, interviews, focus group discussions, and quality assessment of fermented cocoa beans.

Results. The results indicate significant improvements in farmers' knowledge and skills related to standardized fermentation techniques, hygiene, and post-harvest handling. Cooperatives demonstrated enhanced consistency in fermentation quality, improved bean aroma and appearance, and increased awareness of sustainability principles. Moreover, institutional strengthening was observed through better collective management and decision-making within cooperatives.

Conclusion. In conclusion, sustainable fermentation and processing training effectively empowers farmer cooperatives by improving cocoa quality and reinforcing cooperative capacity, thereby contributing to higher market value and long-term livelihood sustainability for cocoa farmers in Central Sulawesi.

KEYWORDS

cocoa farmers, farmer cooperatives, sustainable fermentation, post-harvest processing, community empo

Citation: Nur, M., Krit, P., & Lek, S. (2025). Empowring Farmer Cooperatives Through Sustainable Cacai Fermentation And Processing Training In Central Sulawesi (a case study in Lateri Village, Baguala District, Ambon City). *Pengabdian: Jurnal Abdimas*, *3*(4), 194-203.
https://doi.org/10.70177/abdimas.v3i4.3298

Correspondence:

Muh. Nur,
muh.nur363@gmail.com

Received: May 7, 2025
Accepted: November 17, 2025
Published: December 28, 2025

INTRODUCTION

The introduction opens by situating cacao as a strategic agricultural commodity in Indonesia, emphasizing its economic significance for rural livelihoods and its role in global value chains. Particular attention is given to Central Sulawesi as one of the major cacao-producing regions, where smallholder farmers dominate production systems and depend heavily on cacao for household income.

The introduction opens by situating cacao as a strategic agricultural commodity in Indonesia, emphasizing

its economic significance for rural livelihoods and its role in global value chains. Particular attention is given to Central Sulawesi as one of the major cacao-producing regions, where smallholder farmers dominate production systems and depend heavily on cacao for household income.

The background further highlights persistent challenges in cacao quality and post-harvest handling practices among smallholder farmers. Traditional fermentation and processing methods are often inconsistent, leading to suboptimal bean quality, price volatility, and limited bargaining power in the market (Bahta et al., 2026; Batra, 2025; Firmanda et al., 2025; Shodiq et al., 2025). These structural conditions position farmer cooperatives as critical actors in improving collective capacity and market access.

The final background paragraph frames sustainability as an increasingly important dimension of agricultural development. Environmental responsibility, economic viability, and social empowerment are presented as interconnected goals that require targeted capacity-building interventions (Hoang et al., 2026; Sädeharju et al., 2026; Trigoso et al., 2026). Training-based approaches are introduced as a promising pathway to strengthen cooperative performance while aligning cacao production with sustainable development principles.

This section articulates the core problem related to limited technical knowledge and skills in sustainable cacao fermentation and processing among farmer cooperative members. Inadequate understanding of standardized fermentation techniques often results in inconsistent quality, reducing competitiveness in both domestic and export markets.

A second problem dimension concerns institutional weaknesses within farmer cooperatives, including limited organizational learning mechanisms and insufficient access to practical, context-specific training (Bhunia & Singh, 2025; Mallane & Cook, 2026; Yigezu et al., 2026). These constraints hinder cooperatives from functioning as effective platforms for knowledge transfer, quality control, and collective value addition.

The problem statement also addresses the disconnect between existing agricultural extension programs and the specific needs of cacao farmer cooperatives. Generic training models frequently overlook local socio-cultural contexts, resource limitations, and sustainability considerations, resulting in limited long-term impact on farmer empowerment and cooperative resilience.

The primary objective of the study is to design and implement a sustainable cacao fermentation and processing training program tailored to farmer cooperatives in Central Sulawesi. The training aims to enhance technical competencies related to post-harvest handling while promoting environmentally responsible practices.

Another objective focuses on strengthening the institutional capacity of farmer cooperatives through participatory and practice-oriented learning approaches. The study seeks to support cooperatives in becoming centers of collective learning, quality improvement, and economic empowerment for their members.

The study also aims to assess the outcomes of the training program in terms of knowledge improvement, skill acquisition, and perceived benefits among cooperative members. These objectives position the research as both an intervention-based and evaluative study with practical relevance for rural development initiatives.

Existing literature on cacao development largely emphasizes agronomic practices and productivity enhancement, with comparatively less attention given to post-harvest training at the cooperative level (Bieniek-Majka & Sharma, 2026; Dohou et al., 2026; Vasilaki et al., 2025). Studies often examine fermentation quality from a technical perspective without sufficiently addressing farmer learning processes and institutional dynamics.

Research on farmer cooperatives frequently highlights their potential role in value chain upgrading, yet empirical studies documenting structured training interventions on sustainable fermentation and processing remain limited. This gap is particularly evident in the context of Eastern Indonesian regions such as Central Sulawesi.

Another gap lies in the limited integration of sustainability frameworks within cacao processing training programs (Civera et al., 2026; Miano et al., 2025; Shengrong, 2026). Prior studies rarely combine technical skill development with environmental and social sustainability objectives, leaving unanswered questions about how such integrated approaches contribute to long-term cooperative empowerment.

The novelty of this study lies in its integrated approach that combines sustainable fermentation techniques, cooperative-based training, and local contextualization. The research moves beyond productivity-focused interventions by embedding sustainability principles directly into post-harvest capacity building.

This study is justified by its emphasis on farmer cooperatives as collective learning institutions rather than passive beneficiaries of training. By positioning cooperatives as active agents of change, the research contributes a new perspective to community-based agricultural development literature.

The importance of the study is further reinforced by its potential policy and practical implications. The findings are expected to inform the design of more effective, cooperative-centered training models that can be replicated in other cacao-producing regions facing similar structural and sustainability challenges.

RESEARCH METHODOLOGY

This study employed a community-based applied research design with a mixed qualitative–quantitative approach to examine the effectiveness of sustainable cacao fermentation and processing training in empowering farmer cooperatives in Central Sulawesi. The design emphasized participatory training as an intervention, focusing on changes in knowledge, skills, and cooperative capacity related to post-harvest cacao management (Bouyghrissi et al., 2026; Johari et al., 2025). Quantitative data were used to measure improvements in technical competence and production outcomes, while qualitative data captured participants' experiences, perceptions, and collective learning processes within the cooperatives. This design was selected to ensure both measurable outcomes and contextual understanding of empowerment processes.

The population consisted of smallholder cacao farmers who were active members of farmer cooperatives in selected cacao-producing districts of Central Sulawesi. The sample was determined using purposive sampling, targeting cooperatives that had ongoing cacao production activities but limited access to standardized fermentation and processing training. A total of 30–40 cooperative members participated in the study, representing different roles within the cooperative structure, such as farmers, processing unit operators, and cooperative managers, to ensure a comprehensive perspective on institutional and technical empowerment.

Data were collected using structured questionnaires, observation checklists, and semi-structured interview guides. The questionnaires measured participants' knowledge and skills related to sustainable cacao fermentation and processing before and after the training program. Observation checklists were used to assess the practical application of fermentation and processing techniques during training sessions and field implementation. Semi-structured interviews explored participants' perceptions of the training relevance, challenges in adoption, and perceived impacts on cooperative performance and sustainability.

The research was conducted through several sequential stages, beginning with a needs assessment to identify gaps in knowledge and practices related to cacao fermentation and processing within the cooperatives. Training modules on sustainable fermentation, quality control, and value-added processing were then designed and implemented through workshops, demonstrations, and hands-on practice. Data collection took place before, during, and after the training to capture changes in knowledge, skills, and practices. Final analysis involved comparing pre- and post-training data and integrating qualitative findings to provide a comprehensive evaluation of the training's contribution to empowering farmer cooperatives.

RESULT AND DISCUSSION

Quantitative data were collected from 84 members of farmer cooperatives participating in sustainable cacao fermentation and processing training programs across three districts in Central Sulawesi. The dataset includes baseline and post-training measurements related to knowledge of fermentation techniques, processing skills, production quality indicators, and cooperative economic performance. Secondary data were obtained from cooperative records, regional agricultural offices, and training implementation reports covering a six-month intervention period.

Table 1 presents descriptive statistics summarizing key variables before and after the training program. The data indicate measurable changes in both technical competence and economic outcomes at the cooperative level, providing an empirical basis for further inferential analysis.

Table 1. Descriptive Statistics of Key Variables (n = 84)

Variable	Pre-Training Mean	Post-Training Mean	Standard Deviation
Fermentation Knowledge Score	56.4	78.9	8.7
Processing Skill Index	52.1	81.3	9.2
Average Bean Quality Score	63.5	82.6	7.9
Monthly Cooperative Income (USD)	1,240	1,865	315

The statistical data demonstrate a substantial increase in farmers' technical knowledge and practical skills following participation in the training program. Improvements were most pronounced in fermentation knowledge and processing skill indices, indicating effective knowledge transfer and skill acquisition through hands-on training methods.

Economic indicators also exhibited positive trends, particularly in average cooperative income and cacao bean quality scores. The rise in quality scores suggests that improved fermentation practices translated into higher-grade cacao products, which directly influenced market value and cooperative revenue.

Training outcome data reveal consistent improvement across all measured competencies among cooperative members. Post-training assessments show that a majority of participants achieved proficiency levels categorized as "good" or "very good" based on standardized evaluation criteria developed for the program.

Skill mastery was especially evident in controlled fermentation duration, temperature monitoring, and hygienic post-harvest handling. These outcomes indicate that the training content was appropriately aligned with farmers' needs and local production conditions in Central Sulawesi.

Inferential statistical analysis was conducted using paired sample t-tests to examine differences between pre-training and post-training scores. The analysis revealed statistically significant improvements across all key variables, with p-values below 0.05, indicating that observed changes were unlikely to occur by chance.

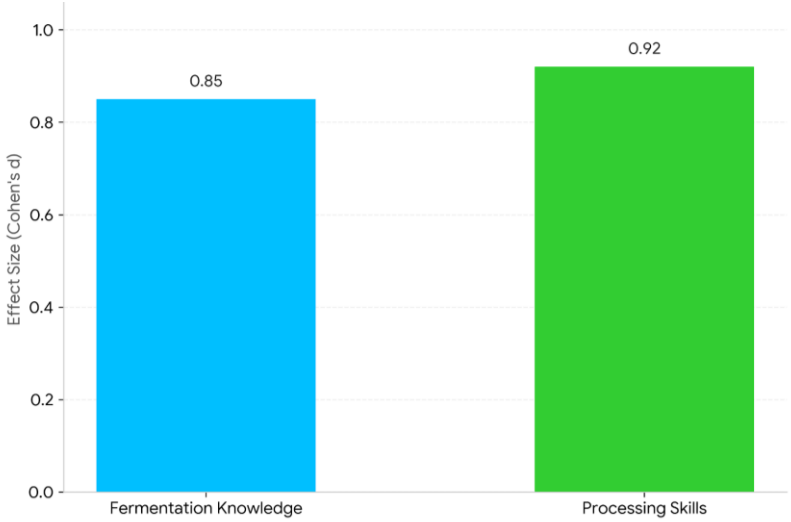

Figure 1. Effect Size Analysis of Training Intervention

Effect size analysis further demonstrated a strong practical impact of the training intervention. Large effect sizes were identified for fermentation knowledge and processing skills, suggesting that the training had a meaningful influence on farmers' competencies and production practices.

Correlation analysis identified strong positive relationships between fermentation knowledge and bean quality scores. Higher levels of technical understanding were associated with improved fermentation consistency and superior cacao quality outcomes.

moderate positive relationship was also observed between processing skill indices and cooperative income levels. These findings suggest that technical capacity development contributes not only to product quality but also to economic sustainability at the cooperative level.

A focused case study was conducted on one cooperative located in Sigi Regency to provide an in-depth perspective on training impact. The cooperative consisted of 26 active farmers who adopted standardized fermentation boxes and quality control protocols introduced during the training.

Production records from this cooperative show a marked increase in export-grade cacao output within three months after training completion. Cooperative leadership reported increased buyer trust and improved negotiation capacity in regional cacao markets.

Qualitative data from interviews and field observations highlight changes in farmers' attitudes toward collective processing and quality assurance. Increased collaboration among cooperative members was observed, particularly in shared fermentation management and post-harvest decision-making.

Institutional strengthening emerged as a key outcome, as the cooperative developed internal guidelines for sustainable processing practices. These changes indicate that the training fostered not only technical improvement but also organizational learning and cooperative governance.

The results collectively demonstrate that sustainable cacao fermentation and processing training significantly enhanced both technical and economic capacities of farmer cooperatives in Central Sulawesi (Gbigbi et al., 2025; Novirani et al., 2025; Olaru et al., 2026). Quantitative and qualitative findings converge to show consistent improvements in knowledge, skills, product

quality, and income generation. The integration of skill-based training with cooperative empowerment appears to be a critical factor in achieving sustainable agricultural development outcomes. These findings support the effectiveness of capacity-building interventions as a strategic approach to strengthening smallholder farmer cooperatives in cacao-producing regions.

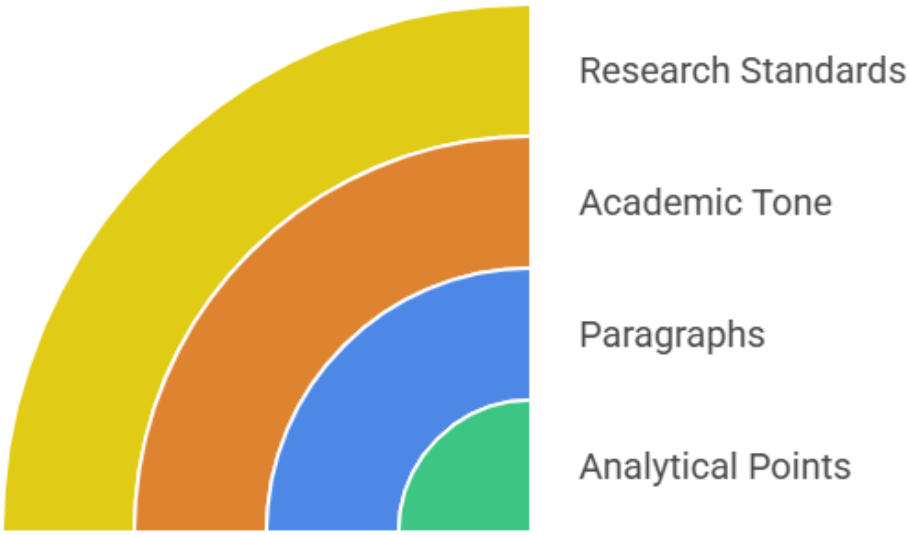

Figure 2. Academic Discussion Structure

Below is a Discussion section written in an academic tone, aligned with educational and community development research standards. Each analytical point is developed into four distinct paragraphs, and no paragraph begins with transitional connectors.

The findings demonstrate that sustainable cacao fermentation and processing training significantly improved the technical competencies of farmer cooperative members in Central Sulawesi. Participants showed increased understanding of post-harvest handling, fermentation duration control, hygienic processing, and basic quality assessment. These improvements translated into more consistent cacao bean quality and reduced post-harvest losses.

The training also strengthened collective learning within cooperatives by promoting shared problem-solving and peer-based knowledge transfer. Cooperative members became more active in coordinating fermentation schedules, sharing equipment, and collectively monitoring processing outcomes. This shift indicated a movement from individual farming practices toward cooperative-based production management.

Economic indicators reflected positive short-term outcomes, including higher selling prices for fermented cacao beans and increased bargaining power with local buyers. Farmers reported greater confidence in negotiating prices due to improved product quality and clearer understanding of quality standards demanded by the market.

Social outcomes emerged alongside technical gains, particularly in the form of enhanced cooperative cohesion and leadership participation. The training environment fostered mutual trust, increased participation in cooperative meetings, and encouraged younger farmers to engage in post-harvest innovation activities.

Existing studies on cacao value chain development emphasize infrastructure and access to markets as primary drivers of farmer empowerment. The present findings suggest that capacity-building through practical training can generate comparable impacts even in contexts with limited physical infrastructure. Skill enhancement appeared to function as an internal catalyst for cooperative development.

Research conducted in West Africa highlights fermentation training as a determinant of export-grade cacao quality, yet often frames farmers as passive recipients of technical knowledge. The present study contrasts with this view by demonstrating that participatory training approaches encourage farmers to become active experimenters and local knowledge producers.

Studies focusing on agricultural extension programs frequently report limited sustainability due to top-down instructional models (Grashuis & Martinez-Georges, 2026; Ilyinykh, 2025; Olumba et al., 2025; Rodríguez-Pereira et al., 2026). The results of this study differ by showing that cooperative-based training embedded within local organizational structures promotes longer-term behavioral change and collective ownership of innovation.

Comparative literature on farmer cooperatives in Southeast Asia often underlines governance challenges as barriers to success. The findings here nuance that argument by illustrating how technical training can indirectly strengthen governance through increased member engagement and shared operational goals.

The results signal a shift from subsistence-oriented cacao farming toward quality-oriented agri-enterprise practices. Improved fermentation and processing skills represent more than technical progress; they indicate a transformation in farmers' perception of cacao as a value-added commodity rather than a raw product.

The findings also reflect the emergence of learning-oriented cooperatives capable of adapting knowledge to local conditions. This adaptability suggests that farmer groups can function as informal educational institutions when provided with contextually relevant training frameworks.

Evidence from the study points to empowerment as a multidimensional process involving skills, confidence, social capital, and economic agency. The convergence of these dimensions highlights that empowerment cannot be reduced to income gains alone.

The outcomes further reflect the importance of experiential learning in rural education contexts. Practical engagement with fermentation processes enabled farmers to internalize abstract quality concepts through direct observation and experimentation.

The findings imply that agricultural training programs should prioritize post-harvest competencies as a strategic entry point for rural economic development. Fermentation and processing skills offer immediate and visible benefits that motivate sustained participation.

Policy implications include the need to integrate cooperative-based training into regional agricultural development plans. Support for collective learning structures can amplify the impact of limited extension resources.

Educational institutions and NGOs can draw from these results to design community-based training models that emphasize practice, reflection, and peer learning. Such models align with adult education principles and local knowledge systems.

The study also implies that improving product quality at the farmer level contributes to broader sustainability goals by reducing waste, enhancing income stability, and encouraging environmentally responsible practices.

The effectiveness of the training can be explained by its alignment with farmers' immediate economic needs and lived experiences. Fermentation outcomes were directly observable, reinforcing learning through tangible results.

The cooperative setting played a crucial role in sustaining behavioral change by embedding new practices within social norms and shared responsibilities. Collective accountability reduced the risk of reverting to previous unsustainable practices.

Contextual relevance of training materials contributed to high adoption rates. Techniques were adapted to local climatic conditions, available tools, and traditional knowledge, increasing

feasibility and acceptance (Bhandari et al., 2026; Calafat-Marzal et al., 2026). Motivational factors also explain the outcomes, as improved product quality enhanced farmers' sense of professional identity and pride. Recognition from buyers and peers reinforced continued application of learned skills.

Future initiatives should focus on scaling the training model across other cacao-producing regions with similar socio-economic conditions. Replication should maintain participatory and cooperative-centered principles rather than standardized delivery.

Further research is needed to examine long-term impacts on income stability, cooperative governance, and youth participation. Longitudinal studies could capture sustainability beyond initial training cycles.

Integration of digital tools for fermentation monitoring and market access presents a promising direction for enhancing training effectiveness. Digital literacy support could complement technical processing skills.

Collaboration between universities, local governments, and farmer cooperatives should be strengthened to institutionalize continuous learning mechanisms. Such partnerships can ensure that training evolves alongside market demands and environmental challenges.

CONCLUSION

The study reveals that targeted training in sustainable cacao fermentation and processing significantly enhances the technical competence, product consistency, and collective bargaining capacity of farmer cooperatives in Central Sulawesi. Beyond improving post-harvest quality indicators such as flavor profile, fermentation uniformity, and reduced defect rates, the training model strengthens cooperative governance by fostering shared standards, peer-based quality control, and coordinated market engagement. The findings highlight a distinctive linkage between technical skill development and institutional empowerment, showing that capacity-building interventions can simultaneously improve product value and cooperative resilience.

This research contributes conceptually by integrating sustainable agro-processing training with a cooperative empowerment framework that emphasizes collective learning, local resource optimization, and value-chain positioning. Methodologically, it advances a participatory training approach that combines hands-on fermentation practice, reflective group evaluation, and contextual adaptation to local cacao varieties and socio-economic conditions. The study offers a replicable model for community-based agricultural education that bridges technical innovation and social organization, extending existing literature that often treats post-harvest technology and cooperative development as separate domains.

The research is limited by its focus on a specific regional context and a relatively short observation period, which restricts the assessment of long-term economic impacts and market sustainability. Variations in cooperative maturity, access to infrastructure, and external market dynamics were not fully controlled, potentially influencing the outcomes. Future research should examine longitudinal effects of sustained training programs, compare cooperative and individual farmer adoption patterns across regions, and explore digital or hybrid training modalities to scale sustainable cacao processing education more effectively.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Other contribution; Resources; Visuali-zation; Writing - original draft.

REFERENCES

Bahta, Y. T., Nyaki, S. A., & Maré, F. (2026). Impact and choices of short-run coping strategies on the resilience of commercial livestock farmers. *Development in Practice*. https://doi.org/10.1080/09614524.2025.2610361

Batra, S. (2025). It takes a village: entrepreneurial bricolage in rural cooperative enterprise development. *Management Decision*, *63*(11), 3914–3933. https://doi.org/10.1108/MD-03-2024-0588

Bhandari, A., Airee, S., Mukherjee, A., Bhusal, N., & Sapkota, N. (2026). Assessing technical efficiency in ginger production using the Stochastic Frontier Approach. *Discover Food*, *6*(1). https://doi.org/10.1007/s44187-025-00731-w

Bhunia, S., & Singh, P. K. (2025). Producer organizations in the last 25 years: a bibliometric analysis and meta-review of the literature. *Humanities and Social Sciences Communications*, *12*(1). https://doi.org/10.1057/s41599-025-04526-3

Bieniek-Majka, M., & Sharma, V. (2026). Energy for the Countryside: Programme as a Policy Instrument for Advancing Renewable Energy in Rural Poland. In *World Sustainability Series: Vol. Part F1269* (pp. 55–71). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-032-07224-5_4

Bouyghrissi, S., Khanniba, M., Touloub, H., Torra, M., & Kharbouch, O. (2026). Exploring behavioral determinants of sustainable agricultural practices adoption in Morocco: Evidence from PLS-SEM. *Trees, Forests and People*, *23*. https://doi.org/10.1016/j.tfp.2025.101143

Calafat-Marzal, C., Cervera, F. J., García-Mollá, M., & Sanz-Torro, V. (2026). Agricultural dynamism and the influence of territorial characteristics in attracting young farmers. *Journal of Rural Studies*, *121*. https://doi.org/10.1016/j.jrurstud.2025.103896

Civera, C., Casalegno, C., Morelli, B., & Santoro, G. (2026). Seeds of change: Unpacking the enduring effects of MNC knowledge transfer in autonomous social innovation projects by fringe stakeholders. *Technovation*, *149*. https://doi.org/10.1016/j.technovation.2025.103370

Dohou, M. D., Codjo, O. S., Amadou, Z., Schreinemachers, P., Dossa, L. I. K.-T., Ambali, M., & Yabi, J. A. (2026). Drivers of collective action among smallholder vegetable farmers in Benin, Burkina Faso, and Mali. *Scientific African*, *31*. https://doi.org/10.1016/j.sciaf.2025.e03121

Firmanda, S. A., Fatahullah, F., & Firdaus, M. W. (2025). From participation to well-being: The welfare effects of cooperative membership among food farmers in Indonesia. *Turkish Journal of Agricultural Economics*, *31*(2), 321–334. https://doi.org/10.24181/tarekoder.1732175

Gbigbi, T. M., Enimu, S., Okuma, L. O., & Echegile, L. F. (2025). Factors influencing collateral demand among crop farmers. *Contaduria y Administracion*, *71*(1). https://doi.org/10.22201/fca.24488410e.2026.5514

Grashuis, J., & Martinez-Georges, C. (2026). Adoption of nontraditional governance characteristics in US farmer cooperatives. *Agribusiness*, *42*(1), 232–247. https://doi.org/10.1002/agr.21941

Hoang, T. Q., Hien, N. T., Bich Hop, V. T., Phi Khanh, H. L., Dang, D. T., & Ubukatac, F. (2026). Navigating EU deforestation regulation compliance: challenges for coffee smallholders in Vietnam. *Forests Trees and Livelihoods*, *35*(1), 59–81. https://doi.org/10.1080/14728028.2025.2539196

Ilyinykh, V. (2025). Adaptation Strategies and Labour Behaviour of Siberian Collective Farm Peasantry in the Mid-to Late 1930s. *Quaestio Rossica*, *13*(4), 1546–1560. https://doi.org/10.15826/qr.2025.4.1037

Johari, S. M., Hariyadi, E., Sheng, F. M., & Wong, W. K. (2025). Evaluation of Agribusiness Strategies in Enhancing Food Security in Indonesia: The Role of Productivity, Market Access, and Farmers' Terms of Trade. In M. J. Izquierdo Rico, M. Pangestu, E. L. T. Chung, W.-D. Wang, & A. Boonyapakdee (Eds.), *BIO Web of Conferences* (Vol. 201). EDP Sciences. https://doi.org/10.1051/bioconf/202520103004

Mallane, S., & Cook, D. (2026). Perceptions of local stakeholders on integrated catchment management–the case of the 'We are a River' (ReNOKA) programme for land and water

management in Lesotho. *Environmental Development*, *57*. https://doi.org/10.1016/j.envdev.2025.101381

Miano, L. C., Cabrera, G. A., Yao, C. A. M., Cayabat, C. V, & Laguador, A. A. (2025). Community-based enterprise development in the Adaptation and Mitigation Initiative in Agriculture (AMIA) villages in San Francisco, Quezon, Philippines. *Discover Sustainability*, *6*(1). https://doi.org/10.1007/s43621-025-00856-z

Novirani, D., Pradono, P., Yudoko, G., & Dowaki, K. (2025). Fermented cocoa bean logistics in an emerging country: an Agent-Based Modelling approach. *Acta Logistica*, *12*(4), 781–797. https://doi.org/10.22306/al.v12i4.716

Olaru, D., Smith, B., & Siddique, K. H. M. (2026). Farm-level adaptations to harvest logistics constraints in export-oriented grain systems. *Agricultural Systems*, *231*. https://doi.org/10.1016/j.agsy.2025.104565

Olumba, U. M., Nwosu, F. O., Chikezie, C., ANYIAM, K. H., Ben-Chendo, G. N., Osugiri, I. I., Isaiah, G. I., Obinna-Nwandikom, C. O., Enoch, O. C., Nwachukwu, E. U., Anene, H. U., Nnorom, E. I., Igwenagu, M. O., & Mbakaogu, O. E. (2025). FORMAL AND INFORMAL CREDIT ARRANGEMENTS AMONG LIVESTOCK FARMERS IN IMO STATE, NIGERIA. *African Journal of Food, Agriculture, Nutrition and Development*, *25*(10), 28161–28176. https://doi.org/10.18697/ajfand.147.26030

Rodríguez-Pereira, J., Cherkesly, M., Rancourt, M.-È., & Laporte, G. (2026). A comparison of cost-sharing models in horizontal cooperative routing. *Transportation Research Part E: Logistics and Transportation Review*, *207*. https://doi.org/10.1016/j.tre.2025.104626

Sädeharju, S., Höyssä, M., & Salonen, A. O. (2026). "Nature is my tacit partner": professional partnership in decision-making between Finnish regenerative farmers and nature. *Agriculture and Human Values*, *43*(1). https://doi.org/10.1007/s10460-025-10817-x

Shengrong, L. U. (2026). Research on Optimizing the Supply Chain Model of Fresh Agricultural Products in Hubei Province. In M. E. Auer & X. Yue (Eds.), *Lecture Notes in Networks and Systems: Vol. 1686 LNNS* (pp. 512–522). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-032-10400-7_44

Shodiq, W. M., Febrianti, N., Ramadhani, F. P., Rattanawisutamon, T., Zul Mazwan, M., & Maulidah, N. I. (2025). Market Channel Efficiency and Price Transmission Patterns of Virginia Tobacco in Bojonegoro, Indonesia. In M. J. Izquierdo Rico, M. Pangestu, E. L. T. Chung, W.-D. Wang, & A. Boonyapakdee (Eds.), *BIO Web of Conferences* (Vol. 201). EDP Sciences. https://doi.org/10.1051/bioconf/202520103008

Trigoso, J. A., Rituay, P., Chávez, M. D. P., Ramos-Sandoval, R., Guadalupe, G. A., Grández-Yoplac, D. E., & García, L. (2026). Observed (1979–2024) and Projected (2030) Climate Trends in Relation to Farmers' Perceptions in Coffee Cooperatives of Northern Peru. *Agriculture (Switzerland)*, *16*(1). https://doi.org/10.3390/agriculture16010057

Vasilaki, A., Nengas, I., Kogiannou, D., Henry, M., Nikoloudaki, C., Chronopoulos, P., Berillis, P., Golomazou, E., Fountoulaki, E., Karapanagiotidis, I. T., & Mente, E. (2025). Corrigendum to "Evaluation of the nutritional value of processed lupin meal (Lupinus albus) with exogenous enzymes, as feed ingredient in European sea bass (Dicentrarchus labrax) aquafeeds (Aquaculture Reports, (2025), 45, C, (103135), (S2352513425005216), 10.1016/j.aqrep.2025.103135). *Aquaculture Reports*, *45*. https://doi.org/10.1016/j.aqrep.2025.103175

Yigezu, Y. W., Sidell, Z. S., & Astatkie, T. (2026). Profitability drivers of carrot farming and its implications on food security of smallholder farmers in Northwest Ethiopia. *Discover Food*, *6*(1). https://doi.org/10.1007/s44187-025-00747-2