



# The Impact of Capability on Cooperative Performance and Sustainability: A Case Study of West Java Coffee Farmers Cooperatives

Wini Fetia Wardhiani<sup>1,\*</sup>, Tuti Karyani<sup>2</sup>, Iwan Setiawan<sup>3</sup> and Ery Supriyadi Rustidja<sup>4</sup>

<sup>1</sup>Doctoral Student, Padjadjaran University, Bandung, Indonesia

<sup>2,3</sup>Lecturer of the Faculty of Agriculture, Padjadjaran University

<sup>4</sup>Lecturer of the Faculty of Science and Technology at Ikopin University

\*Corresponding author email: [wini\\_fetia@yahoo.com](mailto:wini_fetia@yahoo.com)

---

## Abstract

The agricultural sector faces demographic challenges, so intelligent technology, artificial intelligence, big data, and augmented reality are strategic choices. Because the use of information technology has a direct or indirect impact on Indonesia's agricultural sector, coffee agribusiness cooperatives' information and communication technology (ICT) is becoming increasingly important in meeting market demand. Along with the advancement of automation, physical, cyber, and IoT systems, coffee cooperatives must prepare for and adapt to the industrial revolution 4.0 age in order to capture market demand opportunities, value chains, and the added value of coffee agribusiness. The presence of ICT can increase the performance and institutional sustainability of rural coffee farmers, especially cooperatives. Performance is a description of the achievement of organizational tasks to realize the goals, objectives, mission and vision of the organization and its business. The cooperative's performance explains the services offered to its members and the community/farmers as measured by indicators to see the organization's operating mechanism and the business that has been carried out and to determine the achievement of the objectives reached. Meanwhile, the ability to innovate is critical, particularly the use of ICT to assist the performance and sustainability of coffee cooperatives, so that cooperatives can compete, remain stable, or survive in an era of increased free competition. Quantitative descriptive method with Linear Regression analysis was used to identify the effect of cooperative capability on the performance and sustainability of cooperatives in several coffee cooperatives in West Java. The study's findings revealed that the cooperative's power had no meaningful impact on the Coffee Cooperative's performance. Nonetheless, the cooperative's capabilities had a beneficial and considerable impact on the Coffee Cooperative's sustainability. At the same time, the cooperative's performance has a good and significant impact on the coffee cooperative's sustainability. The performance of the Coffee Cooperative in the Industrial Revolution 4.0 era mediated the ability of cooperatives to have a good and significant effect on sustainability. This study suggests that cooperatives improve their capacities in membership, management, and business models in order to become sustainable cooperatives based on information technology and achieve additional value from market-driven coffee goods.

Keywords: Capability, Coffee, Cooperative, Performance, Sustainability

---

## 1. Introduction

Coffee plants that are cultivated in Bandung Regency are Arabica and Robusta coffee types. This is driven by the geographical condition of the Coffee Plantation in Bandung Regency, which is located at an altitude of 1200 m above sea level, where at this altitude, it meets the criteria for the cultivation of Arabica coffee commodities. Most of the coffee plantation areas in Bandung Regency are managed by farmers with not too large a land area, so these coffee plantation is known as people's coffee plantations, namely plantations managed by smallholder farmers with less than 0.5 hectares.

For farmers in West Java with a narrow arable area, of course, it is very difficult to strengthen their bargaining position because the results they get are also small. Therefore, efforts to improve coffee farmers' position must lead to forming farmer institutions, meaning that farmers need to be consolidated in a group cooperation forum or other cooperation institutions. Institutions are not only limited to organizations but include the rules of the game between coffee business actors so a healthy partnership is formed. Institutions that can support strengthening or increasing the bargaining position of coffee farmers are institutions that can provide services to the interests of farmers. Institutions that match the above demands are cooperatives (Haryanto, et al. 2020). Cooperatives are organized by their members to provide services whose costs must be taken into account (service and operation at cost) by maximizing the acceptance of cooperative members for the products they produce (Yakar-Pritchard and Caliyurt, 2021). Based on

Minister of Agriculture No. 18/Permentan/RC.040/4/2018 concerning Guidelines for Farmer Corporation-Based Agricultural Area Development: Farmer Corporations are "Farmer Economic Institutions with legal entities in the form of cooperatives or other legal entities with most of the capital ownership owned by farmers". Farmer corporations do not only rely on the productivity and quality of agricultural production but are more determined by the ability of human resources to run a profit-oriented business so that farmers benefit.

Furthermore, the Ministry of Agriculture (2018) provides special notes related to the formation of farmer corporations; in initiating the formation of Farmer Institutions to become Farmer Corporation Institutions, at least 5 (five) main aspects or supports are needed: First, consolidation of farmers into Farmer Economic Institutions that are legal entities; Second, accessibility to public facilities or infrastructure; Third, accessibility to modern agricultural facilities; Fourth, connectivity with partners, both the processing industry and the modern trading industry; and Fifth, accessibility to capital and insurance. From the description above, it can be concluded that the importance of farmer corporations with legal entities in the form of cooperatives for farmers in increasing their productivity. Cooperatives have fundamental differences from other companies because cooperatives (cooperatives) try to provide maximum service to their members so that their members are able to obtain maximum revenue (Wardhiani, et al. 2023). At the same time, the company (corporate) maximizes profits for the interests of the company itself. The services provided by cooperatives to their members, especially in terms of marketing agricultural products, will have a significant influence on the acceptance of their members (Yuliando, et al. 2015). For this reason, there is a need for a coffee cooperative which can become an organization that accommodates coffee farmers to maximize their production. Coffee cooperatives can play a role in providing services to their members so that they can quickly obtain the goods they need from producers who have a strong economy (shops, wholesalers, agents, etc.), both goods for production purposes and goods necessities of life, at reasonable prices that the members of the cooperative concerned can reach. This coffee cooperative also provides services so that the coffee produced by its members can be marketed in an integrated manner by obtaining a reasonable price, which satisfies the farmers in balance with all their hard work (Shumeta and D'Haese, 2015).

In the era of the industrial revolution 4.0, internet and computer technology began to be used by coffee cooperatives in West Java. Information technology is needed to increase coffee production because the information we can get from this internet media is speedy and helps farmers' knowledge in increasing their knowledge so that farmers can increase their production.

## 2. Literature Review

The literature review will discuss theories that will support ideas and concepts regarding the Role of Information Technology in improving Cooperative Performance and Cooperative Sustainability, to see the clarity of direction, originality and usefulness as well as the position of this research compared to previous research findings. To strengthen the framework of thought, a literature review will be presented, which includes theories (macro, mezzo and micro) and relevant concepts of cooperative capability, membership and management.

### 2.1. Cooperative

The meaning of cooperatives comes from the word "co", which means together and "operation", which means work. So that it can be interpreted that cooperatives have the meaning of working together. In this case, the cooperative means an economic forum consisting of people or bodies that are open and voluntary and aim to fight for the welfare of the members together (Ortega, et al. 2019). Cooperatives are business entities comprised of individuals or legal entities based on the principles of kinship and economic democracy. So, in terms of running the cooperative, what must be emphasized is the members' interests; the cooperative must be able to work effectively and efficiently under cooperative and economic principles (Yuliarmi, et al. 2020).

### 2.2. Capability

Capabilities are another combination of capacity and ability (skills) that indicate a person's level of ability (qualities) or intelligence in completing specific tasks. Capabilities are measurements every community uses to see the ability of various aspects of life, for example, in organizations, departments, individuals, or systems. This process is seen from how to achieve the vision (goals) with the level of success.

The definition of capability is a process used by the general public to assess the ability of social groups or individuals, which can be seen from the goals, working methods, results, and final reports so that they are considered helpful in determining social values in social life (Rusidi and Suratman, 2002).

### 2.3. Sustainability

Cooperative sustainability is a joint's ability to maintain performance in its strategic environment by responding creatively to the dynamics of the strategic environment around it. Sustainability Metrics Because many facets of development must be examined, including ecological, economic, socio-cultural, legal, and institutional factors, the

notion of sustainable development is multidisciplinary. Indicators are one method for assessing and promoting the sustainability of a manufacturing business. Indicators are also useful variables that represent the level of implementation of the dimensions (Krajnc and Glavič, 2003).

In the current era of the Industrial Revolution 4.0, cooperatives must adapt to the rapid development of information technology. In the retail sector, for example, our cooperatives and MSME players must also be able to take advantage of e-commerce platforms or develop marketplace platforms to strengthen market penetration.

### 3. Materials and Methods

#### 3.1. Material

The researcher took the research location at the Coffee Cooperative in West Java and focused on 3 Regencies which are considered to have many coffee cooperatives that are known to be successful and always try to prosper their members. The districts taken were Bandung Regency, West Bandung Regency and Garut Regency. This study uses a combination research design (mixed methods). Mix method is a research step that combines two forms of quantitative and qualitative research (Cresswell, 2010).

The research was analyzed using the Structural Equation Model (SEM). According to Dahlan (2014), SEM is a multivariate technique used to test theories simultaneously regarding relationships between several variables. SEM can explain causality between independent variables on the dependent variable. SEM accommodates path analysis capabilities by displaying path diagrams in schematic diagrams to make it easier to analyze with a visual display. The number of samples was determined using the slovin formula so that from 503 populations, 222 people or respondents were obtained.

#### 3.2. Method

##### 3.2.1. Model Testing and Validation

Testing and validation of the model are carried out through three stages: Evaluation of the measurement model, Evaluation of the structural model and Evaluation of the goodness of fit model.

##### 1). Evaluation of the measurement model (measurement model)

Evaluation of the measurement model is to test the quality of the measurement model; based on the results of the Evaluation, it can be seen whether the indicators used are valid or not (Hair et al., 2010; Hoyle et al., 2012). This activity is called construct validity which shows the extent to which several measurement indicators used as measuring tools can reflect latent constructs, the construct validity that is often carried out is convergent validity as measured by looking at loading factor (LF), variance extracted (VE) and Construct reliability (CR), the outstanding value of  $LF \geq 0.70$ , but the minimum value of  $LF \geq 0.50$ . Standardized loading factor values below 0.5 can be excluded from the model. The results of the LF squared are called commonalities or indicator reliability. In this case, it can be interpreted as the percentage variance in the indicator that latent variables can explain. The calculation of the variance extracted is done based on the formula:

$$\text{Varians Extracted} = \frac{\sum \text{Std Loading}^2}{\sum \text{Std Loading}^2 + \sum \varepsilon_j} \quad (1)$$

The VE value represents the average of the variations in the indicator data that latent variables can explain. The standard VE value is 0-1 and is acceptable if the VE value  $\geq 0.50$ .

The calculation of construct reliability (CR) is carried out based on the formula:

$$\text{Construct Reliability} = \frac{(\sum \text{Std Loading})^2}{(\sum \text{Std Loading})^2 + \sum \varepsilon_j} \quad (2)$$

The CR value can be defined as the conbrach's alpha value in the reliability test. NR values range from 0-1, suitable if  $CR \geq 0.7$

##### 1. Evaluation of the structural model (structural model)

The structural model evaluation aims to test the quality of the structural model. The testing process can be carried out in two ways, namely, based on the path coefficient and based on the R-square value.

##### 2. Evaluate the suitability of the model (Goodness of fit Model)

The number of observed variables (which cannot be measured directly) will bring up more unique values in the covariance matrix than the number of parameters to be estimated. According to Dachlan (2004), it is necessary to assess how to fit a model is built to the data used, commonly called the Goodness of Fit Model (GOF).

### 4. Results and Discussion

From the results of the SEM test, we can create a matrix of research results shown in the table below:

**Table 1.** Matrix of Research Result

Hypothesis		Results	SEM Analysis Results
H1	There is an effect of Cooperative Capability on the Performance of Coffee Cooperatives in the Industrial Revolution 4.0	Unproven and significant	Value t count = 1.95 Rejected
H2	There is an effect of Coffee Cooperative Performance on the Sustainability of Coffee Cooperatives in the Industrial Revolution 4.0	Proven and significant	Value t count = 6.89 Received
H3	There is an influence of the Capabilities of Coffee Cooperatives on the Sustainability of Coffee Cooperatives in the Industrial Revolution 4.0	Proven and significant	Value t count = 1.97 Received
H4	There is an influence of the Capabilities of Coffee Cooperatives on Sustainability mediated by the performance of Coffee Cooperatives in the Industrial Revolution 4.0	Proven and significant	Value t count = 1.99 Received

Based on the results of the data analysis that has been done, the study results of the relationship between research variables can be explained. The explanation of the results of this study is as follows:

- a. Cooperative Capability Has No Significant Influence on the Performance of Coffee Cooperatives in the 4.0 Industrial Revolution era. The results showed that the cooperative capability variable did not have a significant effect on the performance of the Coffee Cooperative in the 4.0 Industrial Revolution era; this was evidenced by the count value of 1.95. It can be interpreted that increasing the capability of cooperatives in terms of 1) membership, 2) management, and 3) Business will not directly affect the performance of the Coffee Cooperative in the Industrial Revolution 4.0 era.  
This is not in line with research conducted by Macharia (2019), which states that the performance of coffee cooperatives in Kiambu County, Kenya, is strongly influenced by the role of management or administrators and also the involvement of farmers, income levels and determining the effect of intermediary interventions on the performance of cooperative communities. Coffee. Meanwhile, the results of Dyahrini (2019) say that organizational culture affects performance through the competitive advantage of cooperatives. This finding implies that if the corporate culture is strong, the competitive advantage will be better, which will positively impact the performance of cooperatives in West Java Province.
- b. Cooperative Performance Has a Positive and Significant Influence on the Sustainability of Coffee Cooperatives in the Industrial Revolution 4.0 era. The study results show that cooperative performance variables have a positive and significant influence on the sustainability of coffee cooperatives in the Industrial Revolution 4.0 era; this is evidenced by the count of 6.89. Increasing the performance of cooperatives in terms of 1) productivity, 2) effectiveness, 3) quality and 4) achievement will directly affect the sustainability of coffee cooperatives in the Industrial Revolution 4.0 era.
- c. Cooperative Capabilities Have a Positive and Significant Influence on the Sustainability of Coffee Cooperatives in the Industrial Revolution 4.0 era. The study results show that the cooperative capability variable significantly influenced coffee cooperatives' sustainability in the Industrial Revolution 4.0 era, evidenced by the count value of 1.97. Increasing the capability of cooperatives in terms of 1) membership, 2) management, and 3) entrepreneurship will not directly affect the sustainability of coffee cooperatives in the Industrial Revolution 4.0 era.
- d. The Capability of Cooperatives Has a Positive and Significant Influence on Sustainability mediated by the Performance of Coffee Cooperatives in the Industrial Revolution 4.0 era. The study results show that the cooperative capability variable significantly influences sustainability mediated by the performance of coffee cooperatives in the Industrial Revolution 4.0 era; this is evidenced by the count value of 1.99. Increasing the capability of cooperatives in terms of 1) membership, 2) management, and 3) entrepreneurship will not indirectly affect the performance of Coffee Cooperative Cooperatives-mediated sustainability in the Industrial Revolution 4.0 era.

## 5. Conclusion

From the discussion above, it can be concluded that only capabilities did not significantly affect the performance of coffee cooperatives in the Industrial Revolution 4.0 era. In contrast, capacities and performance positively impact the sustainability of cooperatives. And finally, it is proven that capability also has a positive effect on sustainability mediated by the performance of cooperatives in the era of the industrial revolution 4.0.

## Acknowledgments

Thank you to Allah SWT, the supervising lecturers, friends, all respondents and resource persons who have helped in completing this research

## References

- Cresswell, J.W. (2020). *Research Design: Pendekatan Kualitatif, Kuantitatif, dan Mixed*; Pustaka Pelajar: Yogyakarta, Indonesia.
- Dyahrini, W. (2019). *Budaya Organisasi: Pengaruhnya Terhadap Kinerja Melalui Keunggulan Bersaing Koperasi di Jawa Barat*; Universitas Widyatama: Bandung, Indonesia.
- Haryanto, R., Buchori, I., Yuliasuti, N., Saleh, I., Sugiri, A., Nuari, B., Putri, N. R. (2020). Preparedness to Implement a Spatial Plan: The Impact of the Land Cooperative in Central Bangka Regency. *Sustainability*, 12, 10665.
- Krajnc, D., Glavič, P. (2003). Indicators of Sustainable Production. *Clean Technol. Environ. Policy*, 5, 279–288.
- Macharia, K. B. (2019). *Determinans of Performance of Coffee Co-Operative Societies in Kiambu County, Kenya*; Kenyatta University: Nairobi, Kenya.
- Ortega, D. L., Bro, A. S., Clay, D.C., Lopez, M. C., Tuyisenge, E., Church, R. A., Bizoza, A. R. (2019). Cooperative membership and coffee productivity in Rwanda's specialty coffee sector. *Int. J. Plant Breed. Res*, 11, 967–979.
- Rusidi, Suratman, M. (2020). *20 Pokok Pemikiran Tentang Pembangunan Koperasi*. IKOPIN: Bandung, Indonesia.
- Shumeta, Z., D'Haese, M. (2015). Do coffee cooperatives benefit farmers? An exploration of heterogeneous impact of coffee cooperative membership in Southwest Ethiopia. *Int. Food Agribus. Manag. Rev*, 19, 37–52.
- Wardhiani, W. F., Karyani, T., Setiawan, I., & Rustidja, E. S. (2023). The Effect of Performance on the Sustainability of Coffee Farmers' Cooperatives in the Industrial Revolution 4.0 in West Java Indonesia. *Sustainability*, 15(6), 4901.
- Yakar-Pritchard, G., Caliyurt, K. (2021). Sustainability Reporting in Cooperatives. *Risks*, 9, 117.
- Yuliando, H., Erma, K., Cahyo, S. A., Supartono, W. (2015). The Strengthening Factors of Tea Farmer Cooperative: Case of Indonesian Tea Industry. *Agric. Dan Agric. Sci. Procedia*, 3, 143–148.
- Yuliarmi, N. Y., Dunggio, M., Yasa, I. N. M., Wright, L. T. (2020). Improving public welfare through strengthening social capital and cooperative empowerment. *Cogent Bus. Manag.* 7, 1841075.