

Sustainability Analysis of Gallus Gallus Domesticus Poultry at The Jago Karah Farm Community, Surabaya

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Submitted 8 May 2025; Approved 20 June 2025

ABSTRACT

The complexity of urban livestock poultry issues, such as higher demand for eggs than supply, rising feed prices, densely populated locations with limited land, several members leaving the community, and the suboptimal use of technology, can have an impact on the sustainability of poultry. This study aims to evaluate the sustainability status of *Gallus gallus domesticus* poultry at the Jago Karah Farm Community based on ecological, economic, social, technological, and institutional dimensions. The analytical method used is Multi-Dimensional Scaling (MDS) through the Rapid Appraisal of the Status of Poultry (Rap-Poultry) approach. The analysis results show that the ecological dimension has a sustainability score of 72.28, the economic dimension 51.78, the social dimension 69.60, the technological dimension 51.03, and the institutional dimension 78.21. The overall sustainability score of *Gallus gallus domesticus* poultry is 64.97. The sustainability status of *Gallus gallus domesticus* poultry in the JKF Community is categorized as moderately sustainable, with the ecological, economic, social, and technological dimensions also considered moderately sustainable. In contrast, the institutional dimension is classified as highly sustainable.

Keywords: *Gallus gallus domesticus*, *Livestock Poultry*, *Sustainability*, *Urban*,

BACKGROUND

The livestock sub-sector is one of the components of the agricultural sector that significantly contributes to national economic growth, job creation, and food security in Indonesia. According to data from Statistics Indonesia in 2024, the livestock sub-sector demonstrated its prominence with an economic growth increase of 9.21% in 2023 compared to the previous year. This economic growth was supported by the role of livestock poultry as a key provider of animal protein for the Indonesian population (Firnanda et al., 2023).

Free-range chicken poultry (local/native chickens) is one of the types of poultry that demonstrates high economic potential (Rembo & Bay, 2023). According to data from the Ministry of Agriculture, in 2024, the national population of native chickens increased by 47.9% over the past year. East Java is the province with the second-largest native chicken population in Java Island, following West Java. Unlike other regions, Surabaya has the lowest native chicken population in East Java (Ministry of Agriculture, 2024). This city's decline in livestock population has been continuously recorded from 2019 to 2021, in contrast to the increasing demand for eggs.

The Jago Karah Farm Community, located in Karah Subdistrict, Jambangan District, Surabaya City, with its main poultry facilities situated under a toll road, focuses on raising *Gallus*

gallus domesticus. This chicken breed offers superior advantages to regular native chickens, including better egg production, growth rate, brooding behavior, and hatchability (Prawiranegara & Mulijanti, 2020). Poultry activities in urban areas are expected to maintain good sustainability to avoid negative impacts. This condition should not be assessed solely from an economic standpoint but must also consider social and ecological aspects. This aligns with Elkington's sustainability theory, which states that the concept of sustainable development must address three main pillars, known as the "Triple Bottom Line": profit (economic), people (social), and planet (environmental) (Schiavo & Scavarda, 2024).

From the ecological aspect, JKF poultry is located in a densely populated urban area with limited space and proximity to residential neighborhoods, which presents a significant challenge for the farm. This is primarily due to the waste produced by the poultry, which can disrupt the comfort of the surrounding community and the livestock itself (Pasini et al., 2024). On the other hand, the institutional aspect shows positive potential, as there is strong support for urban poultry initiatives through Surabaya City Regional Regulation No. 12 of 2014. From the economic aspect, the increasing prices of commercial feed annually have become a significant concern among farmers (Huda et al., 2024). The high cost of commercial feed forces farmers to produce their feed to reduce expenses. However, making homemade feed is considered time-consuming due to the required fermentation and chopping stages. Farmers also avoid using shredding machines provided by banks, citing the risks involved and reluctance to perform regular cleaning. From the social aspect, the high cost of commercial feed has led several JKF members to withdraw from the community.

The complexity of issues in each aspect of JKF poultry has driven the need for research to evaluate the sustainability status of *Gallus gallus domesticus* poultry in the JKF Community, viewed from ecological, economic, social, technological, and institutional aspects. This refers to the study conducted by Antikasari et al. (2023), which highlights the sustainability research on *Gallus gallus domesticus* poultry across five aspects: environmental, economic, social, technological, and institutional. This study is expected to provide recommendations for the future development of JKF poultry, aiming for a well-integrated sustainability approach that ensures effective balance across all aspects.

RESEARCH METHODS

This research was conducted from February to March 2025. The research method used is a descriptive quantitative approach. The research location was selected purposively at the *Gallus gallus domesticus* poultry farm of the Jago Karah Farm Community. This selection was based on the fact that the location is one of the poultry farms implementing the urban poultry concept in Surabaya. The sampling method used in this study is a census, meaning that the entire population is considered the research sample. Therefore, the research sample consists of 30 active farmers in the Jago Karah Farm Community.

The data processing and analysis technique in this study uses Multi-Dimensional Scaling (MDS) analysis through the RAP-Fish (Rapid Appraisal for Fisheries) approach, which has been modified into The Rapid Appraisal of The Status of Poultry (Rap-Poultry), evaluated from the economic, ecological, social, technological, and institutional dimensions. The MDS analysis with the RAP-Poultry approach aims to assess and evaluate the sustainability of a poultry operation. Three types of analyses will be conducted: ordination analysis, Monte Carlo analysis, and leverage analysis. The

MDS analysis using the RAP-Poultry approach in this study was performed using Microsoft Excel, supported by the Rapfish software. The steps for MDS analysis through the RAP-Poultry approach, according to Kavanagh & Pitcher (2004), are as follows:

Determination of attributes

The attributes are identified by analyzing the issues present at the research site. The attributes utilized in this study are listed in Table 1 below.

Table 1. Determination of Attributes

No	Dimension	Attribute	Source
1	Ecology	Discipline of Farmers in Cleaning the Coop	Suryanti et al. (2019)
		Type of Feed	Sangadji and Tatipikalawan (2024)
		Awareness of the Importance of Cleanliness	Suryanti et al. (2019)
		Waste Management	Antikasari et al. (2023)
		Chicken Density Level	Antikasari et al. (2023)
2	Economy	Pest and Disease Control	Antikasari et al. (2023)
		Profit	Antikasari et al. (2023)
		Other Sources of Income	Sangadji and Tatipikalawan (2024)
		Productivity of Gallus gallus domesticus Eggs	Antikasari et al. (2023)
		Market Reach	Antikasari et al. (2023)
3	Social	Product Yield	Suryanti et al. (2019)
		Sales System	Antikasari et al. (2023)
		Community Acceptance	Sangadji and Tatipikalawan (2024)
		Employment Absorption from the Community	Antikasari et al. (2023)
		Community Conflicts	Antikasari et al. (2023)
4	Technology	Duration of Livestock Farming	Sangadji and Tatipikalawan (2024)
		Education Level	Sangadji and Tatipikalawan (2024)
		Livestock Information	Antikasari et al. (2023)
		Feed Production	Antikasari et al. (2023)
		Use of Probiotics	Antikasari et al. (2023)
5	Institutional	DOC Production	Antikasari et al. (2023)
		Level of Technology Adoption	Sumber
		Technology Application in the Coop Training	Suryanti et al. (2019)
		Role of Extension Institutions	Sangadji and Tatipikalawan (2024)
		Availability of a Clear Organizational Structure	Suryanti et al. (2019)
		Marketing Institution	Antikasari et al. (2023)
		Function of Gallus gallus domesticus Livestock Groups	
		Banking Support	Antikasari et al. (2023)
		Government Support	Antikasari et al. (2023)

- Assessment of each attribute used (scoring)

This study uses ordinal scaling with values ranging from 0 to 2. A score of 0 indicates a poor condition, 1 indicates a moderate/adequate condition, and 2 indicates a good condition.

- Ordination analysis

Ordination analysis is conducted using the Euclidean Distance technique in the Rapfish application, which is a method for determining the distance between points/objects within it (Yusuf et al., 2021). Ordination analysis can be carried out using the following steps:

Process 1: Determining the Euclidean distance

$$d = \sqrt{(|x_1 - x_2|^2 + |y_1 - y_2|^2 + |z_1 - z_2|^2 + \dots)}$$

Description:

d = Euclidean distance

x, y, z = attributes

Process 2: Projecting the Euclidean distance onto two dimensions

$$d_{i,j} = a + bD_{i,j} + e, \text{ dimana } e = \text{error}$$

Description:

$d_{i,j}$ = Euclidean distance on the plot from point i to point j

a = constant

b = coefficient

$D_{i,j}$ = actual Euclidean distance from point i to point j

Process 3: Regression using the ALSCAL algorithm

$$d_{i,j} = a + bD_{i,j}$$

Process 4: Iteration in Rapfish stops when the stress value is less than 0.25, calculated using the formula:

$$\text{Stress} = \sqrt{\frac{1}{m} \sum_{k=1}^m \left[\frac{\sum_i \sum_j (D_{ijk} - d_{ijk})^2}{\sum_i \sum_j d_{ijk}^2} \right]}$$

Description:

m = number of attributes

D_{ijk} = actual Euclidean distance from point i, j, k

d_{ijk} = Euclidean distance on the plot from point i, j, k

Process 5: The ordination results can be viewed in the quadrant diagram of the ordination space. The ordination results will indicate the sustainability values, which can be used to determine the level of sustainability based on the classification shown in Table 2 below

Table 2. Sustainability Index Values

Index Value	Category	Description
0 – 25	Poor	Not Sustainable
25,01 – 50	Fair	Less Sustainable
50,01 – 75	Adequate	Moderately Sustainable
75,01 – 100	Good	Highly Sustainable

Source: Yusuf, et al. (2021)

- Leverage analysis

This study determines the leverage factor using the mid-value law approach. The calculation of the mid-value law is as follows:

$$\text{Leverage Attribute} = \frac{\text{highest RMS value of the attribute}}{2}$$

- Monte Carlo analysis

The confidence interval must be 95%, so the maximum allowable difference between the Monte Carlo results and the ordination analysis is 5%.

RESULT AND DISCUSSION

Sustainability Status and Leverage Factors of the Jago Karah Farm Community Poultry Poultry in Surabaya Viewed from the Ecological Dimension

The sustainability measurement in the ecological dimension, as shown in Figure 1, indicates a sustainability score of 72.28. This score falls within the ordination scale range of 75.01 – 100, meaning the ecological sustainability status of the *Gallus gallus domesticus* poultry at the JKF Community is moderately sustainable.

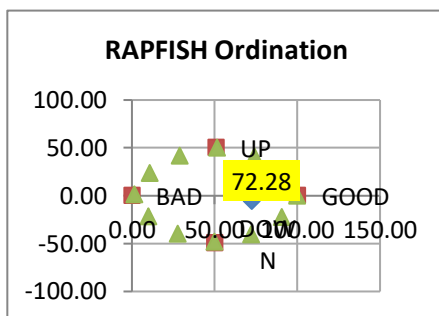


Figure 1. Analysis Ordination of the Ecological Dimension

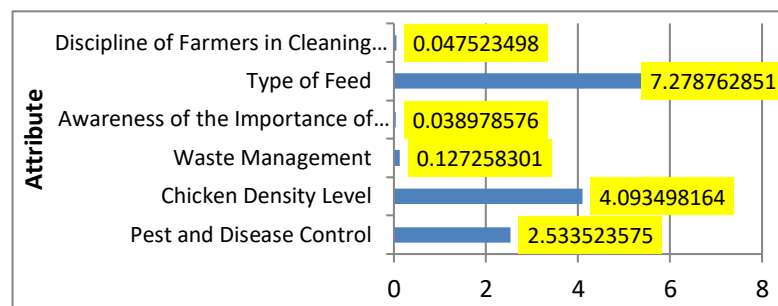


Figure 2. Leverage Analysis of the Ecological Dimension

This suggests that the *Gallus gallus domesticus* poultry at JKF Community has already implemented sound ecological principles, although there is room for improvement to achieve a highly sustainable ecological status. The cultivation practices minimize the negative impact on the urban environment, meaning the carrying capacity of the urban environment can be well maintained both now and in the future, as the urban environment is a critical aspect.

The ecological dimension measurement in this study uses six attributes, with the analysis results shown in Figure 2, which consist of: (1) Discipline of farmers in cleaning the pens with an RMS value of 0.04%, (2) Type of feed with an RMS value of 7.27%, (3) Awareness of the importance of cleanliness with an RMS value of 0.03%, (4) Waste management with an RMS value of 0.12%, (5) Chicken density level with an RMS value of 4.09%, (6) Pest and disease control with an RMS value of 2.53%. The leverage attributes are determined based on the mid-value law, with values greater than 3.63. Therefore, the leverage attributes for the sustainability of the *Gallus gallus domesticus* poultry at JKF Community in the ecological dimension are attribute (5) Type of Feed and attribute (2) Chicken Density Level.

The type of feed is the most sensitive attribute to the sustainability of the ecological dimension. This is because feed is the primary factor in the formation of poultry waste, which impacts the quality of the surrounding environment, particularly air quality due to the waste. Environmental pollution and nutrient inefficiency are consequences of poor waste management and low nutrient digestibility (Adegbeye et al., 2025). Probiotics are the component in the feed that most influence the preservation Sustainability Analysis of *Gallus Gallus Domesticus* Poultry (Amalia et al., 2025)

of the surrounding ecology. Probiotics support planetary sustainability by contributing to efficient nutrient cycling, waste reduction, and sustainable poultry practices (Chen et al., 2025).

The JKF poultry uses a mixed commercial and fermented feed type. The fermented feed contains probiotics. However, the JKF community produces fermented feed that can only be consumed by chickens older than one month, so day-old chicks (DOC) still use commercial feed from factories. To maintain its support for the environment, farmers continue to provide probiotics in the drinking water given to DOC, although not all farmers mix probiotics into the DOC's drinking water. Therefore, efforts to create more micro-sized fermented feed safe for DOC digestion are still necessary to maximize the environmental dimension's carrying capacity for future sustainability. Additionally, good management of the poultry housing can provide better environmental support, as it is not only about the type of feed used but also about paying attention to the management of the poultry pens.

Awareness of the importance of cleanliness is the least sensitive attribute to the sustainability of the ecological dimension. Although low, this remains an important aspect that must be considered to support ecological sustainability. Most JKF farmers already have a good level of awareness regarding the importance of cleanliness. JKF farmers know theoretically that cleanliness is important and demonstrate their actions in poultry operations, such as waste management, pen cleaning, and pen management. Additionally, JKF farmers share essential practices with new farmers that support farm cleanliness for the sustainability of urban poultry.

Sustainability Status and Leverage Factors of the Jago Karah Farm Community Poultry in Surabaya Viewed from the Economic Dimension

The sustainability measurement in the economic dimension, as shown in Figure 3, indicates a sustainability score of 51.78. This score falls within the ordination scale range of 50.01 – 75, meaning the economic sustainability status of the *Gallus gallus domesticus* poultry at the JKF Community is moderately sustainable.

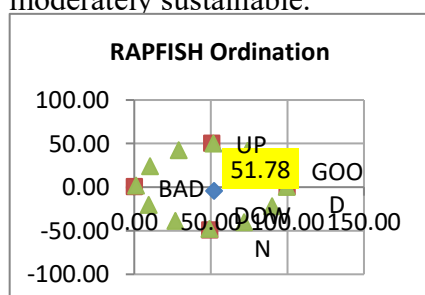


Figure 3. Ordination Analysis of the Economic Dimension

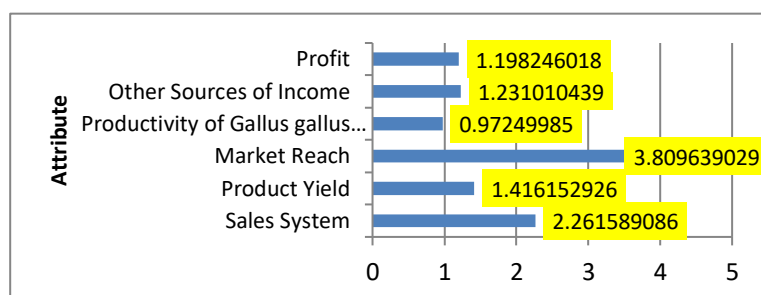


Figure 4. Leverage Analysis of The Economic Dimension

This suggests that the *Gallus gallus domesticus* poultry at JKF Community is good for its economic sustainability. However, further efforts are needed to achieve a more optimal economic sustainability, as the sustainability score is very close to the "less sustainable" category. Proper efforts can improve the sustainability status, but poor efforts could worsen the sustainability status.

The economic dimension measurement in this study uses six attributes, with the analysis results shown in Figure 4, which consist of: (1) Profit with an RMS value of 1.19%, (2) Other sources of income with an RMS value of 1.23%, (3) *Gallus gallus domesticus* egg productivity with an RMS value of 0.97%, (4) Marketing reach with an RMS value of 3.80%, (5) Product output with an RMS

value of 1.41%, and (6) Sales system and pen cleaning with an RMS value of 2.26%. Based on the mid-value law, with a value greater than 1.90, the key leverage attributes for the sustainability of the *Gallus gallus domesticus* poultry at JKF Community in the economic dimension are attribute (4) Marketing reach and attribute (1) Sales system.

The most sensitive attribute in driving the economic dimension is market reach. The wider the market reach, the greater the number of targeted consumers, which can increase business profits (Mendrofa et al., 2024). JKF Farm currently has a limited market reach, with most of its distribution concentrated in the local area of Jambangan District. This is due to the farm's focus on meeting the demand for eggs within the Jambangan area, where even the current demand has not been fully met. As a result, the sales scale to areas outside the district remains very small. The fact that JKF Farm operates mainly on a micro-business scale also contributes to its limited capacity to meet demand. To expand its marketing network and enhance sustainability value, further efforts are needed to boost the production of KUB (Kampung Unggul Balitbangtan) chicken eggs. This will enable the farm to fulfill local demand first and expand its market reach to other areas to generate greater profits.

The egg productivity of *Gallus gallus domesticus* is the least sensitive attribute. This means that egg productivity is not a priority that needs to be focused on to boost sustainability. Although the productivity is fairly good, it has not shown sufficient production levels. High productivity, if not accompanied by many livestock, will result in low production and could lead to losses. Farmers will incur losses if the production volume exceeds the Break Even Point (BEP) unit (Pradesa, 2025). This is why the demand for eggs in JKF has not been met effectively. Therefore, increasing the number of livestock and maximizing the egg productivity of *Gallus gallus domesticus* is necessary to boost egg production so that the demand for eggs can be effectively fulfilled.

Sustainability Status and Leverage Factors of the Jago Karah Farm Community Poultry in Surabaya Viewed from the Social Dimension

The sustainability measurement in the social dimension, as shown in Figure 5, indicates a sustainability score of 69.60. This score falls within the range of 50.01 – 75 on the ordinal scale, meaning the social dimension sustainability status of the *Gallus gallus domesticus* farm in the JKF Community is in moderately sustainable status.

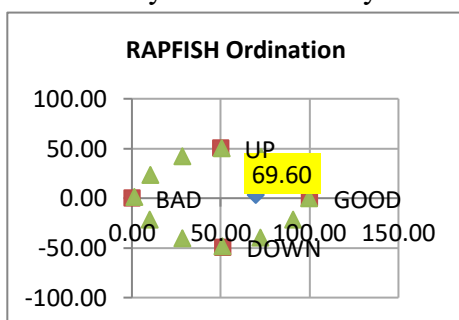


Figure 5. Ordination Analysis of the Social Dimension

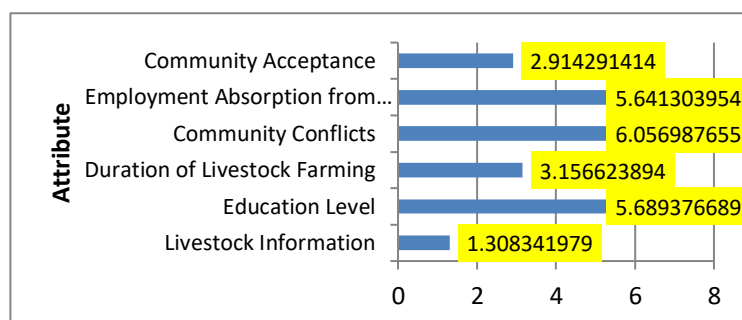


Figure 6. Leverage Analysis of the Social Dimension

This status suggests that the JKF poultry has a fairly good level of sustainability in terms of both the farmers' social well-being and the surrounding community's social conditions. This situation requires further effort to ensure that sustainability can improve to a highly sustainable status in the future.

The measurement of sustainability in the social dimension in this study used six attributes, with the analysis results shown in Figure 6. These attributes consist of (1) Community acceptance with an RMS value of 2.91%, (2) Employment absorption from the community with an RMS value of 5.64%,

(3) Community conflict with an RMS value of 6.05%, (4) Length of poultry experience with an RMS value of 3.15%, (5) Education level with an RMS value of 5.68%, and (6) Poultry information with an RMS value of 1.30%. Based on the median value rule, with values above 3.02, the key attributes that influence the sustainability of the *Gallus gallus domesticus* farm in the JKF community's social dimension are (3) Community conflict, (2) Employment absorption from the community, (5) Education level, and (4) Length of poultry experience.

The key leverage attribute for sustainability in the social dimension, with the highest sensitivity, is community conflict. Such conflicts have the potential to disrupt operations, erode public trust, and even threaten the long-term viability of the business. Similarly, Yulianso et al. (2025) emphasized the importance for livestock enterprises to foster a positive perception within the community, as this is closely linked to the sustainability of livestock business development. Throughout its operations, JKF Farm has not encountered any community conflicts, whether in the form of complaints, protests, or public objections. This indicates that the surrounding community has welcomed the presence of JKF Farm in their environment. Nevertheless, it remains essential to continuously work toward maintaining this conflict-free condition in future operations. Sustaining social sustainability for JKF Farm requires ongoing communication with the local community, transparency, active engagement, and fostering a harmonious relationship with the surrounding population..

Information about poultry is the least sensitive attribute in the sustainability of the *Gallus gallus domesticus* poultry business in the JKF Community. The farmers are already very capable of obtaining poultry-related information very well. Most of the JKF community farmers have obtained poultry information independently through the Internet. This indicates that most farmers have good initiative, reflecting that the quality of human resources (HR) in the JKF community is also relatively good. The farmers actively search for information by watching videos on YouTube about the proper cultivation of *Gallus gallus domesticus*. However, some farmers with limited age and knowledge about digitalization rely solely on information from the community leader. Therefore, the leader needs intensive mentoring to ensure the farm operates well.

Status and Leverage Attributes of Sustainability at Jago Karah Farm Community Poultry Farm in Surabaya Viewed from the Technology Dimension

The sustainability measurement in the technology dimension, as shown in Figure 7, indicates a sustainability value of 51.03. This value falls within the ordinate scale range of 50.01 – 75, meaning the sustainability status of the technology dimension in the *Gallus gallus domesticus* poultry of the JKF Community is moderately sustainable.

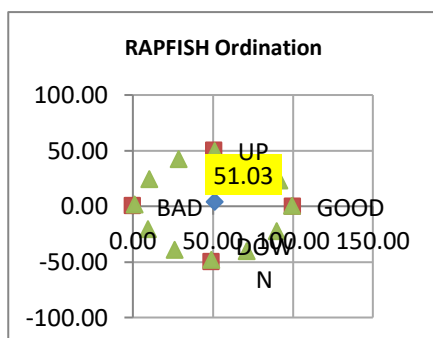


Figure 7. Ordination Analysis of the Technology Dimension

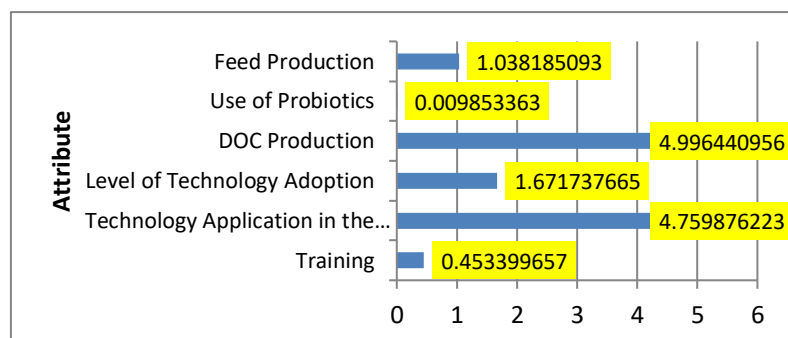


Figure 8. Leverage Analysis of the Technology Dimension

The lowest sustainability score was reflected in the technological dimension. This aligns with the study by Septiawan and Mardiah (2025), which indicates that the dimension with the lowest level of sustainability requires improvements in its sensitive attributes to enhance overall sustainability. This suggests that the technology applied in the JKF poultry is beginning to support the sustainability of the business, but it is not yet fully optimal. The application of technology still requires improvement or enhancement for sustainability to continue in the future.

The measurement of the technology dimension in this study uses six attributes, with the analysis results as shown in Figure 8, consisting of: (1) Feed production with an RMS value of 1.03%, (2) Use of probiotics with an RMS value of 0.009%, (3) Seed production with an RMS value of 4.99%, (4) Level of technology implementation with an RMS value of 1.67%, (5) Application of technology in the cage with an RMS value of 4.75%, and (6) Training with an RMS value of 0.45%. Based on the law of median values, where values greater than 2.49 indicate significant attributes, the leverage attributes for the sustainability of the *Gallus gallus domesticus* poultry business in the JKF community within the technology dimension are attribute (3) Seed production and (5) Application of technology in the cage.

DOC production is the most sensitive attribute in driving the sustainability of the technology dimension. Seed production is related to the quality and productivity of *Gallus gallus domesticus*. Good technology in DOC procurement can create superior seeds in large quantities, with shorter time and more uniform quality. In the *Gallus gallus domesticus* farms within the JKF community, several farmers have implemented egg incubator machines provided through banking assistance at various points of the farmers' cages. However, the limited capacity and availability of egg incubators have resulted in some farmers still incubating eggs manually using hen brooding. Farmers often face difficulties upgrading existing facilities or investing in new equipment and technology (Bist et al., 2024). This creates a quality gap in the resulting *Gallus gallus domesticus*. There is a need for a shared, scheduled hatching timetable among farmers, so all farmers can hatch eggs for chick production effectively. In addition, institutional support to procure higher-capable egg incubators should be pursued, or funding assistance should be given so each farmer can purchase their incubator.

The use of probiotics is the attribute with the lowest sensitivity to the sustainability of the *Gallus gallus domesticus* poultry business in the JKF community. Probiotics are related to the level of innovation in a farm. Innovation in probiotics is crucial for technology sustainability in JKF poultry and requires further efforts to maximize it. The JKF poultry uses probiotics in feed and drinking water for livestock, except for the DOC feed, because DOC does not easily digest its size. However, the probiotics are still provided in drinking water because the liquid form is easier to digest. Not all farmers provide probiotics in the drinking water for their DOCs. In the future, creating probiotics in fermented feed with a more micro-sized formula will be a key step to maximizing the implementation of this innovation in all phases of *Gallus gallus domesticus*, ensuring the expected results are also maximized. Additionally, enforcement for farmers to provide probiotics in the drinking water for DOCs is also necessary to optimize innovation and support the sustainability of technology in JKF poultry.

Status and Leverage Attributes of Sustainability in the Jago Karah Farm Community Livestock in Surabaya from the Institutional Dimension

The sustainability measurement in the institutional dimension, as shown in Figure 9, indicates a sustainability value of 78.21. This value falls within the ordinal scale range of 75.01 – 100, meaning

the sustainability status of the institutional dimension of the *Gallus gallus domesticus* poultry in the JKF Community is very sustainable.

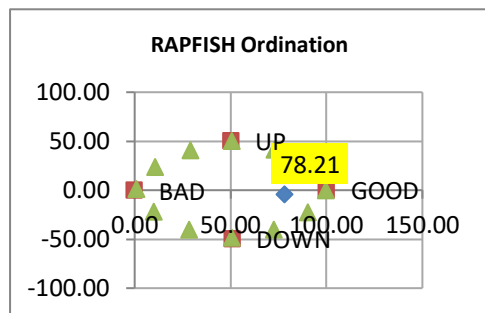


Figure 9. Ordination Analysis of the Institutional Dimension

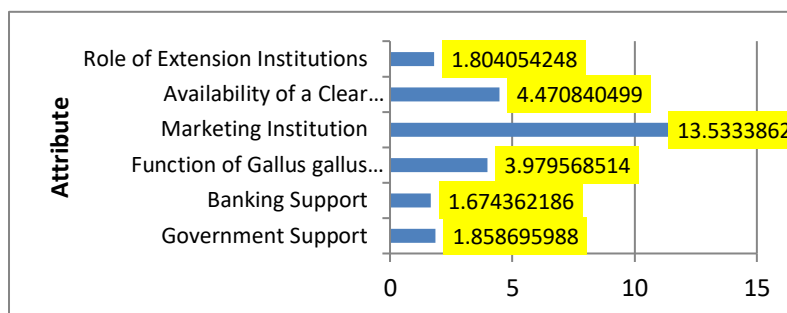


Figure 10. Analisis Analysis of the Institutional Dimension

This suggests that the institutional aspects are well-supported for the sustainability of the *Gallus gallus domesticus* poultry in the JKF Community. This is consistent with the research by Antikasari et al. (2023), which states that the dimension with the highest score in the sustainability analysis indicates a significant opportunity for development in supporting business sustainability. The efforts that need to be made include strengthening the institutional performance to make it more optimal and maintaining its sustainability status.

The measurement of the institutional dimension in this study used six attributes, with the analysis results shown in Figure 10, consisting of: (1) The role of extension institutions with an RMS value of 1.80%, (2) Availability of a clear organizational structure with an RMS value of 4.47%, (3) Marketing institution with an RMS value of 13.53%, (4) The function of the *Gallus gallus domesticus* livestock group with an RMS value of 3.97%, (5) Bank support with an RMS value of 1.67%, and (6) Government support with an RMS value of 1.85%. Based on the midpoint rule, with values greater than 6.76, the sustainability leverage attribute for the *Gallus gallus domesticus* poultry business in the JKF community within the institutional dimension attributes (3) Marketing institution.

The marketing institution attribute is the most sensitive factor in leveraging the sustainability of the JKF livestock farm. A practical and well-structured marketing institution can significantly influence income and the long-term continuity of the business. A strong marketing system enables products from the *Gallus gallus domesticus* farm to be sold at competitive prices, expand market reach, and build better relationships with consumers or distributors (Tarigan et al., 2025). At the JKF farm, only a few farmers are involved in marketing partnerships to sell their products, typically with café and restaurant business partners. However, the farmers could not adequately meet the high demand for chickens, leading the community to terminate partnerships with these business partners. Only a few farmers whose production levels are above the community average continue to maintain these partnerships. Therefore, it is necessary to improve farm production before establishing further collaborations with business partners.

Banking support within the institutional dimension is the attribute with the lowest sensitivity to the sustainability of the JKF livestock farm. The existing banking institutions are already well-established and play a significant role in supporting farm operations. Nevertheless, efforts to improve the performance of banking institutions further regarding the JKF poultry are still necessary for optimal outcomes. The JKF poultry has greatly benefited from banking institutions, particularly through support in livestock machinery technology that helps streamline operational processes. In

addition, ongoing efforts are to secure capital funding to help farmers overcome financial challenges in developing their farms.

Sustainability Analysis of Gallus gallus domesticus Poultry in the Jago Karah Farm Community

The overall sustainability score of the Gallus gallus domesticus poultry business in the JKF community, as shown in Figure 11, is 64.97. This score falls within the ordinal range of 50.01–75%, indicating that the overall sustainability status considering the ecological, economic, social, technological, and institutional dimensions can be categorized as moderately sustainable.

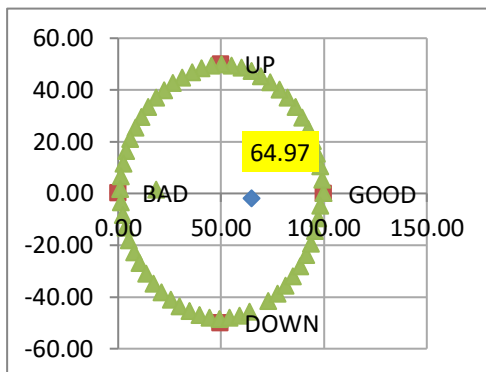


Figure 11. Ordination Analysis Sustainability of Gallus gallus domesticus Farming in the JKF Community

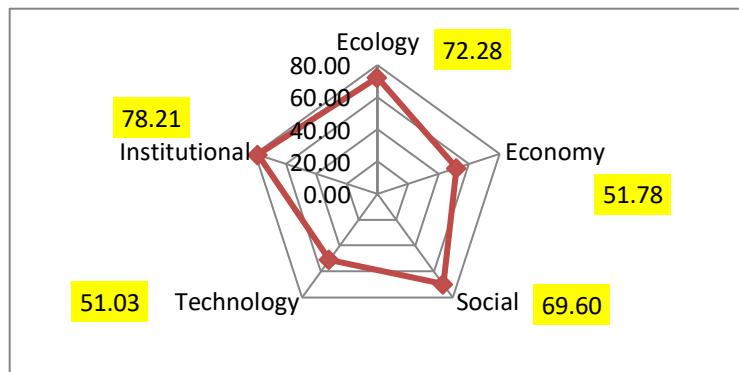


Figure 12. Kite Diagram

For a more concise view of the sustainability status, refer to Figure 12. The kite diagram illustrates that the sustainability of Gallus gallus domesticus poultry in the JKF community is very sustainable in the institutional dimension. Meanwhile, the ecological, economic, social, and technological dimensions are categorized as moderately sustainable. This means that efforts are needed to improve sustainability in the ecological, economic, social, and technological dimensions. In contrast, for the institutional dimension, efforts should focus on maintaining and maximizing its already high sustainability status.

Results of MDS, Monte Carlo, Stress, and RSQ Analysis

The ordination analysis results indicate a good outcome when the Stress value is less than 0.25. The analysis results as shown in Tabel 3, show a Stress value below 0.25, indicating that the error in the analysis is relatively minimal.

Table 3. Results of MDS, Monte Carlo, Stress, and RSQ Analysis

Dimension	MDS	Monte Carlo	Difference(%)	Stress	Rsqr
Ecology	72,28	72,7	0,42	0,15	0,94
Economy	51,78	51,77	0,01	0,15	0,93
Social	69,6	69,43	0,17	0,14	0,94
Technology	51,03	51,58	0,55	0,15	0,93
Institutional	78,21	78,24	0,03	0,14	0,93
JKF Sustainability	64,97	65,03	0,06	0,13	0,95

This suggests that all attributes from the five analyzed sustainability dimensions are valid and scientifically accountable (Rusdi et al., 2023). Additionally, the Rsq value represents a strong analysis when it approaches 1. The Rsq value in this analysis is indicated to be close to 1, meaning it effectively reflects the actual conditions. The accuracy of the analysis is also assessed by the difference between the Monte Carlo and MDS values, which should not exceed 5%. The analysis results show a difference below 5%, indicating that the analytical accuracy is met.

CONCLUSION AND SUGGESTION

The results of this study show that the ecological dimension has a sustainability score of 72.28, the economic dimension 51.78, the social dimension 69.60, the technological dimension 51.03, and the institutional dimension 78.21. The overall sustainability score of the *Gallus gallus domesticus* poultry business in the JKF Community is 64.97. This indicates that the sustainability status of the *Gallus gallus domesticus* poultry in the JKF Community is moderately sustainable overall. The ecological, economic, social, and technological dimensions are moderately sustainable, while the institutional dimension is highly sustainable. Several efforts are needed to maintain the sustainable status and improve the dimensions that are still moderately sustainable. Recommended actions include: (1) Producing JKF fermented feed with finer particle sizes to improve digestibility for DOC (Day-Old Chicks) and standardizing the mixing of probiotics in DOC drinking water. (2) Increasing the number of livestock to maximize production to meet market demand, which in turn can support the expansion of marketing reach. (3). Maintaining communication, transparency, active involvement, and a harmonious relationship with the surrounding community to ensure the social sustainability of JKF poultry operations. (4) Implementing a rotational and scheduled hatching system among farmers. (5). Continuing institutional support by providing livestock machinery to maximize production, enabling future business partnerships for higher-volume sales, (6) Expanding the scope of institutional collaboration to include farmers who have not yet been covered, and (7) Absorption of livestock products from farmer groups.

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