

# Implementation Characteristics of the GSCM (Green Supply Chain Management) Strategy to Improve Quail Farming Performance in Malang Regency

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**ABSTRACT :** The purpose of this study was to determine the characteristics of quail farmers in Malang Regency. This study was conducted in September 2025 in quail farming areas spread across several subdistricts, namely Kalipare, Poncokusumo, and Lawang, Malang Regency, East Java Province. The research method used was a survey employing a quantitative approach. The methods used in this research is snowball sampling. Primary data were collected through questionnaires and direct interviews with farmers quail from the Malang Regency. Based on field observations and considerations, the minimum number of respondents used in this study was 30 farmers. Data analysis was conducted using quantitative descriptive methods. The results of the characteristics of farmers with large-scale operations (7.500–30.000 birds) showed the highest percentage at 40% (12 people); educational dominated by high school graduates at 70% (21 people); in terms of age, the largest group was 31–35 years old at 37% (11 people); farming experience was dominated by the 5–7 year range at 64% (19 people); and the number of family dependents was dominated by 4 people at 37% (11 people). These conditions indicate that quail farming in Malang Regency has good potential for business development based on Green Supply Chain Management.

**KEYWORDS :** Farmer Characteristics, Green Supply Chain Management, Quail.

## I. INTRODUCTION

Sustainability issues are increasingly becoming a global concern as environmental damage caused by uncontrolled production and consumption practices continues to rise. One of the factors contributing to global conflicts is economic activity. Indonesia has experienced industrial growth that has yielded economic benefits, such as increased national income and the creation of jobs. However, these benefits inevitably result in significant negative impacts on the environment. Corporate operations, including those in the food and livestock sectors, contribute to rising greenhouse gas emissions (Daeli, 2024). The livestock sector is a major source of environmental pollution originates from animal manure, which can affect air, soil, and water quality. In addition to producing an unpleasant odor, improper management of animal manure waste can result in greenhouse gas (GHG) emissions in the form of CH<sub>4</sub> ; if not properly treated, these emissions are released directly into the atmosphere, where they have a global warming potential far higher than that of CO<sub>2</sub> (Sinatrya *et al.*, 2024). The impacts of greenhouse gas (GHG) emissions are long-term, with increasingly evident effects if left unaddressed—such as rising temperatures, rising sea levels, and weather instability—which can threaten the survival of living organisms, cause health issues, and disrupt economic stability related to employment. These challenges are driving various sectors—including livestock and agriculture—to adopt supply chain approaches that emphasize efficiency, sustainability, and environmental stewardship. The poultry sector, in the national context, is a key pillar of food security, including quail farming. This sector holds significant economic potential in providing eggs for consumption and a source of animal protein at relatively affordable prices. However, in general, the production and distribution systems in quail farming still operate conventionally, are fragmented, and lack the support of partnerships seen in the broiler chicken or large livestock sectors.

A discussion by the Malang Regency Livestock and Animal Health Service revealed that most quail farmers in Malang Regency operate on a small- to medium-scale basis, with supply chains that are not yet optimally integrated. The flow of information, products, and finances among supply chain actors remains conventional, potentially leading to marketing inefficiencies and margin disparities between farmers and downstream actors. Furthermore, farmers are not yet organized into partnership groups or cooperatives, and the products they produce are generally sold through informal distribution channels, making them vulnerable to price fluctuations and manipulation by product marketers (middlemen). Malang Regency's quail population in 2025 was recorded

at 485.266 birds. This aligns with the general price of quail eggs, which ranges around Rp. 22.500/kg, with 1 kg containing 90 eggs. The availability of animal protein such as quail eggs can be considered more ideal compared to other protein sources, such as beef, which costs around Rp. 125.600/kg, and free-range chicken, which costs Rp. 47.000/kg (Setyowati *et al.*, 2022). Given the positive trend among some consumers in Indonesia who are willing to pay more for environmentally friendly products, several informants stated that higher prices are not a barrier as long as the products provide long-term benefits in terms of quality and their environmental impact (Pradani and Wati, 2025). This indicates a market opportunity that can be leveraged by livestock business operators, including those in the quail farming sector. This situation reflects a gap between global demands for sustainability and the reality of on-the-ground practices, particularly in the quail farming sector, which lacks an efficient and environmentally oriented supply chain system. This gap presents both a challenge and an opportunity to design a more adaptive, integrated, and sustainable supply chain system through the implementation of Green Supply Chain Management in quail farms in Malang Regency. The implementation of Green Supply Chain Management strategies in quail farms aims to minimize or eliminate waste and pollution (greenhouse gas emissions and other waste) throughout the entire supply chain. This study aims to measure the level of implementation of Green Supply Chain Management (GSCM) principles in the quail farming supply chain—covering upstream, on-farm, and downstream aspects—and to analyze the impact of this implementation on marketing efficiency and marketing margins using multiple regression analysis. The results of this study are expected to serve as a practical reference for quail farmers and stakeholders in building a quail supply chain system that is greener, more efficient, and more competitive, while supporting food security and sustainable livestock development in Indonesia.

## II. RESEARCH METHODS

**Time, Location, and General Situation:** This study was conducted in September 2025 in quail farming areas spread across several subdistricts, namely Kalipare, Poncokusumo, and Lawang, in Malang Regency, East Java Province. The selection of these locations was based on the fact that these three subdistricts have the highest quail populations compared to other subdistricts in Malang Regency. According to 2025 data from the Malang Regency Livestock Service, the quail population in Kalipare subdistrict was 86.111, in Poncokusumo subdistrict was 44.717, and in Lawang subdistrict was 42.920.

## III. DATA COLLECTION

This study was conducted in September 2025 in quail farming areas spread across several subdistricts, namely Kalipare, Poncokusumo, and Lawang, in Malang Regency, East Java Province. The research method used was a survey with a quantitative approach. Two sampling methods were employed: purposive sampling (selecting respondents intentionally based on specific criteria) and snowball sampling (identifying, selecting, and collecting samples within a continuous network or chain of relationships). Primary data were collected through questionnaires and direct interviews with farmers, feed suppliers, and quail egg consumers, while secondary data were obtained from the Malang Regency Livestock Service, the Central Statistics Agency (BPS), scientific publications, and other relevant documents. Based on field observations and considerations, the minimum number of respondents used in this study was 30 farmers. **Data Analysis:** The data analysis used is descriptive analysis. This analysis is used to analyze, describe, and summarize various conditions and situations based on data in the form of numbers collected through analysis and interviews conducted in the field. The analysis of respondent profiles was conducted descriptively by calculating the frequency distribution of each category, which was then converted to percentages using the following formula (Tinangon *et al.*, 2023).

$$\text{Percentage (\%)} = \frac{F}{N} \times 100$$

Explanation:

F = Number of respondents who selected a specific category

N = Total number of respondents

## IV. RESULTS AND DISCUSSION

**Descriptive Analysis of the Characteristics of Quail Farmers in Malang Regency, East Java Province, Indonesia.** The purpose of this study was to determine the characteristics of quail farmers in Malang Regency. The data were analyzed using descriptive statistical analysis to identify the characteristics of quail farmers in Malang Regency in order to summarize, present, and interpret the data clearly and systematically.

Tabel 1. Characteristics of Quail Farmers In Malang Regency, East Java Province, Indonesia.

| No. | Farmer Characteristics        | The Number of Respondents<br>(person) | Percentage (%) |
|-----|-------------------------------|---------------------------------------|----------------|
| 1.  | Business Scale                |                                       |                |
|     | Small Scale (1000-3000 ekor)  | 6                                     | 20             |
|     | Medium Scale (4000-6500 ekor) | 12                                    | 40             |
|     | Large Scale (7500-30000 ekor) | 12                                    | 40             |
|     | Total                         | 30                                    | 100            |
| 2.  | Education                     |                                       |                |
|     | Elementary School             | 6                                     | 20             |
|     | Junior High School            | 1                                     | 3              |
|     | Senior High School            | 21                                    | 70             |
|     | Bachelor                      | 2                                     | 7              |
|     | Total                         | 30                                    | 100            |
| 3.  | Age                           |                                       |                |
|     | 25-30 year                    | 2                                     | 7              |
|     | 31-35 year                    | 11                                    | 37             |
|     | 36-40 year                    | 4                                     | 13             |
|     | 41-45 year                    | 4                                     | 13             |
|     | >46 year                      | 9                                     | 30             |
|     | Total                         | 30                                    | 100            |
| 4.  | Farming Experience            |                                       |                |
|     | 2-4 years                     | 3                                     | 10             |
|     | 5-7 years                     | 19                                    | 64             |
|     | 8-10 years                    | 7                                     | 23             |
|     | >10 years                     | 1                                     | 3              |
|     | Total                         | 30                                    | 100            |
| 5.  | Number of Family Dependents   |                                       |                |
|     | 1 person                      | 2                                     | 7              |
|     | 2 person                      | 4                                     | 13             |
|     | 3 person                      | 6                                     | 20             |
|     | 4 person                      | 11                                    | 37             |
|     | 5 person                      | 7                                     | 23             |
|     | Total                         | 30                                    | 100            |

Source: Primary data processed (2025).

Business Scale : The scale of a quail farm refers to the relative size of the quail farming operation. This scale can vary from small farms with a limited number of quail to large-scale operations. The scale of quail farming operations in Malang Regency is categorized into small-scale operations with a quail population of 1.000–3.000

Birds, medium-scale operations with a quail population of 4.000–6.500 birds, and large-scale operations with a quail population of 7.500–30.000 birds. The research findings on the scale of quail farming operations in Malang Regency, which is divided into three districts—Kaipare, Lawang, and Poncokusumo—show that the highest percentage (40%, or 12 farmers) falls into the largescale and small-scale categories. Meanwhile, the lowest percentage, at 20% (6 farmers), was for those with a quail population of 4.000–6.500 birds. The total number of farmers surveyed in this study was 30. The scale of quail farming operations in Malang Regency is dominated by large-scale and small-scale operations. Small-scale quail farms are predominantly found in Lawang Subdistrict, while large-scale quail farms are predominantly found in Kaipare Subdistrict. High feed costs have caused some quail farmers to discontinue their farming operations.

**Education :** An individual's ability to operate a poultry farm is greatly influenced by their intellectual capacity. Individuals with higher levels of education tend to be better equipped to adopt or reject innovations. Adequate education can assist the community in efforts to increase livestock production and improve farm management skills (Sudrajat and Adyatama, 2025). Research findings on the educational levels of quail farmers in Malang Regency show the following distribution: elementary school 20% (6 people), junior high school 3% (1 person), senior high school 70% (21 people), and bachelor's degree 7% (2 people). The total number of farmers surveyed in this study was 30 people. Educational level reflects the highest level of education attained by farmers, which can influence their ability to manage livestock businesses in a more modern and efficient manner (Prasetyo *et al.*, 2025).

**Age :** The age of livestock farmers, as a demographic factor, is believed to influence the productivity of livestock operations. Productivity is one of the indicators used to assess the success and efficiency of livestock operations (Al Ghozali *et al.*, 2025). The research findings on farmer characteristics based on age show significant variation, with the highest percentage (37%, or 11 people) falling in the 31–35 age group, followed by the second-highest age group, which was dominated by those aged >46 years (9 people); the third-highest age group was 36–40 years at 13% (4 people); the 41–45 age group at 13% (4 people); and the lowest was the 25–30 age group (2 people). Younger farmers tend to have a greater interest and desire to learn new things; in other words, they are more open to innovation even though they do not have much farming experience (Seran *et al.*, 2025).

**Farming Experience :** Farming experience refers to the length of time a farmer has spent running a farming business. The longer the experience, the wiser the farmer becomes in making decisions. This experience is gained through their involvement in the farming business over a certain period of time (Dan *et al.*, 2025). Research findings on the characteristics of farming experience indicate that quail farmers have varied levels of experience in their profession: 3% (1 person) have more than 10 years of farming experience, 10% (3 people) have 2–4 years of farming experience, 23% (7 people) have 8–10 years at 23% (7 people), and 5–7 years at 64% (19 people). The highest category is 5–7 years of farming experience; the second-highest category is 8–10 years of farming experience; the third-highest category is 2–4 years of farming experience; and the lowest category is dominated by those with >10 years of farming experience. Based on the classification of livestock farming experience characteristics in this study, farming experience lasting 5 to 10 years is categorized as a sufficient level of experience; however, this level of experience is not yet sufficient to guarantee the efficiency and productivity of the livestock business (Dan *et al.*, 2025).

**Number of Family Dependents :** The number of family dependents refers to all individuals living in a single household—including the husband, wife, children, and other members—who receive food from the head of the household according to the farmer's needs. The number of family dependents affects the family's well-being; however, this number can also have a positive impact if each dependent family member can assist with livestock farming activities (Mandalika *et al.*, 2025). Research findings on the characteristics of the number of dependents in livestock farmers' households show significant variation: the highest percentage of dependents is found in households with 4 dependents (37%), households with 5 dependents at 23% (second highest), households with 3 dependents at 20% (third highest), households with 2 dependents at 13% (fourth highest), and households with 1 dependent at 7% (lowest). The highest percentage of households with four dependents among quail farmers certainly reduces the farmers' income because they must provide for the living expenses of each family member. The number of family members influences the farmers' decision-making. Consequently, the more dependents a family has, the heavier the financial burden the farmers must bear (Aku and Hadini, 2026).

## V. CONCLUSION

The characteristics of quail farmers in Malang Regency are dominated by farmers of working age with a secondary education level, sufficient farming experience, and who manage small to medium-scale smallholder farming operations. Most farmers use their own land, employ family members or local labor, and operate their businesses sustainably with livestock populations that vary according to coop capacity. These conditions indicate that quail farming in Malang Regency has good potential for business development based on Green Supply Chain Management.

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