Analysis of Public Perceptions Towards Layer Chicken Farm: Insight from Sumarambu Subdistrict, Indonesia

Andi Muhammad Alif Zalzabila, Vidyahwati Tenrisanna*, Muh Ridwan, Kasmiyati Kasim
Faculty of Animal Science, Hasanuddin University, Makassar, Indonesia
✉ vidi_tenrisanna@yahoo.com.au

ABSTRACT

This study investigated community perceptions towards the presence of a layer chicken farm in Sumarambu Subdistrict, Telluwanua District, Palopo City, Indonesia. A descriptive quantitative survey was conducted on 40 households within a 500-meter radius of the farm, categorized into three zones based on proximity. Perceptions were measured across environmental, economic, and social aspects using a Likert scale. The results showed that the community agreed the farm had negative environmental impacts, such as strong odour and poor waste management, with perceptions varying significantly by proximity. From an economic perspective, residents noted advantages, including reduced egg prices and increased consumption. Nonetheless, perceptions were consistent across different areas, suggesting that the farm acts as an economic enclave with minimal integration into the broader community. From a social perspective, the community demonstrated differing opinions regarding the positive impacts on employment, social assistance, and compensation, with no significant spatial variations. This highlights a lack of social responsibility initiatives. The Kruskal-Wallis test revealed substantial differences in environmental perceptions among zones for odour and waste, but not for water pollution and cleanliness. No significant zonal differences were found for economic and social aspects. This study emphasizes the importance of understanding and integrating community perceptions into sustainable livestock development to ensure alignment with local needs, values, and expectations.

Keywords: *Environmental, Economic, Social, Sustainable, Livestock*

INTRODUCTION

Poultry farming, particularly in the layer chicken farming sector, has experienced significant growth. The production of laying chickens plays a vital role in supplying animal protein to the public and addressing various industrial needs, particularly in the food industry. This is in line with Indonesia's population; according to the 2020 population census, the recorded population was 270 million, nearly three times the count from the 1961 census (BPS Statistics Indonesia, 2022). The growing awareness among the Indonesian public about the critical role of animal protein has favourably impacted the expansion of businesses in the layer chicken farming sector. In 2024, the population of layer chickens in Indonesia was 414,758,411 birds (BPS Statistics Indonesia, 2024).

Layer chickens are integral to poultry production due to their dietary benefits, economic impact, and efficiency. They are pivotal in efforts to improve sustainability and productivity through continued research and development in the poultry sector (He et al., 2021; Khalifah et al., 2023; Liu et al., 2019; Nyoni et al., 2018).

The Indonesian government strives to improve national food security by meeting animal protein needs in alignment with population growth and protein nutrition awareness (Santoso, 2022).. Layer poultry farming is crucial to animal husbandry and emphasises efficiency, productivity, and sustainability. Improving efficiency, particularly through technological advancements, such as cloud-based poultry farming information management systems, has significantly enhanced farm management by increasing flexibility, scalability, and service efficiency

(Zheng et al., 2021). Although intensive poultry farming is efficient, it significantly impacts the environment through greenhouse gas emissions and pollutants, such as ammonia, nitrous oxide, and methane. These contaminants can lead to air, soil, and water pollution, contribute to the emergence of antimicrobial-resistant pathogens, and cause serious ethical and environmental issues for both animal and human health (Gržinić et al., 2022).

Perception is defined as the way humans think about something and is influenced by their individual experiences, knowledge, and emotions. It can vary among individuals based on their viewpoints and interpretations. In the context of layer chickens, community perceptions are often shaped by economic, social, and environmental considerations (Estrada-González et al., 2020; Rajkumar et al., 2021). These differences in perception are influenced by knowledge levels, exposure to poultry farming practices, and cultural community values (Cui & Liu, 2016; Hedman et al., 2020; Nyoni et al., 2018).

Community perception is a pivotal factor in the sustainable advancement of livestock, shaping local endorsements, practice implementation, and policy development (Schneider & Tarawali, 2021). Community perception significantly impacts local support for sustainable practices. Involving the community, particularly through effective communication in rural regions, increases support for sustainable programs and enhances participation (Feng et al., 2024). Community perceptions also guide policies that balance the environmental impacts of livestock development. An example of how environmental concerns might drive precise management tactics is the use of GIS technology in sustainable manure management (Grieco et al., 2024).

Layer chicken farming positively impacts socioeconomic conditions by increasing local income, improving access to protein-rich eggs, and alleviating nutritional deficiencies. It also encourages community engagement in various business activities and promotes skill and knowledge development. (Surni et al., 2020).

The farming of layer chickens leads to significant environmental pollution, resulting in strong odours and skin irritation for nearby residents due to the contamination of water sources. This practice contributes to ammonia emissions, negatively impacts air and soil quality, and causes acidification and eutrophication of ecosystems. (Jiang et al., 2021). The selection of Sumarambu Subdistrict as a study location was based on the importance of the regional context: data from the South Sulawesi Provincial Statistics Agency (Badan Pusat Statistik Provinsi Sulawesi Selatan, 2024). Poultry population data in Palopo City show significant farm concentrations, indicating potential environmental impacts. The BPS data on livestock numbers and poultry production enable comparisons with other South Sulawesi districts. Understanding local perceptions of these issues informs environmental effects and helps develop waste management strategies for similar regions.(Badan Pusat Statistik Kota Palopo, 2024; Badan Pusat Statistik Provinsi Sulawesi Selatan., 2024). Overall, understanding and incorporating community perceptions into sustainable livestock development initiatives can enhance their success by ensuring alignment with local needs, values, and expectations.

. Palopo City in South Sulawesi Province has an emerging economic sector focused on agriculture and livestock, particularly chicken farming. Despite its smaller population compared to other regions, it shows promise for layer chicken farming because of its fertile land, tropical climate, and abundant water resources. The availability of local feed ingredients, such as corn and bran, can lower production costs. Improved infrastructure further facilitates the distribution of Palopo eggs, especially in the Sumarambu Subdistrict, which has favourable agricultural land for expanding poultry operations.

The Sumarambu Subdistrict, located in the Telluwanua District of Palopo, covers 34.34 km² and includes seven sub-districts. It is a hilly area with land used for residential, agricultural, and green space purposes. A survey identified a chicken farm with 3,000-5,000 egg-laying chickens situated 60 m from nearby residences, impacting approximately 40 households due to strong odours. This study investigates community perceptions of the farm, focusing on the environmental, economic, and social factors that shape local attitudes.

This study uniquely focuses on the Sumarambu Subdistrict of Palopo City, a non-coastal, hilly area that has not been previously explored in research. It integrates economic, social, and environmental dimensions to comprehensively understand community perceptions and link them directly to sustainable livestock development policies. Using evidence from a medium-scale layer chicken farm with approximately 40 households, this study examines micro-level social-environmental conflicts that are often overlooked in livestock research. This study fills a gap in the Indonesian poultry literature by providing perspectives on how local community perceptions influence sustainable poultry development strategies for regional conditions.

RESEARCH METHODS

Location and Time of the Study

This study was conducted in the Sumarambu Subdistrict, Telluwanua District, Palopo City, South Sulawesi Province, Indonesia, from February 2025 to March 2025. The selection of the study site was based on several critical considerations. First, environmental concerns associated with layer chicken farms, such as odour and waste management, have the potential to impact community perceptions, rendering this an intriguing subject for academic research. Furthermore, the farm's strategic location facilitated the collection of direct insights from nearby residents, thereby enhancing the robustness of the research.

Population and Sample

A population is described as a broad area encompassing objects or subjects that possess specific qualities and characteristics identified by the researcher for the study, from which conclusions are derived. A sample is a part of the population (Sugiyono, 2013). The population in this study is the number of households living in proximity within a 500-meter radius of a layer chicken farm, which is 40. Based on this study, since the population is not greater than 100 respondents, the entire population was sampled, consisting of 40 household heads. Including the entire population increases accuracy by considering all data points and reducing errors from excluding any group (Mujere, 2016). Although appropriate for a localised case study, this limitation reduces the generalisability of the findings to broader populations or different geographic settings. The distribution of respondents is presented in Table 1.

Table 1. Distribution of Respondents by Zone Distance

No	Zone	Distance Range	Total Sample (People)
1	Zone 1	Short range 0–100 m	14
2	Zone 2	Medium range 101–250 m	13
3	Zone 3	Far range 251–500 m	13
	Total		40

Source: Processed Primary Data, 2025

The respondents were divided into three zones based on the distance of their residence from a poultry farm. Zone 1 (short range, 0–100 m) had the highest number of respondents with 14 people (35% of the total sample). Zone 2 (medium range, 101–250 m) and Zone 3 (far range, 251–500 m) had 13 respondents (32.5%) each.

Data Analysis

1. Descriptive Analysis

Descriptive statistics were used to summarize the respondents' characteristics and their perceptions for each indicator. The data analysis used in this study to determine the public's perception of the presence of layer chicken farms was a quantitative descriptive analysis using frequency distribution tables with measurements utilising a Likert scale. The Likert scale is a key measurement instrument utilised in social science and educational research aimed at gauging attitudes, perceptions, values, and behavioural modifications by having respondents express their level of agreement or disagreement on a multi-point scale (Joshi et al., 2015). Responses were measured using a three-point Likert scale

3 = Strongly Agree
2 = Agre
1 = Disagree

Frequencies and percentages of each response category were calculated for the three spatial zones (Z1, Z2, and Z3). To provide a more quantitative and methodologically standard measure of perception, mean scores were also calculated using the formula:

$$Mean = \frac{(3 x Strongly\ Agree) + (2 x Agree) + (1 x Disagree)}{Total\ Respondents}$$

The mean score approach is widely recognized in social and behavioral research as an appropriate method for quantifying respondents' attitudinal tendencies on Likert-type scales (Joshi et al., 2015; Tanujaya et al., 2022). Mean values enable researchers to identify the relative intensity of perception in a statistically interpretable form, without assuming equal intervals between response categories. The interpretation of mean scores in this study follows the standard range:

Mean Range	Interpretation
1.00–1.66	Negative perception (Disagree)
1.67–2.33	Moderate perception (Agree)
2.34–3.00	Positive perception (Strongly Agree)

A three-point Likert scale (1 = Disagree, 2 = Agree, 3 = Strongly Agree) was employed in this study to measure community perceptions. Although five-point or seven-point scales are commonly used, the three-point format was chosen for simplicity and respondent clarity, particularly for populations with heterogeneous educational levels, to minimise ambiguity (Tanujaya et al., 2022; Wu & Leung, 2017). Additionally, this approach minimizes respondent confusion and cognitive burden while maintaining satisfactory validity and reliability for attitude measurement Following this, the standard deviation (SD) is determined to evaluate the extent of variation or spread within the data set (Adeleke et al., 2024).

2. Inferential Statistical Analysis

The primary objective of this study was to examine whether perceptions of layer farming impacts differed significantly among the three spatial zones. In this research, all perception variables were measured using an ordinal three-point Likert scale, and each zone consisted of a relatively small, independent sample (13–14 respondents). Consequently, the study adopted the Kruskal–Wallis H-test, a non-parametric alternative to one-way ANOVA that does not require normality or equal variances (Macfarland & Yates, 2016; Ostertagová et al., 2014). The Kruskal–Wallis test compared the median ranks of perception scores across the three independent zones to determine whether at least one group differed significantly. The Kruskal–Wallis test was used to evaluate the following hypotheses:

H0: There is no significant difference in perception among the three zones.
H1: At least one zone differs significantly in perception.
A significance level of **α = 0.05** was used. If $p < 0.05$, the null hypothesis (H_0) was rejected, indicating significant differences in perception among the zones.

The variable indicators in this study were intended to measure the values of the studied variables. The indicators of the research variables are presented in Table 2.

Table 2. Variables and Indicators for Measuring Research Variables

Variable	Sub Variable	Indicator
Public Perception	Environmental Aspect - Odour (Pollution)	1. Pollution caused by layer chickens that produces strong odours
	Environmental Aspect - Water Pollution	1. The presence of layer chicken farms causes water pollution (foul odour) 2. Water pollution can affect human health caused by layer chicken farms
	Environmental Aspect - Waste	1. Poultry waste is left to accumulate 2. Lack of cleanliness and ineffective waste management
	Economic Aspect - Household Income	1. Increase in household income of surrounding communities 2. Contributes to community welfare
	Economic Aspect - Egg Prices	1. Affordable egg prices for the community 2. Increased egg consumption due to low prices
	Social Aspect - Community Cooperation	1. Creates job opportunities for surrounding communities 2. Promotes good interaction between farmers and the community
	Social Aspect - Social Assistance	1. Provides social assistance to the community 2. Provides compensation to the community

RESULTS AND DISCUSSION

Characteristics of Respondents

Respondents' characteristics can influence their assessment of community perceptions. The respondent characteristics considered in this study were age, sex, education, and occupation, as shown in Table 3.

Table 3. Summary of Respondents' Characteristics

Variable	Category	Number of People	Percentage (%)
Gender	Men	18	45
	Women	22	55
Age (Years)	20–35	12	30
	36–51	16	40
	52–67	10	25
	68–83	2	5
Education	No Schooling	3	7.5
	Elementary School	4	10
	Junior High School	9	22.5
	Senior High School	18	45
	Bachelor's Degree	6	15
Occupation	Housewives	20	50
	Farmers	14	35
	Laborers	5	12.5
	Family Planning Instructor	1	2.5
Total		40	100

Source: Processed Primary Data, 2025

The respondents in the Sumarambu Subdistrict in Table 3 consisted of 18 males (45%) and 22 females (55%), indicating a higher response rate among women. This trend suggests that women are generally more responsive to surveys, potentially because of their greater sensitivity to perceiving emotional and social information (Boediarsih et al., 2016).

The largest proportion of respondents fell within the 36–51 years age group (40%), whereas the smallest proportion was in the 68–83 years age group (5%). This distribution shows that most respondents were in the productive age range, which allowed them to provide relevant and responsible answers to the survey questions. According to Kenny, Flouris, Mcginn, & Groeller (2016), age strongly influences labor productivity, as physical capacity tends to decline with older age.

Most respondents had a Senior High School education (45%), while the smallest group was those without schooling (7.5%). This indicates that the community has a relatively poor educational background, which can be linked to economic limitations and a lack of awareness of the importance of education. Investment in education contributes to enhanced academic performance, which in turn feeds back into societal and economic welfare by developing knowledgeable and capable citizens (Hayat et al., 2022).

The largest proportion of respondents were housewives (50%), followed by farmers (35%), labourers (12.5%), and a small number of family planning instructors (2.5%). This finding suggests that many women in the area dedicate themselves to household responsibilities, which may also be influenced by economic conditions in the area. Accordingly, in developing countries, women's employment is often vital for supplementing family income and improving living standards (Elneel & Almulhim, 2023).

Public Perceptions of the Existence of Layer Chicken Farms

In this study, the community's perception of the existence of chicken layer farms was analysed from three aspects: environmental, economic, and social.

Environmental Aspect

Layer chicken farms significantly impact the environment through air, water, and soil pollution and affect nearby communities through odours and the potential spread of disease. The community's perceptions of the environmental aspects of the Sumarambu sub-district are presented in Table 7.

Table 4. Respondents' Perception of Environmental Aspects

Sub-Variable	Indicator	Zone	Strongly Agree (n, %)	Agree (n, %)	Disagree (n, %)	Mean Score	SD
Odour (Smell)	Strong Odour	Z1	14 (100%)	0 (0%)	0 (0%)	3.00	0.00
		Z2	13 (100%)	0 (0%)	0 (0%)	3.00	0.00
		Z3	0 (0%)	8 (61.5%)	5 (38.5%)	1.62	0.51
	Overall		27 (67.5%)	8 (20%)	5 (12.5%)	**2.54**	0.76
Water Pollution	Foul-Smelling Water	Z1	0 (0%)	14 (100%)	0 (0%)	2.00	0.00
		Z2	0 (0%)	13 (100%)	0 (0%)	2.00	0.00
		Z3	0 (0%)	13 (100%)	0 (0%)	2.00	0.00
	Overall		0 (0%)	40 (100%)	0 (0%)	**2.00**	0.00
	Water Causes Disease	Z1	0 (0%)	14 (100%)	0 (0%)	2.00	0.00
		Z2	0 (0%)	13 (100%)	0 (0%)	2.00	0.00
		Z3	0 (0%)	13 (100%)	0 (0%)	2.00	0.00
	Overall		0 (0%)	40 (100%)	0 (0%)	**2.00**	0.00
Waste	Accumulated Waste	Z1	6 (42.9%)	6 (42.9%)	2 (14.2%)	2.29	0.49
		Z2	3 (23.1%)	2 (15.4%)	8 (61.5%)	1.62	0.51
		Z3	5 (38.5%)	3 (23.1%)	5 (38.5%)	2.00	0.52
	Overall		14 (35%)	11 (27.5%)	15 (37.5%)	**2.02**	0.34
	Lack of Cleanliness	Z1	2 (14.3%)	8 (57.1%)	4 (28.6%)	1.86	0.37
		Z2	4 (30.8%)	4 (30.8%)	5 (38.5%)	1.92	0.44
		Z3	2 (15.4%)	5 (38.5%)	6 (46.1%)	1.77	0.42
	Overall		8 (20%)	17 (42.5%)	15 (37.5%)	**1.90**	0.13
					Overall	**2.09**	

Source: Processed Primary Data, 2025

As shown in Table 4, odour is the most strongly perceived environmental issue among the respondents. In Zone 1, all respondents (14 people; 100%) strongly agreed that poultry farms produced a strong odour, and the same pattern appeared in Zone 2 (13 people; 100% strongly agreed). Conversely, all respondents in Zone 3 disagreed about its presence, suggesting that the odour intensity decreased with distance from the source. This is in line with the opinion of Asrul et al. (2023), who noted that farm odours are seen as unpleasant, affecting community tolerance based on wind direction and seasonal conditions, particularly during the rainy season. The overall mean score for odour perception was 2.54, categorized as a positive perception. This indicates that respondents clearly recognized odour as a major environmental nuisance.

All 40 respondents reported no unpleasant odours in their water, rejecting any association with the nearby chicken farms. None indicated a strong agreement that odours were present, suggesting that the community perception of normal water quality was influenced by their use of odourless tap and well water sources. All respondents (40 people, 100%) stated that water did not cause disease in zones 1, 2, or 3. This shows that the community has no concerns about the health impacts of water and considers it safe for use in the long term. This study aligns with the literature showing that public perception of water safety is often tied to sensory cues (odour, taste, clarity) rather than chemical or microbiological tests (Eck et al., 2019).

Zone 1 faced severe livestock waste accumulation, with most respondents agreeing that it was problematic. Zone 2 shows favourable views, with residents disagreeing with waste management issues. Zone 3 has mixed opinions, although less severe than Zone 1, with some waste being resold as fertiliser. Accordingly, public opinion tends to vary, as observed in the implementation of integrated agriculture-livestock systems that convert waste into fertiliser (Swastika et al., 2024).

For the indicator Lack of Cleanliness, perception was also moderate. Zone 1 respondents mainly agreed (8 people; 57.1%) or disagreed (4 people; 28.6%) with the statement, while Zone 2 and Zone 3 displayed similar

patterns. The overall mean score was 1.90. This indicates that livestock business owners struggle with waste management, raising health concerns for both livestock and humans. This is in line with the study by Farradinna et al.(2023), who found that farmer groups still use traditional and unsanitary waste management practices, although educational initiatives have improved awareness of the environmental and health risks associated with waste. This highlights the low perception of cleanliness in areas that struggle with waste management issues.

The overall mean score of 2.09 across environmental indicators signifies a moderate level of concern, reflecting awareness of environmental degradation without extreme polarization. Analysis shows odour as the primary environmental concern, with higher intensity near poultry farms, while water pollution and waste perceptions remain moderate and uniform across areas.. Accordingly, water pollution from poultry farms is more spatially uniform than odour, largely due to nutrient runoff, particularly nitrogen and phosphorus, which can disperse over larger areas through water bodies, causing problems such as eutrophication (Gržinić et al., 2022; Lundén et al., 2019).

The analysis of standard deviation (SD) values indicates that respondents generally shared similar perceptions of the environmental, economic, and social impacts of poultry farming. Most SD values were low to moderate (0.00–0.76), except for Strong Odour, which had the highest SD of 0.76, reflecting varied views among residents near farms about environmental impacts. Conversely, perceptions of Water Pollution and Cleanliness showed very low SD values (0.00–0.13), indicating a consensus on living conditions and awareness among respondents. Understanding these variations can guide stakeholders in developing policies and strategies that address diverse community perceptions.(Gan & Hu, 2016). The Kruskal-Wallis test results for environmental aspects are presented in Table 5.

Table 5. Kruskal-Wallis Test Results on Environmental Aspects

No	Sub-Variable	Indicator	H (χ^2)	df	*p*-value
1	Odour (Smell)	Strong Odour	22.891	2	0.0001
2	Water Pollution	Foul-Smelling Water	0.000	2	1.000
3	Water Pollution	Water Causes Disease	0.000	2	1.000
4	Waste	Accumulated Waste	6.895	2	0.0318
5	Waste	Lack of Cleanliness	1.270	2	0.5298

Source: Processed Primary Data, 2025

In Table 5, the Kruskal-Wallis test results show that perceptions of odour and accumulated waste differ significantly between zones (χ^2 significant, $p < 0.05$). Both are directly perceptible environmental nuisances, confirming that physical distance strongly influences how residents evaluate environmental quality. Previous studies have shown that poultry farming activities have a significant impact on air quality and odour for the surrounding community (Donakpo et al., 2024). Meanwhile, for water pollution and lack of cleanliness waste indicators, no significant differences were found between zones ($p > 0.05$). This shows that public perception of water pollution and lack of cleanliness waste is more homogeneous across zones, so for these indicators, H$_0$ is not rejected.

Odour and waste perceptions vary significantly by proximity, highlighting the need for targeted mitigation near farm zones, including improved ventilation, odour control, and waste management strategies. Meanwhile, consistent perceptions of water and cleanliness suggest opportunities for community education and participatory environmental monitoring to enhance awareness and reporting capacity.

Economic Aspects

The existence of egg-laying chicken farms significantly influences the daily lives of the surrounding community, serving as a major source of income for farmers and contributing to the local economy through job creation and the availability of affordable egg products. The community's perception of this economic aspect is detailed in Table 9 for the Sumarambu Subdistrict.

Table 6. Respondents' Perception of Economic Aspects

Sub-Variable	Indicator	Zone	Strongly Agree (n, %)	Agree (n, %)	Disagree (n, %)	Mean Score	SD
Family Income	Increased Income	Z1	0 (0%)	2 (15.4%)	12 (84.6%)	1.15	0.00
		Z2	0 (0%)	2 (15.4%)	11 (84.6%)	1.15	0.10
		Z3	0 (0%)	0 (0%)	13 (100%)	1.00	0.22
	Overall		0 (0%)	4 (10%)	36 (90%)	**1.08**	0.12
	Community Welfare	Z1	0 (0%)	2 (15.4%)	12 (84.6%)	1.15	0.10
		Z2	0 (0%)	2 (15.4%)	11 (84.6%)	1.15	0.20
		Z3	0 (0%)	2 (15.4%)	11 (84.6%)	1.15	0.10
	Overall		0 (0%)	6 (15%)	34 (85%)	**1.15**	0.12
Egg Price	Cheap Egg Price	Z1	7 (50%)	4 (28.6%)	3 (21.4%)	2.29	0.42
		Z2	4 (30.8%)	5 (38.5%)	4 (30.8%)	2.00	0.37
		Z3	7 (53.8%)	7 (53.8%)	1 (7.7%)	2.46	0.31
	Overall		18 (45%)	16 (40%)	6 (15%)	**2.25**	0.37
	Increased Egg Consumption	Z1	3 (21.4%)	7 (50%)	4 (28.6%)	1.93	0.39
		Z2	4 (30.8%)	6 (46.2%)	3 (23.1%)	2.08	0.33
		Z3	0 (0%)	7 (53.8%)	6 (46.2%)	1.54	0.34
	Overall		7 (17.5%)	20 (50%)	13 (32.5%)	**1.85**	0.35
					Overall	**1.63**	

Source: Processed Primary Data, 2025

Based on the survey in Table 6, 40 respondents disagreed that layer farming increased income in the three zones. Zones 1 and 2 reported no increase in family income, and Zone 3 noted a lack of economic benefits. The farms did not create direct employment or related opportunities, resulting in minimal income impact on local communities that were not involved in farm operations. A study in Lamongan indicates that poor business management results in significant income risks and frequently insufficient profits, with the local community experiencing only minimal spillover benefits (Suwarta & Hanafie, 2018).

. Community welfare indicators indicate that 85% of respondents in zones 1-3 believe there have been no welfare improvements. Zone 1 reported no changes due to limited economic benefits from livestock farming, Zone 2 had similar views, and Zone 3 showed slightly more positive perceptions of indirect benefits. Overall, the community feels unprosperous from livestock enterprises, primarily due to a lack of employment opportunities in these sectors. These findings are in line with previous studies that highlighted how livestock-related programs or enterprises have a minimal impact on households not directly engaged in the sector (Fyka et al., 2020; Hermaliza et al., 2022).

In total, 45% of respondents (18 out of 40) believed that egg prices were low, particularly in Zones 1–3. Zone 1 emphasised the economic benefits for households from lower prices, Zone 2 highlighted lower prices as a key advantage of local farms, and Zone 3 showed the highest acceptance, perceiving eggs as significantly cheaper than market rates. These findings align with previous research, indicating that local poultry production decreases household expenses on eggs and enhances accessibility for communities (Suwarta & Hanafie, 2018).

In a survey of 40 respondents from three zones, 50% reported an increase in egg consumption due to the expansion of poultry farming in the area. Zone 1 showed some agreement with increased household consumption, while Zone 2 had higher positive perceptions, predominantly indicating a strong agreement. Zone 3 reported the highest increase, reflecting better access and affordability of the eggs. According to Scudiero et al. (2023), regions with easy access to eggs through local poultry farming usually have higher egg consumption, which may lead to lower prices owing to reduced transport costs.

The economic aspect shows negative perceptions (mean score = 1.63) with low variability across zones (SD = 0.00–0.42), indicating similar views on poultry farming's economic effects. Increased Income and Community Welfare indicators showed low mean scores (≈1.10), suggesting uniform disagreement about improved household welfare. Cheap Egg Prices and Increased Egg Consumption had higher means (≈2.20),

reflecting consumer benefits rather than direct economic gain. Thus, the poultry industry contributes more to consumer affordability than community income generation across zones. Accordingly, the economic integration of such operations is crucial; without it, the potential economic benefits can become isolated from the broader community development (Bassignana et al., 2022). The Kruskal-Wallis test results for economic aspects are presented in Table 7.

Table 7. Kruskal-Wallis Test Results on Economic Aspects

No	Sub-Variable	Indicator	H (χ²)	df	*p*-value
1	Family Income	Increased Income	0.133	2	0.9358
2	Family Income	Community Welfare	0.454	2	0.7971
3	Egg Price	Cheap Egg Price	1.989	2	0.3699
4	Egg Price	Increased Egg Consumption	4.299	2	0.1166

Source: Processed Primary Data, 2025

In Table 7, the results of the Kruskal-Wallis test across all indicators, no statistically significant differences (p > 0.05) were observed in economic perceptions between zones. This indicates that economic perceptions are spatially homogeneous, suggesting that layer farming does not create place-based economic disparities but also fails to deliver localized benefits (Thamaga-Chitja et al., 2025). The poultry sector in Sumarambu Subdistrict functions as an enclave industry, providing egg supply and market stability but limited community benefits. Local authorities should promote inclusive mechanisms like procurement and training to generate sustainable community income.

Social Aspect

The social aspect of the layer chicken farms in the Sumarambu Subdistrict pertains to community interactions, relationships, and dynamics that affect the social lives of individuals and groups. For detailed observations, see Table 8.

Table 8. Respondents' Perception of Social Aspects

Sub-Variable	Indicator	Zone	Strongly Agree (n, %)	Agree (n, %)	Disagree (n, %)	Mean Score	SD
Community Cooperation	Job Opportunities	Z1	0 (0%)	0 (0%)	14 (100%)	1.00	0.00
		Z2	0 (0%)	0 (0%)	13 (100%)	1.00	0.00
		Z3	0 (0%)	0 (0%)	13 (100%)	1.00	0.00
	Overall		0 (0%)	0 (0%)	40 (100%)	**1.00**	0.00
	Good Interaction	Z1	10 (71.4%)	4 (28.6%)	0 (0%)	2.71	0.46
		Z2	9 (69.2%)	4 (30.8%)	0 (0%)	2.69	0.48
		Z3	9 (69.2%)	4 (30.8%)	0 (0%)	2.69	0.48
	Overall		28 (70%)	12 (30%)	0 (0%)	**2.70**	0.47
Social Assistance	Social Aid	Z1	0 (0%)	0 (0%)	14 (100%)	1.00	0.00
		Z2	0 (0%)	0 (0%)	13 (100%)	1.00	0.00
		Z3	0 (0%)	0 (0%)	13 (100%)	1.00	0.00
	Overall		0 (0%)	0 (0%)	40 (100%)	**1.00**	0.00
	Compensation	Z1	0 (0%)	0 (0%)	14 (100%)	1.00	0.00
		Z2	0 (0%)	0 (0%)	13 (100%)	1.00	0.00
		Z3	0 (0%)	0 (0%)	13 (100%)	1.00	0.00
	Overall		0 (0%)	0 (0%)	40 (100%)	**1.00**	0.00
	Overall					**1.43**	

Source: Processed Primary Data, 2025

As shown in Table 8, all 40 respondents across Zones 1-3 disagreed that poultry activities create local jobs. This reveals a structural separation between poultry production and the local labour market, indicating a disconnection between agribusinesses and community economic systems. This suggests the absence of inclusive business models that integrate local participation. According to Efendi et al. (2022), mismatched skill structures and poor institutional linkages between local human resources and industry needs cause these inefficiencies. This reveals a systemic governance gap in the community integration of rural poultry enterprises, potentially fuelling perceptions of inequality and reducing social acceptance of livestock operations.

A total of 80% of respondents strongly agreed that community interactions remained positive and that poultry farms had not disrupted social relationships. Rather than interpreting this solely as harmony, it reflects a form of social resilience, with communities sustaining cohesion despite external industrial pressures. This finding supports Pérez-Lombardini et al. (2024), who demonstrated that in small-scale livestock systems, social organisation and cultural values act as buffers against conflicts and facilitate coexistence.

All respondents disagreed with receiving social assistance from poultry business owners. This indicates a failure of vertical social linkages and the absence of corporate-community engagement and CSR initiatives in the region. The lack of assistance reflects the communication gaps between businesses and communities. As Emeka-Okoli et al. (2024) emphasised, effective stakeholder engagement requires dialogue and mutual trust to be established. Without these elements, businesses risk being perceived as detached, reducing their social benefits, and eroding their legitimacy among the residents.

Everyone disagreed with the statements about poultry farm money, feeling excluded from the benefit sharing. Communities face problems without compensation, resulting in an unfair distribution of industry costs and benefits.. Evidence from Sutanto et al. (2024) in the Sidrap Regency shows that fair compensation enhances labour participation in the poultry industry. In Sumarambu Subdistrict, these findings emphasize the need for transparent compensation schemes to improve social equity and efficiency.

The overall average score (mean = 1.43) indicates that the community's perception of social aspects is negative, while the SD (0.00–0.48) shows a low variability among respondents. Almost all community members do not experience direct social benefits such as job opportunities, social assistance, or compensation (mean = 1.00, SD = 0.00). In contrast, only the Good Interaction indicator showed a positive perception (mean = 2.70, SD = 0.47), indicating that social relations in the community remain harmonious even without direct support from livestock businesses. Furthermore, Job Opportunities, Social Aid, and Compensation all scored 1.00, indicating that residents perceived no tangible social or economic benefits from poultry enterprises. This underscores the importance of integrating CSR within rural cooperatives to enhance sustainability-oriented activities among farmers.(Rostami & Salehi, 2023). Communities coexist peacefully with poultry farms but feel socially and economically excluded from them. Poultry businesses should create social responsibility programs, hire local employees, and engage with communities. Table 9 presents the results of the Kruskal-Wallis test on social aspects.

Table 9. Kruskal-Wallis Test Results on Social Aspects

No	Sub-Variable	Indicator	H (χ²)	df	*p*-value
1	Community Cooperation	Job Opportunities	0.000	2	1.0000
2	Community Cooperation	Good Interaction	0.013	2	0.9936
3	Social Assistance	Social Aid	0.000	2	1.0000
4	Social Assistance	Compensation	0.000	2	1.0000

Source: Processed Primary Data, 2025

In Table 9, the Kruskal–Wallis results for social aspects show no statistically significant differences ($p > 0.05$) across all indicators, suggesting that spatial proximity does not influence the social perceptions of poultry farms. Instead, the data highlight a broader structural issue: poultry operations in the Sumarambu Subdistrict function with minimal social integration and without organised corporate social responsibility (CSR) initiatives. CSR is critical for companies to implement sustainable development and address societal impacts. The absence of a structured CSR program reflects missed opportunities for business-community engagement (Ardiansyah & Alnoor, 2024).

CONCLUSION

This study examined community perceptions of a layer chicken farm in Sumarambu Subdistrict, Palopo City, Indonesia, through environmental, economic, and social lenses across three spatial zones. Findings indicate that residents perceive significant negative environmental impacts, particularly odour and waste accumulation, with perceptions varying by proximity to the farm. Economically, the community recognized benefits such as affordable egg prices and increased consumption, but these perceptions were consistent across zones, reflecting limited direct economic integration or income improvements for residents. Socially, the community reported no tangible benefits in employment, social assistance, or compensation, despite maintaining positive social interactions, highlighting a lack of corporate social responsibility initiatives. Statistical analysis confirmed significant zonal differences in environmental perceptions but not in economic or social aspects. These results underscore the need to incorporate community perceptions into sustainable livestock development to align farm operations with local needs and expectations. Recommendations include enhancing environmental management practices, implementing participatory governance, and fostering CSR programs to improve social and economic inclusion. Future research should broaden geographic scope and employ mixed methods to deepen understanding of community-industry dynamics and waste management strategies in poultry farming contexts.

REFERENCES

.

Adeleke, A. K., Olajiga, O. K., Montero, D. J. P., & Olu-Lawal, K. A. (2024). Statistical Techniques in Precision Metrology, Applications and Best Practices. *Engineering Science & Technology Journal*, *5*. https://doi.org/10.51594/estj.v5i3.944

Ardiansyah, M., & Alnoor, A. (2024). Integrating Corporate Social Responsibility into Business Strategy: Creating Sustainable Value. *Involvement International Journal of Business*, *1*. https://doi.org/10.62569/iijb.v1i1.5

Asrul, Mansur, M., & Nugraha, A. (2023). Persepsi Masyarakat Terhadap Keberadaan Peternakan Ayam Petelur di Kelurahan Massepe Kecamatan Tellu Limpoe Kabupaten Sidenreng Rappang. *Jurnal Sains Peternakan*, *11*. https://doi.org/10.21067/jsp.v11i2.9010

Badan Pusat Statistik Kota Palopo. (2024). *Badan Pusat Statistik Kota Palopo*. Makassar: BPS Provinsi Sulawesi Selatan.

Badan Pusat Statistik Provinsi Sulawesi Selatan. (2024). *Sulawesi Selatan dalam Angka 2024.* Makassar: BPS Provinsi Sulawesi Selatan.

Bassignana, C. F., Vazzana, C., Merante, P., Migliorini, P., & Belliére, S. R. (2022). Assessment of Agricultural Biodiversity in Organic Livestock Farms in Italy. *Agronomy*, *12*. https://doi.org/10.3390/agronomy12030607

Boediarsih, B., Shaluhiyah, Z., & Mustofa, S. B. (2016). Persepsi Remaja tentang Peran Gender dan Gender Seksualitas di Kota Semarang. *Jurnal Promosi Kesehatan Indonesia*, *11*. https://doi.org/10.14710/jpki.11.1.28-37

BPS Statistics Indonesia. (2022). *Analisis Profil Penduduk Indonesia*. Badan Pusat Statistik Indonesia. https://www.bps.go.id/id/publication/2022/06/24/ea52f6a38d3913a5bc557c5f/analisis-profil-penduduk-indonesia.html

BPS Statistics Indonesia. (2024). *Layer Population by Province (Heads), 2024*. https://www.bps.go.id/en/statistics-table/2/NDc3IzI=/populasi-ayam-ras-petelur-menurut-provinsi--ekor-.html

Cui, B., & Liu, Z. P. (2016). Determinants of Knowledge and Biosecurity Preventive Behaviors for Highly Pathogenic Avian Influenza Risk Among Chinese Poultry Farmers. *Avian Diseases*, *60*. https://doi.org/10.1637/11361-010116-reg

Donakpo, S., Anne-Marie Ablan, E., & Navouon, F. (2024). Perceptions Of The Health Risks of Local Poultry Farming and The Behavior of Urban And Peri-Urban Populations In The Town of Korhogo (Côte D'ivoire). *International Journal of Social Sciences*, *11*(10), 8281–8287. https://elibrary.ru/item.asp?id=74715920

Eck, C. J., Wagner, K. L., Chapagain, B., & Joshi, O. (2019). A Survey of Perceptions and Attitudes about Water

Issues in Oklahoma: A Comparative Study. *Journal of Contemporary Water Research & Education*, *168*(1), 66–77. https://doi.org/https://doi.org/10.1111/j.1936-704X.2019.03321.x

Efendi, F., Astari, L. D., Chong, M. C., Puspitasari, I. T., Kurniati, A., Aurizki, G. E., & Auwalin, I. (2022). The Paradox of Surplus and Shortage: A Policy Analysis of Nursing Labor Markets in Indonesia. *Journal of Multidisciplinary Healthcare*, *Volume 15*. https://doi.org/10.2147/jmdh.s354400

Elneel, F. A., & Almulhim, A. F. (2023). Socio-Economic Factors and Women's Empowerment: The Mediation Role of Training/Skill Development. *WSEAS TRANSACTIONS ON BUSINESS AND ECONOMICS*, *21*. https://doi.org/10.37394/23207.2024.21.17

Emeka-Okoli, S., Nwankwo, E. E., Nwankwo, T. C., & Otonnah, C. A. (2024). Communication strategies for effective CSR and stakeholder engagement in the oil & gas industry: A conceptual analysis. *World Journal of Advanced Research and Reviews*, *21*. https://doi.org/10.30574/wjarr.2024.21.3.0663

Estrada-González, I. E., Márquez-Benavides, L., Taboada-González, P. A., & Guerrero-García-Rojas, H. (2020). Decreasing the Environmental Impact in an Egg-Producing Farm through the Application of LCA and Lean Tools. *Applied Sciences*, *10*. https://doi.org/10.3390/app10041352

Farradinna, S., Elfis, E., Arizona, R., Rachman, J., & Titisari, P. W. (2023). Livestock waste management to improve community knowledge in the cow farming groups. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, *8*(1), 52–62. https://doi.org/10.26905/ABDIMAS.V1I1.8384

Feng, Z., Feng, X., Zhang, J., & Li, L. (2024). Towards a Communication Ecology in the Life of Rural Senior Citizens: How Rural Public Spaces Influence Community Engagement. *Sustainability*, *16*. https://doi.org/10.3390/su16104256

Fyka, S. A., Abdullah, B., Limi, M. A., Salamah, S., & Fitriaman, F. (2020). The Welfare Level of Farmers in The Implementation of Integration System of Farming Rice and Beef Cattle in Small Household Scale in Buke Sub-District, South Konawe District. *Buletin Penelitian Sosial Ekonomi Pertanian Fakultas Pertanian Universitas Haluoleo*, *22*(1), 7–11. https://doi.org/10.37149/BPSOSEK.V22I1.12063

Gan, L., & Hu, X. (2016). The pollutants from livestock and poultry farming in China—geographic distribution and drivers. *Springer*, *23*(9), 8470–8483. https://doi.org/10.1007/S11356-016-6075-9

Grieco, R., Cervelli, E., Bovo, M., Pindozzi, S., Scotto Di Perta, E., Tassinari, P., & Torreggiani, D. (2024). The role of geospatial technologies for sustainable livestock manure management: A systematic review. *Science of the Total Environment*, *954*. https://doi.org/10.1016/j.scitotenv.2024.176687

Gržinić, G., Piotrowicz-Cieślak, A., Klimkowicz-Pawlas, A., Górny, R. L., Ławniczek-Wałczyk, A., Piechowicz, L., Olkowska, E., Potrykus, M., Tankiewicz, M., Krupka, M., Siebielec, G., & Wolska, L. (2022). Intensive poultry farming: A review of the impact on the environment and human health. *Science of the Total Environment*, *858*. https://doi.org/10.1016/j.scitotenv.2022.160014

Hayat, K., Yaqub, K., Aslam, M. A., & Shabbir, M. S. (2022). Impact of Societal and Economic Development on Academic Performance: A Literature Review. *IRASD Journal of Economics*, *4*. https://doi.org/10.52131/joe.2022.0401.0064

He, W., Li, P., & Wu, G. (2021). Amino Acid Nutrition and Metabolism in Chickens. *Advances in Experimental Medicine and Biology*, *1285*. https://doi.org/10.1007/978-3-030-54462-1_7

Hedman, H. D., Vasco, K. A., & Zhang, L. (2020). A Review of Antimicrobial Resistance in Poultry Farming within Low-Resource Settings. *Animals : An Open Access Journal from MDPI*, *10*. https://doi.org/10.3390/ani10081264

Hermaliza, H., Apridar, A., & Sartiyah, S. (2022). Determination of Farmer's Welfare and Its Impact on the Economy of the Livestock Sub Sector in Aceh Province, Indonesia. *International Journal of Finance, Economics and Business*, *1*(3), 189–197. https://doi.org/10.56225/IJFEB.V1I3.58

Jiang, J., Tempio, G., Sutton, M. A., Stevenson, D. S., & Uwizeye, A. (2021). A climate-dependent global model of ammonia emissions from chicken farming. *Biogeosciences*, *18*. https://doi.org/10.5194/bg-18-135-2021

Joshi, A., Chandel, S., Pal, D., & Kale, S. (2015). Likert Scale: Explored and Explained. *British Journal of Applied Science & Technology*, *7*. https://doi.org/10.9734/bjast/2015/14975

Kenny, G. P., Flouris, A. D., Mcginn, R., & Groeller, H. (2016). Age, human performance, and physical employment standards. *Applied Physiology, Nutrition, and Metabolism*, *41*. https://doi.org/10.1139/apnm-2015-0483

Agribusiness Study Program, Universitas Muhammadiyah Sinjai

Khalifah, A., Abdalla, S., Rageb, M., Maruccio, L., Ciani, F., & El-Sabrout, K. (2023). Could Insect Products Provide a Safe and Sustainable Feed Alternative for the Poultry Industry? A Comprehensive Review. *Animals : An Open Access Journal from MDPI*, *13*. https://doi.org/10.3390/ani13091534

Liu, Z., Li, G., Liu, A., Wu, G., Yang, N., Yan, Y., & Sun, C. (2019). Genome-wide association analysis of egg production performance in chickens across the whole laying period. *BMC Genetics*, *20*. https://doi.org/10.1186/s12863-019-0771-7

Lundén, J. M., Maurer, J. J., Shen, C., Ricke, S. C., Rothrock, M. J., Gibson, K. E., & Micciche, A. C. (2019). Pastured poultry production in the united states: strategies to balance system sustainability and environmental impact. *Frontiersin.OrgMJ Rothrock Jr, KE Gibson, AC Micciche, SC RickeFrontiers in Sustainable Food Systems, 2019•frontiersin.Org*, *3*, 74. https://doi.org/10.3389/FSUFS.2019.00074/FULL

Macfarland, T. W., & Yates, J. M. (2016). *Kruskal–Wallis H-Test for Oneway Analysis of Variance (ANOVA) by Ranks*. https://doi.org/10.1007/978-3-319-30634-6_6

Mujere, N. (2016). *Sampling in Research*. https://doi.org/10.4018/978-1-5225-0007-0.ch006

Nyoni, N. M. B., Grab, S., & Archer, E. R. M. (2018). Heat stress and chickens: climate risk effects on rural poultry farming in low-income countries. *Climate and Development*, *11*. https://doi.org/10.1080/17565529.2018.1442792

Ostertagová, E., Kováč, J., & Ostertag, O. (2014). Methodology and Application of the Kruskal-Wallis Test. *Applied Mechanics and Materials*, *611*. https://doi.org/10.4028/www.scientific.net/amm.611.115

Pérez-Lombardini, F., Siqueiros-García, J. M., Solorio-Sánchez, F. J., & Galindo, F. (2024). Integrating social dynamics in the participatory modeling of small-scale cattle farmers' perceptions and responses to climate variability in the Yucatan Peninsula, Mexico. *Frontiers in Sustainable Food Systems*, *7*. https://doi.org/10.3389/fsufs.2023.1321252

Rajkumar, U., Rama Rao, S. V, Raju, M. V. L. N., & Chatterjee, R. N. (2021). Backyard poultry farming for sustained production and enhanced nutritional and livelihood security with special reference to India: a review. *Tropical Animal Health and Production*, *53*. https://doi.org/10.1007/s11250-021-02621-6

Rostami, K., & Salehi, L. (2023). Rural cooperatives social responsibility in promoting Sustainability-oriented Activities in the agricultural sector: Nexus of community, enterprise, and government. *Sustainable Futures*, *7*. https://doi.org/10.1016/j.sftr.2023.100150

Santoso, U. (2022). Upaya Peningkatan Konsumsi Protein Hewani Asal Ternak di Indonesia. *Buletin Peternakan Tropis*, *3*. https://doi.org/10.31186/bpt.3.2.89-95

Schneider, F., & Tarawali, S. (2021). Sustainable Development Goals and livestock systems. *Revue Scientifique et Technique de l'OIE*, *40*. https://doi.org/10.20506/rst.40.2.3247

Scudiero, L., Tak, M., Alarcón, P., & Shankar, B. (2023). Understanding household and food system determinants of chicken and egg consumption in India. *Food Security*, *15*. https://doi.org/10.1007/s12571-023-01375-3

Sugiyono. (2013). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Surni, Haryulin Astuti, M., Abdul Wahib, M., Miar, Feronika Elbaar, E., Arimbawa, P., M J Kapa, M., & Roy Nendissa, D. (2020). Socio-economic impact of the Covid-19 pandemic: Empirical study on the supply of chicken meat in Indonesia. *AIMS Agriculture and Food*, *6*. https://doi.org/10.3934/agrfood.2021005

Sutanto, H., Suprapti, I. A. P., Harsono, I., & Irwandi. (2024). Study Determinants of Labor Absorption in Layer Breeder Chicken Farming Sector Businesses. *Journal of Economics, Entrepreneurship, Management Business and Accounting*, *2*. https://doi.org/10.61255/jeemba.v2i1.284

Suwarta, & Hanafie, R. (2018). The influence of business management on income and the risk of income in the broiler chicken farming. *Journal of Socioeconomics and Development*, *1*(1), 25–31. http://publishing-widyagama.ac.id/ejournal-

Swastika, D. K. S., Priyanti, A., Hasibuan, A. M., Sahara, D., Arya, N. N., Malik, A., Ilham, N., Sayekti, A. L., Triastono, J., Asnawi, R., Sugandi, D., Hayati, N. Q., & Atman, A. (2024). Pursuing circular economics through the integrated crop-livestock systems: An integrative review on practices, strategies and challenges post Green Revolution in Indonesia. *Journal of Agriculture and Food Research*, *18*, 101269. https://doi.org/10.1016/J.JAFR.2024.101269

Tanujaya, B., Charitas, R., Prahmana, I., & Mumu, J. (2022). Likert Scale in Social Sciences Research: Problems

and Difficulties. *FWU Journal of Social Sciences*. https://doi.org/10.51709/19951272/winter2022/7

Thamaga-Chitja, J. M., Tamako, N., & Ojo, T. O. (2025). Implications of Land Ownership Heterogeneity on Household Food Security: A Case Study of Urban Farming in Pietermaritzburg, KwaZulu-Natal Province. *Land*, *14*. https://doi.org/10.3390/land14020236

Wu, H., & Leung, S.-O. (2017). Can Likert Scales be Treated as Interval Scales?—A Simulation Study. *Journal of Social Service Research*, *43*. https://doi.org/10.1080/01488376.2017.1329775

Zheng, H., Zhang, T., Fang, C., Zeng, J., & Yang, X. (2021). Design and Implementation of Poultry Farming Information Management System Based on Cloud Database. *Animals*, *11*. https://doi.org/10.3390/ani11030900