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The Influence of Technical, Economic, and Social Factors on the Success of Native Chicken Farming with the Moderating Role of Good Farming Practices in Fakfak Regency

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Abstract:
Background. This study examines the success of native chicken farming in Fakfak Regency, which remains an important livelihood activity but faces various technical and institutional constraints.
Aims. The study aims to analyze the influence of technical, economic, and social factors on farming success, as well as to assess the moderating role of Good Farming Practices (GFP).
Methods. A mixed-method approach was applied, combining quantitative and qualitative analyses. Data were collected through surveys and in-depth interviews with smallholder farmers. Quantitative data were analyzed using multiple linear regression and moderation analysis, while qualitative data were used to enrich the interpretation of findings.
Result. The results indicate that technical factors, such as feeding management and disease control, have the most dominant influence on farming success, followed by economic and social factors. The GFP index significantly strengthens the relationship between these production factors and business outcomes, suggesting that better farming practices enhance overall performance.
Conclusion. Qualitative findings reveal persistent challenges, including limited feed availability, weak institutional support, and low adoption of improved technologies. In conclusion, strengthening technical management and promoting GFP implementation are critical for improving productivity.
Implementation. The study implies that policy interventions and extension services should focus on capacity building and sustainable farming practices to support smallholder farmers.

Keywords: native chicken, farming success, good farming practices, moderation, smallholder

INTRODUCTION

Native chicken farming is an important sector within smallholder livestock systems, contributing significantly to the supply of animal protein and improving rural livelihoods. In Fakfak Regency, this sector remains predominantly managed under traditional systems, resulting in relatively low productivity.

Fakfak Regency is part of a livestock development cluster that has not yet reached optimal productivity and management performance. The distribution of native chicken populations in West Papua remains uneven, with most areas classified as low-production zones (Murwanto, 2022; Sirait et al., 2023). In this region, farming practices are largely traditional, and productivity remains limited. Various factors, including technical, economic, and social aspects, are assumed to influence farming success. This condition indicates the need for a more targeted development approach, particularly through the application of appropriate technology, institutional strengthening, and improved access to production resources.

Furthermore, modern livestock development emphasizes integrating technical, economic, and social factors to enhance business performance. The implementation of Good Farming Practices (GFP) has been recognized as an effective approach to improving production efficiency, animal health, and the sustainability of smallholder farming systems (FAO, 2021). In this context, GFP serves not only as a technical standard but also as a transformative tool for shifting traditional farming systems toward more productive and competitive models. Therefore, this study aims to analyze the influence of these factors on the success of native chicken farming and to examine the moderating role of GFP.

Despite the growing body of research on smallholder poultry farming, previous studies have predominantly focused on the direct effects of technical and economic factors on productivity. Limited attention has been given to the integrated analysis of technical, economic, social, institutional, and environmental factors within a single analytical framework. Moreover, the moderating role of Good Farming Practices (GFP) in strengthening the relationship between production factors and farming success remains underexplored, particularly in marginal regions such as West Papua. Therefore, there is a need for a comprehensive empirical study that examines the multidimensional determinants of native chicken farming success while considering the moderating function of sustainable farming practices.

This study introduces a comprehensive analytical model that integrates technical, economic, social, institutional, and environmental factors in explaining the success of native chicken farming. Unlike previous studies, this research positions Good Farming Practices (GFP) as a moderating variable that strengthens the relationship between production factors and business outcomes. The study also provides empirical evidence from a marginal livestock production area, contributing to the development of sustainable smallholder poultry systems.

The novelty of this study lies in the integration of multidimensional production factors and the application of Good Farming Practices (GFP) as a moderating variable in explaining

the success of native chicken farming. This approach provides a more comprehensive understanding of the determinants of smallholder livestock performance. Furthermore, the study offers empirical insights from marginal production areas, supporting the development of sustainable poultry farming systems.

LITERATURE REVIEW

A combination of internal and external factors, including technical, economic, and social dimensions, influences the success of livestock enterprises. Technical factors, such as feed management, animal health, and husbandry systems, directly affect productivity (Nugroho et al., 2022). Economic factors include access to capital, production costs, and market prices, while social factors encompass farmers' experience, education level, and social networks.

Good Farming Practices consist of a set of management principles designed to improve production efficiency and ensure sustainability (FAO, 2021). The adoption of GFP has been shown to enhance productivity and efficiency in smallholder livestock systems (Alders et al., 2021). In this regard, GFP can function as a moderating variable that strengthens the relationship between production factors and farming success.

METHODS

This study employed a quantitative approach supported by qualitative analysis. The research was conducted in Fakfak Regency, with respondents consisting of native chicken farmers. Data were collected through structured questionnaires and in-depth interviews.

The variables analyzed included technical, economic, social, institutional, and environmental factors, as well as the Good Farming Practices index as a moderating variable. Data analysis was conducted using multiple linear regression and moderation analysis with interaction terms. Qualitative data were analyzed using a thematic approach to complement the quantitative findings.

RESULT AND DISCUSSION

Result

Respondent Characteristics

The characteristics of respondents are presented in Table 1.

Table 1. Respondent Characteristics

Variable	Mean	Category
Age (years)	42.6	Productive

Variable	Mean	Category
Education (years)	9.8	Moderate
Farming experience (years)	6.4	Moderate
Livestock ownership (heads)	23.5	Small-scale

Source: Research data

The results indicate that most farmers are within a productive age range, have moderate levels of education, and have sufficient farming experience. These conditions present strong potential for the adoption of innovations; however, technical support and extension services are still required to enhance farming capacity. This finding is consistent with Winarso et al. (2023), who reported that productive age and farming experience significantly influence technology adoption in smallholder farming systems.

Descriptive Analysis of Variables

The descriptive analysis, which includes technical, economic, social, institutional, and environmental factors, as well as farmer perception and business success, is presented in Table 2.

Table 2. Mean Scores of Research Variables

Variable	Mean Score	Category
Technical Factors	3.82	Good
Economic Factors	3.45	Fair
Social Factors	4.01	Good
Institutional Factors	3.12	Fair
Environmental Factors	3.76	Good
Farmer Perception	4.10	Very Good
Business Success	3.68	Good

Source: Research data

Overall, technical, social, and environmental factors are categorized as good, while economic and institutional factors remain at a moderate level. Farmers' perceptions are highly positive, indicating a favorable outlook toward native chicken farming. This finding supports Alders et al. (2021), who highlighted that positive farmer perception is a key determinant of success in smallholder poultry systems.

Multiple Linear Regression Analysis

The multiple linear regression analysis is presented in Table 3 for the variables that significantly influence business success in Fakfak Regency.

Table 3. Regression Results of Determinants of Farming Success

Variables	coefficient (β)	t-test	Significant
Technical Factors	0,35	4,12	0,000
Economic Factors	0,21	2,85	0,005
Social Factors	0,18	2,34	0,021
Institutional Factors	0,12	1,98	0,049
Environmental Factors	0,16	2,10	0,037

The regression equation is expressed as follows:

$$Y = \beta_0 + 0.35X_1 + 0.21X_2 + 0.18X_3 + 0.12X_4 + 0.16X_5 + \varepsilon$$

Where:

Y= Native chicken farming success

X_1= Technical factors

X_2= Economic factors

X_3= Social factors

X_4= Institutional factors

X_5= Environmental factors

β_0= Constant

ε= Error term

All variables significantly affect farming success, with technical factors having the strongest influence, followed by economic and social factors. This indicates that farming success largely depends on farmers' ability to manage production aspects, such as feed, animal health, and housing.

These results are consistent with Nugroho et al. (2022), who stated that technical factors are the primary determinants of productivity in smallholder livestock systems, particularly in feed utilization and animal health management.

Mediation Analysis of Farmer Perception

The mediation analysis shows that farmer perception mediates the relationship between internal and external factors and business success, as presented in Table 4.

Table 4. Mediation Test of Farmer Perception

Relationship	Direct coefficient	Coefficient After Mediation	Description
Technical factors → Success	0,35	0,21	Partial
Economic factors → Success	0,21	0,14	Partial
Perception → Success	0,42	-	Significant

The results indicate that farmers' perceptions act as a partial mediating variable. Technical and economic factors continue to directly influence farming success, but their effects are amplified by farmers' perceptions. Positive perception enhances motivation and the ability to adopt innovations, thereby increasing productivity and income. This finding aligns with Abebe et al. (2023), who stated that farmers' perceptions are an important mediating factor in the success of livestock development programs in developing countries.

Moderation Analysis of Good Farming Practices

The moderation test was conducted to determine whether the Good Farming Practices (GFP) Index strengthens or weakens the relationship between the determining factors (technical, economic, social, institutional, and environmental) and the success of native chicken farming. The analysis was performed by including interaction terms between each factor and the GFP Index in the regression model.

Table 5. Results of the Moderation Test of the Good Farming Practices Index

Variables	coefficient (β)	t-test	Significant
Technical Factors	0.28	3.65	0.001
Economic Factors	0.17	2.41	0.018
Social Factors	0.15	2.12	0.036
Institutional Factors	0.10	1.85	0.067
Environmental Factors	0.13	2.05	0.043
GFP Index	0.39	4.88	0.000
Technical × GFP	0.22	3.11	0.003
Economic × GFP	0.14	2.26	0.026
Social × GFP	0.11	2.01	0.047
Institutional × GFP	0.08	1.72	0.089
Environmental × GFP	0.12	2.08	0.041

The analysis shows that the Good Farming Practices index has a significant direct effect on farming success. Moreover, most interaction variables are statistically significant, particularly those involving technical, economic, social, and environmental factors.

Figure 1 shows that GFP strengthens the relationship between technical factors and farming success. At higher levels of GFP, improvements in technical factors lead to greater increases in farming success compared to lower levels of GFP.

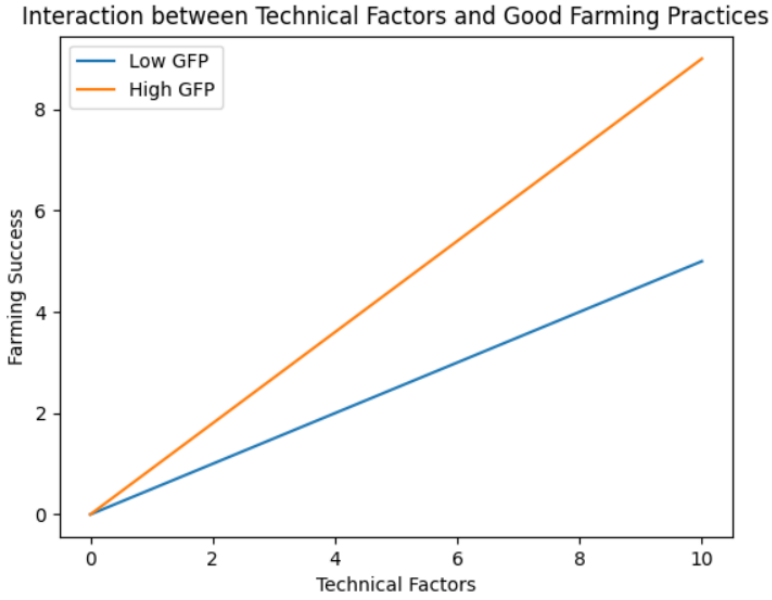

Figure 1. Interaction between Technical Factors and Good Farming Practices

The figure illustrates a difference in slope between low- and high-GFP conditions. Under high-GFP conditions, the slope is steeper, indicating that improvements in technical factors lead to greater increases in farming success. This suggests that implementing proper farming practices enhances production performance and efficiency (Du et al., 2022).

These results confirm that GFP functions as a moderating variable, strengthening the relationship between technical factors and farming success. In modern livestock systems, standardized and sustainable practices not only increase productivity but also enhance the effectiveness of production inputs (Singh et al., 2023).

Thematic Qualitative Analysis

The qualitative analysis identified several key themes. First, limited access to quality feed was identified as a major constraint affecting productivity. Second, farmers rely heavily on traditional knowledge, resulting in low adoption of modern technology. Third, institutional support remains limited, particularly in terms of extension services and training. Fourth, there is increasing awareness among farmers regarding the importance of proper farming practices, which presents an opportunity for future development.

DISCUSSION

The results of this study indicate that the success of native chicken farming in Fakfak Regency is the result of the interaction among technical, economic, social, institutional, and environmental factors, as well as farmer perception as a mediating variable. Technical factors

emerge as the primary determinant, as they are directly related to the production process, particularly in terms of feed quality, animal health, and housing management. This condition suggests that productivity improvements cannot be achieved without strengthening the technical aspects (Nugroho et al., 2022; Bist et al., 2024).

However, technical factors do not operate in isolation. Economic factors, such as access to capital and markets, also significantly influence business success. In regions such as Fakfak, which face infrastructure limitations, distribution systems and price conditions become critical determinants of business sustainability. This finding underscores that smallholder livestock systems are influenced not only by production aspects but also by market conditions and supportive policies (Birthal & Negi, 2023).

Farmer perceptions have been shown to play a strategic role in strengthening the relationship between these factors and business success. Farmers with positive perceptions tend to be more adaptive to innovation, more active in seeking information, and more consistent in managing their enterprises. In contrast, negative perceptions can become a barrier, even when technical support is available. This finding reinforces the notion that livestock development is not solely technical in nature but must also account for the social and psychological aspects of farmers (Abebe et al., 2023; Meena et al., 2022).

The results of this study are consistent with the trend in sustainable livestock development, which emphasizes the integration of technical, economic, and social aspects. FAO (2021) asserts that the success of modern livestock systems is not only measured by productivity, but also by their ability to adapt to local conditions and improve farmers' welfare. In addition, a systems-based sustainability approach highlights the importance of resource efficiency and animal welfare in enhancing the competitiveness of livestock production (Herrero et al., 2021). Therefore, an approach that integrates technical factors and farmer perception is highly relevant for application in marginal areas such as West Papua.

Good Farming Practices (GFP) not only function as an independent variable but also as a reinforcing factor within livestock production systems. In the context of technical factors, the implementation of proper farming practices—such as feed management, housing, sanitation, and disease control—has been shown to improve the efficiency of input use. In other words, farmers who consistently apply GFP can maximize the benefits of their technical resources, thereby achieving better farm performance (Du et al., 2022; Soviadan et al., 2024).

From an economic perspective, the moderating role of GFP is reflected in improved resource-use efficiency. Farmers who adhere to GFP principles tend to use feed and veterinary

inputs more efficiently, thereby reducing production costs and increasing profitability. This finding is consistent with FAO (2021) and recent studies indicating that sound management practices can enhance both technical efficiency and the profitability of livestock enterprises (Kumar et al., 2023).

Meanwhile, regarding social and environmental factors, the GFP index strengthens the relationship by increasing farmers' awareness of sustainable farming practices. Farmers who have a good understanding and implementation of GFP tend to be more concerned with animal welfare and environmental impacts, which ultimately support the sustainability of their enterprises. However, for institutional factors, the moderating effect is not significant, indicating that supporting institutions remain suboptimal in promoting the implementation of GFP at the farmer level (Alders et al., 2021).

These findings indicate that the success of native chicken farming is determined not only by internal factors but is also strongly influenced by the quality of farming practices applied. The GFP index serves as a key variable in bridging the potential possessed by farmers with the outcomes achieved in their farming enterprises.

The results of the qualitative analysis provide a deeper understanding of the dynamics of native chicken farming in Fakfak Regency. These findings indicate that business success is influenced not only by measurable quantitative factors but also by the social, cultural, and knowledge conditions of farmers.

Limited access to resources and information remains a major constraint on business development. This suggests that policy interventions should focus on strengthening farmers' capacity through training and extension support. This approach is consistent with Alders et al. (2021), who emphasized the importance of capacity building in improving the productivity of local poultry systems.

In addition, the gap between perception and practice indicates that changes in farmer behavior require time and an appropriate approach. Although farmers may have positive perceptions, without adequate technical and institutional support, such changes are difficult to achieve. Therefore, integrating technical and social approaches is essential for the development of smallholder livestock systems (Meena et al., 2022).

The combination of quantitative and qualitative analyses provides a more comprehensive understanding of the factors influencing business success. This approach enables the formulation of more targeted development strategies, particularly in enhancing the

implementation of Good Farming Practices as a key to the sustainability of livestock enterprises.

State of the Art	Research Gap	Novelty (Research Novelty)
Previous research has shown that the success of small-scale poultry farming businesses is influenced by technical factors such as feed, livestock health, and cage management.	Most studies only assess technical factors directly against productivity without considering the multi-dimensional interactions between technical, economic, social, and institutional factors.	This research integrates technical, economic, social, institutional, and environmental factors in one systemic model to explain the success of free-range chicken businesses.
Studies on smallholder farming businesses emphasize the importance of economic factors such as access to capital, production costs, and market prices in determining business sustainability.	Previous research has rarely examined the role of economic factors simultaneously with social factors and farmers' perceptions in comprehensive statistical models.	This study simultaneously examines the influence of technical, economic, and social factors on business success using a multivariate regression approach.
Recent research shows that farmers' perceptions have an effect on the adoption of technology and the success of livestock businesses.	The role of farmers' perception as a mediating variable in the relationship between production factors and business success is still limited in the local livestock literature.	This study identifies the perception of farmers as a mediating variable that strengthens the influence of production factors on business success.
Good Farming Practices (GFP) have been recognized as a management standard to improve production efficiency and sustainability of livestock systems.	Most studies only examine GFP as an independent variable, not as a moderation variable in a model of livestock business success.	This study tested GFP as a moderating variable that strengthens the relationship between production factors and the success of free-range chicken businesses.
The modern approach to farm development emphasizes the integration of technical and social aspects in a sustainable livestock system.	Empirical research on the integration of technical, social, and management practices in the context of free-range chicken farming in marginalized areas such as West Papua is still very limited.	This study provides empirical evidence on the success model of free-range chicken businesses based on management practices and local conditions in marginalized areas.

CONCLUSION

Technical, economic, and social factors significantly influence the success of native chicken farming, with technical factors being the most dominant. Good Farming Practices

strengthen the relationship between these factors and farming success. Therefore, promoting GFP is essential for improving productivity and sustainability.

Implications

This study provides important implications for the development of smallholder livestock systems. The findings highlight the importance of promoting Good Farming Practices to improve productivity and sustainability. Academically, this study contributes to the understanding of moderation effects in livestock systems. Practically, it provides a basis for policymakers and stakeholders to design more effective and sustainable intervention programs.

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