

Adding Value to Banana Farming through Production Quality, Post-Harvest Processing, and Access to Local Markets in Regencies of East Java

Donny Ivan Samuel Simatupang¹, Ni Luh Sri Suryaningsih², Asman³, Muhammad Ali Hasim Asyari⁴

¹Program Studi Agribisnis, Universitas Methodist Indonesia and donnyivan83@gmail.com

²Program Studi Teknik Pertanian, Universitas Musamus and suryaningsih@unmus.ac.id

³Universitas Muhammadiyah Kalimantan Timur and asm267@umkt.ac.id

⁴Universitas Muhammadiyah Kalimantan Timur and mah364@umkt.ac.id

ABSTRACT

Banana farming represents an important agricultural activity that contributes to rural economic development and farmers' livelihoods in Indonesia. However, many smallholder banana farmers continue to face challenges in maximizing economic value due to inconsistent production quality, limited post-harvest processing capabilities, and restricted access to profitable markets. This study aims to analyze the influence of production quality, post-harvest processing, and access to local markets on value creation in banana farming across regencies in East Java. This research employed a quantitative approach involving 100 banana farmers as respondents. Data were collected using a structured questionnaire measured with a five-point Likert scale and analyzed using Statistical Package for the Social Sciences (SPSS) version 25. The data analysis included validity testing, reliability testing, descriptive statistics, classical assumption tests, and multiple linear regression analysis. The results indicate that production quality, post-harvest processing, and access to local markets have positive and significant effects on value creation in banana farming. Production quality has a significant influence, post-harvest processing contributes positively, and access to local markets demonstrates the strongest effect. The coefficient of determination shows that the research model explains 62.7% of the variation in agricultural value creation. These findings indicate that increasing banana farming competitiveness requires an integrated strategy involving quality improvement, processing innovation, and stronger market connectivity. This study provides practical implications for farmers, agricultural institutions, and policymakers in developing sustainable and value-oriented banana agribusiness systems in East Java.

Keywords: *Banana Farming, Production Quality, Post-Harvest Processing, Local Market Access, Agricultural Value Creation*

1. INTRODUCTION

Banana farming represents a strategic agricultural sector that contributes significantly to rural economic development, food security, and livelihood sustainability in developing countries, including Indonesia [1], [2]. As one of the most widely cultivated tropical fruits, bananas possess strong production potential due to their adaptability to diverse agroecological conditions, relatively short harvesting cycles, and high domestic and international market demand. In Indonesia, banana cultivation serves as an important source of income for millions of smallholder farmers, particularly in rural areas where agricultural activities remain central to household economic resilience. East Java is recognized as one of the major agricultural regions with substantial banana production capacity; however, the economic benefits generated from banana farming remain relatively constrained [3]. Many smallholder farmers continue to operate within traditional production systems characterized by limited product differentiation, minimal processing activities, and weak market bargaining power. Consequently, increasing agricultural output alone is insufficient to enhance farmers' welfare, as greater emphasis is required on developing value creation strategies that improve product competitiveness, strengthen market positioning, and increase economic returns [4], [5].

Value creation has increasingly become a fundamental concept in agricultural transformation, shifting farming systems from commodity-based production toward competitive and sustainable agribusiness models. In the agricultural context, value creation involves a series of activities aimed at increasing the economic, functional, and market value of agricultural products through improvements in production efficiency, quality enhancement, innovation adoption, and market integration [6], [7]. Smallholder farmers often experience limited economic gains because they primarily participate in the early stages of agricultural supply chains, while higher value accumulation occurs during processing, distribution, and retail activities. Therefore, strengthening farmers' ability to create value represents a critical pathway for improving rural economic resilience and reducing dependency on low-margin commodity markets [8]. Within banana farming, value creation can be achieved through interconnected mechanisms, including improving production quality, implementing effective post-harvest management, and expanding access to profitable markets. These dimensions are particularly important because agricultural commodities are increasingly evaluated not only based on production volume but also based on quality consistency, consumer preferences, and supply chain competitiveness [9].

Production quality represents one of the most influential factors determining the market competitiveness and economic value of agricultural commodities. In modern agricultural markets, consumers and buyers increasingly demand products with consistent quality characteristics, including physical appearance, size uniformity, freshness, taste, maturity level, and safety standards [10]. Farmers who are capable of maintaining stable production quality have greater opportunities to access premium markets, establish stronger buyer relationships, and obtain higher selling prices [11]. However, smallholder banana farmers in East Java continue to encounter various limitations that affect quality improvement, including insufficient cultivation knowledge, inconsistent farming practices, limited access to quality inputs, and inadequate quality management systems. These challenges often result in heterogeneous product characteristics and reduced competitiveness in increasingly demanding agricultural markets [12], [13]. Therefore, improving production quality is not merely a technical issue but also a strategic mechanism for enhancing value creation by enabling farmers to capture greater economic benefits from their agricultural activities.

Beyond production quality, post-harvest processing plays a crucial role in increasing the economic value and sustainability of banana farming. Agricultural commodities such as bananas are highly perishable products that experience quality degradation, physical damage, and price volatility when effective post-harvest management systems are absent. The implementation of post-harvest strategies, including sorting, grading, packaging, storage improvement, and product diversification, provides opportunities to minimize losses while expanding economic opportunities [14]. Processing innovations such as banana chips, banana flour, dried bananas, and other derivative products allow farmers to extend product shelf life, access broader consumer segments, and participate in higher-value agricultural supply chains. Nevertheless, the adoption of post-harvest processing among smallholder banana farmers remains limited due to several structural barriers, including inadequate technological capacity, limited financial resources, insufficient processing infrastructure, and low innovation capability [15]. This condition highlights the importance of strengthening post-harvest strategies as an essential component of agricultural value creation.

Market access constitutes another critical dimension influencing farmers' ability to maximize the economic value of agricultural production. Effective market access enables farmers to establish direct relationships with consumers, retailers, processors, and institutional buyers, thereby

improving price transparency and reducing dependence on traditional intermediaries. Local markets provide significant opportunities for banana farmers because they support shorter supply chains, stronger producer-consumer interactions, and greater responsiveness to local demand dynamics [16]. However, many smallholder farmers remain constrained by limited marketing networks, insufficient market information, weak negotiation capacity, and reliance on conventional trading systems. The integration of farmer organizations, agricultural cooperatives, digital marketing channels, and local food networks may provide alternative mechanisms for improving market accessibility and strengthening farmers' market orientation [17]. Previous studies have highlighted the importance of quality improvement, supply chain integration, and market-oriented strategies in enhancing agricultural competitiveness; however, existing literature has predominantly focused on major commodities such as rice, coffee, cocoa, and palm oil [18]–[20]. Empirical studies examining how production quality, post-harvest processing, and local market access collectively influence value creation in smallholder banana farming remain relatively limited, particularly within the Indonesian agricultural context.

East Java provides a relevant empirical setting for examining agricultural value creation because the province combines substantial banana production potential with persistent challenges related to smallholder competitiveness and market integration. Despite its contribution to rural livelihoods, banana farming in East Java has not fully achieved its economic potential due to structural limitations in production management, processing capability, and market connectivity. This gap between agricultural potential and economic realization indicates the need for empirical investigation into the determinants that enable farmers to generate greater value from banana commodities. Therefore, this study aims to analyze the influence of production quality, post-harvest processing, and access to local markets on value creation in banana farming across regencies in East Java. Theoretically, this study contributes to the agricultural value creation literature by providing an integrated perspective on how production, processing, and market dimensions interact in smallholder farming systems. Practically, the findings provide strategic insights for farmers, agricultural institutions, and policymakers in designing interventions related to quality improvement, processing innovation, and market strengthening. Through a value-oriented agricultural development approach, banana farming can transition from a conventional commodity production system toward a more competitive, sustainable, and economically empowering agribusiness model.

2. LITERATURE REVIEW

2.1 *Agricultural Value Creation in Smallholder Farming*

Agricultural value creation has become a crucial concept in modern agribusiness development as it emphasizes transforming agricultural commodities from basic products into goods with higher economic, social, and market value [21], [22]. For smallholder farmers, value creation provides opportunities to overcome dependency on fluctuating commodity prices by improving product quality, strengthening production systems, developing processing capabilities, and expanding market relationships. From a value chain perspective, agricultural value is generated through integrated improvements in production, post-harvest management, distribution, and marketing activities that enhance competitiveness and profitability [23], [24]. In banana farming, value creation can be achieved through quality improvement, post-harvest

innovation, product diversification, and better market access. This concept aligns with the Resource-Based View (RBV), which highlights that valuable resources such as farming knowledge, technical capabilities, processing skills, and market networks serve as strategic assets that enable farmers to achieve competitive advantages and generate sustainable economic value [24], [25].

2.2 Production Quality and Agricultural Value Creation

Production quality refers to farmers' ability to produce agricultural commodities that satisfy consumer expectations in terms of physical characteristics, safety, durability, and consistency. In competitive agricultural markets, quality has become a key factor influencing product differentiation, market acceptance, and economic value, particularly for perishable commodities such as bananas, where attributes including size, appearance, freshness, taste, maturity, and resistance to damage determine consumer preferences [26]. Higher production quality enables farmers to access premium markets, strengthen relationships with buyers, reduce post-harvest losses, and improve profitability. In banana farming, quality outcomes are influenced by cultivation practices, planting materials, input management, pest control, harvesting techniques, and farmers' technical capabilities [27], [28]. However, smallholder farmers often face challenges in implementing quality-oriented production systems due to limited access to technology, extension services, and production resources [29]. Previous studies suggest that improved product quality contributes positively to value creation by enhancing consumer perceptions, market competitiveness, and price advantages [30]. Therefore, production quality is considered an important determinant in increasing the economic value of banana farming, leading to the following hypothesis:

H1: Production quality has a positive and significant effect on value creation in banana farming.

2.3 Post-Harvest Processing and Agricultural Value Creation

Post-harvest processing refers to activities after harvesting that aim to maintain quality, extend shelf life, and transform agricultural products into higher-value goods. For perishable commodities such as bananas, effective processing helps reduce losses, manage market fluctuations, and create additional income opportunities through product diversification, including banana chips, flour, and other processed products [1]. By moving beyond raw commodity sales, farmers can strengthen their position within agricultural value chains and improve economic returns. However, limited capital, technology, skills, and institutional support remain major barriers to processing adoption among smallholder farmers [3]–[5]. Therefore, post-harvest processing is considered an important factor influencing value creation in banana farming, leading to the following hypothesis:

H2: Post-harvest processing has a positive and significant effect on value creation in banana farming.

2.4 Access to Local Markets and Agricultural Value Creation

Market access refers to farmers' ability to connect with buyers, distribution channels, consumers, and market information systems to commercialize agricultural products effectively. Strong market access enables farmers to obtain better prices, understand

consumer preferences, reduce dependency on intermediaries, and establish sustainable business relationships. For smallholder banana farmers, local market access through retailers, restaurants, farmer groups, and digital channels can improve income opportunities by creating shorter supply chains and facilitating direct market interactions [8], [10]. However, limited market information, weak bargaining power, and inadequate networks often restrict farmers from capturing the full economic value of their products [3], [13]. Therefore, strengthening local market access is considered an important factor influencing value creation in banana farming, leading to the following hypothesis:

H3: Access to local markets has a positive and significant effect on value creation in banana farming.

3. METHODS

This study employed a quantitative research approach to examine the factors influencing value creation in banana farming through production quality, post-harvest processing, and access to local markets in East Java. The quantitative approach was selected because this study aims to empirically test the relationships among variables through numerical measurement and statistical analysis. An explanatory research design was applied to identify the extent to which Production Quality (PQ), Post-Harvest Processing (PHP), and Access to Local Markets (ALM) influence Value Creation in Banana Farming (VCB). The research model consists of three independent variables, namely PQ, PHP, and ALM, while VCB functions as the dependent variable.

The research was conducted among banana farmers across several regencies in East Java, Indonesia. East Java was selected as the research location because it represents one of Indonesia's important agricultural regions with substantial banana production potential. However, many banana farmers continue to experience challenges related to inconsistent product quality, limited post-harvest processing capabilities, and restricted market connectivity. Therefore, this research setting provides an appropriate context for analyzing factors that contribute to agricultural value creation and improving the competitiveness of banana farming systems.

Table 1. Research Variables and Indicators

Variable	Code	Indicators
Production Quality (PQ)	PQ1	Consistency of banana fruit quality
	PQ2	Physical appearance and size of bananas
	PQ3	Taste and freshness of harvested bananas
	PQ4	Application of good cultivation practices
	PQ5	Ability to meet buyer quality requirements
Post-Harvest Processing (PHP)	PHP1	Sorting and grading practices after harvesting
	PHP2	Use of appropriate packaging techniques
	PHP3	Processing of bananas into derivative products
	PHP4	Reduction of post-harvest losses
	PHP5	Innovation in banana product development
Access to Local Markets (ALM)	ALM1	Availability of local buyers
	ALM2	Ease of obtaining market information
	ALM3	Strength of relationships with customers
	ALM4	Ability to access profitable selling channels
	ALM5	Use of digital and local marketing channels
Value Creation in Banana Farming (VCB)	VCB1	Increase in selling value of banana products
	VCB2	Improvement of farmer income
	VCB3	Product differentiation ability
	VCB4	Expansion of market opportunities

	VCB5	Improvement of farming competitiveness
--	------	--

Data analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 25 to examine measurement quality and test the proposed hypotheses. The validity test was performed using Pearson Product Moment correlation analysis, while reliability was assessed through Cronbach's Alpha, with values above 0.70 indicating acceptable internal consistency. Descriptive statistical analysis was applied to describe respondent characteristics and farmers' perceptions regarding production quality, post-harvest processing, local market access, and value creation. Prior to regression analysis, classical assumption tests, including normality, multicollinearity, and heteroscedasticity tests, were conducted to ensure the suitability of the model. Multiple linear regression analysis was then applied to evaluate the influence of Production Quality (PQ), Post-Harvest Processing (PHP), and Access to Local Markets (ALM) on Value Creation in Banana Farming (VCB). Hypothesis testing was performed using t-tests for partial effects, F-tests for simultaneous effects, and the coefficient of determination (R^2) to determine the explanatory capability of the research model, with a significance level of 0.05 used as the decision criterion [31].

4. RESULT AND DISCUSSION

4.1 Respondent Characteristics

Data analysis was conducted using SPSS version 25, including validity, reliability, descriptive, and classical assumption tests to ensure measurement quality and model suitability. Multiple linear regression analysis was applied to examine the effects of Production Quality (PQ), Post-Harvest Processing (PHP), and Access to Local Markets (ALM) on Value Creation in Banana Farming (VCB). Hypotheses were tested using t-tests, F-tests, and the coefficient of determination (R^2) with a significance level of 0.05.

Table 2. Respondent Demographic Characteristics

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	72	72.0
	Female	28	28.0
Age	<30 years	12	12.0
	31–40 years	34	34.0
	41–50 years	38	38.0
	>50 years	16	16.0
Education Level	Elementary School	22	22.0
	Junior High School	26	26.0
	Senior High School	38	38.0
	Diploma/Bachelor Degree	14	14.0
Farming Experience	1–5 years	18	18.0
	6–10 years	35	35.0
	11–20 years	32	32.0
	>20 years	15	15.0
Farm Scale	Small-scale (<1 ha)	67	67.0
	Medium-scale (1–3 ha)	28	28.0
	Large-scale (>3 ha)	5	5.0

Table 2 presents the demographic characteristics of 100 banana farmers participating in this study. The majority of respondents were male (72.0%), while female farmers accounted for 28.0%. Regarding age distribution, most farmers were between 41–50 years old (38.0%), followed by those aged 31–40 years (34.0%). In terms of education level, the largest proportion of respondents had completed senior high school (38.0%), while only 14.0% had a diploma or bachelor degree. Based on farming experience, most respondents had 6–10 years of experience (35.0%), followed by 11–20 years

(32.0%). Regarding farm scale, the majority of farmers operated small-scale farms of less than 1 hectare (67.0%), indicating that banana farming in the research area is predominantly managed by smallholder farmers.

4.2 Descriptive Statistical Analysis

Descriptive statistical analysis was conducted to evaluate respondents' perceptions regarding production quality, post-harvest processing, local market access, and value creation. The measurement used a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 3. Descriptive Statistics of Research Variables

Variable	N	Min	Max	Mean	Standard Deviation
Production Quality (PQ)	100	3.00	5.00	4.18	0.54
Post-Harvest Processing (PHP)	100	2.60	5.00	3.92	0.63
Access to Local Markets (ALM)	100	2.80	5.00	4.05	0.58
Value Creation (VCB)	100	3.00	5.00	4.11	0.56

Table 3 presents the descriptive statistics of the research variables involving Production Quality (PQ), Post-Harvest Processing (PHP), Access to Local Markets (ALM), and Value Creation (VCB). The results show that all variables obtained relatively high mean values, indicating positive perceptions among respondents. Production Quality recorded the highest mean score of 4.18 with a standard deviation of 0.54, followed by Value Creation (4.11; SD = 0.56), Access to Local Markets (4.05; SD = 0.58), and Post-Harvest Processing (3.92; SD = 0.63). The findings indicate that banana farmers generally perceive their production quality, market accessibility, and value creation practices as favorable, although post-harvest processing remains comparatively lower, suggesting opportunities for improvement in processing capabilities and value-added activities.

4.3 Validity Test

The validity test was conducted using Pearson correlation analysis. An indicator was considered valid if the correlation coefficient exceeded 0.30 and the significance value was below 0.05.

Table 4. Validity Test Results

Variable	Indicator	Correlation Value	Sig.	Result
Production Quality	PQ1	0.724	0.000	Valid
	PQ2	0.781	0.000	Valid
	PQ3	0.756	0.000	Valid
	PQ4	0.802	0.000	Valid
	PQ5	0.748	0.000	Valid
Post-Harvest Processing	PHP1	0.715	0.000	Valid
	PHP2	0.763	0.000	Valid
	PHP3	0.791	0.000	Valid
	PHP4	0.744	0.000	Valid
	PHP5	0.806	0.000	Valid
Local Market Access	ALM1	0.735	0.000	Valid
	ALM2	0.770	0.000	Valid
	ALM3	0.812	0.000	Valid
	ALM4	0.759	0.000	Valid
	ALM5	0.783	0.000	Valid
Value Creation	VCB1	0.792	0.000	Valid
	VCB2	0.815	0.000	Valid
	VCB3	0.778	0.000	Valid
	VCB4	0.746	0.000	Valid

	VCB5	0.801	0.000	Valid
--	------	-------	-------	-------

Table 4 presents the validity test results for all research indicators. The results show that all indicators for Production Quality (PQ), Post-Harvest Processing (PHP), Local Market Access (ALM), and Value Creation (VCB) obtained correlation values ranging from 0.715 to 0.815 with significance values of 0.000, which are below the 0.05 threshold. These findings indicate that all questionnaire items have a significant correlation with their respective constructs and meet the validity criteria. Therefore, all measurement indicators used in this study are considered valid and appropriate for further statistical analysis.

4.4 Reliability Test

The reliability test was conducted using Cronbach's Alpha coefficient to evaluate the internal consistency of the research instruments. The results show that all variables achieved Cronbach's Alpha values above the recommended threshold of 0.70, indicating that the measurement instruments are reliable. Value Creation obtained the highest reliability score (0.883), followed by Access to Local Markets (0.875), Production Quality (0.861), and Post-Harvest Processing (0.842). These findings confirm that all research constructs demonstrate strong internal consistency and are suitable for further statistical analysis.

4.5 Classical Assumption Test

4.5.1 Normality Test

The normality test was conducted using the Kolmogorov-Smirnov test to examine whether the residual data followed a normal distribution. The results show a statistic value of 0.071 with a significance value of 0.200, which exceeds the 0.05 threshold. These findings indicate that the residual data are normally distributed, confirming that the regression model satisfies the normality assumption and is appropriate for further analysis.

4.5.2 Multicollinearity Test

Table 5. Multicollinearity Test Result

Variable	Tolerance	VIF
Production Quality	0.621	1.610
Post-Harvest Processing	0.574	1.742
Access to Local Markets	0.603	1.658

Table 5 presents the multicollinearity test results for the independent variables. The findings indicate that all variables have tolerance values above 0.10 and Variance Inflation Factor (VIF) values below 10, demonstrating that the regression model does not experience multicollinearity problems. Production Quality (PQ) obtained a tolerance value of 0.621 and VIF of 1.610, Post-Harvest Processing (PHP) recorded a tolerance value of 0.574 and VIF of 1.742, while Access to Local Markets (ALM) showed a tolerance value of 0.603 and VIF of 1.658. These results confirm that the independent variables are not highly correlated with each other and are suitable for multiple regression analysis.

4.6 Multiple Linear Regression Analysis

Multiple regression analysis was conducted to examine the effect of production quality, post-harvest processing, and access to local markets on value creation in banana farming.

Table 6. Multiple Regression Results

Variable	Regression Coefficient (β)	t-value	Sig.
Constant	0.642	2.118	0.037
Production Quality	0.318	4.126	0.000

Post-Harvest Processing	0.286	3.574	0.001
Access to Local Markets	0.354	4.583	0.000

The multiple linear regression analysis produced the equation $VCB = 0.642 + 0.318PQ + 0.286PHP + 0.354ALM + e$. The results indicate that all independent variables have positive and significant effects on Value Creation in Banana Farming (VCB). Among the predictors, Access to Local Markets (ALM) has the strongest influence with a coefficient of 0.354 ($t = 4.583$; $p = 0.000$), followed by Production Quality (PQ) with a coefficient of 0.318 ($t = 4.126$; $p = 0.000$) and Post-Harvest Processing (PHP) with a coefficient of 0.286 ($t = 3.574$; $p = 0.001$). Since all significance values are below 0.05, H1, H2, and H3 are accepted, confirming that production quality, post-harvest processing, and local market access significantly contribute to value creation in banana farming.

4.7 Coefficient of Determination

Table 9. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error
1	0.792	0.627	0.615	0.351

The coefficient of determination (R^2) value of 0.627 indicates that production quality, post-harvest processing, and access to local markets explain 62.7% of the variation in value creation among banana farmers. The remaining 37.3% is explained by other factors outside this research model, such as financial access, government support, farming technology adoption, and cooperative involvement.

Discussion

The findings demonstrate that Production Quality (PQ) has a positive and significant effect on Value Creation (VCB), indicating that improvements in banana quality contribute directly to increasing farmers' economic value. Bananas with superior characteristics, including better appearance, freshness, size consistency, and market suitability, are more likely to achieve higher prices and stronger buyer acceptance. This result supports the Resource-Based View (RBV), which emphasizes that valuable internal capabilities, such as production knowledge and quality management practices, serve as strategic resources for achieving competitive advantages [4], [9]. Therefore, strengthening cultivation techniques, harvesting practices, and quality control systems is essential for improving farmers' competitiveness and value creation capacity.

Post-Harvest Processing (PHP) also has a positive and significant influence on Value Creation, demonstrating that processing activities contribute to increasing product value through loss reduction and product differentiation. Although its effect is lower compared with other variables, post-harvest processing remains an important mechanism that enables farmers to move beyond dependence on raw banana sales. Processing innovation can extend product shelf life, expand market opportunities, and generate additional income sources. However, the relatively lower contribution indicates that processing adoption among smallholder farmers remains limited, requiring greater support through training, technology access, and institutional facilitation [10], [11].

Access to Local Markets (ALM) has the strongest influence on Value Creation, highlighting the importance of market connectivity in improving farmers' economic performance. Farmers with stronger relationships with buyers, better access to market information, and broader distribution channels are better positioned to capture higher economic benefits from banana production. This finding reinforces the importance of market-oriented agricultural development, where improved market access enables farmers to reduce dependency on intermediaries, negotiate better prices, and respond more effectively to consumer demand. Therefore, strengthening farmer networks, local supply chains, cooperatives, and digital marketing channels represents a strategic approach to enhancing the competitiveness and sustainability of banana farming [1], [16].

CONCLUSION

This study examined the influence of production quality, post-harvest processing, and access to local markets on value creation among banana farmers in East Java. The findings confirm that all three factors significantly contribute to increasing the economic value of banana farming activities. Production quality positively affects value creation by enabling farmers to produce higher-quality bananas that meet market expectations, improve competitiveness, and strengthen bargaining positions. Post-harvest processing also contributes positively by reducing losses, extending product shelf life, and creating value-added products, although its lower contribution indicates the need for greater support in technology, training, and processing capacity. Meanwhile, access to local markets has the strongest influence, demonstrating that market connectivity, buyer relationships, and market information are essential for farmers to capture greater economic benefits. The coefficient of determination ($R^2 = 0.627$) indicates that production quality, post-harvest processing, and market access collectively explain 62.7% of the variation in value creation, highlighting the importance of an integrated approach combining internal farming capabilities and external market integration. Practically, farmers, cooperatives, and local governments should strengthen cultivation practices, processing innovation, market networks, training programs, and institutional support to enhance banana farming competitiveness. Overall, transforming banana farming into a value-driven agribusiness system requires simultaneous improvements in product quality, post-harvest innovation, and market accessibility to increase farmer income and support sustainable agricultural development in East Java.

REFERENCES

- [1] A. Z. Tayibnapis and L. E. Wuryaningsih, "Evamping the supply chain of fruit and vegetable in East Java Province, Indonesia," *Int. J. Manag. Bus. Stud.*, vol. 7, no. 2, pp. 9–15, 2019.
- [2] I. K. Nawireja, "UNDERSTANDING AGROBIODIVERSITY CONSERVATION AS A SECONDARY EFFECT".
- [3] I. Sulistyowarni, S. Sundari, and S. Halim, "The potential of banana trading commodity to fulfill market demand and support food security in defense economic perspective (Study in Bogor District)," *J. Pertahanan Bela Negara*, vol. 10, no. 3, pp. 307–332, 2020.
- [4] G. M. Ningsih, F. P. Ramadhani, and W. M. Shodiq, "The Role of Extension Workers in Marketing 'Sang Mulyo' Banana Seedlings," *Agriecobis J. Agric. Socioecon. Bus.*, vol. 8, no. 01, 2025.
- [5] A. P. Akmad, A. D. Paco, and R. E. Mayo, "Critical hurdles and influences in networks (CHAIN): A quantitative analysis on the determinants and impacts of the marketing chain on banana production in Palimbang," *Psychol. Educ. A Multidiscip. J.*, vol. 29, no. 10, pp. 1617–1628, 2024.
- [6] D. S. Damardjati, "ANALYSIS OF FRUIT AND VEGETABLE VALUE CHAINS IN INDONESIA".
- [7] C. J. M. Tukan, J. M. Roshetko, S. Budidarsono, and G. S. Manurung, "Banana Market Chain Improvement–Enhance Farmers' Market Linkages in West Java, Indonesia," *Acta Hort.*, vol. 699, p. 699, 2005.
- [8] J. C. Tukan, S. Budidarsono, G. S. Manurung, and J. M. Roshetko, "Market chain improvement: linking farmers to markets in Nanggung, West Java, Indonesia," *Acta Hort.*, vol. 699, p. 429, 2006.
- [9] R. Lestari, "MODEL OF ECONOMIC EMPOWERMENT WITH INDUSTRIALIZATION APPROACH USING BANANA WASTE AS THE RAW MATERIAL, IN NANGGROE ACEH DARUSSALAM (NAD)," *South East Asia J. Contemp. Business, Econ. Law*, vol. 15, no. 5, 2018.
- [10] A. B. Molina, C. Hermanto, A. B. Pattison, and S. Subandiyah, "Integrated crop production of bananas in Indonesia and Australia," 2019.
- [11] J. Sulaksana and R. Haq, "Apuy Banana Farming Development Strategy (Musa paradisiaca L.) in Majalengka Regency, West Java Province, Indonesia," *Sarhad J. Agric.*, vol. 41, no. 330, 2025.
- [12] A. de Brauw et al., *Agricultural value chain finance in Indonesia*. Intl Food Policy Res Inst, 2021.
- [13] J. H. Sulaksana, "R. and Dinar. 2025. Apuy banana farming development strategy (Musa paradisiaca L.) in Majalengka Regency, West Java Province, Indonesia," *Sarhad J. Agric.*, vol. 41, no. 3, pp. 981–990.
- [14] N. Yuliana and S. Hidayati, "Potential banana-based agroindustry in Lampung Province-Indonesia," 2018.
- [15] E. Lestari, A. Wibowo, and P. Rahayu, "Stakeholder Analysis in the Development of a Banana Center in Karanganyar Regency, Central Java, Indonesia," in *Proceedings of the 3rd International Conference on Sustainable Agriculture for Rural Development (ICSARD 2022)*, Springer Nature, 2023, p. 89.
- [16] N. C. Svara, "Horticultural Value Chains for Improved Livelihoods-Opportunities for smallholder farmers from the Karo Highlands, Sumatra, Indonesia." 2015.
- [17] E. Purnawan, "Investments, Local Food System and Local Food Security among Small Family Farms: Evidence from Sekayam Sub-district, Sanggau Regency, Indonesia," 2021.

- [18] L. O. Palupi, "Alignment between Supply Chain Structure and Operations Strategy of Traditional Wholesale Food Markets in Indonesia," 2025.
- [19] Herawati, Y. N. Muflikh, N. Rosiana, and T. G. Dewi, "Feasibility model of controlled atmosphere storage implementation for shallot farmers in West Java.," 2024.
- [20] A. Nugraha, "An ethnography study of farming style in Gianyar, Bali, Indonesia," *Wageningen Univ. Wageningen*, 2015.
- [21] B. Kaido, "Supply Chain Current Condition and Barrier of Small Farmers: Case of Pineapple Farming Tangkit Baru Hamlet, Muaro Jambi, Jambi Province, Indonesia".
- [22] B. Suyanto, S. Adam, and S. Ariadi, "Welfare and Bargaining Power of Farmers in Bromo-Tengger-Semeru, Agropolitan Area, East Java," *Opción Rev. Ciencias Humanas y Soc.*, no. 21, pp. 1102–1119, 2019.
- [23] I. D. Efendi and S. P. Awang Maharijaya, "Proceeding International Seminar on Tropical Horticulture 2016: The Future of Tropical Horticulture".
- [24] F. Purwanto, S. Soesanto, S. Rahayu, Z. A. Fitriyani, and D. G. P. Putra, "Circular economy approach: A sustainable business model in transforming farmers' livelihoods," *J. Econ. Res. Policy Stud.*, vol. 6, no. 2, pp. 389–409, 2026.
- [25] J. Sulaksana, I. Marina, F. Saputra, and Y. Hidayat, "Sustainability Dimensions of Gedong Gincu Mango Farming: a Case Study in Majalengka Regency, West Java Province, Indonesia," *Anuário do Inst. Geociências*, vol. 48, p. e66097, 2025.
- [26] L. A. Murdhani, M. Mujahidin, E. Wahyudi, and M. Marzuki, "Diversification of Beneng Taro (Birak) Processing to Support Food Security Policy in Central Lombok Regency," *Society*, vol. 13, no. 1, pp. 765–787, 2025.
- [27] T. R. Anggoro, S. N. Fadillah, and K. Prayoga, "Farming performance and evaluation of the adoption of robusta coffee cultivation based on geographical indication in candirot district temanggung regency," in *IOP Conference Series: Earth and Environmental Science*, IOP Publishing, 2024, p. 12041.
- [28] A. Fauzi, K. Kustini, N. I. K. Wardani, M. Idhom, and W. Santoso, "Location quotient analysis in superior product determination in several sectors in Bangkalan Regency," in *EBGC 2019: Proceedings of the 2nd International Conference on Economics, Business, and Government Challenges, EBGC 2019, 3 October, UPN "Veteran" East Java, Surabaya, Indonesia*, European Alliance for Innovation, 2020, p. 171.
- [29] M. Y. E. Fahmi, "Spatial and Institutional Challenges in Rice-Based Agropolitan Transformation: A Case Study of East Java, Indonesia," in *IOP Conference Series: Earth and Environmental Science*, IOP Publishing, 2026, p. 12026.
- [30] S. A. Andayani, "Development model of mango agribusiness as an effort to ensure supply continuity.," 2017.
- [31] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to use and how to report the results of PLS-SEM," *Eur. Bus. Rev.*, vol. 31, no. 1, pp. 2–24, 2019, doi: <https://doi.org/10.1108/EBR-11-2018-0203>.