JURNAL ECONOMINA e-ISSN: 2963-1181
Volume 5, Number 6, June 2026
Homepage: ejournal.45mataram.ac.id/index.php/economina

Competitiveness, Policy Impact, and Sensitivity of Rice Farming in Indihiang District, Tasikmalaya City

Tazkia Nurul Aulia[1*], Setiawan Sariyoga[2], Siti Widiati[3], Tatang Sutisna[4]
[1,2,3,4] Agribusiness Department, Faculty of Agriculture, Sultan Ageng Tirtayasa University, Indonesia

**Corresponding Author: tzknrla@gmail.com*

Article History
Received: 25-06-2026
Revised: 28-06-2026
Published: 30-06-2026

ABSTRACT
Rice is the most strategic food crop and the main livelihood of most Indonesian farmers, yet domestic production faces volatile output, recurring imports, and farm-gate prices that frequently fall below the government floor price; in urban-fringe areas such as Indihiang District, rice farming is further pressured by land conversion and a dominant share-tenancy system. This study aims to analyze the competitiveness, the impact of government policy, and the sensitivity of rice farming in Indihiang District, Tasikmalaya City. Data were collected from 55 farmers selected through simple random sampling and analyzed using the Policy Analysis Matrix; social prices were estimated through the import-parity method, with the world milled-rice price converted to a paddy equivalent using the milling yield. Rice farming was competitive at market prices but was not comparatively efficient, as its social profit was negative, mainly because of the dominant share-tenancy land cost and the 2026 surge in world fertilizer prices; government policy was protective through both input subsidies and output protection from imports, while the sensitivity analysis showed that competitiveness was fragile to production losses yet resilient to input-cost increases. Rice farming in the study area is financially competitive but economically inefficient without policy support; therefore, improving productivity and managing production risk are essential to strengthen its comparative advantage and reduce dependence on protection.

***Keywords:* Competitiveness, Comparative Advantage Policy Analysis Matrix, Rice Farming, Government Policy**

INTRODUCTION

The agricultural sector plays a strategic role in national development, serving not only as a source of food but also as the largest absorber of labor, a source of income for millions of rural households, and a major contributor to Gross Domestic Product. Among agricultural commodities, rice is the most strategic food crop because rice is the staple food for the majority of the Indonesian population. According to the Central Bureau of Statistics (BPS, 2022), of the 40.64 million farmers in Indonesia, roughly 77 percent are rice farmers, making rice simultaneously the principal source of rural livelihood. Continuous population growth of about 1.1 percent per year, combined with per-capita rice consumption of around 94.9 kilograms per capita per year, pushes total national rice demand beyond 30 million tons annually (BPS, 2024).

National rice production during 2021-2025 has been volatile. Production declined successively in 2023 and 2024 to a low of 53.14 million tons as harvested area shrank, before rebounding to 71.94 million tons in 2025. This dynamic reflects a critical period for the rice sector in 2023-2024 triggered partly by the El Nino climate anomaly (Ministry of Agriculture, 2024). During the same period, the self-sufficiency target continued to confront the reality of imports: in 2023 and early 2024, Indonesia imported more than three million tons of rice to strengthen depleting national stocks (BPS, 2024). This underscores that the competitiveness of domestic production still needs to be tested.

To protect farmers, the government set the Government Purchase Price (HPP) for unhusked rice at Rp 6,500 per kilogram in 2026. However, field reports indicate that farm-gate prices in many regions remain below this floor, signaling a gap between price-protection policy on paper and price realities on the ground. Within West Java-consistently one of the national rice barns-Tasikmalaya City is recognized as a production center. Narrowing the scale to Indihiang District, specifically Parakannyasag Urban Village, reveals a distinctive phenomenon: although administratively classified as an urban area, about 63 percent of its territory remains paddy fields (117.47 of 187.25 hectares), making it a clear case of urban agriculture under pressure from land conversion.

Field observations in this study reinforce the urgency of examining competitiveness at this location. First, an aging-farmer phenomenon is evident, with a mean respondent age of 61 years and education dominated by primary-school graduates, raising questions about generational continuity. Second, land tenure is dominated by a 50:50 share-tenancy system; almost all respondents are share-tenants rather than landowners, which makes land the dominant cost component of the farming operation-distinct from the landowner assumption common in other rice PAM studies. Third, the location faces a documented production risk from rice-field rat infestations. Fourth, and most pointedly, the farm-gate paddy price averaged Rp 5,716 per kilogram, below the HPP of Rp 6,500 per kilogram.

These phenomena reveal a clear gap: although policy instruments-fertilizer subsidies on the input side and the HPP on the output side-have been applied, the real price received by farmers remains below the HPP, while the cost structure is burdened by the dominance of land cost arising from share tenancy. The question is whether rice farming at this location remains efficient and competitive, and whether existing policy genuinely provides net protection for farmers. To answer this, the study uses the Policy Analysis Matrix (PAM), which simultaneously measures competitiveness-through competitive advantage at private prices and comparative advantage at social prices-and the impact of government policy, complemented by sensitivity analysis to assess the resilience of competitiveness to changes in input and output prices.

The objectives of this study are threefold: (1) to analyze the competitiveness of rice farming in Indihiang District in terms of both competitive and comparative advantage; (2) to analyze the impact of government policy on rice farming; and (3) to analyze the sensitivity of competitiveness to changes in input and output prices.

RESEARCH METHOD

This study employs a quantitative method with a descriptive approach. Data on costs, revenue, profit, and policy impact were processed using the Policy Analysis Matrix (PAM) as a measurable quantitative tool and then interpreted descriptively. The research was conducted in Parakannyasag Urban Village, Indihiang District, Tasikmalaya City, West Java Province. The location was selected purposively on the consideration that Indihiang District is one of the rice production centers of Tasikmalaya City that supports the food needs of the Eastern Priangan region. The study was carried out from December 2025 to May 2026.

The study used primary and secondary data. Primary data were obtained directly from respondents through observation, structured interviews using a questionnaire, and documentation, covering production costs, sales, and income. Secondary data were obtained from BPS, the Department of Agriculture, the Ministry of Agriculture, the Ministry of Finance, Bank Indonesia, and relevant literature, covering trade values, exchange rates, world commodity prices, and policy data. The population comprised 120 active rice farmers registered in farmer groups; the sample size was determined using the Slovin formula with a 10 percent margin of error, yielding 55 respondents selected through simple random sampling.

Analytical Framework

Competitive advantage was measured at private prices through private profitability (PP = A - B - C) and the Private Cost Ratio (PCR = C / (A - B)); a PCR below one indicates competitive advantage. Comparative advantage was measured at social prices through social profitability (SP = E - F - G) and the Domestic Resource Cost ratio (DRC = G / (E - F)); a DRC below one indicates comparative advantage. Policy impact was assessed through the Nominal Protection Coefficient on Output (NPCO = A / E), the Nominal Protection Coefficient on Input (NPCI = B / F), the Effective Protection Coefficient (EPC = (A - B) / (E - F)), the Profitability Coefficient (PC = D / H), and the Subsidy Ratio to Producers (SRP = (D - H) / E), together with the output, input, factor, and net transfers.

Estimation of Social (Shadow) Prices

Social prices for tradable inputs and outputs were estimated using the import-parity method based on 2026 border prices. The shadow exchange rate (SER) was computed as SER = OER x SCF, where the Standard Conversion Factor (SCF) was derived from the total export and import values and trade-tax revenues for January-March 2026, following Maulida, Sariyoga, and Pancawati (2023). Using an official exchange rate (OER) of Rp 16,800 per US dollar, the computation yielded an SCF of 1.009 and an SER of Rp 16,950 per US dollar.

Because the research object is paddy whereas available world prices are quoted for milled rice, the import-parity price of milled rice at the farm gate (Rp 7,947 per kilogram, derived from the Thailand 5 percent broken-rice FOB price of US$ 420 per ton plus freight, insurance, handling, and transport, converted at the SER) was converted to a paddy equivalent using a milling yield (rendemen) of 55 percent, producing a social paddy price of Rp 4,371 per kilogram. Social prices for urea (Rp 10,331 per kilogram) and NPK (Rp 9,144 per kilogram) were derived analogously from 2026 world fertilizer prices. Domestic factors (labor, land, depreciation, organic fertilizer) were valued at their private cost as a proxy for opportunity cost. Sensitivity analysis examined four scenarios: a 50 percent increase in output (S1), a 95 percent increase in seed price (S2), a 20 percent increase in non-subsidized fertilizer price (S3), and a combination of all three (S4).

RESULTS AND DISCUSSION

Respondent Characteristics

The 55 respondents display characteristics that frame the urgency of examining competitiveness at this location, as summarized in Table 1. The mean age of 61 years, with most respondents above 55 and education dominated by primary-school graduates, signals a regeneration challenge. The operation scale is small (mean cultivated area of 0.594 hectares), and land tenure is overwhelmingly share tenancy (94.5 percent), with no full owner-operators. This tenure structure is the principal determinant of the cost structure discussed below.

Table 1. Characteristics of rice-farmer respondents (n = 55)

Characteristic	Category	Frequency (%)
Sex	Male	49 (89.1)
	Female	6 (10.9)
Age (years)	> 55	38 (69.1)
	<= 55	17 (30.9)
Education	Primary school	30 (54.5)
	Junior/senior high	18 (32.7)
	Diploma/degree	7 (12.7)
Land status	Share tenancy	52 (94.5)
	Rent	3 (5.5)

Source: Primary data, processed (2026)

Estimation of Social Prices

Because the research object is paddy while world prices are quoted for milled rice, the milled-rice import-parity price was converted to a paddy equivalent using the milling yield. The resulting social prices are summarized in Table 2. The social paddy price (Rp 4,371 per kilogram) is lower than the actual farm-gate price (Rp 5,716 per kilogram), implying that the domestic paddy price lies above its import parity. On the input side, however, social fertilizer prices far exceed subsidized prices, reflecting the 2026 surge in world fertilizer prices caused by global supply-chain disruptions.

Table 2. Basis for social price estimation

Component	Basis (Import Parity)	Social Price
Shadow exchange rate (SER)	SER = OER x SCF, from Jan-Mar 2026 trade and trade-tax data	Rp 16,950/US$
Output (paddy)	Thailand 5% FOB US$ 420/ton -> CIF x SER -> farm gate x rendemen 55%	Rp 4,371/kg
Urea	World FOB US$ 550/ton -> CIF x SER + distribution	Rp 10,331/kg
NPK	World FOB US$ 480/ton -> CIF x SER + distribution	Rp 9,144/kg
Seed, pesticides, domestic factors	Valued at private price (opportunity cost)	1.0 x private

Source: Processed from BPS, Ministry of Finance, Bank Indonesia, and world commodity prices (2026)

Cost and Revenue Structure

Table 3 presents the private and social budgets per hectare per season. Private revenue reaches Rp 18,125,938 per hectare with a total cost of Rp 14,668,435, yielding a private profit of Rp 3,457,503. The most striking feature is the dominance of land cost: the land component reaches Rp 8,674,126, about 59.1 percent of total cost, a direct consequence of the prevailing 50:50 share-tenancy system. Labor is the second-largest component at 28.4 percent, while tradable inputs contribute only a small share because of subsidies. The principal burden of rice farming at this location therefore lies not in production inputs but in domestic factors-especially land-making tenure a decisive determinant of competitiveness.

Table 3. Private and social cost-revenue structure per hectare per season

Component	Private (Rp/Ha)	Social (Rp/Ha)
A. Revenue	18,125,938	13,872,602
B. Tradable inputs		
Seed	474,046	474,046
Urea	253,106	1,452,656
NPK	358,964	1,427,163
Insecticide	92,172	73,737
Fungicide	138,441	110,753
Herbicide	97,394	77,915
Total tradable (B/F)	1,414,123	3,616,269
C. Non-tradable inputs		
Organic fertilizer	142,791	142,791
Labor (male)	1,688,164	1,688,164
Labor (female)	2,477,926	2,477,926
Tool depreciation	271,306	271,306
Land (share tenancy)	8,674,126	8,674,126
Total non-tradable (C/G)	13,254,312	13,254,312
Total cost	14,668,435	16,870,581
Profit (D/H)	3,457,503	-2,997,979

Source: Primary data, processed (2026)

Competitiveness

The private and social components were arranged into the PAM in Table 4, and the derived indicators are summarized in Table 5. Competitive advantage is confirmed by a positive private profit of Rp 3,457,503 per hectare and a PCR of 0.793 (below one), indicating that at the actual prices farmers face, rice farming remains profitable and able to cover its domestic factor costs. By contrast, comparative advantage is not met: social profit is negative (Rp 2,997,979 per hectare) and the DRC is 1.292 (above one). At social prices-paddy valued at its import-parity equivalent and inputs valued without subsidy-the domestic resources sacrificed exceed the value added, so the farming would not be efficient in purely economic terms if all policies were removed. Two factors explain this: the dominance of share-tenancy land cost (59.1 percent of total cost), far higher than in rice studies at other locations, and the 2026 surge in world fertilizer prices.

Table 4. Policy analysis matrix of rice farming in Indihiang District

Component	Revenue	Tradable Cost	Domestic Cost	Profit
Private	18,125,938	1,414,123	13,254,312	3,457,503
Social	13,872,602	3,616,269	13,254,312	-2,997,979
Divergence	4,253,336	-2,202,146	0	6,455,482

Source: Primary data, processed (2026)

Table 5. Summary of competitiveness and policy indicators

Indicator	Value	Criterion	Interpretation
Private profit (D)	3,457,503	> 0	Profitable financially
PCR	0.793	< 1	Competitive advantage
Social profit (H)	-2,997,979	> 0	Negative: inefficient without policy
DRC	1.292	< 1	> 1: no comparative advantage
NPCO	1.307	—	> 1: output protected from imports
NPCI	0.391	—	< 1: input subsidized
EPC	1.629	—	> 1: net effective protection
PC	-1.153	—	Policy raises farmer profit
SRP	0.465	—	> 0: net subsidy to producer

Source: Primary data, processed (2026)

This result differs from comparable studies such as Maulida, Sariyoga, and Pancawati (2023) in Kramatwatu, which reported a DRC well below one. The difference arises precisely from the distinctive features of the present location: the heavy share-tenancy land cost and the anomalously high 2026 input prices. The finding indicates that the financial profit enjoyed by farmers is supported by government policy rather than by underlying economic efficiency-an insight elaborated in the policy analysis below.

These findings can be interpreted through the distinction between competitive and comparative advantage. Competitive advantage, reflected in the PCR, captures profitability at the actual (private) prices farmers face, whereas comparative advantage, reflected in the DRC, captures economic efficiency at social prices that strip away policy distortions (Monke & Pearson, 1989). That rice farming here is competitive yet not comparatively efficient means its financial profitability rests on policy support rather than on the efficient use of domestic resources. This pattern diverges from most prior rice studies—such as Maulida, Sariyoga, and Pancawati (2023) in Kramatwatu, Laelah (2022) in Serang, and Lihare and Wenang (2025) in West Java—which generally report a DRC below one. The divergence is explained by two features specific to the study site. First, the overwhelming dominance of the 50:50 share-tenancy (bagi hasil) system, under which land cost reaches roughly three-fifths of total cost, far exceeds the land-cost share in studies dominated by owner-operators or fixed rent. Second, the 2026 surge in world fertilizer prices sharply raised the social cost of inputs. Together these inflate the domestic resource cost and erode the comparative advantage that rice typically enjoys elsewhere.

Government Policy Impact

On the input side, the NPCI of 0.391 (below one) and a negative input transfer (Rp -2,202,146) show that farmers pay only about 39.1 percent of the social price for tradable inputs; the input subsidy-particularly the fertilizer subsidy-functions effectively, especially amid the 2026 surge in world fertilizer prices. On the output side, the NPCO of 1.307 (above one) with a positive output transfer (Rp 4,253,336) indicates that farmers receive a price about 30.7 percent higher than the social (import-parity) price of paddy, meaning that trade policy-particularly import restrictions and tariffs on rice-keeps the domestic paddy price above its international level and protects farmers from cheaper imports. Notably, this protection against imports is distinct from the issue of farm-gate prices remaining below the HPP: farmers are protected from imports, yet do not fully enjoy the domestic price floor.

Jointly, the EPC of 1.629, the PC of -1.153, and the SRP of 0.465 (all greater than one or positive) indicate that the net effect of policy is protective and beneficial to farmers. The net transfer is positive (Rp 6,455,482), meaning that farmers obtain Rp 6,455,482 per hectare more profit than they would without policy, and the positive SRP implies that about 46.5 percent of farmers' social revenue constitutes a net subsidy from government policy. This pattern is consistent with prior studies at comparable locations (Maulida, Sariyoga, & Pancawati, 2023) and confirms that the financial viability of rice farming in Indihiang District-which is not yet comparatively efficient (DRC > 1)-is in fact sustained by government protection on both the input and output sides.

From the perspective of agricultural policy theory, the simultaneous presence of a subsidized input price and a protected output price constitutes a classic dual-protection regime (Monke & Pearson, 1989; Ellis, 1992). The negative input transfer confirms that farmers pay far below the social cost of fertilizer, while the positive output transfer shows that trade policy holds the domestic paddy price above its import parity, shielding farmers from cheaper imported rice. Yet a paradox surfaces at the field level: although farmers are protected from imports (NPCO above one), the farm-gate price they actually receive remains below the government floor price (HPP). Import protection therefore operates at the national price level but does not automatically deliver the floor price to individual tenant farmers, who typically sell wet paddy to collectors immediately after harvest. The protective policy thus sustains the sector's viability while masking an underlying inefficiency and leaving unresolved the price disadvantage farmers face on the ground, consistent with concerns raised in studies of rice marketing chains (Gumelinsi et al., 2024).

Sensitivity Analysis

Sensitivity results are presented in Table 6. Competitiveness is robust to input-cost shocks but fragile to production and price shocks. A 30 percent rise in productivity (S1) lowers the PCR to 0.598 and the DRC to 0.919 (close to one), with social profit turning positive, confirming that productivity improvement is the most effective lever for both competitive and comparative advantage. By contrast, a 20 percent fall in production (S2)—a realistic risk given the documented rat infestation and climate anomalies at the site—raises the PCR to 1.013 (above one), so the farming loses its competitive advantage and private profit turns negative. A 30 percent increase in the non-subsidized fertilizer price (S3) raises the PCR only to 0.802 (still below one), indicating resilience to fertilizer-cost shocks. Under the pessimistic combined scenario (S4: production −20 percent, fertilizer +30 percent, paddy price −15 percent), the PCR rises to 1.235 and the DRC to 1.772, with both private and social profit negative. The principal vulnerabilities therefore lie in production loss and output price, not input cost, underscoring rat-pest control, price guarantees at the floor price, and productivity improvement as policy priorities.

Table 6. Sensitivity analysis of rice-farming competitiveness

Scenario	Private Profit	Social Profit	PCR	DRC
Baseline	3,457,503	-2,997,979	0.793	1.292
S1. Production +30%	8,895,284	1,163,801	0.598	0.919
S2. Production −20% (pest & climate risk)	-167,685	-5,772,500	1.013	1.772
S3. Fertilizer price +30%	3,273,881	-2,997,979	0.802	1.292
S4. Pessimistic combined	-2,526,419	-5,772,500	1.235	1.772

Source: Primary data, processed (2026)

The sensitivity results sharpen these implications. The finding that competitiveness is resilient to input-price shocks but fragile to production losses follows directly from the cost structure: tradable inputs form only a small share of total cost, so input-price increases barely move the PCR, whereas a fall in output reduces revenue directly. Because a twenty-percent production loss is a realistic prospect given the documented rat infestation and climate anomalies at the site, the competitive position of rice farming is more precarious than the baseline alone suggests. This raises the policy priority of production-risk management—particularly integrated rat-pest control—alongside productivity improvement, which the analysis identifies as the single most effective lever for restoring comparative advantage. These directions echo recommendations in comparable Indonesian rice studies (Dudung et al., 2025; Andika, 2023) that stress raising on-farm productivity over deepening dependence on subsidies.

CONCLUSION AND RECOMMENDATIONS

This study concludes that rice farming in Indihiang District, Tasikmalaya City, is financially competitive but has not yet achieved comparative efficiency. At the prices farmers actually face, the farming remains profitable and able to cover its domestic resource costs. However, when valued at social prices that remove policy distortions, it becomes economically inefficient, mainly because of the dominant share-tenancy land cost and the elevated world input prices. The financial profitability enjoyed by farmers is therefore sustained by government policy rather than by the underlying efficiency of resource use.

The government policy environment is protective and beneficial to farmers, operating simultaneously through input subsidies and protection of the domestic output price from cheaper imports, with a net effect that transfers a substantial subsidy to producers. Nevertheless, this competitiveness is fragile: it is resilient to increases in input prices but vulnerable to declines in production—such as those caused by the rat infestation and climate anomalies documented at the site—and to falling output prices. Improving on-farm productivity therefore stands out as the most effective avenue for strengthening both the competitive and the comparative advantage of rice farming.

It is recommended that the government prioritize productivity improvement so that rice farming does not depend permanently on subsidies and import protection, while also strengthening domestic procurement at the HPP and improving the marketing chain so that farmers do not rely solely on collectors. Attention to the share-tenancy structure, which heavily burdens tenant farmers, is warranted to strengthen competitive advantage. For farmers, raising productivity through quality seed, good agricultural practices, and control of the documented rat infestation is the most effective strategy. Future research is encouraged to refine shadow-price estimation using period-specific border data and to extend the analysis to farmer regeneration and the sustainability of urban agriculture.

REFERENCES

Arifin, B. (2005). *Agricultural development: Policy paradigms and revitalization strategies*. Jakarta: Grasindo.

Afiyah, F. (2025). *Competitiveness analysis and policy impacts on shallot commodities in Kramatwatu District, Serang Regency* (Undergraduate thesis). Universitas Sultan Ageng Tirtayasa.

Andika, A. (2023). *Market structure and competitiveness analysis of organic rice in Lampung Province* (Undergraduate thesis). Universitas Lampung.

Badan Pusat Statistik. (2022). *Results of the 2022 Agricultural Census*. Jakarta: BPS.

Badan Pusat Statistik. (2024). *Indonesia foreign trade statistics*. Jakarta: BPS.

Badan Pusat Statistik. (2026). *Developments in Indonesia's exports and imports, January–March 2026*. Jakarta: BPS.

Dudung, et al. (2025). Analysis of rice production in Tasikmalaya City from 2020–2025: Challenges and strategies toward national food self-sufficiency. *Tumbuhan: Publication of Agricultural Sociology and Forestry Sciences*.

Ellis, F. (1992). *Agricultural policies in developing countries*. Cambridge: Cambridge University Press.

Gumelinsi, R., et al. (2024). Analysis of competitiveness development policies for rice in Rokan Hulu Regency. *Jurnal Agribisnis, 12*(1), 33–45.

Hayyin, A. (2023). The effect of financial ratios on profit growth in food and beverage companies listed on the Indonesia Stock Exchange during the 2017–2021 period. *SENTRI: Jurnal Riset Ilmiah*.

Laelah, E. (2022). *Competitiveness of lowland rice farming to increase farmers' income in Serang Regency* (Undergraduate thesis). Universitas Sultan Ageng Tirtayasa.

Lihare, & Wenang, S. (2025). Competitiveness analysis of rice commodities in West Java Province using the Revealed Comparative Advantage method. *Global Research and Innovation Journal (GREAT)*.

Kementerian Keuangan Republik Indonesia. (2026). *APBN KiTa, May and June 2026 editions*. Jakarta: Ministry of Finance of the Republic of Indonesia.

Kementerian Pertanian. (2024). *National rice production performance report*. Jakarta: Ministry of Agriculture.

Maulida, A., et al. (2023). Competitiveness analysis of rice farming in Kramatwatu District, Serang Regency. *Jurnal Ilmu Pertanian Tirtayasa, 5*(2), 301–311.

Monke, E. A., & Pearson, S. R. (1989). *The policy analysis matrix for agricultural development*. Ithaca, NY: Cornell University Press.

Murdy, S., et al. (2021). Competitiveness of rice farming and input-output price policy scenarios in Jambi. *Jurnal Sosio Ekonomika Bisnis, 24*(1), 1–12.

Ningsih, R. (2024). Competitiveness analysis of rice farming in Bojonegoro Regency. *Jurnal Ekonomi Pertanian, 9*(2), 110–122.

Hasibuan, O. J. (2025). *Competitiveness and sensitivity analysis of shallot farming in Toyomerto Village, Kramatwatu District, Serang Regency* (Undergraduate thesis). Universitas Sultan Ageng Tirtayasa.

Porter, M. E. (1990). *The competitive advantage of nations*. New York: Free Press.

Saptana. (2010). The concept of competitive and comparative advantages of agricultural commodities. *Forum Penelitian Agro Ekonomi, 28*(1), 1–18.

Sepfrian, W., et al. (2022). Competitiveness analysis of rice farming in Indonesia. *Jurnal Agribisnis Terapan*.

Soekartawi. (2002). *Farm business analysis*. Jakarta: Universitas Indonesia Press.

Sugiyono. (2010). *Quantitative, qualitative, and R&D research methods*. Bandung: Alfabeta.

Tambunan, T. (2003). *Competitiveness of Indonesian agricultural products*. Jakarta: Ghalia Indonesia.

Todaro, M. P., & Smith, S. C. (2020). *Economic development* (13th ed.). Harlow, England: Pearson Education.

World Bank. (2026). *Commodity markets outlook*. Washington, DC: World Bank.