ISSN: 2621-4709 E-ISSN: 2621-2528
Journal of Applied Agricultural Science and Technology
Vol. 10 No. 3 (2026): 476-495

Value Addition and Business Model Adaptation in Arabica Coffee Processing: A Mixed-Methods Study

Mubarokah [a,*], Putra Astaman [a], Aulia Nurul Hikmah [a], Brilliani Raras Sakapuspa [b], Ummu Liyana binti Abdul Aziz [c]

[a] Department of Agribusiness, Faculty of Agriculture, Universitas Pembangunan Nasional Veteran Jawa Timur, Surabaya, Indonesia
[b] Department of Economy Development, Faculty of Economic and Business, Universitas Pembangunan Nasional Veteran Jawa Timur, Surabaya, Indonesia
[c] Faculty of Arshad Ayub Graduate Business School, Universiti Teknologi Mara, Shah Alam, Malaysia

Abstract. *Although Arabica coffee prices may be favorable in certain periods, increased production during peak harvest seasons can create excess supply and expose farmers to price declines, particularly when farmers rely mainly on selling coffee cherries or green beans with limited value addition. Therefore, downstream processing is needed to capture higher added value and reduce farmers' vulnerability to market volatility. This study aims to analyze the added value generated from Arabica coffee processing and map the business model adaptation of farmer groups in Trawas District, Mojokerto Regency, East Java Province. The study was conducted from January to June 2023 using a mixed-methods approach that combined quantitative value-added analysis with qualitative Business Model Canvas mapping. The Hayami method was used to calculate value added, while interviews, field observations, and focus group discussions identified business model components and development strategies. The results show that processing red coffee cherries into green beans generated an added value of IDR 4,975.00/kg with a value-added ratio of 39.48%, indicating a moderate level of value creation. In contrast, processing green beans into ground coffee generated a much higher added value of IDR 102,250.00/kg with a value-added ratio of 90.88%, indicating a high level of value creation. These findings demonstrate that downstream processing into ground coffee provides substantially greater economic benefits than green bean processing. Practically, farmer groups need to strengthen processing capacity, product quality control, packaging, branding, digital marketing, and institutional partnerships to capture higher value and reduce vulnerability to price fluctuations caused by excess supply during peak harvest periods.*

Keywords: *added value; arabica coffee agroindustry; business model canvas; downstream processing; farmer groups.*

Type of the Paper: Regular Article.

1. Introduction

The plantation sub-sector has consistently expanded in terms of cultivated area, output, and foreign exchange earnings [1]. According to Marit [2], coffee is a top export commodity that is essential to the national economy as a primary source of farmers' income, a generator of foreign currency, a provider of industrial raw materials, and a creator of employment via processing, marketing, and trade. Indonesian coffee output increased by 3.12% from 2019 to 2021 [3]. In 2020, Arabica coffee accounted for 206.96 thousand tons, representing 27.15% of total production, while coffee consumption grew by an average of 8.22% annually from 2016 to 2021 [4]. Global coffee

https://doi.org/10.55043/jaast.v10i3.513
Received October 17, 2025; Received in revised form May 18, 2026; Accepted June 12, 2026; Published August 21, 2026
* Corresponding author
Email: mubarokah@upnjatim.ac.id

production increased by 0.1% to 168.2 million bags in the 2022/23 period [5]. The sector is rapidly evolving in Indonesia, becoming a dominant trend and lifestyle [6]. This strong growth is driven by global developments, where demand for high-quality coffee remains a primary focus for entrepreneurs domestically and internationally [7].

Coffee businesses generate added value through careful post-harvest handling and adherence to Good Manufacturing Practice (GMP) standards, especially in wet processing. Farmers further enhance the value of beans by processing them into roasted or ground coffee [8]. However, technical cultivation barriers and high costs caused by weather and machine rental, undermine these efforts [9]. Downstream policies mitigate these problems by reinforcing value and productivity initiatives while supporting economic stability. Stronger policy coordination in production, regulation, institutions, trade, and promotion is critical for transforming the sector.

Trawas coffee has established itself as a leading product of Mojokerto Regency, demonstrating its competitiveness through exports to international markets, including Europe. The economic potential of this commodity is further illustrated by Reswita [10], who found that processing coffee beans into powder can generate an added value of IDR 10,346.67 per kilogram, with a ratio of 32.08%. This significant added value has encouraged the local government to promote downstream processing among farmer groups, shifting from simply selling green beans to producing ground coffee to increase farmers' income at the greater participation of the value chain.

Approximately 90% of the coffee cultivated in Trawas is Arabica, with total annual production estimated at 40–50 tons. With more intensive management, production could increase to approximately 100 tons per year. The quality of excellent coffee is determined throughout cultivation to post-harvest processing [11,12]. The primary markets for Trawas Coffee include Mojokerto, Surabaya, Sidoarjo, Pasuruan, Solo, Jogja, and surrounding areas. Trawas Coffee is available in both raw bean and powder forms, providing convenience to consumers. Known for its distinctive taste, coffee from the slopes of Mount Welirang, Mojokerto Regency, is characterised by its sweetness and pronounced aroma during roasting, distinguishing it from other regional varieties. However, increased harvest volumes may expose farmers to market uncertainty and price declines, particularly when they rely mainly on selling coffee cherries or green beans. Therefore, downstream processing is an anticipatory strategy to increase added value, strengthen farmer income, and reduce vulnerability to market fluctuations.

Arabica coffee farmers in Mojokerto Regency face challenges in production, marketing, and management, including reliance on outdated technology, a limited customer base, and inadequate financial oversight. Farmers also struggle to maintain product quality, particularly in selecting beans and ensuring ripeness, which may affect the quality of processed coffee products. Although

these upstream constraints influence the performance of Arabica coffee agribusiness, this study specifically focuses on the downstream subsystem, particularly the transformation of coffee cherries and green beans into higher-value processed products. The upstream challenges are presented as contextual factors and the need to strengthen downstream activities. The novelty of this study lies in its integration of Hayami value-added analysis and the Business Model Canvas within a mixed-methods framework.

Previous studies on coffee agroindustry have widely examined post-harvest processing, value-added creation, and business development strategies. However, most have investigated value-added analysis and business model development separately. Value-added studies generally focus on calculating economic benefits of coffee processing, while business model studies emphasize strategic mapping without directly linking it to measured economic value creation. Therefore, a research gap remains in studies that simultaneously integrate quantitative value-added analysis with qualitative business model mapping, particularly at the farmer group level in Arabica coffee agroindustry. This study addresses this gap by combining the Hayami value-added method and the Business Model Canvas within a mixed-methods framework to explain how much added value is generated from coffee processing and how farmer groups can adapt their business model to capture greater value. Therefore, this study aims to: (1) measure the added value generated from Arabica coffee processing into green beans and ground coffee; (2) map the existing business model of Arabica coffee farmer groups using the Business Model Canvas; and (3) formulate business model adaptation strategies to improve farmer group income, market access, and downstream competitiveness.

2. Materials and Methods

2.1. Research Site

Research was conducted from January to June 2023 in the Trawas District, Mojokerto, East Java. This site was chosen because it is a major Arabica coffee centre, with an ideal agroclimate (700-1,200 m altitude, 18-22°C), but faces downstream challenges in achieving sustainable economic value.

2.2. Research Design

This study applied a mixed-methods design, blending quantitative description, and qualitative analysis. It used a single embedded case study targeting the Arabica coffee downstream chain in Trawas District. The mixed-methods design was implemented by integrating quantitative and qualitative findings at the interpretation stage. Quantitative data from the Hayami value-added analysis were used to measure the economic benefits generated from processing Arabica coffee into green beans and ground coffee. Qualitative data from interviews, field observations, and FGDs

were used to explain the managerial, institutional, technological, and marketing factors behind the value-added results. Triangulation was conducted by comparing questionnaire data, interview findings, FGD results, field observations, and secondary data from relevant institutions.

Surveys captured primary data from farmers and businesses, while interviews and FGDs elicited qualitative insights. The scope of the discussion outlines the boundaries of the subject matter, which includes:

a) Focus on calculating the financial added value in the process of transforming green coffee beans into Arabica coffee powder.
b) Mapping and designing business models using the Business Model Canvas (BMC) framework for coffee processing businesses at the farmer/farmer group level.
c) The discussion is limited to downstream product development strategies, particularly green bean and ground coffee processing. Upstream aspects such as cultivation are discussed only as contextual factors and are not the main object of analysis.

2.3. Population and Sample

The sample consisted of farmer groups involved in the Arabica coffee value chain in Trawas District. The unit of analysis was the farmer group, particularly groups actively involved in post-harvest handling and downstream processing of Arabica coffee. Four farmer groups, comprising 100 farmers, were purposively selected because they met three criteria: (1) active involvement in Arabica coffee production and processing; (2) experience in processing coffee cherries into green beans or ground coffee; and (3) direct participation in local marketing or farmer-group-based coffee business activities. This purposive selection was considered appropriate because the study aims to obtain in-depth information from actors who directly manage downstream coffee processing. Therefore, the selected groups were not intended to statistically represent all coffee farmers in Mojokerto Regency, but to represent key farmer-group actors involved in Arabica coffee downstream activities in the study location.

2.4. Types and Techniques of Data Collection

Primary data was collected through interviews with farmer group leaders, MSME actors, and agency officials, emphasizing strategies, obstacles, and downstream opportunities. Questionnaires captured respondent profiles, cost structures, marketing, and margins. Secondary data from the Mojokerto Agricultural Office, the BPS, and relevant publications informed macro- and policy-level analyses.

2.5. Data Analysis

Data analysis used value-added analysis and the Business Model Canvas, aligned with the study's objectives:

a) Quantitative Analysis: Using the Hayami method (Table 1) was used with variables including input, output, price, labor wage, and raw material price variables. Value-added was assessed for transforming green beans into ground coffee using production data and Hayami et al. [13] to calculate conversion factors, labour coefficients, and profit levels. According to Epaga et al. [14], value-added ratios are classified as (a) low if < 15%, (b) moderate if 15–40%, and (c) high if > 40%.

b) Qualitative Analysis: The BMC was used to analyze and design the 9 elements of the business model (Customer Segments, Value Proposition, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partners, Cost Structure). To formulate efforts to increase income through the downstream development of Arabica coffee products, the Business Model Canvas (BMC) method by Rizan et al. [15] was employed. This canvas-shaped business model framework comprises nine elements that determine the appropriate business model and strategy. BMC simplifies complex company ideas into a single canvas sheet that includes a business plan with nine well-integrated essential sections covering both internal and external strategy analysis. BMC analysis also facilitates farmer groups in managing coffee beans into ground coffee by implementing their business model. The results of the value-added analysis were integrated with the Business Model Canvas elements to formulate business model adaptation strategies for farmer groups.

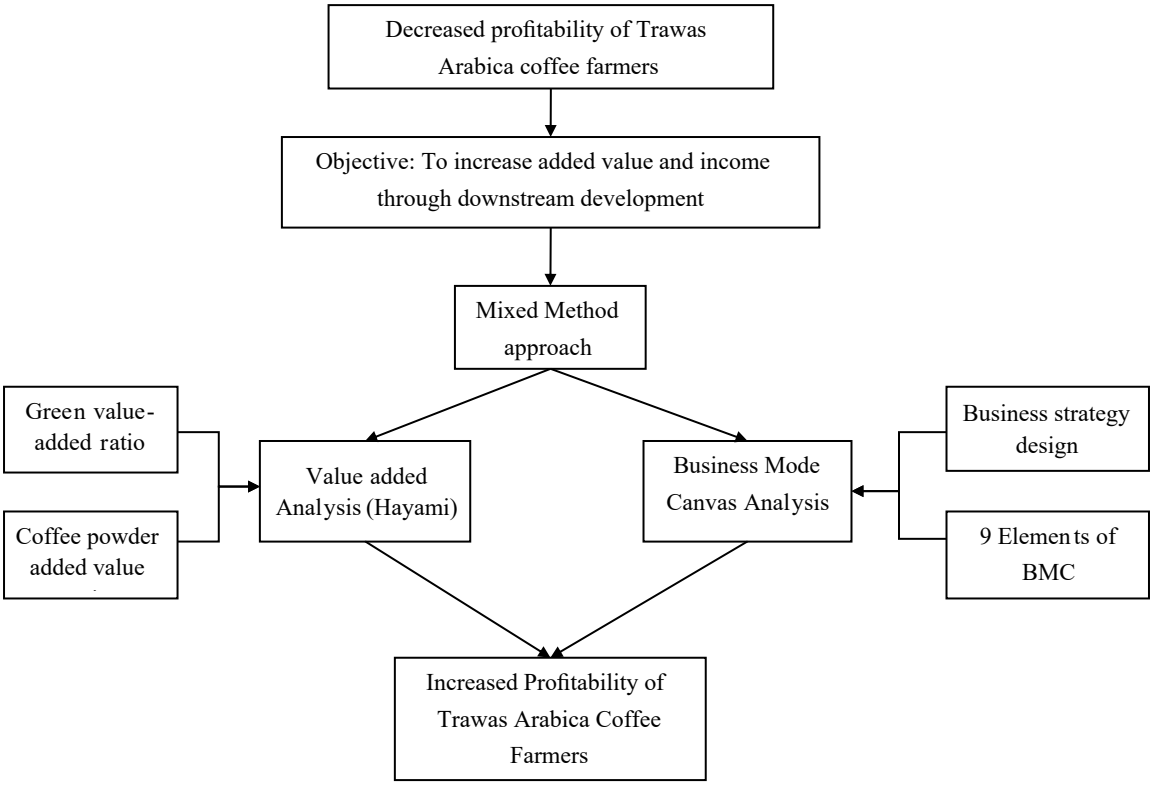

Fig. 1. Research framework.

Table 1. Hayami methods for value added.

No	Variable	Unit	Calculation Formula
	I. Basic Production Parameter		
1	Final Product Volume	Kg	Q_out
2	Raw Material Quantity	Kg	Q_in
3	Labor Input	Man-day	L
4	Transformation Efficiency Coefficient		$\eta = Q\_out / Q\_in$
5	Workforce Input Density	Man-day/Kg	$\alpha = L / Q\_in$
6	Final Product Market Value	IDR per Kg	P_out
7	Workforce Compensation Rate	IDR/Man-day	w
	II. Value-Added Components		
8	Primary Input Material Costs	IDR per Kg	C_mat
9	Supporting Input Costs	IDR per Kg	C_other
10	Revenue per unit input	IDR per Kg	$V\_out = \eta \times P\_out$
11a	Economic value contribution	IDR per Kg	$VA = V\_out - C\_mat - C\_other$
11b	Value creation efficiency	Percent (%)	$R\_VA = (VA / V\_out) \times 100$
12a	Labor compensation share	IDR per Kg	$I\_labor = \alpha \times w$
12b	Distribution to Labor	Percent (%)	$S\_labor = (I\_labor / VA) \times 100$
13a	Company Surplus / Profit	IDR per Kg	$\pi = VA - I\_labor$
13b	Profit rate	Percent (%)	$R\_\pi = (\pi / VA) \times 100$
14	Profit Margin	IDR per Kg	$M = V\_out - C\_mat$
14a	Labor income share in margin	Percent (%)	$S\_labor\_margin = (I\_labor / M) \times 100$
14b	Other input contributions in margin	Percent (%)	$S\_other = (C\_other/M) \times 100$
14c	Net profit share in margin	Percent (%)	$S\_profit = (\pi / M) \times 100$

Based on Fig. 1, this study is grounded in the economic vulnerability of Arabica coffee farmers, particularly when increased production during peak harvest periods creates the potential for excess supply and price decline. In this context, dependence on selling coffee cherries or green beans with limited added value may reduce farmers' ability to capture higher economic returns. Therefore, downstream processing into ground coffee is considered a strategic approach to increase added value and strengthen farmer group income. This study applies a mixed-methods approach by combining the Hayami value-added analysis and the Business Model Canvas. The Hayami method quantitatively measures the added value and profitability of coffee processing, while the Business Model Canvas maps and redesigns the business model across nine key elements. The integrated findings are then used to formulate business model adaptation strategies to improve marketing, operations, partnerships, and value capture at the farmer group level.

Limitations of Discussion: (1) This study does not discuss in detail the technical aspects of coffee cultivation, land suitability analysis, or the complex farmer institutional dynamics; (2) market and consumer analysis is exploratory and based on limited primary data from the study location rather than a comprehensive market survey; and (3) the strategies generated using the Business Model Canvas are conceptual and have not yet been empirically tested through implementation at the farmer group level.

2.6 Ethical Considerations

This study involved farmer group leaders, MSME actors, and local government

representatives as participants in interviews and FGD. Prior to data collection, the purpose of the study was explained to all participants. Participation was voluntary, and informed consent was obtained before interviews and FGDs were conducted. Respondents were allowed to decline to answer questions or withdraw from the discussion at any time. Personal identities were kept confidential, and the collected data were used solely for academic and research purposes.

3. Results and Discussion

Coffee farmers in the Trawas subdistrict process Arabica coffee from red cherries into green beans and ground coffee. Approximately 42% of sales consist of red coffee cherries using a conventional drying process that relies on sunlight. Green beans account for 38% of overall sales, while ground coffee accounts for the remaining 20%. This variation in the types of coffee products sold directly affects farmers' income.

Table 2. Natural Process Arabica Coffee Added Value Calculation.

No	Variable	Unit	Coffee Type	
			Green Bean	Ground Coffee
I. Output, Input, Price				
1	Final Product Volume	Kg	245.76	337.50
2	Raw Material Quantity	Kg	1.650.00	450.00
3	Labor Input	Man-day	93.54	110.66
4	Transformation Efficiency Coefficient		0.14	0.75
5	Workforce Input Density	Man-day/Kg	0.05	0.25
6	Final Product Market Value	IDR per Kg	90.000.00	150.000.00
7	Workforce Compensation Rate	IDR/Man-day	50.000.00	50.000.00
II. Value-Added Components				
8	Primary Input Material Costs	IDR per Kg	7.000.00	8.525.00
9	Supporting Input Costs	IDR per Kg	625.00	3.250.00
10	Revenue per unit input	IDR per Kg	12.600.00	112.500.00
11a	Economic value contribution	IDR per Kg	4.975.00	102.250.00
11b	Value creation efficiency	Percent (%)	39.48	90.88
12a	Labor compensation share	IDR per Kg	2.500.00	14.500.00
12b	Distribution to the Labor	Percent (%)	50.25	12.88
13a	Company Surplus	IDR per Kg	2.475.00	87.750.00
13b	Profit Margin	Percent (%)	49.74	85.81
14	Profit Margin	IDR per Kg	5.600.00	103.975.00
14a	Labor income	Percent (%)	44.64	13.94
14b	other contributions from inputs	Percent (%)	11.16	3.12
14c	Net profit	Percent (%)	44.19	84.39

Source: Data processed, 2023.

Field findings from interviews and FGDs indicate that most farmers still prefer to sell coffee as red cherries or green beans rather than process it further into ground coffee. This decision is caused by a lack of awareness of the potential added value and is also influenced by practical and risk-based economic considerations at the farmer-group level. Farmers generally calculate that selling cherries or green beans provides faster cash turnover, requires lower processing costs, and involves fewer risks related to product quality, packaging, and market absorption. In contrast, ground coffee processing requires additional capital, roasting and grinding equipment, labor,

processing time, packaging materials, branding capability, and more stable market access. Therefore, although downstream processing generates higher economic potential, many farmers remain dependent on less processed coffee forms because they are easier to sell, provide quicker income after harvest, and involve lower operational risk. Table 2 illustrates the results of calculating the added value of ground coffee and green beans.

Table 2 indicates that the average added value derived from the natural processing of red coffee cherries into green beans in Ketapanrame Village and Trawas Village is Rp 4,975.00 per kilogram. In contrast, the added value of transforming green beans into ground coffee is Rp 102,250.00 per kilogram. The value-added ratio for green beans is at 39.48%, while for ground coffee, it is significantly higher at 90.88%. The results indicate that the processing of green beans in Ketapanrame Village and Trawas Village is at a moderate level. In accordance with the established criteria [14], a value-added ratio of >40% in the form of green beans to ground coffee indicates that the natural process method provides a very good or high value-added ratio.

The value-added calculation indicates a substantial difference between green bean and ground coffee processing. Processing red coffee cherries into green beans generated an added value of IDR 4,975.00/kg with a value-added ratio of 39.48%, indicating a moderate level of value creation. In contrast, processing green beans into ground coffee generated an added value of IDR 102,250.00/kg with a value-added ratio of 90.88%, indicating a high level of value creation. This difference confirms that greater economic value is captured at the more advanced processing stage. Green beans remain closer to semi-processed raw material and remain dependent on intermediate buyers, whereas ground coffee allows farmer groups to capture additional margins from roasting, grinding, packaging, branding, and direct marketing. Thus, the value-added result demonstrates the superiority of ground coffee processing and highlights the need for stronger business capacity among farmer groups to manage downstream activities more effectively.

These findings indicate that farmers' decisions are not based solely on the amount of value added, but also on liquidity, risk, labor availability, processing capacity, and market certainty. In this context, farmers' economic calculation is more practical and short-term oriented: selling cherries or green beans reduces processing risk and accelerates income, while ground coffee processing offers higher margins but requires stronger business capacity. This explains why the high value-added ratio of ground coffee has not automatically shifted all farmer groups to adopt more advanced downstream processing. Therefore, business model adaptation is needed to reduce the practical barriers that prevent farmer groups from capturing higher value at the downstream stage. Several studies also indicate that value-chain coordination, product innovation, and downstream processing contribute to competitiveness and value creation in coffee-related agroindustry [16–20]. Therefore, the proposed business model renewal in Fig. 2. is directed to

strengthen the ability of farmer groups to transition from production-oriented activities to market-oriented downstream agribusiness.

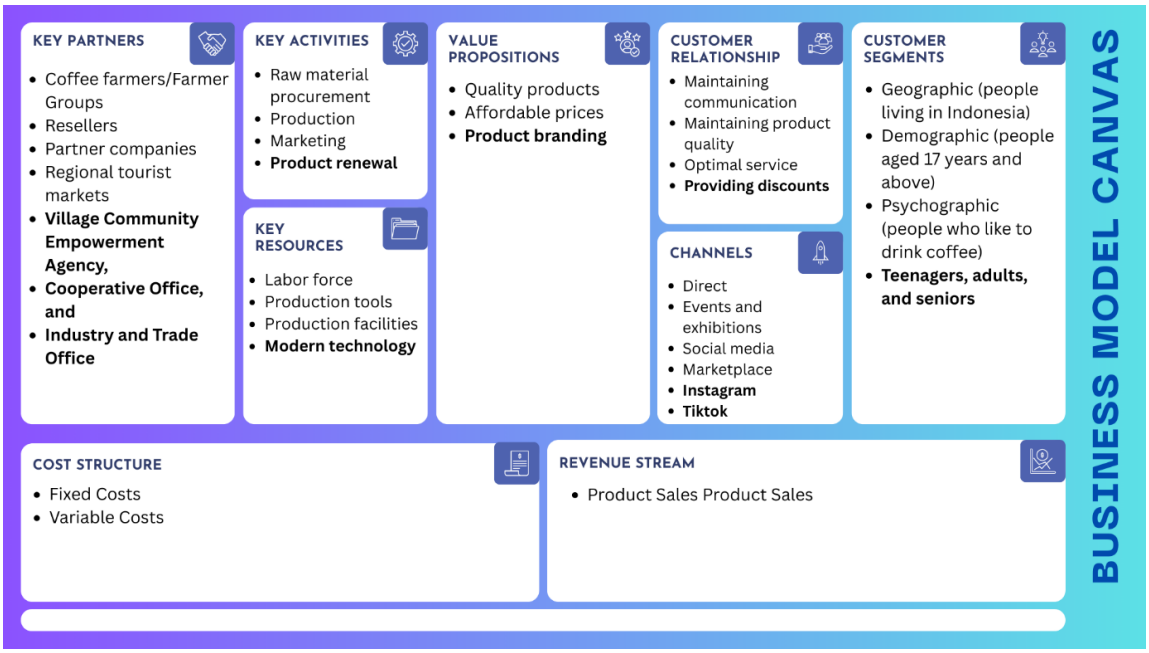

Fig. 2. Alternative business model renewal in increasing Arabica coffee agribusiness income. Source: Processed Primary Data, 2023.

Although the proposed Business Model Canvas renewal provides strategic direction for Arabica coffee downstream development, its implementation requires consideration of its feasibility at the farmer group level. Several strategies, such as improving packaging, strengthening digital promotion, and expanding partnerships with local souvenir shops and coffee shops, are relatively feasible in the short term because they require moderate investment and can be supported through training or institutional facilitation. In contrast, strategies involving processing technology improvement, quality standardization, certification, and broader market expansion require higher capital, stronger managerial capacity, and continuous support from local government and partner institutions. Therefore, the implementation of the proposed model should be conducted gradually, beginning with low-cost and high-impact activities before moving toward more capital-intensive interventions.

Table 3 presents the feasibility, main constraints, and implementation priority of the proposed strategies for strengthening the marketing mix of the Arabica coffee business. The feasibility of the proposed strategies also depends on the ability of farmer groups to maintain supply continuity, product consistency, and collective management. Without these conditions, downstream processing may increase production costs without guaranteeing stable market absorption. Therefore, institutional strengthening is essential to ensure that farmer groups can coordinate raw material supply, manage shared processing facilities, apply quality standards, and conduct collective marketing. In this context, the proposed BMC strategy should be understood as

a marketing tool, as a gradual institutional, and managerial transformation for farmer-group-based Arabica coffee agroindustry.

Table 3. Feasibility and Implementation of Strategies.

Strategy proposal	Feasibility	Main constraints	Implementation priority
Improve packaging and labeling	High	Design skills, packaging cost	Short term
Use social media and digital marketing	High	Digital literacy, content consistency	Short term
Partner with souvenir shops and coffee shops	Moderate	Product consistency, supply continuity	Short–medium term
Improve roasting and grinding equipment	Moderate	Capital, technical skills	Medium term
Product certification and regional branding	Moderate–low	Administrative process, institutional coordination	Medium–long term
Expansion to wider markets	Moderate–low	Production capacity, quality control, logistics	Long term

Explanations related to several elements in the Business Model Canvas (Fig. 2) will be discussed in detail in the explanation of each element:

3.1. Customer Segments

The customer segment for Trawas Arabica ground coffee consists mainly of local consumers, tourists, coffee shops, souvenir stores, and consumers who purchase coffee through digital channels. Field findings indicate that packaged ground coffee is mostly positioned as a local specialty product and tourist souvenir, while original-flavor ground coffee is commonly consumed in local coffee shops. This indicates that the customer segment remains relatively narrow and is strongly associated with local tourism and regional identity.

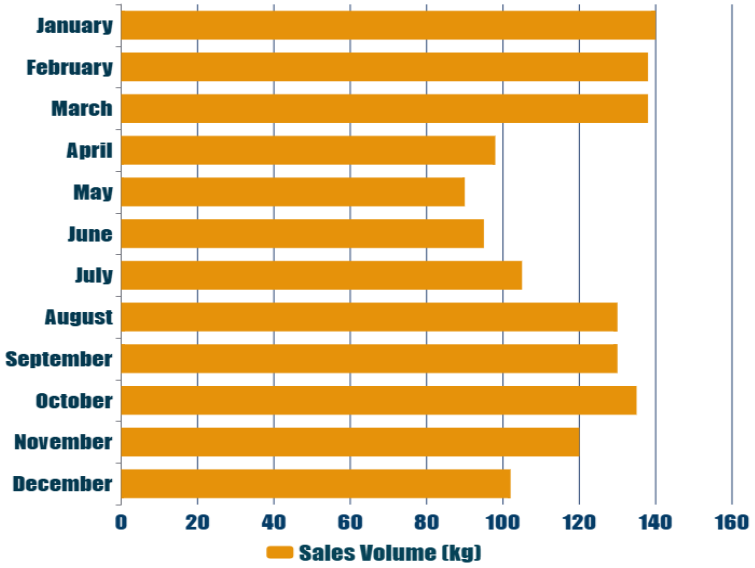

Fig. 3. Coffee Sale Volume in 2023, Trawas-Mojokerto.

Based on Fig. 3, the analysis of 12 months of sales data reveals significant seasonal fluctuations, with peaks and troughs attributable to external factors. Sales volume started at 100

kg in December, then increased to 135–140 kg in the first quarter (January-March), driven by the holiday season and cold weather, before experiencing a sharp decline to a low of 90 kg in May, likely due to reduced tourism activity and the potential influence of Ramadan. Recovery began in July, reaching a second peak of around 130-135 kg in August and October as socio-economic activity normalized, then declined again to 120 kg in November. This seasonality pattern indicates that marketing and supply chain management strategies must be optimized by preparing larger stocks in the first and third quarters. Furthermore, this data provide a strong basis for developing time-series-based predictive models such as SARIMA in further research in the agro-industry field.

Previous studies highlight the importance of clearer segmentation in coffee marketing. Consumer demand for Arabica coffee is influenced by taste, aroma, consumption frequency, purchasing convenience, and product identity [21–23]. Therefore, farmer groups should broaden their target market beyond local buyers to include specialty coffee consumers, urban households, cafés, tourists, and online consumers who value origin-based coffee products [24].

3.2. Channels

The channel element shows that coffee marketing in Trawas remains dominated by conventional direct sales from producers to consumers, local shops, and souvenir outlets. Field data indicate that around 70% of distribution still relies on conventional channels, while only 25% uses digital platforms such as Instagram and TikTok, and 5% involves intermediary channels through souvenir shops. This condition limits the market reach of farmer groups, although ground coffee has a much higher value-added ratio than green beans. Therefore, digital marketing is needed for promotion and expanding consumer access, building direct relationships with buyers, and reducing dependence on local intermediaries. Previous studies show that Instagram, WhatsApp Business, and other social media platforms can support coffee product promotion, strengthen customer communication, and improve market reach for small coffee businesses [25–33].

3.3. Customer Relationships

Customer relationship strategies in the Trawas Arabica coffee business remain relatively simple. Discounts are rarely offered and are generally limited for bulk purchases. Therefore, customer relationships should not rely solely on price discounts, because the competitiveness of ground coffee depends more on product consistency, trust, taste experience, packaging, and regional identity. This finding aligns with previous studies showing that discounts may influence purchase interest but their effect on actual purchasing decisions can vary depending on brand image, trust, product uniqueness, and customer relationship management [34–37]. Therefore, farmer groups should develop relationship-building strategies through repeat purchase incentives,

customer feedback, storytelling about Trawas Arabica coffee, and after-sales communication using digital platforms.

3.4. Key Partners

Key partnerships are essential for strengthening downstream Arabica coffee processing because farmer groups continue to face limitations in capital, technology, certification, packaging, and market access. Field findings show that cooperation with local government agencies has existed, particularly through regional product promotion activities. However, this collaboration remains occasional and has not yet fully addressed the operational needs of farmer groups. More structured partnerships are needed with the Agriculture and Plantation Office, Cooperative and MSME Office, Industry and Trade Office, tourism actors, coffee shops, souvenir outlets, and financial institutions. Previous studies emphasize that institutional support, stakeholder collaboration, access to capital, and value-chain coordination are important for improving competitiveness and downstream development in coffee agroindustry [38–44].

3.5. Key Activities

The key activities required for downstream development include quality control, roasting, grinding, packaging, branding, promotion, and market management. At present, farmer groups remain more dominant in production and basic processing activities, while branding and attractive packaging are often handled by second parties such as souvenir shops or coffee shops. This condition indicates that farmer groups have not fully captured the downstream value created after processing. Previous studies indicate that packaging, brand image, product quality, and product innovation can influence purchasing decisions, satisfaction, and consumer loyalty [45–51]. Therefore, key activities should expand from processing alone to include product standardization, packaging improvement, brand development, digital content creation, and customer management.

Table 4. Equipment used to dry Arabica coffee in Trawas District.

Items	Specifications
Input Capacity	3 kg – 10 kg / process
Machine Dimensions	980 x 47 x 115 cm
Material	Galvalume plate
Drying Temperature	0 – 300 ºC
Heat Source	Pipe-shaped gas furnace
Fuel	LPG
Temperature Control	Thermometer

3.6. Key Resources

The key resources needed for Arabica coffee downstream processing include processing equipment, skilled labor, working capital, raw material continuity, product packaging, and digital marketing capacity. Field findings show that drying, roasting, and grinding technologies remain important constraints for farmer groups. Some processing activities still rely on simple or limited-capacity equipment, while traditional sun-drying is vulnerable to weather conditions and may

delay production during the rainy season. The drying equipment used in Trawas District is presented in Table 4.

Table 4 summarizes the specifications of the drying equipment utilized for Arabica coffee processing in Trawas District. This condition confirms that appropriate processing technology is important for improving product consistency, reducing processing delays, and strengthening competitiveness. The key resources for Arabica coffee downstream processing include processing equipment, skilled labor, working capital, raw material continuity, product packaging, and digital marketing capacity. Field findings show that drying, roasting, and grinding technologies remain important constraints for farmer groups. Some processing activities still rely on simple or limited-capacity equipment, while traditional sun-drying is vulnerable to weather conditions and may delay production during the rainy season. This condition confirms that appropriate processing technology is important for improving product consistency, reducing processing delays, and strengthening competitiveness. Previous studies also reported that drying and roasting technologies contribute to better quality, productivity, and efficiency in the coffee agroindustry [52–55]. Therefore, key resource development should prioritize appropriate technology, operator training, quality control skills, and access to working capital.

3.7. Value Proposition

The value proposition of Trawas Arabica ground coffee lies in its local origin, distinctive taste, aroma, and identity as a coffee product from the slopes of Mount Welirang. However, the current product offering remains limited, consisting mainly of pure original-flavor ground coffee. This creates both a strength and a limitation. On one hand, original Arabica coffee supports authenticity and regional identity. In contrast, limited product diversification may restrict access to younger consumers and broader market segments. Previous studies show that product innovation, sensory attributes, processing methods, and diversification strategies can strengthen consumer acceptance and increase the competitiveness of coffee-based products [56–62]. Therefore, the value proposition should be strengthened by improved packaging, clearer product information, origin-based storytelling, and gradual product diversification without weakening the authenticity of Trawas Arabica coffee as a local specialty product.

4. Conclusions

The value-added analysis shows that processing red coffee cherries into green beans generates an added value of IDR 4,975.00/kg with a value-added ratio of 39.48%, indicating a moderate level of value creation. In contrast, processing green beans into ground coffee generates a significantly higher added value of IDR 102,250.00/kg, with a value-added ratio of 90.88%, indicating a high level of value creation. These findings confirm that downstream processing into

ground coffee provides substantially greater economic benefits than selling coffee in less processed forms.

The Business Model Canvas analysis indicates that the Arabica ground coffee business managed by farmer groups has promising potential but still requires business model renewal. The primary weaknesses include limited market channels, conventional promotion, inadequate branding and packaging, limited processing technology, and weak institutional partnerships. Therefore, the higher added value of ground coffee can only be captured more effectively if farmer groups strengthen their downstream business capacity, particularly in processing, quality control, marketing, partnerships, and customer relationship management.

Based on the findings, several practical recommendations are proposed. First, farmer groups should strengthen downstream processing capacity by improving product quality control, roasting and grinding practices, packaging, labeling, and product standardization. Second, digital marketing through social media, WhatsApp Business, and marketplace platforms should be gradually developed to expand market reach and reduce dependence on conventional sales channels. Third, partnerships with coffee shops, souvenir outlets, tourism actors, cooperatives, and local government agencies should be strengthened to support product promotion, market access, equipment assistance, training, and business licensing. Fourth, local government support is important to facilitate access to capital, post-harvest technology, certification, and regional branding, enabling the development of Trawas Arabica coffee as a competitive local agroindustry product.

Abbreviations

BMC	business model canvas
GMP	good manufacturing practice
SARIMA	seasonal autoregressive integrated moving average

Data availability statement

The datasets generated or analysed during the current study are readily accessible from the cor-responding author upon reasonable request.

CRediT authorship contribution statement

Mubarokah: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing – original draft. **Briliani Raras Sakapuspa**: Methodology, Validation, Formal analysis, Writing – review & editing. **Aulia Nurul Hikmah**: Investigation, Data curation, Visualization, Writing – review & editing. **Putra Astaman**: Supervision, Validation, Project administration, Writing – review & editing.

Declaration of Competing Interest

The authors of this manuscript declare no conflict of interest in this field.

Declaration of Use of AI in the Writing Process

During the preparation of this manuscript, the authors used DeepSeek as generative AI tools to assist with language refinement, grammar checking, and improving the clarity of several sentences. The authors reviewed, edited, and verified all AI-assisted outputs and take full responsibility for the content of the manuscript.

Acknowledgement

We would like to thank the farmer groups, MSME actors, and local government representatives who participated in and assisted with field data collection. The authors also acknowledge all parties who provided information and support during the research process.

References

[1] Rifa'i A. Economy-wide impacts of palm oil downstream in North Sumatra: A CGE approach. World Development Perspectives 2025;39:100706. https://doi.org/https://doi.org/10.1016/j.wdp.2025.100706. https://www.sciencedirect.com/science/article/pii/S2452292925000517

[2] Marit EL. Kopi Papua: Strategi Pemberdayaan Orang Asli Papua Dalam Industri Kreatif Di Era Otsus Papua. E-Mabis: Jurnal Ekonomi Manajemen Dan Bisnis 2019;20:121–30. https://doi.org/10.29103/e-mabis.v20i2.289. https://journal.unimal.ac.id/emabis/article/view/289

[3] BPS BPS. Statistik Kopi Indonesia 2022. 2022. https://www.bps.go.id/id/publication/2023/11/30/abde293e6c0fc5d45aaa9fe8/statistik-kopi-indonesia-2022.html

[4] Direktorat PJ. Statistik Perkebunan Unggulan Nasional. Sekretariat Dirjend Perkebunan Kementerian Pertanian 2023:1–23. https://ditjenbun.pertanian.go.id/?publikasi=buku-statistik-perkebunan-2021-2023

[5] Bidin A. Coffee Report and Outlook. International Coffee Organization ICO 2023;1:1–39. https://www.inter-reseaux.org/wp-content/uploads/Coffee_Report_and_Outlook_April_2023_-_ICO.pdf

[6] Aulia MR, Darmansyah D, Tanjung YW, Safrika S, Nugroho Y, Nasution A, et al. Pendampingan Pelaku Usaha Tani Dalam Peningkatan Potensi Hilirisasi Kopi Robusta Kabupaten Aceh Barat. EJOIN : Jurnal Pengabdian Masyarakat 2023;1:1241–5. https://doi.org/10.55681/ejoin.v2i10.1707. https://ejournal.nusantaraglobal.ac.id/index.php/ejoin/article/view/1707

[7] Wibowo A. Potensi dan tantangan kopi di era milenial. War Pus Penelit Kopi Kakao Indones. Warta Pusat Peneliti Kopi Kakao Indonesia 2019;31:16–23. https://www.researchgate.net/profile/Ari-Wibowo-7/publication/343416562_Potensi_dan_Tantangan_Kopi_di_Era_Milenial/links/5f291871458515b729007f1a/Potensi-dan-Tantangan-Kopi-di-Era-Milenial.pdf

[8] Heriana, Sukainah A, Wijaya M. Pengaruh Suhu dan Waktu Penyangraian Terhadap Kadar Kafein dan Mutu Sensori Kopi Liberika (Coffea liberica) Bantaeng. PATANI (Pengembangan Teknologi Pertanian Dan Informatika)) 2023;6:1–10. https://doi.org/10.47767/patani.v6i1.442. https://ojs.poltesa.ac.id/index.php/patani/article/view/442

[9] Perdana AC, Rahayu S. Analisis Efisiensi Kinerja Agroindustri Kopi di Kota Sungai Penuh, Provinsi Jambi, Indonesia. Agro Bali : Agricultural Journal 2022;5:322–30. https://doi.org/10.37637/ab.v5i2.941.

[10] Reswita. Pendapatan dan Nilai Tambah Usaha Kopi Bubuk Rebusta di Kabupaten Lebong (Studi Kasus Pada Usaha Kopi Bubuk Cap Padi). Agrisep 2016;15:255–61. https://www.neliti.com/publications/74797/pendapatan-dan-nilai-tambah-usaha-kopi-bubuk-robusta-di-kabupaten-lebong

[11] Rahmalia D, Zakaria WA, Rufaidah E. Analisis Nilai Tambah Kopi Bubuk Tjap Tugu Liwa (Studi Kasus Pada Agroindustri Tjap Tugu Liwa di Kecamatan Balik Bukit Kabupaten Lampung Barat). Jurnal Ilmiah Mahasiswa Agroinfo Galuh 2023;10:304. https://doi.org/10.25157/jimag.v10i1.8908. https://jurnal.unigal.ac.id/index.php/agroinfogaluh/article/view/8908

[12] Zuliani IF, Safwandi Z. Strategi Pengembangan Umkm Dan Koperasi Dalam Meningkatkan Komunitas Ekspor Kopi Arabica Di Kabupaten Aceh Tengah. At-Tasyri': Jurnal Ilmiah Prodi Muamalah 2023;14:153–64. https://doi.org/10.47498/tasyri.v14i2.1281. https://ejournal.staindirundeng.ac.id/index.php/Tasyri/article/view/1281

[13] Hayami Y, Kawagoe T, Morooka Y, Siregar M. Agricultural Marketing and Processing in Upland Java A Perspective From A Sunda Village. 1987. https://repository.unescap.org/handle/20.500.12870/4023

[14] Epaga P, Baihaqi A, Susanti E. Analisis Nilai Tambah Agroindustri Pengolahan Kopi Arabika Ekspor Di Kabupaten Aceh Tengah (Studi Kasus Pada Ksu Sara Ate). Jurnal Agribisnis Dan Sosial Ekonomi Pertanian UNPAD 2021;4:602–11. https://www.academia.edu/42048119/analisis_nilai_tambah_agroindustri_pengolahan_kopi_arabika_ekspor_di_kabupaten_aceh_tengah_studi_kasus_pada_ksu_sara_ate_

[15] Rizan M, Sumastuti E, Dkk. Bisnis Modal Canvas Membangun Rencana Bisnis Yang Inovatif. Correspondencias & Análisis 2023:1–23. https://repository.penerbitwidina.com/publications/563948/bisnis-model-canvas-membangun-rencana-bisnis-yang-inovatif

[16] Adong A, Ambler K, Bloem JR, de Brauw A, Herskowitz S, Islam AHMS, et al. The unmet financial needs of intermediary firms within agri-food value chains in Uganda and Bangladesh. Food Policy 2025;132. https://doi.org/10.1016/j.foodpol.2025.102838. https://www.scopus.com/inward/record.uri?eid=2-s2.0-105000375190&doi=10.1016%2Fj.foodpol.2025.102838&partnerID=40&md5=3289e0955eea160ea9f5b4631b9489c4

[17] Viana GS, Santana DB, Pereira LDA, Tieghi H, da Silva VF, Ayer JEB, et al. Association between higher coffee quality, bioactive chemical profile and sustainable practices. Front Agron 2025;7. https://doi.org/10.3389/fagro.2025.1645329 https://www.scopus.com/inward/record.uri?eid=2-s2.0-105017062385&doi=10.3389%2Ffagro.2025.1645329&partnerID=40&md5=bf1a695e622fa24399d56cb7a4ef0c0a

[18] Bettaieb I, Idoudi S, Ali Benabderrahim MA, Nagaz K, Smaoui S, Walid W. A novel coffee blend: enhancing phenolic profile and antioxidant capacity of date seed coffee with freeze–drying impact. Euro-Mediterranean J Environ Integr 2025. https://www.scopus.com/inward/record.uri?eid=2-s2.0-105016734041&doi=10.1007%2Fs41207-025-00946-4&partnerID=40&md5=becf992b35438313007c7f055e76fb26

[19] Adeel S, Rehman F-U, Amin A, Amin N, Batool F, Hassan A, et al. Sustainable exploration of coffee extracts (coffea arabica l.) for dyeing of microwave-treated bio-mordanted cotton fabric. Pigment Resin Technol 2023;52:331–40. https://doi.org/10.1108/PRT-02-2022-0024 https://www.scopus.com/inward/record.uri?eid=2-s2.0-85132915435&doi=10.1108%2FPRT-02-2022-0024&partnerID=40&md5=dd72cf41fb3bb083f1128a181a144205

[20] Suryana D, Tridakusumah AC, Charina A. Evaluation of Business Feasibility and Impact of Local Innovation on Improving Coffee Quality in Garut Regency Production Center. Agric 2024;36:191–212. https://doi.org/10.24246/agric.2024.v36.i2.p191-212.

[21] Pratama IPA, Dewi RK, Artini NP. Mapping the Consumers Coffee Powder Mangsi Coffee Based on. Jurnal Sosial Ekonomi Dan Kebijakan Pertanian 2021;5:102–9. https://ejournal2.undip.ac.id/index.php/agrisocionomics/article/view/8378

[22] Fathira NH, Fitriani N, Fathimah MZ, Khasanah Z, Farhan EA, Sitepu RKK. Analisis Persepsi Dan Preferensi Konsumen Terhadap Permintaan Kopi Arabika Di Kota Bogor. JMD : Jurnal Riset Manajemen & Bisnis Dewantara 2025;8:11–8. https://doi.org/10.26533/jmd.v8i1.1342. https://ejournal.stiedewantara.ac.id/index.php/JMD/article/download/1342/651

[23] Doktri WI. Segmentasi dan Strategi Pemasaran Kopi Java Ijen Raung Bondowoso 2018;8:1–12. http://jurnal.unmuhjember.ac.id/index.php/SMBI/article/view/1763

[24] Basda MI, Hasan I, Rasyid R. Strategi Pengembangan Usaha Kopi Bubuk. Wiratani: Jurnal Ilmiah Agribisnis 2022;5:164. https://doi.org/10.33096/wiratani.v5i2.99. http://103.133.36.87/index.php/wiratani/article/view/99

[25] Susanto RI. Personal Branding Konten Kreator @pandawaragroup Melalui Media Sosial Instagram. Jurnal Audiens 2024;5:270–89. https://doi.org/10.18196/jas.v5i2.362. https://journalaudiens.umy.ac.id/index.php/ja/article/view/362

[26] Wijayanti SW, Ekoresti SN, Rubyasih A, Komarudin M, Munawar W. Peningkatan Promosi Usaha Kopi BUMDes Jaya Laksana Melalui Pemanfaatan Media Sosial. ALMUJTAMAE: Jurnal Pengabdian Masyarakat 2022;2:119–25. https://doi.org/10.30997/almujtamae.v2i2.6531.

[27] Wijayanti F, Desnilasari D, Sholichah E, Karim MA. Producing Cascara, A Way to Increase Value Added of Arabica Coffee. In: AIP Conference Proceedings 2024. https://doi.org/10.1063/5.0185594 https://www.scopus.com/inward/record.uri?eid=2-s2.0-85185772522&doi=10.1063%2F5.0185594&partnerID=40&md5=7adee738d95dcc03cb2cc66446fc1dfd

[28] Pillaca-Pullo OS, Lopes AM, Rodriguez-Portilla LMI, Estela-Escalante W. Optimizing medium composition with wastewater from Coffea arabica processing to produce single-cell protein using Candida sorboxylosa. J Chem Technol Biotechnol 2023;98:106–16. https://doi.org/10.1002/jctb.7219. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85138050293&doi=10.1002%2Fjctb.7219&partnerID=40&md5=435ff4a6d13771c51c63802b62f733dc

[29] Martunis, Zakaria S, Sulaiman MI, Munawar AA. Optimization of coffee vinegar production from cherry Pulp as by product of arabica coffee processing. In: IOP Conference Series: Earth and Environmental Science 2024. https://doi.org/10.1088/1755-1315/1356/1/012038. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85198382904&doi=10.1088%2F1755-1315%2F1356%2F1%2F012038&partnerID=40&md5=39f82ba10ae4e57d90790bd585c99161

[30] Machado DB, Oliveira RA. Functional And Technological Properties Of Coffee Mucilage (Coffea arabica) And Its Application In Edible Films. Quim Nova 2023;46:778–84. https://doi.org/10.21577/0100-4042.20230052. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85170836527&doi=10.21577%2F0100-4042.20230052&partnerID=40&md5=c0f19a7f363c222d81c2f096e1971eb3

[31] Firdaus AM, Hadiyanto. Efektivitas Instagram Sebagai Media Promosi Produk Olahan Pertanian Kopi Di Rumah Kopi Sunda Hejo. Jurnal Sains Komunikasi Dan Pengembangan Masyarakat [JSKPM] 2022;5:895–907. https://doi.org/10.29244/jskpm.v5i06..924. https://ejournal-skpm.ipb.ac.id/index.php/jskpm/article/view/924

[32] Then J, Brian R, Theodora M. S. Optimalisasi dan Peningkatan Penggunaan Media Sosial Instagram sebagai Media Promosi Jum's Coffee. Jurnal Bangun Abdimas 2022;1:51–9. https://doi.org/10.56854/ba.v1i2.88. http://ejurnal.bangunharapanbangsa.com/index.php/abdimas/article/view/88

[33] Fadhilah F, Satyanegara D, Pertiwi WNB. Optimalisasi Strategi Pemasaran Melalui Media Sosial bagi UMKM Kopi Dadaman Desa Citaman Banten. Jurnal Pemberdayaan Masyarakat Universitas Al Azhar Indonesia 2023;6:13. https://doi.org/10.36722/jpm.v6i1.2268. https://jurnal.uai.ac.id/index.php/JPM/article/view/2268

[34] Widjaya E, Srikandi P, Yulianto KE. Pengaruh Diskon Terhadap Minat Beli Serta Dampaknya Pada Keputusan Pembelian. Jurnal Administrasi Bisnis 2016;38:184–93. https://media.neliti.com/media/publications/87381-ID-pengaruh-diskon-terhadap-minat-beli-sert.pdf

[35] Sofia S, Pala'biran J, Wijiastuti RD, Jamil A. Pengaruh Keunikan Produk dan Potongan Harga terhadap Keputusan Pembelian Coffee. Lensa Ilmiah: Jurnal Manajemen Dan Sumberdaya 2024;3:1–8. https://doi.org/10.54371/jms.v3i1.300. http://www.journal.ainarapress.org/index.php/lms/article/view/300

[36] Simamora S, Silalahi M, Nainggolan NT, Candra V. Pengaruh Harga Dan Customer Relationship Marketing Terhadap Keputusan Pembelian Konsumen Pada Ud Sentral Jaya Pematangsiantar. SULTANIST: Jurnal Manajemen Dan Keuangan 2019;7:62–72. https://doi.org/10.37403/sultanist.v7i2.154. http://repository.stiesultanagung.ac.id/id/eprint/694/1/jurnal%20sultanis%2C%20juni%202019.pdf

[37] Simange C, Tawas HN, Roring F. Analisis Pengaruh Potongan Harga, Citra Merek, Dan Kepercayaan Pelanggan Terhadap Keputusan Pembelian Di Alfamidi Kec. Tobelo Tengah. Jurnal EMBA : Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi 2023;11:761–71. https://doi.org/10.35794/emba.v11i3.50226. https://ejournal.unsrat.ac.id/index.php/emba/article/view/50226

[38] Damat D, Setyobudi RH, Anwar S, Wedyan MA, Vincevica-Gaile Z, Nugroho YA, et al. Coffee Pulp Characterization and Utilization in Coffee Cherry Flour for Circular Economy Improvement. Sarhad J Agric 2023;39:71–83. https://doi.org/10.17582/JOURNAL.SJA/2023/39/S1.71.83. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85205931233&doi=10.17582%2FJOURNAL.SJA%2F2023%2F39%2FS1.71.83&partnerID=40&md5=2e7c4f8239c0e2808b3afb674e9ecf76

[39] Maiyah N, Kerdpiboon S, Supapvanich S, Kerr WL, Sriprom P, Chotigavin N, et al. Recovering bioactive compounds and antioxidant capacity of medium roasted spent coffee grounds through varied hydrothermal brewing cycles. J Agric Food Res 2025;20. https://doi.org/10.1016/j.jafr.2025.101789. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85219731576&doi=10.1016%2Fj.jafr.2025.101789&partnerID=40&md5=15838078bb3e8ad2a73a155b074fad19

[40] Mendes GDA, Oliveira MALD, Rodarte MP, Anjos VDCD, Bell MJ V. Determination of Arabica and Robusta species in blends of roasted coffee by Mid Infrared spectroscopy in association with mixture design. Food Chem Adv 2024;4. https://doi.org/10.1016/j.focha.2023.100592. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85183914983&doi=10.1016%2Fj.focha.2023.100592&partnerID=40&md5=a8472b27aace056a60de3c1f1e4d0cea

[41] Montis A, Paredes-Orejudo V, Bourez A, Steed J, Stoffelen P, Delporte C, et al. Comparison between ZenoTOF 7600 system and QTOF for plant metabolome: an example of metabolomics applied to coffee leaves. Metabolomics. 2025;21. https://doi.org/10.1007/s11306-024-02211-1. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85216440237&doi=10.1007%2Fs11306-024-02211-1&partnerID=40&md5=fa974eeb485102022eb1951aed4bb5f7

[42] Bastara Z. D, Soetriono S, Hapsari TD. Strategi Pengembangan Agroindustri Kopi Bubuk Arabika Pada Berbagai Skala Usaha Di Kabupaten Situbondo. Agritrop : Jurnal Ilmu-Ilmu Pertanian (Journal of Agricultural Science) 2017;14:186–91. https://doi.org/10.32528/agr.v14i2.432. https://www.neliti.com/publications/273695/strategi-pengembangan-agroindustri-kopi-bubuk-arabika-pada-berbagai-skala-usaha

[43] Syabena MF, Yonariza, Nofialdi. Strategi Pengembangan Usaha Agroindustri Kopi Bubuk Di Nagari Koto Tuo Kecamatan Sungai Tarab Kabupaten Tanah Datar Business Development Strategy of Ground Coffee Agroindustry in Nagari Koto Tuo, Sungai Tarab District, Tanah Datar Regency. Jurnal Agri Sains 2023;7:163–74. https://ojs.umb-bungo.ac.id/index.php/JAS/article/view/1215/0

[44] Marks D. Common challenges of smallholders in ASEAN: Lacking access to land, water, market, and state. Advances in Global Change Research 2019;64:253–81. https://doi.org/10.1007/978-3-319-90400-9_15. https://link.springer.com/chapter/10.1007/978-3-319-90400-9_15

[45] Laoli HYK, Mendrofa Y, Zai KS, Zalukhu Y. Pengaruh Citra Merek Dan Desain Kemasan Terhadap Keputusan Pembelian Konsumen Pada Produk Rifi Gamumu Di CV. Wery Group Kota Gunungsitoli. Jurnal Ekonomi Bisnis, Manajemen Dan Akuntansi (JEBMA) 2024;4:1452–9. https://doi.org/10.47709/jebma.v4i3.4710. https://itscience-indexing.com/jurnal/index.php/jebma/article/view/4710

[46] Sayekti MD, Dwiridotjahjono J. Pengaruh Brand Image dan Kualitas Produk terhadap Loyalitas melalui Kepuasan Konsumen sebagai Variabel Intervening. Al-Kharaj : Jurnal Ekonomi, Keuangan & Bisnis Syariah 2022;5:2511–24. https://doi.org/10.47467/alkharaj.v5i6.2430. https://journal.laaroiba.com/index.php/alkharaj/article/view/2430

[47] Noor ZZ. Product Quality, Brand Image, and Product Taste on Customer Trust at Arabica Coffee in Bandung. Dinasti International Journal of Education Management And Social Science 2024;5:2565–71. https://doi.org/10.38035/dijemss.v5i6.3377.

[48] Putra DFR, Khusniyah, Mardatilla I. Pengaruh Kualitas Produk dan Citra Merek terhadap Keputusan Pembelian (Studi Kasus: Kedai Kopi Kaliombo). Manajemen Agribisnis:Jurnal Agribisnis 2024;24:115–9. https://ejournal.uniska-kediri.ac.id/index.php/agribisnis/article/view/5431

[49] Andriyani W. Influence of product quality and brand image on purchasing decisions for ABC Ground coffee products in South Tangerang. Digital Business: Tren Bisnis Masa Depan 2023;14:67–74. https://doi.org/10.59651/digital.v14i2.109. https://ejournal.cria.or.id/index.php/db/article/view/109

[50] Supiyatun, Djunaedi, Nur L. Pengaruh Green Brand Innovation Dan Green Satisfaction Terhadap Loyalitas Pelanggan Melalui Kualitas Layanan (Studi Kasus: Coffee Shop Area Malang, Jawa Timur). COSTING: Journal of Economic, Business and Accounting 2022;6:1102–15. https://journal.ipm2kpe.or.id/index.php/COSTING/article/download/13175/8302/119151

[51] Ebrahim A, Alhudiri A, Elanizi A, Eltaiash A. The Impact of Product Quality on Customer Satisfaction and Loyalty 2024. https://doi.org/10.13140/RG.2.2.33657.07528. https://hss.limu.edu.ly/wp-content/uploads/sites/39/2024/10/The-Impact-of-Product-Quality-on-Customer-Satisfaction-and-Loyalty.pdf

[52] Setiawan K, Tiri JTK, Vertygo S. The value chain of Timor-origin Arabica coffee in South Central Timor district. Food Res 2025;9:364–8. https://doi.org/10.26656/fr.2017.9(3).094. https://www.scopus.com/inward/record.uri?eid=2-s2.0-105010225848&doi=10.26656%2Ffr.2017.9%283%29.094&partnerID=40&md5=f041e2def2c49c9b4f01f12c60a7a1bf

[53] Oka WSAG, Apriyani BL, Ajeng K. Analisis Kelayakan Pada Agroindustri Kopi Bubuk Di Desa Nogosari Kecamatan Rambipuji Kabupaten Jember Feasibility Analysis of Powder

Coffee Agroindustry in Village Nogosari Kecamatan Rambipuji Jember District. Jurnal Ekonomi Pertanian Dan Agribisnis (JEPA) 2021;5:414–32. https://jepa.ub.ac.id/index.php/jepa/article/view/649

[54] Purkuncoro AE, Santoso EB, Sinaga EJ, Sari SA, Nurcahyo E. Implementasi Teknologi Tepat Guna Mesin Roasting Upaya Peningkatan Produk UMKM Kopi di Malang. Jurnal Pengbadian Masyarakat Ilmu Terapan (JPMIT) 2024;6:165–71. https://doi.org/10.33772/jpmit.v6i2.42. https://jpmit.uho.ac.id/index.php/journal/article/view/42

[55] Fiveriati A, Amalia FR, Bachtiar RR. Teknologi Rotary Dryer Coffe guna Meningkatkan Produktivitas Kopi Gombengsari sebagai Produk Unggulan Central Perkebunan Masyarakat Kabupaten Banyuwangi. E-Dimas: Jurnal Pengabdian Kepada Masyarakat 2020;11:316–22. https://doi.org/10.26877/e-dimas.v11i3.4656.

[56] Irfandi N, Halim EH, Wijayanto G. The Impact of Market Orientation, Product Innovation, and Competitive Advantage on the Marketing Performance of Culinary Enterprises. Golden Ratio of Marketing and Applied Psychology of Business 2024;5:66–81. https://doi.org/10.52970/grmapb.v5i1.784. https://goldenratio.id/index.php/grmapb/article/view/784

[57] Sangta J, Ruksiriwanich W, Chittasupho C, Sringarm K, Rachtanapun P, Bakshani C, et al. Utilization of the sugar fraction from Arabica coffee pulp as a carbon source for bacteria producing cellulose and cytotoxicity with human keratinocyte. Prep Biochem Biotechnol 2024;54:587–96. https://doi.org/10.1080/10826068.2023.2258195. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85172806902&doi=10.1080%2F10826068.2023.2258195&partnerID=40&md5=a6677cc0132220d089051035fb677274

[58] Nurubay BN, Abdul Haiyee Z, Abdul Salam NAA. Cellulase and protease assisted sugar germination on quality improvement of Robusta coffee in comparison to Arabica coffee. Food Res 2024;8. https://doi.org/10.26656/fr.2017.8(S8).28. https://www.scopus.com/inward/record.uri?eid=2-s2.0-105002233482&doi=10.26656%2Ffr.2017.8%28S8%29.28&partnerID=40&md5=48a079343afbbffb6ae6ebf09ae2cb78

[59] Borém FM, Salvio LGA, Corrêa JLG, Alves APC, Dos Santos CM, Haeberlin L, et al. Influence of Fermentation Time and Inoculation of Starter Culture on the Chemical Composition of Fermented Natural Coffee Followed by Depulping. An Acad Bras Cienc 2024;96. https://doi.org/10.1590/0001-3765202420240083. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85204075268&doi=10.1590%2F0001-3765202420240083&partnerID=40&md5=6dafa32fc2a3ec6333706cbc2c8bde62

[60] Sales AL, Cunha SC, Morgado J, Cruz A, Santos TF, Ferreira IMPLVO, et al. Volatile, Microbial, and Sensory Profiles and Consumer Acceptance of Coffee Cascara Kombuchas. Foods 2023;12. https://doi.org/10.3390/foods12142710. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85166351619&doi=10.3390%2Ffoods12142710&partnerID=40&md5=ab0adccb96fa11b940cd1fdf0dfebbe4

[61] Puryantoro. Analisis Nilai Tambah Pengolahan Kopi Arabika di Kelompok Tani Sejahtera Kabupaten Situbondo 2021:1–6. https://repository.unars.ac.id/id/eprint/222/

[62] Wiryaningsih RC, Haryono D, Marlina L. Nilai Tambah Dan Strategi Pengembangan Produk Pada Agrondustri Kopi Bubuk Cap Gunung Di Kabupaten Way Kanan. Jurnal Ilmu Ilmu Agribisnis 2021;9:62–9. https://doi.org/10.23960/jiia.v9i4.5400