

# SWOT Analysis of The Wulan Coffee Agroindustry Based on Geographic Indications

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## ABSTRACT

Wulan Coffee Agroindustry is among the coffee-producing centers in Maesan Sub-district, Tanah Wulan Village. This Sub-district is included in the area to apply for certification by the Geographical Indication Protection Society (GIPS) for Hyang Argopuro Arabica Coffee products. Therefore, this research aimed to formulate a strategic recommendation for developing the Wulan Coffee Agroindustry in dealing with GI certification using the SWOT method. The study included identifying internal and external factors, weighting, and strategy analysis using the SWOT method. The results showed that the total score of the IFAS matrix was 1.178 while the EFAS matrix was 0.070, indicating the IE matrix's position was in the first quadrant of the aggressive strategy. In quadrant I, an aggressive strategy could maximize the strength possessed by Wulan Coffee Agroindustry to deal with existing threats. The aggressive strategy consisted of implementing and maintaining SOP related to sustainable coffee cultivation and production methods, increasing promotional efforts, and branding of monthly coffee products based on GI. This strategy also included certification efforts for export product development, and improvement of coffee agrotourism clusters comprising several stakeholders such as village, sub-district, and the local government of Bondowoso Regency.

**Keywords:** Geographic indications; SWOT analysis; Wulan coffee agroindustry

## INTRODUCTION

Bondowoso Regency is among the coffee-producing areas in Indonesia, located in the Hyang Argopuro mountain range and the Ijen Plateau, with varying highlands and undulating geographical conditions. Based on data from the Directorate General of Plantations (2017), in 2017, this regency became the

largest coffee-producing area in East Java Province, with a Community Plantation production of 8,670 tons. According to standard recommendations, the growing requirements for robusta and arabica coffee plants are between 400 m and 1300 m above sea level (Puspasari and Koswara, 2016). The suitable geographical conditions, climate, and weather can support the development of coffee plantation areas.

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According to Yusuf and Hadi, (2019), the protection of geographical indication (GI) is important for regional development and the economy. Therefore, the Official Gazette of Geographical Indications No. 4 of 2020 announced the submission of GI certification by the Geographical Indication Protection Society (GIPS) of Hyang Argopuro Arabica Coffee, Bondowoso Regency (Directorate General of Brands and Geographical Indications, 2020). The certification submitted included several GI areas, namely Pakem, Maesan, Curahdami, Binakal, and Grujungan Sub-districts. Maesan Sub-district has a coffee center in Tanah Wulan Village, including a farming institution, namely the "Sinar Tani" 01B Farmer Group. Several coffee farmers who are members of the group also belong to the Wulan Coffee Agroindustry with the Village Innovation Development Team. The duties of this institution include post-harvest processing or coffee production, as well as using coffee skin and leaf waste to make brewed tea drinks.

Wulan Coffee Agroindustry may can increase the added value of coffee by developing product variations and improving quality. This effort needs to be carried out to face the GI certification application process, although the sustainability of the program is influenced by the coffee production process and institutions (Lukito et al., 2018; Subekti et al., 2019; Sumbekti et al., 2029). Wulan Coffee Agroindustry has maintained good production management, producing several diversifications, such as ground and roasted coffee (Novita et al., 2020). However, this agroindustry does not have the institutional requirements ready to face GI certification.

Based on the description, there is a need to conduct research related to the competitive position of the product and business development of the Wulan Coffee Agroindustry towards GI certification. The use of Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis is intended to identify the required conditions based on internal factors (strengths, weaknesses) and external (opportunities, threats), which is also called situational analysis (Subaktilah, 2018). The identification process includes environmental conditions at a micro and macro level. Therefore, this research aimed to compile recommendations for strategies for developing the Wulan Coffee Agroindustry in facing GI certification using the SWOT method. The results are expected to provide data and information to coffee farmers, business actors, practitioners, and the government engaged in coffee development, particularly within the scope of the GI area. The SWOT analysis obtained was to determine the current position of the Wulan Coffee Agroindustry and strategies for development.

## **METHODS**

This research used a descriptive and qualitative method. Primary and secondary data collection were collected through observation, interviews, and documentation (Sugiyono, 2008; Prasanti, 2018). The data used were the results of observations, interviews, questionnaires, institution report data information, journals, or related research. Data collection applied questionnaires and determining respondents using purposive sampling methods including representatives of the Bondowoso Regency Agriculture Office, the Indonesian Coffee and Cocoa Research Center, the Maesan Sub-district Geographical Indication Team, and members of the Sinar Tani 01B Farmer Group in Tanah Wulan Village or Wulan Coffee Agroindustry business actors. Characteristics were based on understanding the importance and knowledge of the agroindustry conditions. The criteria were determined due to the increasing spread of COVID-19 during the research, which limited meeting activities with several parties.

The research stages started with a preliminary analysis of the literature and survey, followed by compilation of the internal and external factors on a questionnaire sheet. The preliminary research was conducted to obtain information regarding the problems faced and the environment's influence on the development of the Wulan Coffee Agroindustry business. After compiling the identification of factors, a questionnaire was filled out with selected respondents, which was performed comprehensively on various aspects of internal and external environmental factors. At this stage, the capabilities of each respondent were not considered in the assessment process, including the compilation of statistical reviews using simple correlations and testing the validity/reliability of the research questionnaire instrument. Respondents consisted of 20 people, namely the Head and the Secretary of the Farmer Group, 15 Members of the Farmer Group, the Acting Head of the Indonesian Coffee and Cocoa Research Center, Lecturers at the University of Jember, and the Acting Head of the Agriculture and Food Security Office of Bondowoso Regency. According to Suparto (2014), a validity or reliability test should be conducted to determine the accuracy of a tool to perform measuring functions. Based on the rules, validity is the level of an instrument that estimates what should be measured (Sumanto, 2014).

The results of primary data collection were internal factors (strength and weakness variables) and external factors (opportunity and threat variables). Internal factors were identified as those variables controlled

by the Wulan Coffee Agroindustry, while external could not be controlled or performed. Identification of environmental factors included farming conditions from upstream to downstream, such as environmental conditions, cultivation, production, and marketing, an organizational or business institution. In the secondary data result, the calculation of weights and scores on internal and external factors was presented using the internal factor analysis summary (IFAS) and external factor analysis summary (EFAS) matrices. The data were used for the preparation of the SWOT analysis diagram and strategic recommendations for the development of the Wulan Coffee Agroindustry facing GI certification.

**Materials**

In this research, the tools used were a laptop (HP Pavilion x360 convertible PC I3-u174TU, Hewlett-Packard Company) with Microsoft Office Visio, Microsoft Office Excel and Microsoft Office Word were used for data processing and visualization. A cellphone camera was used for data collection. The materials used were the profile of the land conditions of the Tanah Wulan Village Coffee Plantation and the Wulan Coffee Agroindustry, data on the area of Tanah Wulan Village obtained from the Central Agency of Statistics of Bondowoso Regency (2021). Several government policies, such as work plans or regional government development, could affect the condition of the agroindustry as supporting data for the description of factor identification, as shown in Table 1.

The data was used considering the possible relationship with the internal and external factors of preparing the research questionnaire instrument. This served as the basis for preparing supporting descriptions of the geographical and environmental conditions of the Tanah Wulan Village coffee plantation and the Wulan Coffee Agroindustry in facing GI certification. Data processing and analysis were carried out to compile strategic recommendations using the SWOT method.

**Analysis Method**

The analysis used was IFAS and EFAS, which systematically identified various factors to maximize strengths and opportunities as well as minimize weaknesses and threats. The stages of IFAS and EFAS analysis were used to obtain values as intersection points on the SWOT matrix diagram (Rangkuti, 2001; Yuwanti et al., 2018). The SWOT analysis stages consisted of identifying internal and external factors, calculating weights, ratings, and total scores, assigning scores to the IE matrix (internal-external), determining positions on the SWOT diagram based on quadrants I, II, III, or IV, and formulating strategies on the SWOT matrix (Rangkuti, 2001; Yuwanti et al., 2018). The SWOT matrix was a decision-making formulation tool to determine the strategy taken based on logic to maximize strengths and opportunities while minimizing the institution’s weaknesses and threats (Setyorini et al., 2016; Utsalina and Primandani, 2020).

Table 1. Primary and secondary data

Primary data	Secondary data*
1. Research location point	1. DEMNAS data (geospatial digital data from Geospatial Information Agency of Indonesia) for Tanah Wulan Village
2. Description and data on the condition of Tanah Wulan Village	2. Rainfall data for Bedadung and Sampean watersheds 1999-2018
3. Description and data on the condition of Wulan Coffee Agroindustry	3. Temperature data for Banyuwangi Regency 1999-2018
4. Results of the condition assessment on the questionnaire by respondents	4. Topographic Map of Indonesia (RBI) 2014 for land use mapping
	5. Soil type data for Tanah Wulan Village
	6. Minutes of Application for Registration of GI certification by Arabica Coffee Hyang Argopuro Bondowoso Regency GIPS
	7. Statistical Data for Maesan Sub-district 2018
	8. Statistical Data for Bondowoso Regency 2020

Note: \*Data source from the Central Agency of Statistics, Bondowoso (2021)

## RESULTS AND DISCUSSION

### Wulan Coffee Agroindustry Profile

According to the Central Agency of Statistics of Bondowoso Regency (2021), in 2019, the area of Tanah Wulan Village was 2,047.11 km<sup>2</sup> (ha). The geographical location of the Tanah Wulan Village coffee plantation is on the slopes of the Hyang Argopuro Mountains. Based on this location, an analysis of the area was carried out on Arcgis of 2047.111 ha, while the area of the coffee plantation was 981.99 ha. The coffee plantation land is between 113°70'63.90"-113°73'59.24" East Longitude and 7°99'64.87"-8°01'99.31" South Latitude, as shown in Figure 1. The coffee plantation land of Tanah Wulan Village is managed by the Forestry and Plantation Office or Perum Perhutani along with coffee farmers, including Sinar Tani 01B Farmer Group. The cultivation results are used as raw materials for producing Arabica and Robusta coffee at the Wulan Coffee Agroindustry.

The role of socio-cultural and physical land factors influenced farmers' decision-making regarding

the formation of land use patterns. This was because an area's land use pattern could describe its socio-economic life, serving as an indicator of using natural resource potential, as shown in Table 2.

Table 2 shows that the dominant coffee plantation areas are forests (46.4%) and shrubs (41.67%). Identification of CP as a factor in plant management and soil conservation measures was used to show vegetation conditions in land cover. The use of forest land with a low CP value was because forest land cover had a high canopy and density as well as strong roots to withstand very large rainfall. This land use process, in addition to producing benefits that could be enjoyed, was inseparable from the risk of land damage due to erosion, landslides, environmental pollution, flooding, and others (Salem et al., 2016). Therefore, prevention could be made by improving land use patterns as well as conducting soil and water conservation efforts (Banjarnahor et al., 2018).

Regarding GI, production results were interrelated with the quality of coffee beans (Istiawan and Kastono, 2019). In coffee plantations in Tanah Wulan Village, it was known through DEM analysis that the slope gradient was 0-18%, and there was no steep slope of more than 30%, as shown in Table 3. The slope gradient was significantly related to crop yields, such as fruit weight and number of fruits. Therefore, this could be a loss for farmers when coffee beans had a high water content, leading to weight loss. Efforts that could be applied to increase the quantity and quality of production included pruning unproductive branches and making terraces on sloping land. These efforts were intended to shorten the slope and maintain water moisture in the soil, thereby increasing infiltration and reducing erosion risk.

One of the Sinar Tani 01B Farmer Groups in Tanah Wulan Village was established in 1994 and houses 40 coffee farmers. The Sinar Tani 01B Farmer Group was the starting point, which became the location of the Wulan Coffee Agroindustry in Barat Gunung Hamlet, Tanah Wulan Village.

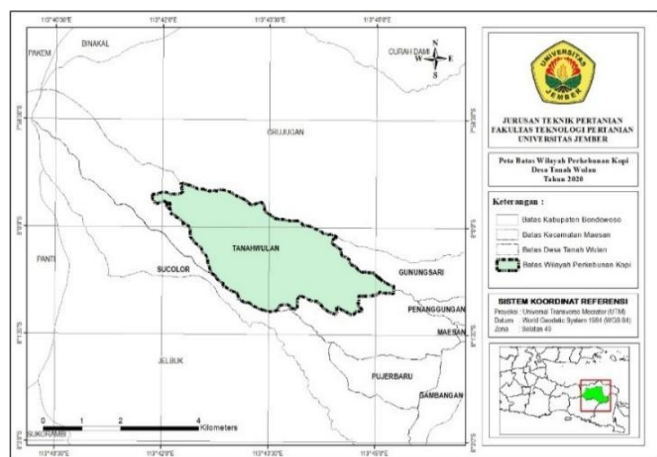


Figure 1. Administrative boundary map of Tanah Wulan Village coffee plantation area

Table 2. Land use for Tanah Wulan Village coffee plantation areas

Land Use	Area (ha)	Area (%)	Conservation Practices Factors (CP)
Forest Area	455.64	46.4	0.001
Moor/ Field	18.65	1.89	0.28
Plantation	96.72	9.85	0.3
Settlement	0.000058	0.000006	1
Rainfed Rice Fields	0.98	0.1	0.05
Shrubs	409.19	41.67	0.1

Table 3. Characteristics of the geographically indicated coffee plantation environment

Environmental elements		Characteristics of plantation land	
		Arabica coffee	Robusta coffee
Topography	Elevation	700 – 1600 masl	500 – 700 masl
	Slope	0 – 18%	
Climate and weather	Temperature	17 – 24 °C	18 – 28 °C
	Rainfall	1,594 - 1,997 mm/year	
	Wet month	4 - 6 months/year	
	Dry month	1 - 4 months/year	
Soil	Soil type	1. Association of yellowish brown andosol and yellowish brown regosol	Reddish brown latosol
		2. Reddish brown latosol	

Based on the interview results, the founder of Wulan Coffee Agroindustry expected that coffee commodity farming in Tanah Wulan Village would benefit the surrounding community. This agroindustry would continue to increase productivity and quality, thereby expanding the marketing network. Arabica and robusta coffee products produced include green coffee beans, roasted, ground, ready-to-brew coffee mix (coffee blend), coffee skin tea (cascara), and leaf tea (konoha) (Novita et al., 2020). Based on the development of coffee in Tanah Wulan Village and surrounding community, a distinctive coffee flavor was found. According to the Minutes of the Ministry of Law and Human Rights (2020), the application for GI certification by Coffee Hyang Argopuro GIPS from Bondowoso Regency showed the distinctive taste of the products such as spicy, nutty, and caramelly sweet. This was the basis for submitting GI certification to protect the potential of coffee beans. Along with introducing the production results of the Tanah Wulan Village through efforts to submit a GI certification, the development strategy attracted the interest of investors as export partners such as PT. Indocom Citra Persada.

### SWOT Analysis of Wulan Coffee Agroindustry

#### Identification of internal factors

The results of the IFAS obtained a score of 1.178, showing a strong internal position in overcoming the weaknesses in the Wulan Coffee Agroindustry. According to Sulistiani (2014), the internal environment could be controlled by the institution to determine its strengths and weaknesses in being competitive in a market base. The identification of these internal factors

showed several dominant points based on the SWOT component matriculation.

#### Strengths

Generally, there is a suitability of the growing requirements for Arabica coffee with the topographic conditions (altitude) of the plantation land in Tanah Wulan Village. The Forestry and Plantation Office manages the plantation through the PHBM (Joint Community Forest Management) program as a working land for coffee farmers of the Sinar Tani 01B Farmer Group. It also serves as a contributor of raw materials for Arabica coffee for the Wulan Coffee Agroindustry production activities. The existing topographic conditions with the growing requirements for coffee plants based on the observed area of 981.99 Ha of Arabica coffee plantation land are at an altitude of 700 - 1600 masl.

Provision has been made for the availability and condition of infrastructure in irrigation (clean water quality) for production activities in the Wulan Coffee Agroindustry. In this context, Maesan Sub-district is included in a special industrial area, where the Public Works and Spatial Planning Office is improving the irrigation management system. The use of agricultural land and the potential for regional development are related to the standard rice field services irrigated using a technical irrigation system. According to the Bondowoso Regency Government's Medium-Term Development Plan report (2018), Maesan Sub-district is included in a special industrial area. Therefore, when the fulfillment of irrigation services is sufficient, it will have an impact on all agribusiness activities. Based on the analysis of the direction and accumulation of water flow, water sources were found in plantation areas or production forests.

## Weaknesses

The institutional conditions of the Sinar Tani 01B Farmer Group in Tanah Wulan Village were found to be less optimal in terms of several factors. This included completeness, control, and archiving of documents for the establishment of the Wulan Coffee Agroindustry permit such as the company's deed (*Akta Pendirian*), Company Registration Certificate (TDP) license, Industrial Registration Permit (TDI), Industrial Business License (IUI), Trade Business License (SIUP), Business Place Permit (SITU), Building Construction Permit (IMB), Taxpayer Identification Number (NPWP), and Liquid Waste Disposal Permit (IPLC). However, only one party was aware of archiving membership documents and production data, which included the Secretary of the Sinar Tani 01B Farmer Group and the Wulan Coffee Agroindustry administration division. This showed that the legal ownership conditions of the institution were only known by one party. The legal conditions of the currently owned business were the industry's deed of the Sinar Tani 01B Farmer Group in Tanah Wulan Village. The constraint factor of fulfilling business legality became less important due to limited funds for the licensing process. This was due to the poor financial condition of the Sinar Tani 01B Farmer Group, thereby limiting joint activities. In addition to financial conditions, the constraint of minimal information known by coffee farmer members showed that fulfilling business legality was not considered necessary.

The institutional condition of the Sinar Tani 01B Farmer Group in Tanah Wulan Village/Wulan Coffee Agroindustry regarding administration and documentation management was less than optimal. The low partnership network was caused by the condition of human resources, the production capacity, and the lack of market share expansion. Institutionally, there was still a lack of partnerships with several parties, thereby reducing the product distribution network, including targets and market share. In this case, weakness was caused by a lack of initiative and limited information, as coffee farmers often ignored and only focused on increasing personal income. This condition promoted the need for comprehensive assistance related to the supply chain for farmers to increase production and income profits (Septarianes et al., 2020).

## Identification of external factors

The results of EFAS obtained a score of 0.070, showing that the Wulan Coffee Agroindustry was not responding enough to opportunities to overcome existing threats. Several dominant points were obtained from the identification of external factors.

## Opportunities

The condition of the plantation land in Tanah Wulan Village, located on the slopes of the Hyang Argopuro Mountains, was a potential area that had an impact on the agribusiness of several other commodities as an effort to accelerate rural agricultural development. Plantation land in the forest area on the slopes of the Hyang Argopuro Mountains used by the Sinar Tani 01B Farmer Group was managed under the Forestry and Plantation Office, with the supervision of Perum Perhutani and BKSDA through the PHBM program. It refers to the Government Regulation of the Bondowoso Regency Number 12 of 2011 in the Bondowoso Regency Spatial Plan for 2011-2031 referring to the General Provisions of the Zoning Regulations for Production and Community Forest Areas. The policy direction for the development of this area included a limited management pattern for tourism, plantations with intercropping, forest product processing, and forest farmer settlements. However, the area did not allow for rice field cultivation activities, social facilities, trade, and industry. According to the policy direction for the development of production and community forest areas, plantation land was considered very suitable for the cultivation of coffee plants and other supporting commodities. This showed the need to consider the suitability of the location for the sustainability of the Wulan Coffee Agroindustry business.

Tanah Wulan Village is included in Bondowoso Regency as a category of underdeveloped areas. It is economically strong but weak in terms of human resource quality and social infrastructure conditions. Therefore, the direction of development is improving social aspects such as education levels, population dependency ratios, and the number of workers. Regarding infrastructure, the adequacy of educational facilities, health facilities, and housing conditions can be improved. Moreover, good economic conditions can be supported by development through agribusiness.

Based on the results, potential agribusiness areas included 3 subsystem aspects, such as upstream, primary farming/agriculture, and downstream. The majority of people in the area were dominated by agribusiness activities, including agricultural industry (processing), trade such as export, upstream agribusiness trade (facilities and capital), agrotourism, and services. Therefore, Maesan Sub-district, particularly Tanah Wulan Village, emphasized the agricultural sector towards a more modern economic structure. Reviewing the submission of GI for coffee commodity would also have an impact on other agricultural and plantation commodity sectors in the Maesan Sub-district. Based on Bondowoso data in 2021, agricultural commodity that

played an important role in Maesan Sub-district consisted of shallots, large chilies, cayenne pepper, cabbage, tomatoes, eggplant, ginger, turmeric, orchids, roses, jasmine, mango, durian, tangerine, banana, papaya, snake fruit, durian, jackfruit, sugar cane, coconut, robusta coffee, arabica coffee, tobacco, rice, corn, soybeans, and cassava. Other supporting commodities included domestic chickens, free-range chickens, cows, goats, and sheep. Additionally, trading business activities play a role in marketing and promoting the potential of local natural resources as well as products or processed goods from micro, small, and medium enterprises (MSMEs) in Bondowoso Regency.

The strategic location of Wulan Coffee Agroindustry between rural and urban areas allowed for effective and efficient supply chain integration in terms of raw material procurement, production activities, and product marketing distribution. Generally, a reciprocal relationship between cities and villages was observed, where rural agricultural areas developed cultivation businesses (on-farm) and household-scale processed products (off-farm). Cities provided facilities for the development of agribusiness such as capital, technology, information, and equipment. Agricultural commodity including coffee could be formed into superior trade supported by the downstream sector. To achieve this objective, agribusiness activities should include actors and communities in accordance with local wisdom, as well as have an economic scale that allowed the development of an export orientation (Basuki, 2012). Although agroindustrial supply chain system was considered complex and interrelated with other components. To address this problem, value chain analysis was used to understand the production flow and how each actor could integrate into various existing factors (Septarianes et al., 2020). Good coffee potential should also be supported by an efficient system that could accommodate all parties in the coffee trade. However, external influences in terms of an unstable regional/national economy posed significant difficulty for coffee farmers to obtain profitable prices (Septarianes et al., 2020). Therefore, government policies should be established to overcome economic fluctuations, by optimizing post-harvest processing technology in improving quality and implementing partnerships with various parties to gain benefits according to the quality of GI-based products.

### **Threats**

A policy was established by Perum Perhutani in the 1990 Directors' Decree concerning guidelines for the Implementation of Forest Coffee regarding Joint Forest Management (profit sharing deposit of 1/3 or 30%

of the harvest) for farmers. In this guideline, coffee farmers with private land usually have an average planting area of 1 Ha, while the cultivated land managed by the Forestry and Plantation Office with supervision by Perum Perhutani can reach 7 Ha. The cultivation methods and area of farmers are classified as having a low productivity level, which contributes to annual harvest fluctuation. According to Suradi et al. (2017), several obstacles in the development of coffee clusters in Bondowoso Regency included inappropriate/less smooth communication between policymakers and farmers, less than optimal human resources, lack of business capital funding from and coffee farmer cooperatives, Other obstacles included weak implementation of the coffee sales system by farmers and the bad attitudes/behavior of farmers. These conditions posed a significant serious threat, considering that production should consistently maintain consumer loyalty and product competitiveness when facing GI certification.

An annual increase of 5% was observed in Micro, Small, and Medium Enterprises (MSMEs) engaged in food/beverage processing, crafts, and others. This phenomenon affected the competition of the Wulan Coffee Agroindustry in submitting access to capital credit from banks in Bondowoso Regency. Several types of agroindustry developed in Bondowoso Regency included coffee, cassava, tobacco, sugar cane, organic rice, fish, as well as beverage and snack processing. According to Hermawati (2015), the contribution of the industrial sector the regency was more dominated by MSMEs, as shown by the resilience of businesses to the economic crisis which continued with an increasing trend. The processing industry sub-sector was food, beverages, and tobacco at 33.51% or 5.45% of the total Gross Regional Domestic Product (GRDP) of the regency in 2011.

### **Competitive position using SWOT analysis**

SWOT analysis compared internal factors (41) of strengths and weaknesses with external (29) of opportunities and threats. The results of the IE matrix value are presented in Table 4 and the position on the SWOT diagram is presented in Figure 2. The analysis results showed that the development of the Wulan Coffee Agroindustry based on GI referred to an aggressive strategy. According to Sandriana et al. (2015), the strategy applicable to the position in quadrant 1 (growth-oriented strategy) was to take advantage of existing opportunities and internal strengths of the industry.

### **Strategy recommendations**

The results obtained based on factor identification with SWOT analysis were the S-O (Strength-Opportunity)

Table 4. Results of the IE matrix value

	Factor variables	Internal factors	Factor variables	External factors
Score	Strengths (S)	3.467	Opportunities (O)	3.190
	Weaknesses (W)	2.289	Threats (T)	3.120
Total Score	X-axis	1.178	Y-axis	0.070

Source: Processed primary data (2020)

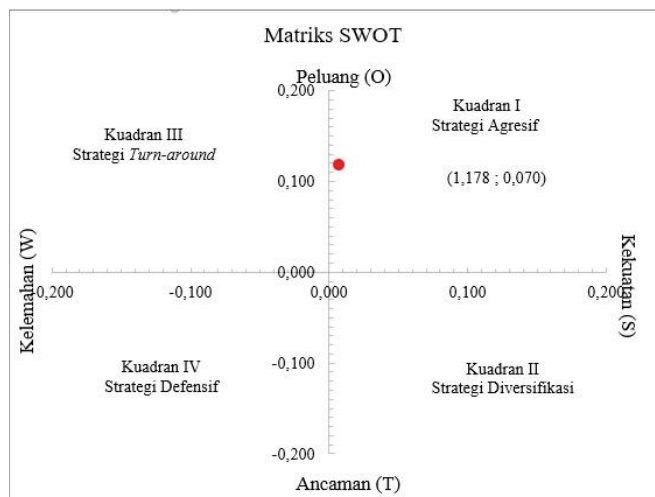


Figure 2. SWOT matrix of Wulan Coffee Agroindustry

strategy or supporting aggressive growth direction (growth-oriented strategy). This showed a favorable situation through strength and opportunity factors. The aggressive strategy (S-O) obtained consisted of 3 proposed alternative strategy recommendations that could be used by the Wulan Coffee Agroindustry based on GI. These included implementing and maintaining Standard Operating Procedures (SOP) related to sustainable coffee cultivation and production methods to sustain the quality standards of GI-based coffee and increase product availability. According to Aridana and Wesnawa (2018), the uniqueness of coffee flavor was not caused by genetic engineering but by environmental conditions due to the implementation of an existing planting system. Developments that could be carried out included human capital and processing, such as methods, equipment, facilities, and procedures. Therefore, processing coffee in various forms in various methods would increase competitiveness (Priantara et al., 2017; Setyowati et al., 2021; Suryaningrat and Novita, 2022).

The role and improvement of institutional performance were found to be essential in maintaining the consistency of implementing the GI-based coffee production system to provide increased income for

farmers and contribute to regional development. This was also intended to increase awareness of farmer groups in partnership and managerial patterns, particularly in terms of technical cultivation, production, administration, and legality. Improving managerial capabilities related to administration included archiving raw material harvest and production data, business cash flow, marketing distribution lists, and business development plans. In the legal sector, data required included quality control factors, product quality, and SOP for processing processes.

According to Suradi et al. (2017), the development of community coffee clusters in Bondowoso Regency was due to the cooperation between 7 parties that started on March 21, 2011, consisting of the Bondowoso Regency Government, the Indonesian Coffee and Cocoa Research Center, Bank Indonesia in Jember, Bank Jatim Bondowoso branch, Perum Perhutani KPH Bondowoso, PT Indokom Citra Persada, and the Indonesian Coffee Farmers Association in Bondowoso Regency. The agreement was continued with a comparative research to Kintamani Bali and Puslitkoka, which produced an SOP for post-harvest technology for Arabica coffee, namely the wet coffee processing process. The community coffee cluster in Bondowoso Regency had improved coffee plant cultivation, increased the quality to match the export quality of processed coffee beans, and produced derivatives of processed ground coffee products (Hariyati, 2014; Purbasari et al., 2021).

Coffee beans should be handled quickly to a more stable form to ensure safe storage for a certain period. The quality criteria of beans, including physical aspects, taste, cleanliness, uniformity, and consistency, were largely determined by the treatment at each stage of the production process. Therefore, farmers' awareness of processing coffee beans to high standards with various methods served as the initial step in developing the post-harvest process. According to GI standards, processing included sorting standards, wet fermentation, drying, and roasting to storage of coffee beans. To improve processing standards, intensive counseling, training, and assistance were needed to implement GI-based methods.



In this context, the stages and specifications of coffee processing equipment that guarantee quality should be determined. These included supporting the development of infrastructure in the form of a more adequate Product Processing Unit (UPH or PPU) in terms of quantity and capacity to motivate farmers to implement GI-based coffee processing standards. The introduction of coffee bean content measuring instruments and education were also needed in motivating farmers to switch to measurement instruments that complied with GI standards. Finally, there should be full cooperation between policymakers, particularly the Agriculture Office, GIPS, coffee farmer group associations, and farmers. The direction of implementing GI-based product quality was towards increasing value or selling price, which could have a significant impact on customer loyalty as buyers. Coffee quality possessed the potential to resolve consumer complaints quickly, serving as a consideration when making purchasing decisions.

Promotional activities should be optimized as the best GI coffee brand in Tanah Wulan Village, as well as strengthening an effective and export-oriented distribution network. The establishment of partnerships with the Village and Sub-district was also recommended to facilitate brand development facilities and infrastructure (HKI). This effort served as a guide to the community in realizing and registering coffee or other products in the GI area. According to Aridana and Wesnawa (2018), the GIPS Farmer Cooperative mediated the coffee trade between farmers/UPH and buyers. The cooperative could be used for operational activities for farmer group associations, particularly the Sinar Tani 01B Farmer Group in Tanah Wulan Village. The role of the GIPS Farmers Cooperative also needed to be intensively promoted by increasing the capacity of human resources and infrastructure accompanied through member motivation in using coffee marketing service media and technology. Therefore, effective and efficient supply chain efforts were implemented to fulfill export demand and increase farmer income through continuous sales to surrounding areas.

Cooperation with the Village and Sub-district should be established in maximizing the potential of natural resources for the development of the Coffee Agrotourism cluster and improving community welfare, particularly the Wulan Coffee Agroindustry. Maesan Sub-district is a special industrial area, and Tanah Wulan Village is the main area of the megalithic site. This could be an opportunity when proper integration was conducted along with the submission of GI certification to support rural agricultural development.

Suradi et al. (2017) stated that the Bondowoso Regency Government planned to grow coffee cluster agrotourism in a village around the Arabica coffee

plantation. It was implemented during the harvest season to promote coffee agrotourism within the Bondowoso community and its surroundings, increasing the regional economy. Therefore, recommendations for developing the Agrotourism Area, particularly in the Maesan Sub-district, must be pursued through policymakers, especially the Agriculture Office, Village apparatus, and Sub-district. These efforts could be realized gradually using government budget funds.

The village finances were generally used for physical development by 50% and village community empowerment accounted for 7%. The majority of the development was still dominated by village road construction comprising more than 50% and community economic empowerment. Based on the results, most villages in Bondowoso Regency budget village finances for community economic empowerment activities. This included increasing community capacity, productive economic efforts, community institution capacity, development of appropriate technology, and job training. The effectiveness of using village finances in development was 98% or in the effective category. Meanwhile, the effectiveness of community empowerment was only 85%, which was in the fairly effective category (Pratomo, 2011; Boedijono et al., 2019).

## **CONCLUSION**

In conclusion, this research showed that preparing a coffee commodity development strategy included internal and external factors of the Wulan Coffee Agroindustry. The identification of internal factors was in the form of dominant strength, namely the height of the Arabica coffee plantation land, with a respondent assessment of 8.70 and a score of 0.13. Meanwhile, the identification of external factors was in the form of dominant opportunities, namely Tanah Wulan Village as a potential agricultural area with a respondent assessment of 8.35 and a score of 0.17. The total score of the IFAS matrix was 1.178, while the EFAS matrix was 0.070, which showed that the position of the IE matrix was in quadrant I (aggressive strategy). The position consisted of implementing and maintaining SOP related to coffee cultivation and production methods to maintain the quality standards of GI-based coffee and increase product availability. These included optimizing promotional activities as the best GI coffee brand in Tanah Wulan Village and strengthening effective and export-oriented distribution networks. The aggressive strategy also comprised establishing cooperation with the Village and Sub-district in maximizing the potential of natural resources for the development of the Coffee

Agrotourism cluster and improving community welfare, particularly the Wulan Coffee Agroindustry.

## CONFLICT OF INTEREST

There is no conflict of interest in this research.

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