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Environmental-Based Coffee Agroforestry Development Strategy in Pujon Forest Area

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ABSTRACT

Agroforestry for coffee in the Pujon forest area needs development considering the importance of community well-being and livelihoods around the forest. Additionally, the forest environment must be preserved to prevent natural disasters in the surrounding areas. The main purpose of this research is to identify strengths that can be enhanced, evaluate weaknesses that need improvement, explore development opportunities, and identify threats that need to be addressed in the context of environmentally based agroforestry in the Pujon forest area. The location was intentionally chosen in the Pujon subdistrict, Malang City. The Pujon forest area was selected for the study because the local community utilizes the land by growing vegetables, which increases the potential for natural disasters. The IFE matrix, EFE matrix, and SWOT analysis were applied. The IFE analysis yielded scores of 1.71 for strengths and 1.52 for weaknesses. Meanwhile, the EFE analysis scored 1.79 for opportunities and 1.64 for threats. The SWOT matrix analysis indicates that the strategy for developing environmentally based coffee agroforestry in the Pujon forest area falls within quadrant I. Therefore, the recommended strategy is to provide moral and material support to farmers who are willing to cultivate coffee plants, aiming to reduce the potential for natural disasters and utilize productive land.

1. INTRODUCTION

1.1. Research Background

The awareness of communities and farmers in transitioning from modern agricultural systems to agroforestry is crucial for the development of agroforestry systems [1]. However, in reality, the community in Pujon shows less interest in agroforestry development. According to data from BKPH Pujon and direct observations by the author, forest areas in the Pujon sub-district, specifically under forest stands (forestry plants), are being cultivated with vegetables.

Pujon sub-district is located in Malang Regency. Astronomically, it lies between 112.2611° - 122.2892° E longitude and 7.5220° - 7.4937° S latitude. The sub-district has eight villages on the slopes and other villages in the valley. The topography consists of hills and flatlands, offering beautiful

landscapes. However, the natural resources in Pujon have not been optimally utilized by the local community [2].

One way to optimize the natural resources in Pujon is by utilizing the forest areas through environmentally based agroforestry. Environmentally based agroforestry involves planting crops or orchards within forest areas while considering environmental conditions. According to [9] agricultural development is essential for improving people's welfare and regional economic growth. Therefore, the strategic development of agriculture is crucial for maximizing natural resources. The choice of SWOT analysis as the primary tool in this research is carefully considered because it provides insights into the internal and external conditions of agroforestry in the region."

1.2. Literature Review

Natural resources closely intertwined with humans include forests. Therefore, as humans, it is our responsibility to protect and preserve forests. Forests play a crucial role in human life,



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providing shelter, shade, and essential resources necessary for our survival [3]. According to Ref. [4], forests serve several functions: (1) supporting livelihoods, (2) preventing floods, erosion, and droughts, and (3) producing timber, non-timber forest products, and medicinal plants.

Agroforestry is a land management practice that addresses land conversion and food availability. Indonesia, with its favorable climate, abundant rainfall, and ample sunlight, is well-suited for implementing agroforestry. Agroforestry is a suitable system or activity for Indonesia. However, to enhance the economy through natural resource management using agroforestry, attention must first be given to improving human resource quality [6].

Ref. [7] said that emphasized the importance of agroforestry development. It can increase income, create employment opportunities, contribute to family and regional incomes, and address food crises in island regions. [5] shares a similar view, stating that agroforestry development can boost income and employment opportunities. The awareness of communities and farmers transitioning from modern agricultural systems to agroforestry is crucial for agroforestry system development [1].

1.3. Research Objective

The main objective of this research is to identify strengths that can be enhanced, evaluate weaknesses that need improvement, discover development opportunities, and identify threats that must be addressed in the context of environmentally based agroforestry in the Pujon forest area. Consequently, a well-formulated strategy for implementing environmentally based agroforestry in Pujon is expected to emerge. In the execution of agroforestry development, it is crucial to involve all stakeholders, including farmers, business actors, BKPH Pujon, and other relevant institutions. Collaborative efforts among stakeholders are expected to create synergy that supports economically effective and socially and environmentally sustainable development strategies. Ultimately, this research aims to positively contribute to the quality and productivity enhancement of agroforestry in the Pujon sub-district. By deeply understanding the conditions and potential of agroforestry in the region, we hope to create an environment conducive to economic growth and the well-being of the local community.

2. MATERIALS AND METHODS

The research location was intentionally chosen in the Pujon sub-district, Malang City. The Pujon forest area was selected as the research site because the local community utilizes the land by planting vegetables, which increases the potential for natural disasters. The characteristics of the respondents were determined

based on several criteria. Respondents included those knowledgeable about agroforestry practices, ranging from land management techniques to government and non-government regulations. Examples of suitable respondents are field officers (BKPH Pujon), members of the Forest Village Community Institution (LMDH), and pesanggem (forest-managing farmers).

Data collection is a crucial methodological step in the research process, aiming to obtain necessary information [10]. The required data includes both primary and secondary data.

Primary data are obtained through direct observations and interview interactions with field officers (BKPH Pujon), the head of the Forest Village Community Institution (LMDH), and 240 Putra et al.

pesanggem. Secondary data sources include relevant books, articles, journals, and institutions related to this research.

The data analysis method employed in this study is the SWOT approach. Strengths and weaknesses factors will be delineated in the Internal Factor Evaluation (IFE) matrix, while opportunities and threats will be outlined in the External Factor Evaluation (EFE) matrix. SWOT analysis systematically identifies factors to develop strategies within an organization [8]. The SWOT approach aims to optimize positive factors (strengths and opportunities) while considering negative factors (weaknesses and threats) that may arise simultaneously. The SWOT matrix aims to identify development strategies for agroforestry in the Pujon forest area.

3. RESULT AND DISCUSSION

3.1 Internal Factor Analysis

Internal factors related to environmentally based agroforestry in Pujon Forest Area

3.1.1 Strength

1) Forest Area of 14.875 Ha

The forest area in Pujon covers approximately 14,875 hectares, indicating that it falls within the category of extensive forest regions. The land within the Pujon forest is also productive, making it suitable for environmentally based agroforestry, particularly for coffee cultivation, as part of natural disaster prevention efforts.

2) Topography suitable for coffee

The Pujon sub-district has a cool climate with an average temperature ranging from 18°C to 24°C and receives abundant rainfall, making it an ideal environment for coffee cultivation. The soil type in Pujon is andosol, characterized by high organic content and fertility. Additionally, the steep terrain in the Pujon forest area is well-suited for growing coffee plants

3) Agroforestry products can contribute to improving the local community's economy.

Agroforestry, which combines agricultural crop cultivation with forest trees, allows communities to sustainably and productively utilize forest land. Harvests from agroforestry crops, such as fruits, nuts, wood, and other products, can be sold or used for daily needs, thereby increasing community income. Additionally, crop diversification within agroforestry reduces the risk of dependence on a single commodity, providing more stable economic security. Agroforestry activities also create employment opportunities throughout the planting, maintenance, and harvesting processes, all of which contribute to enhancing the well-being of the community living around the forest.

4) Availability of human capital

The availability of human resources (HR) is obtained from the local area, specifically the residents of the Pujon sub-district. This can enhance the local economy. Initiatives such as community awareness campaigns and support in the Pujon sub-district can be beneficial. Leveraging the available human resources in the Pujon forest area can be a positive factor for environmentally based agroforestry development.

5) Detailed planning before agroforestry planting activities

Perum Perhutani, before carrying out all its activities within its scope of work, including agroforestry, always plans its activities in detail, which is done two years in advance. The planning conducted by Perum Perhutani includes the types of plants to be cultivated, measuring the land area and plant spacing, sharing the results with local community forest management units (LMDH), and other relevant aspects. This meticulous planning strengthens Perum Perhutani's ability to execute agroforestry planting activities effectively, as everything has been well-designed two years prior, minimizing the occurrence of errors.

6) *Suitability of agroforestry crops planted in forest plots*

Agroforestry coffee plants are well-suited to the environmental conditions in forest plots. The existing forest stands or tree species planted in the forest have sufficient spacing to accommodate coffee cultivation. Planting coffee within an agroforestry system should support both economic sustainability for farmers and environmental conservation, providing ecological benefits such as increased biodiversity and soil quality improvement.

3.1.2 *Weakness*

1) *Harvest Results Take a Long Time*

Farmers in the Pujon District, East Java, face an important dilemma when choosing the type of crops to plant. This situation is primarily influenced by the difference in harvest time between vegetable crops and perennial crops such as coffee. Vegetable crops promise faster harvests, allowing farmers to generate income more quickly and consistently. In an uncertain economic environment, especially in rural areas, speed is key to achieving financial stability. With quick harvest results, farmers can more easily cover living expenses, repay debts, and even expand their businesses. Additionally, vegetable production often requires lower capital investment compared to perennial crops because vegetables have shorter growth cycles and do not require long-term maintenance. Therefore, according to farmers in the Pujon district, planting vegetables is a sound decision because it provides significant economic benefits.

2) *Insufficient Human Resource Quality Farmers in the Pujon*

Districts still lack understanding of how to cultivate perennial crops like coffee. Perennial crops require specialized knowledge regarding planting techniques, maintenance, and more complex harvesting methods compared to vegetable crops. Due to this lack of understanding, farmers often face challenges in managing perennial crops, including pest and disease issues and the need for long-term care. Consequently, many farmers in the Pujon district prefer to grow vegetables with shorter harvest cycles and simpler cultivation techniques. Moreover, the relatively lower maintenance costs of vegetable crops make them a more economical and practical choice for farmers. By cultivating vegetables, farmers can achieve quicker harvest results, which helps boost their income faster. As a result, vegetable cultivation has become more popular among farmers in the Pujon District, even though the potential profits from perennial crops are substantial if managed effectively.

3) *The cost incurred is high*

Farmers in the Pujon Sub-district, East Java prefer to grow vegetables because of the lower costs involved. Vegetable maintenance is relatively simpler and does not require large

investments in maintenance. For example, vegetable crops generally require less fertilizer and pesticides compared to perennial crops such as coffee, which require higher maintenance. Perennial crops often require special treatment, such as regular pruning, intensive fertilization, and protection from pests and diseases. Therefore, by choosing to grow vegetables, farmers can significantly reduce their expenses, which in turn increases their profits and financial stability.

4) *Road access to fields is difficult*

Infrastructure in agribusiness development is a key component to the success of the agribusiness being run. This is because infrastructure is the main access for the distribution of agricultural products. If infrastructure is inadequate, farmers will face many difficulties in running agribusiness such as bad roads, and inadequate bridges. These conditions can lead to financial losses for farmers, as they may not be able to sell their products on time or at a good price. Therefore, infrastructure is a must in the agribusiness of this commodity. With good infrastructure, it will run more smoothly and efficiently, allowing farmers to expand their market reach and increase income.

5) *Intensive Care*

Farmers in the Pujon District predominantly cultivate vegetable crops because growing woody plants like coffee require more intensive care, including seed planting, fertilization, transplanting, spacing management, and pruning. They choose vegetables because they don't demand complex maintenance and can grow relatively independently, making it easier for farmers to manage their fields. Additionally, vegetables have shorter harvesting cycles, allowing farmers to obtain quicker results and utilize land more effectively. Therefore, farmers prefer growing vegetables over woody crops like coffee, which involve more intricate care and longer timeframes.

6) *Dependency on a Single Commodity*

Farmers in the Pujon District remain reliant on a single commodity—vegetables. They hesitate to transition to woody crops like coffee due to the higher costs associated with their care. Vegetables have shorter harvest cycles and simpler maintenance requirements, facilitating farmers' field management. Consequently, farmers focus on cultivating the vegetables they know. Transitioning from vegetables to woody crops like coffee requires a comprehensive approach, including education, financial support, and improved market access. Therefore, Pujon's smallholder farmers need targeted assistance to enhance production quality and income.

3.2 *External Factor Analysis*

External factors related to environmentally based agroforestry in the Pujon Forest Area

3.2.1 *Opportunities*

1) *Possesses a high market value*

The Pujon Sub-district's economy and farmers can gain a great deal from coffee's high selling price. Coffee's high market value directly raises growers' incomes. Farmers and their families can enhance their standard of living and economic standing by obtaining more wages. In terms of the environment, cultivating coffee alongside other crops can improve soil health and biodiversity.

2) *Support from Perhutani in developing agroforestry.* Perhutani offers assistance in the form of complimentary seeds. Tree seedlings for agroforestry systems can be obtained from Perhutani. These seeds may come from fruit-bearing or hardwood tree species, which are valued economically. Furthermore, Perum Perhutani can offer communities or farmers technical support on efficient agroforestry farming methods, such as planting strategies, plant upkeep, and land management. Perhutani can offer instruction and training on the fundamentals of agroforestry, as well as on its advantages and management techniques. Connecting farmers or communities with markets for agroforestry products produced by farmers is another way that Perhutani may support farmers and significantly aid in their product marketing.

3) *High Demand for Coffee*

The increasing demand for coffee in recent years, including in the Pujon Sub-district, can bring many opportunities for local farmers and businesses. Growth in the food and beverage sector of cafes and coffee shops, especially in tourist areas, has driven demand for quality coffee. Tourists and locals often visit cafes to enjoy different types of coffee. Today, coffee is a modern lifestyle, with many people making it their daily drink. Dependence on one type of commodity can be risky, but by diversifying coffee products, Coffee from Pujon can become a flagship product that strengthens local identity and pride.

4) *Low degree of rivalry*

Agroforestry products grown at Pujon include vegetables, elephant grass, and a limited number of coffee products. Due to the small number of coffee-growing farmers in Pujon, there is little competition for coffee commodities in Pujon. Because there aren't many farmers growing coffee, there isn't much rivalry for coffee. Local coffee is the variety grown by growers in Pujon. From here, given the current high demand for coffee commodities, it may be viewed as a potential business opportunity in the future.

5) *Easy market access*

Easy market access is very important for the successful marketing of agroforestry products in Pujon District. Pujon sub-district is known as a good tourist destination, so market access will be easily achieved by marketing agroforestry products at souvenir centers and markets. Tourists tend to be willing to pay more for unique and quality local products. This can increase the selling value of agroforestry products, providing greater profits for farmers. Tourists coming to tourist areas will increase demand for local products, including agroforestry products.

3.2.2 *Threats*

1) *Natural Disasters*

Natural disasters pose a significant threat to the success of agroforestry, especially in vulnerable areas like Pujon. Floods, landslides, and droughts not only damage crops but also alter soil structure and the surrounding environment, which can have long-term impacts on land productivity. Therefore, comprehensive mitigation strategies are needed to address the potential impacts of these natural disasters. Selecting plant species that are resilient to extreme conditions is one measure that can be taken. For

instance, choose plants tolerant to waterlogging to address flood issues or deep-rooted plants to prevent landslides. Implementing soil and water conservation techniques such as terracing, cover cropping, and effective drainage systems can help maintain land stability.

2) *High Labor Costs in Other Sectors*

Farmers in BKPH Pujon face the threat of high labor costs, which directly impact the attractiveness and sustainability of labor in the agroforestry sector, especially due to insufficient incentives in agroforestry. Agroforestry practices, including coffee cultivation, may not offer sufficiently attractive financial incentives to farmers and workers. Without fair profit-sharing schemes or productivity bonuses, farmers tend to seek employment in other sectors that offer greater rewards and do not require lengthy harvest periods.

3) *Overlapping Regulations*

Overlapping regulations present a threat to forest farmers in BKPH Pujon engaged in agroforestry, particularly coffee cultivation, due to conflicting interests between Perhutani and forest farmers. Farmers aim to achieve profitable yields but may disregard forest policies by preferring vegetable cultivation over coffee agroforestry within forest areas. This challenges Perhutani's regulatory efforts to maintain forest integrity and prevent damage from non-compliant agricultural activities.

4) *Plant pests and diseases*

Plant pests and diseases pose serious challenges to agroforestry practices. They can cause significant damage to crops, reduce productivity, and negatively impact farmers' income. Therefore, implementing integrated pest management (IPM) is an effective measure to address these issues.

5) *Social Conflicts*

Social conflicts are a threat to forest farmers in BKPH Pujon engaged in agroforestry, particularly coffee cultivation, primarily due to unclear land ownership rights. Ambiguity or disputes regarding land ownership can be a major source of conflict. Farmers without land certificates or clear ownership proof may face overlapping claims from other individuals or groups, including the government, asserting ownership rights that belong to Perhutani.

3.3 *IFE Matrix Analysis*

The IFE matrix analysis is used to analyze internal factors related to coffee agroforestry in the Pujon forest area. The purpose of the IFE matrix analysis is to identify strengths to leverage and weaknesses to address. The results of the IFE analysis are as follows (Table 1).

Table 1. IFE Matrix Results (Internal Factor Evaluation)

Strength				
No.	Statement	Weight	Rating	Weight Score
1.	Forest Area of 14.875 Ha	0.10	3.86	0,39
2.	Topography suitable for coffee	0.09	3.43	0,31
3.	Agroforestry products can contribute to improving the local community's economy.	0.08	3.14	0,26
4.	Availability of human capital	0.08	3.00	0,24
5.	Detailed planning before agroforestry planting activities	0.08	3.14	0,26
6.	Suitability of agroforestry crops planted in forest plots	0.08	3.14	0,25
TOTAL STRENGTH		0.52	19.71	1.71
WEAKNESS				
No.	Statement	Weight	Rating	Weight Score
1.	Harvest Results Take a Long Time	0.09	3.57	0.34
2.	Insufficient Human Resource Quality	0.08	2.86	0.21
3.	The cost incurred is high	0.07	2.57	0.17
4.	Road access to fields is difficult	0.07	2.57	0.17
5.	Intensive care	0.08	3.14	0.26
6.	Dependency on a Single Commodity Farmers	0.10	3.71	0.36
TOTAL WEAKNESS		0.48	18.43	1.52
TOTAL IFE		1.00	38.14	3.23

Source: Primary data processed, 2024

Table 1 shows the results of the IFE Matrix, where the strength factor score is 1.71 and the weakness factor score is 1.52. The main strength in developing Coffee Agroforestry in the Pujon forest area is the forest area covering 14,875 hectares, with a score of 0.39. This forest area falls into the extensive category. Additionally, the land in the Pujon forest is productive and can be utilized for environmentally friendly coffee agroforestry. On the other hand, the primary weakness in coffee agroforestry development is that farmers (pesantren) are still dependent on a single commodity, with a score of 0.36. This dependence may impact the development of coffee agroforestry in the Pujon forest area.

3.4 EFE Matrix Analysis

The external factors in coffee agroforestry in the Pujon forest area are analyzed using the External Factor Evaluation (EFE) Matrix. The EFE analysis aims to identify the opportunities to be leveraged and the threats to be addressed. Here are the results of the EFE analysis.

Table 2 shows the results of the EFE Matrix, where the opportunity factor score is 1.79 and the threat factor score is 1.64. The main opportunity in developing Coffee Agroforestry in the Pujon forest area is easy market access, with a score of 0.41. This opportunity can enhance the local economy by encouraging agroforestry coffee cultivation and distribution among the communities around the Pujon area. On the other hand, the primary threat to Coffee Agroforestry in the Pujon forest area is the potential occurrence of natural disasters and high wages in other sectors, both with a score of 0.41. Natural disasters such as landslides, forest fires, or other calamities significantly impact coffee agroforestry activities in the Pujon forest area. Additionally, high wages in other sectors pose a substantial threat

to the development of coffee agroforestry in the Pujon forest region.

3.5 Matrix SWOT

3.5.1 SO Strategy

The SO (Strengths-Opportunities) strategy is a strategy derived from the use of strength factors and utilizing existing opportunity factors. The SO strategies used to develop environmentally-based coffee agroforestry in the Pujon forest area are (1) Assisting in the form of moral (encouragement and motivation) and material (seeds, equipment, etc.) to farmers who are willing to plant woody plants to reduce the potential for natural disasters and utilize productive land in the Pujon District forest area (2) Optimizing existing land to meet the high demand for coffee by planting superior varieties of coffee, and (3) Developing processing of agroforestry products by utilizing available human resources to increase selling prices and be able to support the farmers' economy.

3.5.2 WO Strategy

The WO (Weakness-Opportunities) strategy is a strategy derived from minimizing existing weakness factors to take advantage of opportunity factors. The WO strategy used to develop environmentally-based coffee agroforestry in the Pujon forest area is (1) Optimizing agroforestry plant care while still paying attention to environmental aspects and costs incurred. Thus, the crops have good quality and obtain a stable price and (2) Diversify the plant products grown in the forest by planting coffee not only vegetables.

Table 2. EFE Matrix Results (External Factor Evaluation)

Opportunity				
No.	Statement	Weight	Rating	Weight Score
1.	Possesses a high market value	0.11	3.57	0.38
2.	Support from Perhutani in developing agroforestry.	0.10	3.43	0.35
3.	High Demand for Coffee	0.09	3.14	0.29
4.	Low degree of rivalry	0.11	3.57	0.38
5.	Easy market access	0.11	3.71	0.41
TOTAL WEAKNESS		0,51	17.43	1.79
Threats				
No.	Statement	Weight	Rating	Weight Score
1.	Natural Disasters	0.11	3.71	0.41
2.	High Labor Costs in Other Sectors	0.11	3.71	0.41
3.	Overlapping Regulations	0.09	3.00	0.26
4.	Plant pests and diseases	0.10	3.43	0.35
5.	Social Conflicts	0.08	2.71	0.22
TOTAL THREATS		0,49	16.57	1.64
TOTAL EFE		1,00	34.00	3.43

Table 3: Matrix SWOT

	Strength (S)	Weakness (W)
	1. Forest Area of 14.875 Ha 2. Topography suitable for coffee 3. Agroforestry products can contribute to improving the local community's economy. 4. Availability of human capital 5. Detailed planning before agroforestry planting activities 6. Suitability of agroforestry crops planted in forest plots	1. Harvest Results Take a Long Time 2. Insufficient Human Resource Quality 3. The cost incurred is high 4. Road access to fields is difficult 5. Intensive care 6. Dependency on a Single Commodity Farmers
Opportunities (O)	SO Strategy	WO Strategy
1. Has a high selling value There is support from Perhutani in developing agroforestry High Demand for Coffee 2. Low level of competitors Easy market access	3. assist with moral (encouragement and motivation) and material (seeds, equipment, etc.) to farmers who are willing to plant woody plants to reduce the potential for natural disasters and utilize productive land in the forest area of Pujon Sub-district. 4. Optimizing existing land to meet the high demand for coffee by planting superior varieties of coffee 5. Develop processing of agroforestry products by utilizing available human resources to increase selling prices and be able to support the farmers' economy.	1. Optimize agroforestry plant maintenance while still paying attention to environmental aspects and costs incurred. Thus, the crops have good quality and obtain a stable price. 2. Diversify agricultural products planted in the forest by planting coffee, not only vegetables.
Threats (T)	ST Strategy	WT Strategy
1. Potential for natural disasters 2. High wages in other sectors 3. Overlapping regulations 4. Plant pests and diseases 5. The existence of social conflicts	1. Supporting coffee plant production with superior varieties that have high market value, such as Blue Mountain coffee. 2. Conducting data collection and providing clear rights to farmers who practice agroforestry with coffee to prevent illegal land cultivation.	1. Reducing expenses in plant maintenance can be achieved by minimizing the use of chemical pesticides and controlling pests or diseases through Integrated Pest Management (IPM) principles. 2. Implementing a multi-story canopy system by combining tall-canopy trees (such as pine), medium-canopy plants (such as coffee or citrus), and low-canopy crops can help reduce natural disasters. Besides optimizing land use, multi-story systems also act as soil erosion controllers. 3. Performing intensive maintenance while safeguarding cultivated land from illegal encroachment

3.5.3 ST Strategy

ST (Strength-Threat) strategy is a strategy obtained from the use of strength factors to avoid existing threat factors. The ST strategy used to develop environmentally-based coffee agroforestry in the Pujon forest area is (1) Supporting the production of coffee plants with superior varieties that have high selling value such as blue mountain coffee types and (2) Collecting data and providing clear share rights to farmers who plant coffee agroforestry to prevent illegal cultivation.

3.5.4 WT Strategy

WT (Weakness-Threat) strategy is a strategy that reduces weakness factors and avoids existing threat factors. The WT strategies used to develop environmentally-based coffee agroforestry in the Pujon forest area are (1) Reducing costs in plant care, which can be done by reducing the use of chemical drugs and controlling pests or diseases by applying the principles of IPM (Integrated Pest Management) (2) Implementing a multi-story crown system by combining high canopy plants (pine), (2) Applying a multi-story canopy system by combining high canopy plants (pine), medium canopy plants (coffee, or citrus) with low canopy plants in the form of food crops to reduce the occurrence of natural disasters because in addition to being useful in optimally utilizing multi-story land, it can control soil erosion, and (3) Carrying out intensive maintenance while protecting cultivated land from illegal cultivation.

3.6 SWOT Matrix Analysis

4 CONCLUSION

IFE matrix analysis on the strength factors obtained a score of 1.71, and 1.52 was the score for the weakness factors. Meanwhile, EFE matrix analysis on the opportunity factors received a score of 1.79, and 1.64 on the threat factors. The SWOT matrix analysis shows that the environmentally-based coffee agroforestry development strategy in the Pujon forest area is located in quadrant I. Therefore, the strategies that should be implemented are (1) Providing moral (encouragement and motivation) and material (seedlings, equipment, etc.) support to farmers who are willing to plant woody plants to reduce the potential for natural disasters and utilize productive land in the Pujon sub-district forest area, (2) Optimizing the available land to meet the high demand for coffee by planting superior coffee varieties, and (3) Develop processing of agroforestry products by utilizing available human resources to increase selling prices and be able to support the farmers (*pesanggem*) economy.

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