

# SWOT and Analytical Network Process (ANP) Analysis for Robusta Coffee Bean Development Strategy in Panti District, Jember Regency

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## SWOT and Analytical Network Process (ANP) Analysis for Robusta Coffee Bean Development Strategy in Panti District, Jember Regency

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**Abstract.** Development decision making process of the business are influenced by internal and external factors of the business, which influence the success of the business. Strengths, Weakness, Opportunities, and Threats are used to identify all of the factors that influence the succes of a business and produce alternative strategies that are feasible for the business. The object of the research was Robusta coffee beans in Panti District, Jember Regency. Analytical Network Process (ANP) is used to calculate the relative importance of each SWOT factor and sub-factor, considering the dependency between SWOT factors and between sub-factors.

### 1. Introduction

Indonesia is known as the Agricultural Country. This can be shown by the large area of land used for agriculture. It is accounted of about 74.68 percent of agriculture area [1]. One of the sub-sectors of agricultural is the plantation sector. Coffee is a plantation commodity that play an important role in the economy of Indonesia. In average, the coffee exports is around 430,000 tons/year consisting of 85% robusta and 15% arabica, respectively [2]. According to [3], the national coffee processing industry is able to make a significant contribution to the country's foreign exchange from the export value which reached USD 469.4 million in 2017. Among the exported coffee, Jember's coffee is also well known to have a valuable contribution.

Jember coffee is very popular among the people. Robusta coffee is the most developed variety in Jember because it is very easy to be cultivated. One of the sub-districts in Jember Regency which has the potential in developing folk's coffee (kopi rakyat) is the Panti District. Based on natural resources, agro-climate, and natural conditions required for coffee farming for local and international markets, Panti District should be able to increase its productivity. For its development, it is necessary to know what problems are being faced as well as what efforts will be made in dealing with these problems.

The reason for the low productivity of coffee farmers in the Panti District is partly because coffee farmers have not yet taken care of the quality of their crops. Farmers are less oriented to post-harvest and processing, so they are unable to provide added value to agriculture, and do not pay attention to the market. Human resources that are still lacking of skill in marketing and processing of agricultural products are also obstacles that can hamper the development of coffee production in the Panti District.

Therefore to increase coffee production, various efforts need to be made to overcome existing problems, especially in the Panti District. Problems that must be overcome starting from the production stage to marketing. This study was aimed to analyze the internal and external factors that

influence the Robusta coffee agro-industry development strategy in Panti District. In addition, it was also to formulate alternative strategies for the local government and to choose strategic priorities in the development of Agro-industry of Robusta Coffee in Panti District.

## 2. Methods

### 2.1 Logical Framework

This research is a holistic qualitative in which all factors are taken into account as a whole, interdependent for each other's interests. Therefore, in-depth study of theories is needed from many sources taking into account the phenomena that develop in the field [4]. The framework for developing Robusta Coffee in Panti District (fig. 1) is obtained through surveys and interviews with farmer groups so that the actual conditions being faced are known. From various reference sources including expert opinion, comparing theory and reality, then the strategic issues can be obtained. The alternative strategies are the result of weighting the SWOT analysis which is then prioritized using the ANP method.

In this research, the method used is a case study. The case study method is an appropriate strategy if the researcher has few opportunities to control the events to be investigated and the focus of his research lies on contemporary phenomena in the context of real life [5].

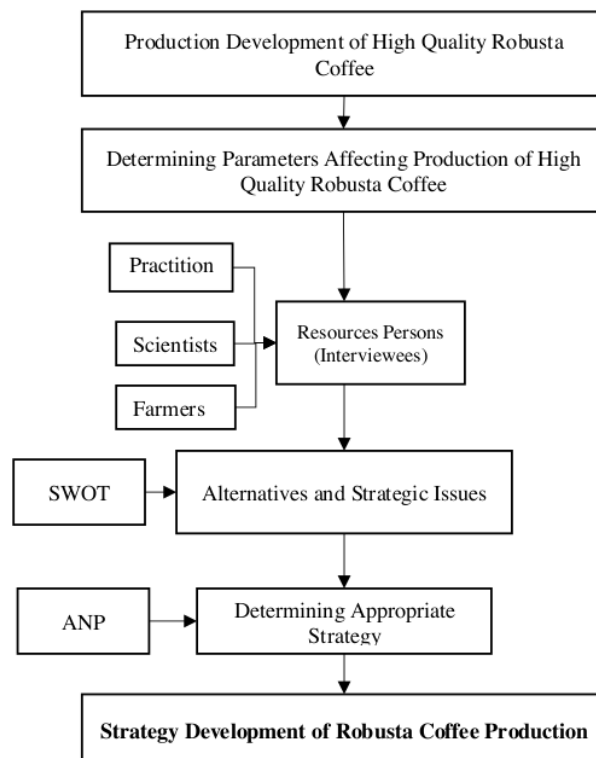


Figure 1. Research Framework of Development of Robusta Coffee in Panti

### 2.2 Methods of Research and Collecting of Data

The research technique used is the survey method. The data used are primary data and secondary data. Primary data were obtained directly from respondents through observation and interviews guided by questionnaires. Secondary data were obtained from related institutions, such as the Central Statistics

Agency, Department of Agriculture, journals, books, and internet media that are in accordance with this study.

### 2.3 Determination of Respondent Techniques

The number of Arabica coffee farmers in Panti's District is 127 people. A number of coffee's farmer respondents (23 persons) were determined purposively. They selected based on their participation in farmer's group activities and ownership of coffee plants. In addition to samples from farmers, informants were also selected purposively, namely 2 academics and 1 coffee farmer group leader.

## 3. Result and Discussion

### <sup>2</sup> 3.1 IFE Matrix (Internal Factor Evaluation)

Based on interviews and validations conducted, 10 indicators were obtained that became <sup>2</sup> internal indicators (strengths and weakness) of Robusta coffee production in Panti District (Table 1).

Table 1. Internal factor matrix of Robusta coffee production in Panti District

| NO | Dominant Internal Factor  | Total | Rating | Weight | Weight x Rating |
|----|---|-------|--------|--------|-----------------|
|    | STRENGTHS   |       |        |        |                 |
| 1  | Indonesia has a tropical climate and rainfall that is very supportive for the development of coffee commodities | 88    | 4      | 0,16   | 0,62            |
| 2  | Indonesia is the third largest country in the world of Robusta coffee producer                                  | 83    | 4      | 0,15   | 0,56            |
| 3  | Indonesia has a special coffee group  | 80    | 3      | 0,15   | 0,52            |
| 4  | Farmers easily obtain superior seeds  | 82    | 4      | 0,15   | 0,54            |
|    | WEAKNESSES  |       |        |        |                 |
| 1  | Roasting and blending technology is not yet fully mastered by the coffee industry                               | 40    | 1,74   | 0,07   | 0,13            |
| 2  | Capital in coffee plantations is still lacking  | 31    | 1,35   | 0,06   | 0,08            |
| 3  | Inadequate facilities and infrastructure in onfarm  | 36    | 1,57   | 0,07   | 0,10            |
| 4  | Very low consumption of coffee per capita   | 36    | 1,57   | 0,07   | 0,10            |
| 5  | Most exports are still in the form of coffee beans  | 31    | 1,35   | 0,06   | 0,08            |
| 6  | High taxes on auxiliary materials such as sugar by 40%  | 32    | 1,39   | 0,06   | 0,08            |
|    | TOTAL   | 539   |        | 1,00   | 2,81            |

### <sup>2</sup> 3.2 EFE Matrix (External Factor Evaluation)

Based on interviews and validations conducted, 9 indicators were obtained that became <sup>2</sup> external indicators (opportunities and threats) of Robusta coffee production in Panti District (Table 2). The total external <sup>2</sup> matrix of opportunities is 0.92 and the total external matrix of threats is 1.34 so that the total score of the total external matrix is 2.26.

Table 2. Matrix of external factors of Robusta coffee production in Panti District

| NO                   | Dominant External Factor  | Total      | Rating | Weight      | Weight x Rating |
|----------------------|---|------------|--------|-------------|-----------------|
| <b>OPPORTUNITIES</b> |   |            |        |             |                 |
| 1                    | Large population of Indonesia is potential for workers in coffee industry                 | 37         | 2      | 0,09        | 0,14            |
| 2                    | Home industry of coffee absorbs 85 percent of coffee production                           | 37         | 2      | 0,09        | 0,14            |
| 3                    | A large number industry of processed coffee that absorb workforce                         | 41         | 2      | 0,09        | 0,17            |
| 4                    | Availability of funds for rehabilitation and rejuvenation of coffee plants                | 41         | 2      | 0,09        | 0,17            |
| 5                    | Counseling availability, research on superior seeds and the release of superior varieties | 41         | 2      | 0,09        | 0,17            |
| 6                    | Free trade  | 38         | 2      | 0,09        | 0,14            |
| <b>THREATS</b>       |   |            |        |             |                 |
| 1                    | Large number of coffee's shop whose raw materials do not use coffee from Indonesia        | 60         | 2,61   | 0,14        | 0,36            |
| 2                    | The demands follow the 4C (Common Code for The Coffee Community) provisions               | 62         | 2,70   | 0,14        | 0,39            |
| 3                    | The existence of SNI  | 77         | 3,35   | 0,18        | 0,59            |
| <b>TOTAL</b>         |   | <b>434</b> |        | <b>1,00</b> | <b>2,26</b>     |

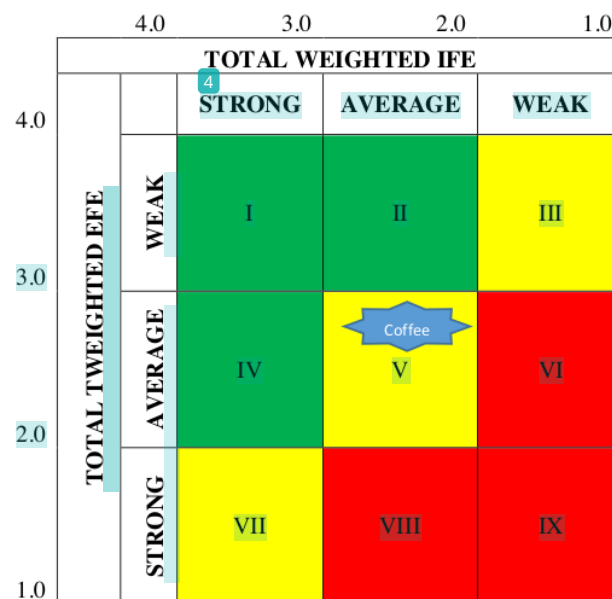


Figure 2. IE Matrix of Robusta Coffee Production in Panti District

### 3.3 SWOT Matrix

The SWOT matrix is a tool used to help determine strategies by considering strengths, weaknesses, opportunities and threats (fig. 2). The SWOT matrix consists of the SO (Strengths Opportunities) strategy, the WO (Weakness Opportunities) strategy, the ST (Strengths Threats) strategy and the WT (Weakness Threats) strategy. Based on the analysis through the IE matrix, robusta coffee production belongs to quadrant V. The company that belongs to fifth quadrant categorized as companies of Enduring and Maintaining [12], this quadrant is suitable for the following strategies:

SO Strategy:

1. Improving the quality of human resources through training and expanding marketing networks and quality of coffee farming (S1, S2, S3, S4, O1, O2, O3, O5, O4, O6).

WO Strategy:

1. Establishing and fostering research institutions and to support association of Jember coffee (W1, W5, W6, O1, O2, O3, O5).
2. Strengthening capital for coffee agro-industry and expanding marketing networks (W2, W3, W4, O4, O6).

ST Strategy:

1. Developing a clean coffee production, improving coffee quality through good post-harvest, and establishing regulations for business partners (S1, S2, S4, T1, T2, T3).
2. Coaching, developing institutional empowerment and farm management (S3, T2, T3).

WT Strategy:

1. Improving coffee marketing chain through related institutions (W2, W3, W4, W5, W6, T1, T2)
2. Creating good cooperation with investors (W1, W2, W3, W4, W5, W6, T1, T2, T3)

### 3.4 Analytical Network Process (ANP)

In determining strategic priorities using the Analytical Network Process (ANP) approach, modeling was done first using the Super Decisions software. From ANP modeling, pairwise comparison matrix was performed. In paired comparison matrices, there are interrelationships between elements in one cluster (inner dependence) as well as relationship elements between different clusters (outer dependence) [13]. Figure 3 shows the ANP model using Super Decisions.

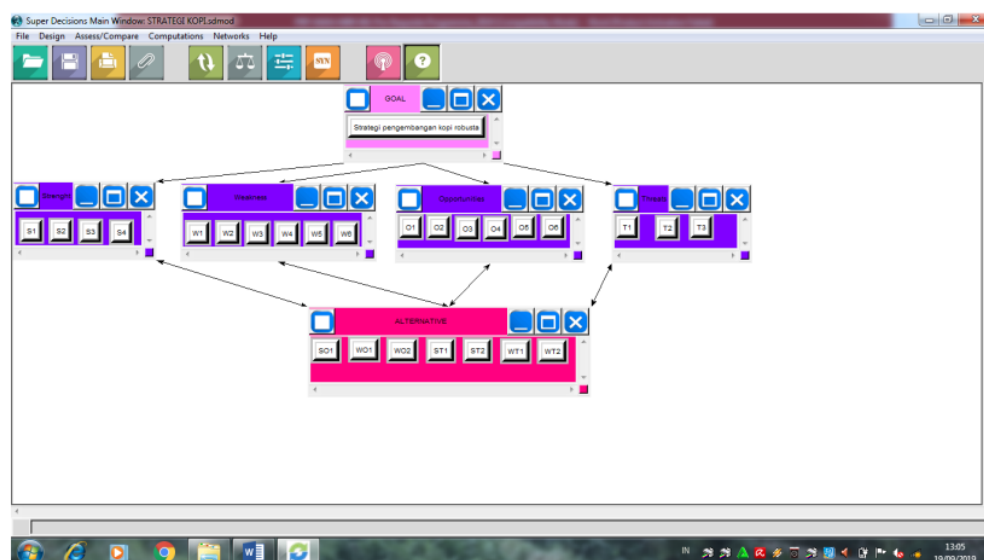


Figure 3. ANP model of coffee development strategy using Super Decisions



### 3.5 Priority of Robusta Coffee Production Strategy in the Panti district

After ANP modeling was done, a pairwise comparison was obtained prioritizing production development strategies with the help of Super Decision Software (fig. 4). From the results of calculations using Super Decisions, priority strategies for developing Robusta coffee production in the orphanage district were obtained. Figure 4 shows the ranking of each alternative. Based on the above it can be seen that the highest alternative value strategy is the ST1 and ST2 strategies namely:

1. Developing clean coffee production, improving coffee quality through good post-harvest, and making regulations for business partners. Prioritizing product quality to enhance competitiveness. Product quality is an important aspect that can be used in competing in the market. Product quality is a comparative advantage that is not owned by competitors, so it can be used as an advantage in competing with other products.
2. Coaching, developing, and institutional empowerment and farm management have to be done. The role of institutions is very necessary in the Development of Coffee Agroindustry. It is aimed to make a welfare at the farm level. Panti sub-district has formed farmer's groups in each village, but mobile and innovative capacity is still inadequate in accessing production, information and marketing systems. With the background of farming conditions such as low land ownership scale, traditional farming systems and diverse product quality, the development of coffee agro-industry requires an institution such as the Coffee Farmers Association. This must be supported by adequate human resources.

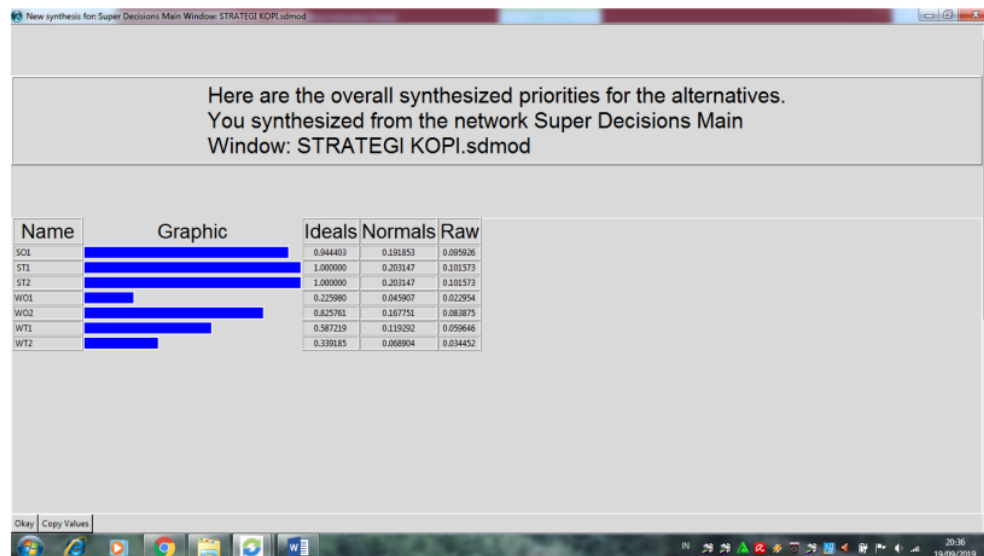


Figure 4. Results of priority analysis of coffee development strategies using Super Decisions

## 4. Conclusions

Based on research conducted by researchers in determining the strategy for robusta coffee agro-industry development in Panti District, it can be concluded that there are 7 alternative strategies obtained in the robusta coffee agro-industry development strategy in Panti District, Jember. The priority strategy was carried out using the ANP approach. Based on calculations using Super Decisions, priority strategies were obtained namely the ST1 and ST2 strategies, namely improving product quality by implementing clean production, coaching and farming management.

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