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FARMER EMPOWERMENT STRATEGY BASED ON GOOD AGRICULTURAL PRACTICES (GAP): EMPIRICAL STUDY OF FOOD CROP FARMERS

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Abstract

This study aims to develop a Strategy for Empowering Food Crop Farmers Based on Good Agricultural Practices (GAP): Analitycal Hierarchy Process (AHP) Approach. This study took place in Semarang Regency, precisely in Jetis Village, Bandungan District according to the targets and objectives of the study. This research uses primary data and secondary data. Data collection methods in this study include observation, interviews, documentation and questionnaires. Key persons in this study include academics, government, farmers, communities, community institutions, and business actors. The analytical method used in this research is the Analytical Hierarchy Process (AHP). The results of the study indicate that the order of priority strategies that can be implemented include the development of human resources, government policies, institutions. Meanwhile, the priority sequence of alternative strategies includes sustainable development and training for farmers and agribusiness actors in creating business innovations, promotion and marketing training using information and communication technology, capacity building for farmers and agribusiness actors in the use of tools, production based on renewable technology. Suggestions that can be given in this study are that the application of good agricultural practices requires a strong commitment from stakeholders so that there needs to be motivation and collaboration between farmers, government and business actors. The application of good agricultural practices needs to be carried out with a consistent strategy so that it requires strict supervision.

Keywords: Good Agricultural Practices (GAP), Analytical Hierarchy Process (AHP) Approach, Food Crops, Jetis Village

INTRODUCTION

Indonesia is an agricultural country that has abundant natural resources so that it is very supportive in the development of agriculture. Agriculture is one of the sectors that absorb the largest workforce. In addition, agriculture also contributes to the supply of export commodities for Indonesia. One area that has abundant agricultural potential is Semarang Regency. The agricultural sector in Semarang Regency is mostly concentrated at the foot of Mount Ungaran. Jetis Village is a village that has abundant agricultural potential. Almost the majority of the population in this village depend on the agricultural sector for their livelihood. The agriculture that is mostly developed in this village is the food crops sub-sector and the horticulture sub-sector. Despite having abundant agricultural potential, the welfare of farmers, especially food crop farmers in Semarang Regency is still relatively low, this is evidenced by the low exchange rate of farmers in the food crop sub-sector as can be seen in the following table:

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Table 1: Farmers' Exchange Rates in Semarang Regency for the 2016-2020 Period

Number	Sub Sector	Years				
		2016	2017	2018	2019	2020
1	Crops	99,51	99,91	99.07	99.11	97.00
2	Horticulture	100,75	102,67	103.10	103.13	103.55
3	People's Plantations	99,39	99,69	100.96	100.07	102.40
4	Farm	100,91	100,55	100.70	100.73	101.46
5	Fishery	105,41	100,43	97.42	97.23	97.53
Average		100,25	100,49	100.92	100.89	100.78

Source: Central Bureau of Statistics, 2021

Based on table 1, it can be explained that the exchange rate for food crop farmers during the 2016-2020 period has the lowest value when compared to other sectors. The exchange rate for food crop farmers is below 100, which means that plant farmers are still experiencing a deficit in running their farming business.

Food crops are one of the export commodities that have a good market share in various countries (Leong et al., 2020; Oo & Usami, 2020). However, to be able to penetrate the export market is not an easy thing. In the current era of globalization, many importing countries demand good quality agricultural products and are environmentally responsible (Kilic et al., 2020; Alzeer et al., 2020). . This is certainly a challenge for farmers in Indonesia considering that there are still many agricultural commodities that have not implemented environmentally friendly agriculture.

The current agricultural system is still oriented towards productivity regardless of environmental sustainability. As a result, agricultural land is increasingly being degraded due to erosion and also excessive use of fertilizers and pesticides. Whereas in the long term this will be a ticking time bomb for the agricultural sector (Ochieng et al., 2019; Senthilkumar et al., 2018; Ranjbar et al., 2021). If you want to be able to penetrate the international market, the agricultural sector must begin to improve to improve the quality of production and be responsible for the environment.

Current domestic and global market demands for agricultural products do not only lead to product quality demands in plain view, but also lead to safety and nutrition as well as environmental responsibility. If the use of fertilizers and pesticides continues to be applied excessively, it will be difficult to meet market demands. As a result, local agricultural products will lose competitiveness with agricultural products from outside. Jetis Village has a conventional farming system that farmers still rely on. This is because the need for chemical fertilizers and pesticides for food crops is very high. To be able to improve the quality and quality of agriculture in Jetis Village, it is necessary to have the right efforts and strategies. One of the efforts that can be applied to face the existing challenges is to apply Good Agricultural Practices (GAP). GAP is the answer to these consumer demands. The character of this agricultural practice is the responsibility of food producers (farmers) to (1) consumers

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(quality and safe products produced, and traceability/traceability; (2) themselves (high productivity); (3) social (safety, security and welfare of farm workers), (4) environment (wise use of pesticides, fertilizers, and agricultural business facilities) Singh & Baldi, 2018; Sennuga et al., 2020). The application of GAP is considered very appropriate to create effective and efficient agriculture, which is responsible for consumers, farmers and of course the environment. The implementation of GAP is expected to help farmers to be able to increase the income they get. However, to be able to implement GAP is not an easy thing because it requires strategies and efforts that are designed appropriately and consistently. The implementation of GAP also requires stakeholder awareness of agricultural practices from upstream to downstream. So that in practice, the agricultural process can be closely monitored and can produce quality products. Therefore, this study aims to develop a Strategy for Empowering Food Crop Farmers Based on Good Agricultural Practices (GAP): Analitycal Hierarchy Process (AHP) Approach.

RESEARCH METHODS

This study took place in Semarang Regency, precisely in Jetis Village, Bandungan District according to the targets and objectives of the study. This research uses primary data and secondary data. Primary data was obtained through data collection using a structured questionnaire, while secondary data used data from publications from government agencies or the results of previous research. The deepening of the problem is carried out through a Focus Group Discussion (FGD). Data collection methods in this study include observation, interviews, documentation and questionnaires. The questionnaire in this study was used to analyze the elements of the supporting factors in the application of GAP. The questionnaire contains a list of closed questions and is addressed to the key person who has been determined based on the sample in the study. The key person given questionnaires and interviews in this study as follows:

a. Bappeda Semarang Regency
b. Semarang Regency Agriculture Service
c. Semarang Regency Environmental Service
d. Non-Governmental Organizations (NGOs)
e. Agricultural academic
f. Environmental Activist in Semarang Regency
g. Semarang Regency farmer group
h. Agricultural Cooperative
i. BUMDes
j. Local Village Apparatus
k. Farmers

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The analytical method used in this research is the Analytical Hierarchy Process (AHP). AHP is a comprehensive decision-making model that takes into account both qualitative and quantitative aspects. The AHP method can help set priorities and goals from various options using several criteria. To determine the priority of the elements in a decision problem is to make pairwise comparisons, where each element is compared in pairs against a specified criterion. The form of pairwise comparison is a matrix. Filling in the pairwise comparison matrix, uses numbers that describe the relative importance of one element over another.

The scale defines and explains the value from 1 to 9 which is determined as a consideration in comparing pairs of similar elements at each level of the hierarchy to a criterion that is at the level above.

Through the Analytical Hierarchy Process (AHP) method, several strategies will be produced that can be used in the context of empowering agribusiness-based farmers with the Good Agricultural Practices (GAP) approach.

Table 2: Pairwise Comparison Scale

Score	**Information**
Value 1	Both factors are equally important
Value 3	One factor is slightly more important than the other
Value 5	One factor is essential or more important than other factors
Value 7	One factor is more important than other factors
Value 9	One factor is absolutely more important than any other factor
Value 2,4,6,8	Intermediate values, between two adjacent consideration values

Source: Saaty, 2013

In solving problems with the Analytical Hierarchy Process (AHP) there are several principles that must be understood, including the following:

1. Decomposition (creating a hierarchy)

In compiling the hierarchy, the objectives must be determined through the criteria used to assess the existing alternatives. Each criterion sometimes has sub-criteria below which have their respective intensity values.

2. Comparative judgment (criteria and alternative assessment)

Criteria and alternatives were carried out by pairwise comparisons. According to Saaty (1988), for various problems, a scale of 1 to 9 is the scale used in the assessment.

3. Synthesis of priority (determining priority)

Determining the priority of each criterion is used as the weight of the criteria in decision making. The Analytical Hierarchy Process (AHP) method performs a priority analysis of each criterion with a pairwise comparison method between two elements so that all existing elements will be included in the comparison.

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4. Logical Consistency (logical consistency)

Consistency has two meanings. The first is that similar objects can be grouped according to their type. The second concerns the level of relationship between objects based on certain criteria. In determining the priority strategy, the steps in the Analytical Hierarchy Process (AHP) method are needed as follows:

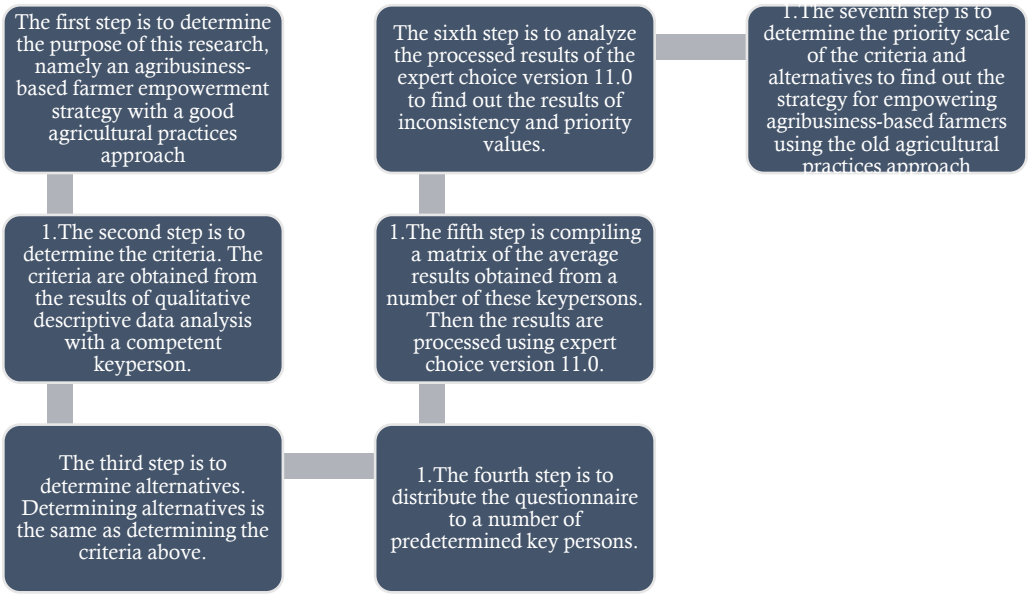

Figure 1: AHP Analysis Steps

Basically the mathematical formulation of the AHP model is done by using a matrix. For example, in an operating subsystem to the operating elements, namely the operation elements A1, A2... An, then the comparison results in pairs of these operating elements will form a comparison matrix. Pairwise comparisons start from the highest level of the hierarchy, where a criterion is used as the basis for making comparisons. Pairwise comparison matrix = PC Matrix is a basic tool used to analyze data based on the AHP method. These are provided with the results of the comparison between each item expressed in the fundamental Saaty scale, after which they are subject to mathematical analysis. Pairwise comparison matrices are usually marked with the symbol A and have the following form:

$$A = [a_{ij}] = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{bmatrix} = \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ \frac{1}{a_{12}} & 1 & \dots & a_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \frac{1}{a_{1n}} & \frac{1}{a_{2n}} & \dots & 1 \end{bmatrix}$$

The value of each in the matrix A (aij) refers to the degree to which (how much) element xi is preferred over xj with respect to a particular feature (criteria, objective, etc.) For each such

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matrix, a so-called preference vector is determined. The latter is most commonly referred to as a priority vector or a weight vector, and in related literature is denoted by the letter w:

$$w = [w_1, w_2, \ldots, w_n]^T$$

It represents the ranking of decision-making criteria or options according to their relative significance or preference. Of the at least a dozen methods for defining priority vectors, the most frequently used is the precise eigenvector method, recommended by Saaty. Other methods of defining weight vectors, which are also willing to be applied by researchers include the LLSM least squares logarithmic method, also called the geometric mean method - GM), and the column normalization method, namely the arithmetic mean method. The result of the comparison of items xi and items xj is inversely proportional to the comparison between xj and xi, as a result the matrix is called a reciprocal matrix. That is, each item corresponds to the characteristics described through the equation:

$$a_{ji} = \frac{1}{a_{ji}} \forall i, j = 1, \ldots, n$$

Where aii = 1 for every i = 1, 2,…, n.

The higher the value of the weight coefficient, the more significant and influential for the criteria concerned. The AHP method consists of two kinds (ranking) of weight coefficients: local priority and global priority.

The literature related to the AHP method very often refers to group decision making. Four sequential paths of aggregate scoring can be distinguished, and these are as follows consensus, voting, aggregated individual scoring - AIJ, and individual priority aggregation - AIP. If consensus cannot be reached or voting cannot take place, AIJ or AIP procedures are applied. In the case of AIJ, the independent matrices A1,…, Am are combined to form one composite matrix: AG = (aij G) and only after that the priority vector is estimated. In this case the aggregation precedes the priority estimate, so in reality it is a comparison aggregation. AIJ is applied when several decision makers act synergistically like a unified team.

Consistency is an important attribute of any comparison matrix. If a matrix is consistent, it means that respondents answered wisely rather than randomly and consistent results are synonymous with their credibility. With regard to mathematics, the matrix is consistent if:

$$a_{ik} = a_{ij} \cdot a_{jk}$$

for each i, j, k = 1,…, n.

In the related literature, a series of indices are proposed to measure the size of this deviation. The index that is most often applied in the AHP method is the Consistency Index and the normal version is the Consistency Ratio. The index was proposed by Saaty in combination with a method involving weight estimation through the right eigenvector (EV) method. Consistency

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is measured based on the assumption that the ideal consistency of the comparison square matrix of n items (An × n) is maintained when the highest eigenvalue (λmax) is equal to the number of items compared to n, namely::

$$\lambda_{\max} = n \text{for all } a_{ij} = \frac{w_i}{w_j}.$$

That is, the closer max approaches the value of n, the more consistent the matrix is. Saaty also proves that an inconsistent matrix has a max value higher than n (Dadkhah and Zahedi, 1993). Deviations from the ideal consistency are measured by the CI consistency index, according to the following equation formula:

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

dimana λmax - 1 adalah deviasi dari semua aij dari nilai estimasiwi wj yaitu deviasi dari konsistensi ideal. Hasil simulasi menunjukkan bahwa nilai ekspektasi CI dari matriks dimensi n + 1 yang dihasilkan secara acak rata-rata lebih tinggi dari nilai ekspektasi CI matriks dimensi n. Ini menyiratkan bahwa CI lebih ketat untuk matriks dengan dimensi yang lebih tinggi dan harus diubah skalanya. In this way we arrive at the consistency ratio CR, which is the normalized value of CI. It is determined by dividing the CI by the so-called Random Index (RI):

$$CR = \frac{CI}{RI}.$$

RI is the arithmetic mean of the CI for a large number of randomly generated matrices of various n dimensions. They are described as constants, tabulated values for n = 3,…., 15., which must be assigned to the formula of the equation. According to Saaty:

a. matrix A is completely (ideally) consistent if CR = 0,
b. almost consistent (or: inconsistent within the allowable limit) if 0 < CR 0.10,
c. matrix A is inconsistent if CR > 0.10

Although CR = 0.10 is the limit value for a matrix that is considered consistent, many experts criticize this level as too limiting and arbitrary. It is also difficult to get an assessment of more than three elements compared at one time. Moreover, Saaty himself stressed that minimizing CR should not be an end in itself. However, in the case of matrices with a CR significantly exceeding the 0.10 level (specifically 0.20 and more), the assessment should be repeated.

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The AHP model used in this study is described in the chart below:

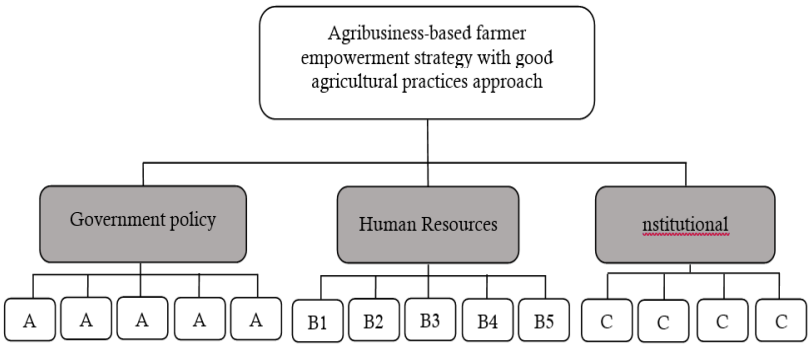

Figure 2: AHP Hierarchical Framework

Information:

1. Government Policy

Government policy in this case is a policy decision formulated by the local government to provide an agribusiness-based farmer empowerment strategy with a Good Agricultural Practices (GAP) approach. In this aspect there are five alternatives including:

A1: Provision of integrated and sustainable agricultural business capital needs by alternative financing model and with soft interest

A2: Providing information, promotion and market guarantee facilities for farmers and actors agribusiness

A3: Providing assistance with vital production tools

A4: Providing easy access to information and communication technology to farmers and agribusiness

A5: Provision of supporting infrastructure for integrated agricultural development and sustainable

2. Human resources

Human resources in this case are focused on the human resources of farmers and agribusiness actors. In this aspect there are five alternatives including the following:

B1: Providing motivation to farmers and agribusiness actors to improve abilities and skills in running their business

B2: Increasing managerial and business management skills

B3: Continuous guidance and training for farmers and agribusiness actors in creating business innovation

B4: Capacity building of farmers and agribusiness actors in the use of tools production based on renewable technology

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B5: Promotion and marketing training using information and communication technology

3. Institutional

Institutional in this case is focused on supporting institutions, groups and cooperatives for farmers and agribusiness actors. In this aspect there are four alternatives including the following:

C1: Capacity building and quality of special institutions for agribusiness companion

C2: Formation of an organization/community forum to establish cooperation between farmers and agribusiness

C3: Training on management of cooperatives and farmer organizations and agribusiness actors

C4: Increasing business partnerships between local agricultural cooperatives and entrepreneurs/investors

Research Stages

This research will be carried out through several stages in the preparation of an agribusiness-based farmer empowerment model with the Good Agricultural Practices (GAP) approach. The stages in the implementation of this research are as follows:

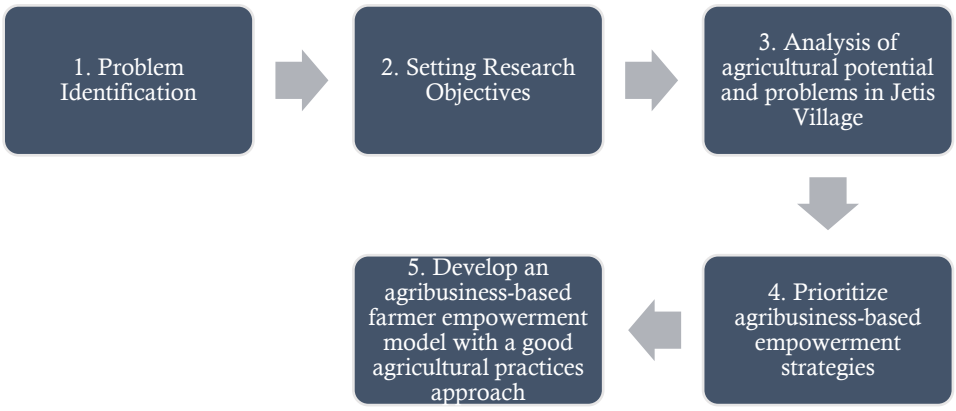

Figure 3: Research Stages

The final goal of this research is the empowerment of agribusiness-based farmers with a good agricultural practices approach.

RESULTS AND DISCUSSION

The analysis of AHP (Analytical Hierarchy Process) in this study was used to prioritize agribusiness-based farmer empowerment strategies with the Good Agricultural Practices (GAP) approach. The components used for AHP analysis in this study include several criteria and alternatives based on the results of a literature review, previous research and interviews with predetermined and competent keypersons in agriculture. Keypersons involved in this study consisted of the Agriculture Service of Semarang Regency, Agricultural Extension

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Officers, Academics, Farmers' Groups, Agribusiness Actors, and Village Apparatus. In the following, the results of the analytical hierarchy process are presented using the Expert Choice 11 program:

AHP Analysis Calculation Results In General All Criteria for Agribusiness-Based Farmer Empowerment Strategy with Good Agricultural Practices (GAP) Approach

Based on the calculation of the analytical hierarchy process against all criteria for agribusiness-based farmer empowerment strategies with a good agricultural practices approach with the expert choice 11 program, the following results were obtained:

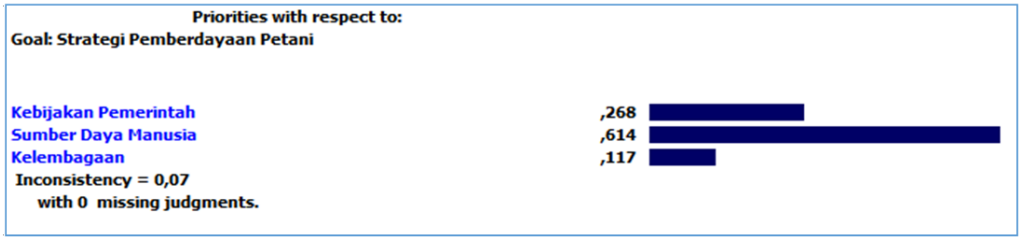

Figure 4: Output of AHP Farmer empowerment strategy based on agribusiness with good agricultural practices approach.

Source: Primary Data Processed, 2022

Based on Figure 4, it can be seen that the most prioritized criteria in agribusiness-based farmer empowerment strategies with a good agricultural practices approach is the development of human resources with a weight value of 0.614. Then the second priority criterion is government policy with a weighted value of 0.268 and the third priority criterion is institutional with a weighted value of 0.117. From the calculation of the Analytical Hierarchy Process (AHP) with the expert choice 11 program, an inconsistency ratio of 0.07 < 0.10 was obtained, which means that the answers given by keypersons are consistent.

Calculation Results of AHP Analysis on Human Resource Development Criteria

Based on the calculation of the analytical hierarchy process against the criteria for developing human resources with the expert choice 11 program, the following results were obtained:

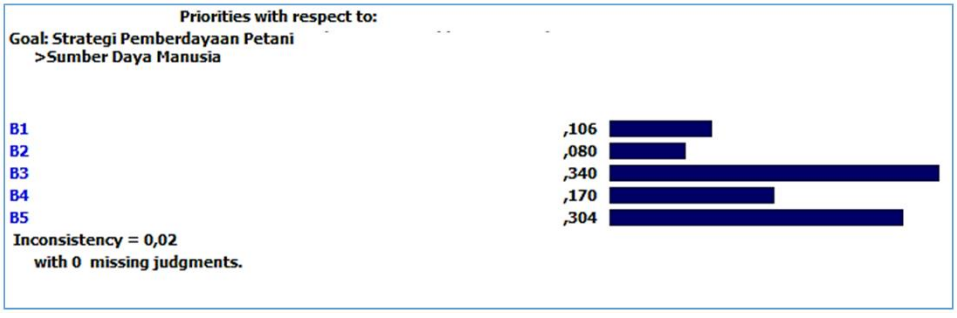

Figure 5: AHP Output Human Resource Development Criteria

Source: Primary Data Processed, 2022

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Information:

B1: Providing motivation to farmers and agribusiness actors to improve abilities and skills in running their business

B2: Increasing managerial and business management skills

B3: Continuous guidance and training for farmers and agribusiness actors in creating business innovation

B4: Increasing the capacity of farmers and agribusiness actors in the use of tools production based on renewable technology

Calculation Results of AHP Analysis on Government Policy Criteria

Based on the calculation of the analytical hierarchy process against the government policy criteria with the expert choice 11 program, the following results were obtained:

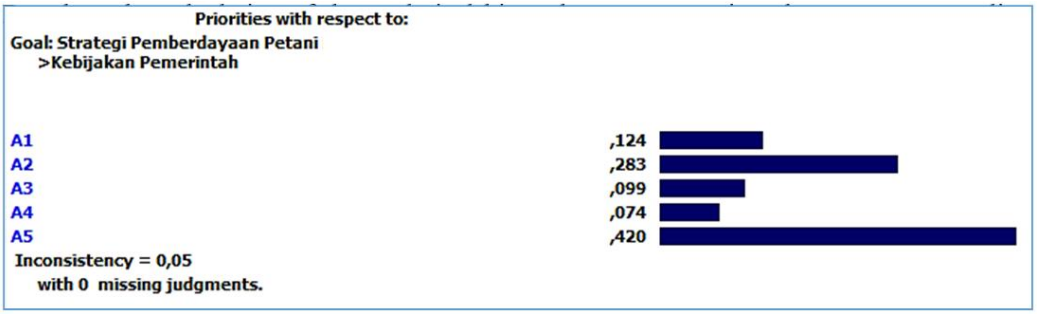

Figure 6: AHP Output Government Policy Criteria

Source: Primary Data Processed, 2021

Information:

A1: Provision of integrated and sustainable agricultural business capital needs by alternative financing model and with soft interest

A2: Providing information, promotion and market guarantee facilities for farmers and actors agribusiness

A3: Providing assistance with vital production tools

A4: Providing easy access to information and communication technology to farmers and agribusiness

A5: Provision of supporting infrastructure for integrated agricultural development and sustainable

Based on Figure 6, it can be seen that the most prioritized alternative in government policy criteria is the provision of supporting infrastructure for integrated and sustainable agricultural development with a weighted value of 0.420. Then the second priority alternative is the provision of information facilities, promotions and market guarantees for farmers and

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agribusiness actors with a weight value of 0.283. While the last priority alternative is the provision of easy access to information and communication technology to farmers and agribusiness actors with a weight value of 0.074. From the calculation of the Analytical Hierarchy Process (AHP) with the expert choice 11 program, the inconsistency ratio was 0.05 < 0.10, which means that the answers given by key persons are consistent.

Calculation Results of AHP Analysis on Institutional Criteria

Based on the calculation of the analytical hierarchy process against the institutional criteria with the expert choice 11 program, the following results were obtained:

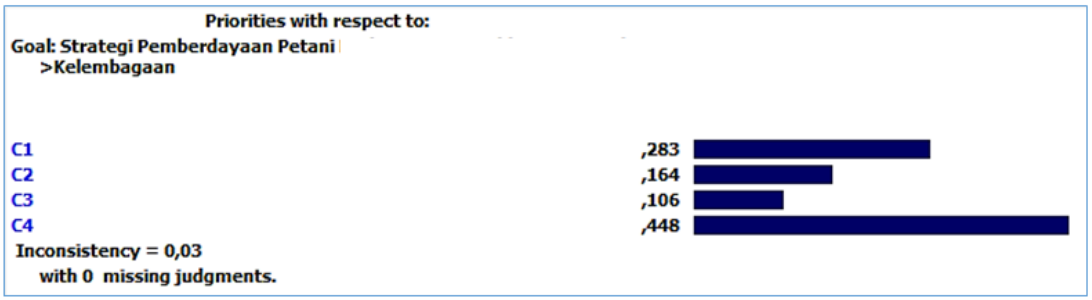

Figure 7: AHP Outputs Institutional Criteria

Source: Primary Data Processed, 2021

Information:

C1: Capacity building and quality of special institutions for agribusiness companion

C2: Formation of an organizational forum/community to establish cooperation between farmers and agribusiness actors

C3: Training on management of cooperatives and farmer organizations and agribusiness actors

C4: Increasing business partnerships between local agricultural cooperatives and entrepreneurs/investors

Based on Figure 7, it can be seen that the most prioritized alternative in the institutional criteria is the improvement of business partnerships between companie local

Agricultural cooperatives with entrepreneurs/investors with a weighted value of 0.448. Then the second priority alternative is to increase the capacity and quality of special institutions accompanying agribusiness with a weight value of 0.283. While the last priority alternative is cooperative management training and farmer organizations and agribusiness actors with a weight value of 0.106. From the calculation of the Analytical Hierarchy Process (AHP) with the expert choice 11 program, the inconsistency ratio result is 0.03 < 0.10, which means that the answers given by keypersons are consistent..

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Calculation Results of AHP Analysis of All Alternatives in agribusiness-based farmer empowerment strategies with a good agricultural practices approach

Based on the calculation of the analytical hierarchy process for all alternative strategies for empowering farmers based on agribusiness with a good agricultural practices approach with the expert choice 11 program, the following results were obtained:

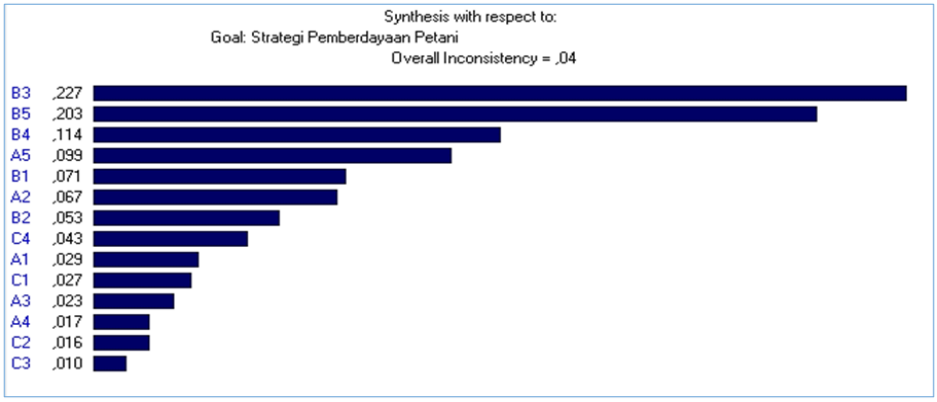

Figure 8: AHP Output Overall Policy Alternatives

Source: Primary Data Processed, 2021

Based on the calculation results from the Analytical Hierarchy Process (AHP) in Figure 8 shows that the most prioritized alternative in agribusiness-based farmer empowerment strategies with a good agricultural practices approach is sustainable development and training for farmers and agribusiness actors in creating business innovations with a weight value of 0.227. The second priority alternative is promotion and marketing training using information and communication technology with a weight of 0.203. While the last priority alternative is cooperative management training and farmer organizations and agribusiness actors with a weight value of 0.010. From the calculation of the Analytical Hierarchy Process (AHP) with the expert choice 11 program, an inconsistency ratio of 0.04 < 0.10 means that the answers given by keypersons are consistent.

Sensitivity Analysis of the Calculation Results of AHP Analysis on agribusiness-based farmer empowerment strategies with a good agricultural practices approach Sensitivity analysis aims to analyze the stability of alternative priorities by making simulation variations on the priority criteria of the strategy. Sensitivity analysis can be performed for both criteria and sub-criteria. Sensitivity analysis is concerned with the question of whether the final result will always be stable if there is a change in the input (input) either assessment or priority. This analysis will also see whether the change will change the alternative or not. From the sensitivity analysis, the following results were obtained:

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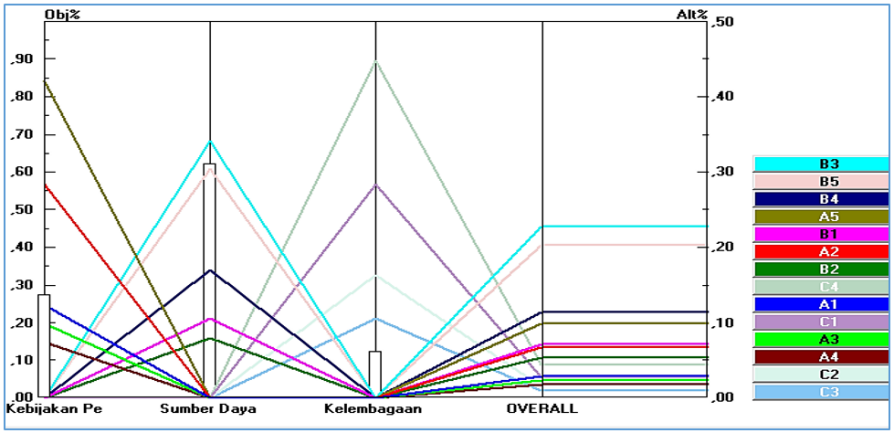

A. Preliminary Results Before Simulation

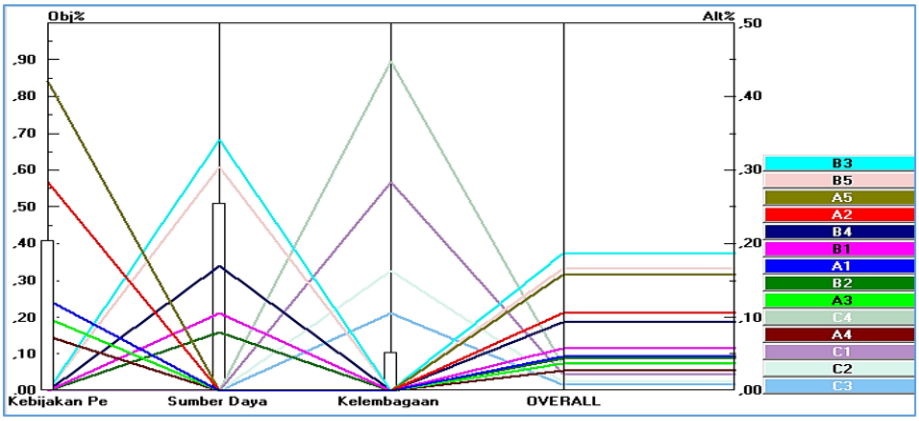

Figure 9: Sensitivity Analysis Results

B. Final Result after Simulation

Source: Processed Data, 2021

Based on Figure 9, it can be seen that the initial results in calculating AHP on an agribusiness-based farmer empowerment strategy with a good agricultural practices approach are obtained that the most prioritized policy alternatives are sustainable development and training for farmers and agribusiness actors in creating business innovations as shown in Figure A. Then after a simulation is carried out by increasing the government policy input from 0.268 or 26.8% to 40%, the priority policy alternatives are the same as shown in Figure B. These results indicate that there is stability in the assessment.

Discussion

Based on the results of the AHP analysis, the priority strategies for empowering farmers in Jetis Village have been obtained using the GAP approach. The application of GAP in the food crop sub-sector is considered appropriate given that the food crop farming system is very vulnerable to land degradation due to the excessive use of chemical fertilizers and pesticides

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and soil erosion that often occurs due to the short cropping cycle of food crops (Sharma et al., 2019; Ng, 2017; Kurtaslan, 2021). The food crops that are widely developed in Jetis Village are rice, corn, soybeans, and tubers.

The farmer empowerment strategy with the GAP approach can be started from improving the quality of existing human resources. The majority of farmers in Jetis Village are now elderly and have low educational backgrounds. Competently, they may indeed be experts in the process of cultivating food crops, but their competencies still tend to be conventional so they need to provide assistance to the importance of developing cultivation competencies that are more environmentally friendly. Farmers also need to be given training on agribusiness so that they are not always manipulated by middlemen. Farmer empowerment strategies require training for farmers that is consistent and in accordance with the needs in the field (Nur et al., 2020; Paumgartten, 2021).

Efforts to create quality and environmentally responsible agriculture certainly require innovation and the application of effective technology. There is a need for assistance with agricultural machinery, especially in the cultivation section so that farmers can carry out more efficient cultivation. There is also a need for innovation, especially the innovation of organic fertilizers and pesticides to be more friendly to the environment. Hadi et al.'s research (2021) explains that sustainable farmer empowerment strategies need to prioritize innovation aspects, especially innovation in the manufacture of organic fertilizers and pesticides. In addition, the ability of farmers in the use of information and communication technology also needs to be improved. Along with technological developments, currently the digital market has penetrated widely in the community so that there is a need for innovation and digital marketing of agricultural products (Smulders et al., 2021; Dubey et al., 2021).

The second aspect that needs to be considered is the need for the government's contribution to formulate pro-agriculture policies with the GAP system. The first policy that can be implemented is the need to provide supporting infrastructure for the implementation of GAP. The infrastructure in question can include cultivation technology infrastructure, agribusiness sub-terminals, and others. In addition, the second policy is the need to provide information and communication facilities for promotion and marketing residents. In this case, the most urgent is the means of convenience in managing environmentally friendly product certification. Sustainable farmer empowerment strategies must prioritize aspects of easy access to information and communication technology to support promotion and marketing (Mulyaningsih et al., 2021; Bedano et al., 2016; Wongprawmas et al., 2015). Farmers also need capital assistance to carry out agricultural cultivation. Apart from direct assistance, the policy that can be applied is assistance in facilitating access to financing with low interest rates so that it does not burden farmers.

The next aspect that needs to be considered is institutional. Agricultural business certainly involves various stakeholders. These stakeholders must be able to play their role effectively and efficiently. The problem is, farmer-level institutions, in this case farmer groups, still need optimal assistance, especially in the application of the new GAP. It is necessary to strengthen farmer group partnerships with various related stakeholders, both providers of production

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inputs and marketing stakeholders. In addition, it is also necessary to increase the capacity and quality of agricultural extension institutions because these institutions directly interact with farmers.

CONCLUSION

Based on the results and discussions that have been described, it can be concluded that Jetis Village as one of the villages that has agricultural potential in the food crop sub-sector requires efforts to empower farmers considering the welfare of existing farmers is still low. Agriculture that tends to be conventional and threatens natural sustainability needs to be addressed by implementing good agricultural practices so that it can have good quality and be environmentally responsible so that it can compete in domestic and global markets. In an effort to implement GAP, it is necessary to develop the right strategic priorities. The priority sequence of strategies that can be implemented is the development of human resources, government policies, institutions. Meanwhile, the priority sequence of alternative strategies includes sustainable development and training for farmers and agribusiness actors in creating business innovations, promotion and marketing training using information and communication technology, capacity building for farmers and agribusiness actors in the use of tools, production based on renewable technology.

Suggestions that can be given in this study are that the application of good agricultural practices requires a strong commitment from stakeholders so that there needs to be motivation and collaboration between farmers, government and business actors. The application of good agricultural practices needs to be carried out with a consistent strategy so that it needs strict supervision. For further research, it is possible to conduct a more detailed analysis of strategy preparation by paying attention to upstream and downstream aspects.

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