INVESTMENT IMPROVEMENT EFFORTS IN THE AGRICULTURAL SECTOR

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Abstract

The agricultural sector in Central Java has great potential and contributes to the third largest GRDP. It can absorb the largest labor force. This sector also has a large impact on other economic sectors. However, investment in the agricultural sector is very small each year. This study aimed to determine the factors that caused low investment in the agricultural sector in Central Java Province, and formulated priority programs in increasing investment in the agricultural sector in Central Java Province. It used quantitative approach with primary and secondary data. The analyses used were regression using the Ordinary Least Square (OLS) and Analytic Hierarchy Process (AHP) estimation methods. The findings of this study indicated that the factors that influenced the low investment in the agricultural sector in Central Java was Gross Regional Domestic Product (GRDP). Labor was the main criterion in increasing investment in the agricultural sector in Central Java Province. The next criteria were the criteria for the availability of land for agriculture, GRDP criteria, and the criteria for credit interest rates. Factors that hinder the strategy of increasing investment in the agricultural sector were infrastructure, low quality of human resources in the agricultural sector, and lack of access to capital. The solutions that can be done are by reducing the conversion of agricultural land, improving the quality of labor in the agricultural sector, and providing easy access to banking capital for farmers.

Keywords: Investment, Agriculture, Strategy, Central Java, Analytic Hierarchy Process.

1. Introduction

Development and investment activities are two things that are very closely related because the formation of capital or investment is seen as one of the main factors in economic development. According to Harrod Domar (in Badrudin 2012: 127) investment is the key to economic growth because investment can create income and can increase the economic production capacity of a region through increasing capital stock. It not only affects the formation of national output but can also have an effect on increasing the establishment of various industries so that it will have an impact on reducing unemployment. Thus, investment can increase national output and employment opportunities which will ultimately have an impact on economic welfare.

Central Java is one of the national food buffer provinces. The importance of the agricultural sector in Central Java Province can illustrate that the agricultural sector can be a mainstay sector if its potential can be explored and continues to be driven to become the engine driving the economy of Central Java Province. When viewed from the structure of Central Java's GRDP, the agricultural sector is included in the top three contributors to Central Java GRDP in 2013-2017 after the processing and trade industries, hotels and restaurants. This can be seen in Figure 1 below.

Figure 1. The Distribution of Percentage of GRDP with the Basis of Constant Prices According to the Business Field of Central Java Province 2013-2017
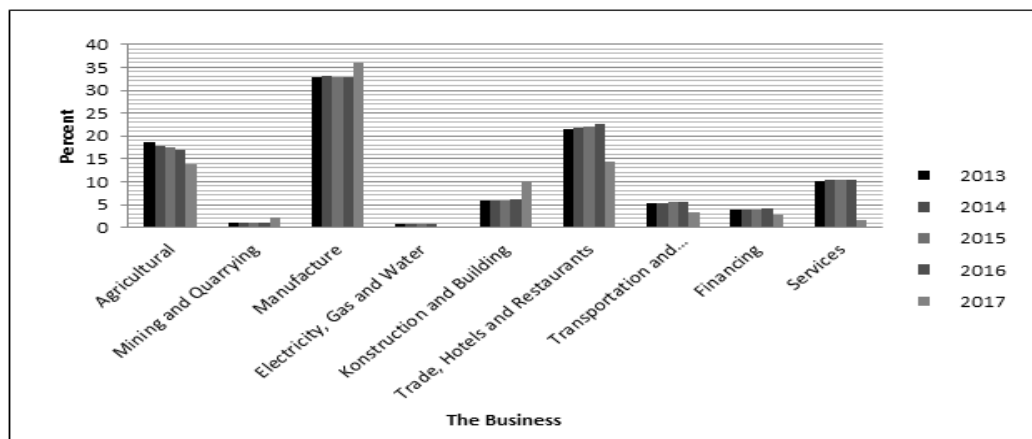
Source: Jawa Tengah Dalam Angka, 2017

Based on the diagram in Figure 1, it is known that in 2013-2017 the manufacturing industry sector had the largest contribution of the total value of Central Java GRDP. It was then followed by the trade, hotel and restaurant sector. The agricultural sector contributed the third largest after the manufacturing industry and trade, hotels and restaurants. Nevertheless, the economy of Central Java still has an agrarian pattern because there are still many residents in the countryside who still rely on the agricultural sector as their livelihood. This is also supported by the study of Friday Francis (2012) who says that development in the agricultural sector in rural areas is very important to be improved because most economies in African countries, especially in rural areas still rely on the agricultural sector to meet food needs in African countries. Also, agriculture sector is one of the most important raw materials for increasing economic growth in the industrial sector in African countries. Based on data from the Central Statistics Agency (BPS, 2017: 69) in 2013-2017 the number of people working in the agricultural sector was higher than other economic sectors in Central Java Province. This can be seen in Table 1 below.

Table 1: Population Aged 15 Years and Over Who Work According to Major Occupation Fields in Central Java Province 2013-2017

Sector	2013	2014	2015	2016	2017
Agriculture	5,616,529	5,376,452	5,064,377	4,926,629	5,173,986
Mining, Electricity, Gas & Water	136,625	108,592	117,772	87,143	115,201
Manufacture	2,815,292	3,046,724	3,297,707	3,044,428	3,173,217
Kontruction and Building	1,046,741	1,097,380	1,207,067	950,578	1,269,113
Trade, Hotels and Restaurant	3,388,450	3,402,091	3,447,147	3,585,596	3,715,488
Transportation	664,080	563,144	547,944	603,862	587,391
Financing	179,804	264,681	282,810	314,246	322,402
Services	1,961,926	2,057,071	2,168,066	2,451,566	2,193,884

Source: Jawa Tengah dalam Angka, 2017

The Central Java agricultural sector was the sector that absorbed the largest labor force compared to other economic sectors from 2013-2017. Even though the absorption of labor in the agricultural sector was quite large, the number of workers in the agricultural sector from 2013-2017 continued to decline. This was due to the transition of traditional economic structures to the structure of a modern economy which has been dominated by the manufacturing sector. Therefore, many workers in Central Java were more interested in working in other sectors such as the manufacturing industry which is always increasing every year with the hope that they will get higher wages or salaries than working in the agricultural sector, although the agricultural sector was able to provide the third largest contribution to the value of Central Java's GRDP and the workforce working in the agricultural sector was the

most compared to other economic sectors. However, the growth rate in the agricultural sector was the smallest compared to other economic sectors. This can be seen in Figure 2 below.

Figure 2. GRDP Growth Rate on the basis of Constant Prices according to the Business Field of Central Java Province 2013-2017
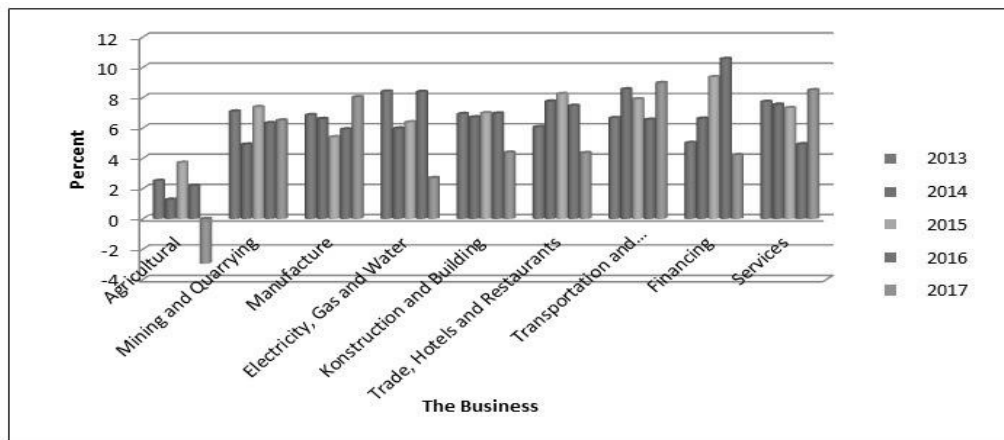
Source: Central Java in Figures, 2017

Based on the diagram in Figure 2, the GRDP growth rate in the agricultural sector was the smallest compared to other economic sectors which were equal to 2.51% in 2013 even this figure always decreased until its growth was negative in 2017 which were -2.95%. The low rate of growth in the agricultural sector was due to a lack of government support in the agricultural sector such as low infrastructure, a lack of government capital assistance in the agricultural sector, traditional technology. Therefore the growth rate in the agricultural sector was very slow from 2013-2017.

Even though the Agriculture sector was one of the third largest contributors to GDP and was a potential sector as well as absorbed the most labor. However, investment in the agricultural sector in Central Java Province was less developed and almost no investors invested in the agricultural sector, including the primary sector compared to the secondary sector such as the manufacturing industry.

Table 2: The Realization of the Value of Domestic Investment and Foreign Direct Investment in Central Java2013-2017 According to the Sector (billion)

Sector	2013	2014	2015	2016	2017	Total
Agriculture			27,107	3,068	1,400	31,575
Mining	18,000					18,000
Manufacture	3,440,448	1,710,962	2,337,312	999,548	3,284,531	11,772,801
Electricity, Gas, & Water						NA
Konstruction	14,350	16,132	34,000	15,500		88,469
Trade	103,078	209,879	174,957	118,265		606,179
Transportation	33,075	175,620			3,646,347	3,855,043
Financing						NA
Services	1,800	10,975	9,437	720		22,932

Source: The Central Bureau of Statistics of Jawa Tengah Dalam Angka

Based on Domestic Investment (PMDN) and Foreign Investment (PMA), the investment invested in the agricultural sector was very small compared to the manufacturing sector. In 2013-2017 Central Java's largest investment was invested in the manufacturing sector, which amounted to 11,772,801 billion. Then, it was followed by the transportation and communication sector, which amounted to 3,855,043 billion and the trade, hotel and restaurant sector which amounted to 606,179 billion. The agricultural, mining and services sectors got small domestic investment (PMDN) and foreign investment (PMA) from 2013-2017, which was 31.575 billion for the agricultural sector, 18,000 billion for the mining sector and 22.932 billion for the services sector.

Based on the description above, it can be seen that the agricultural sector had great potential and contributed the third largest GRDP as well as could absorb the largest number of workers, of course, this sector also has a large impact on other economic sectors. However, investment in the agricultural sector is very little from year to year with almost no investment. Therefore, investment in the agricultural sector in Central Java Province is still relatively few and underdeveloped.

This is also supported by a research conducted by Daniel (2015) entitled "Chinese Trade and Investment in the Nigeria's Agricultural Sector: a Critical Analysis" which shows that investment in the agricultural sector in Nigeria is still low compared to other economic sectors because the agreement trade with China has still not been improved. It was caused by the development of the agricultural sector in China is more advanced and developing in increasing investment in the agricultural sector in the country of Nigeria. As a result, further studies are needed on factors which can cause foreign investment and domestic investment do not invest in the agricultural sector, the Government's strategy to increase both domestic and foreign investment in the agricultural sector to the economy of Central Java, and obstacles and solutions to improve investment in the agricultural sector in Central Java.

2. Methods

The data used in this study were time series secondary data and primary data. The analytical method used was regression analysis and the analysis of Analytic Hierarchy Process (AHP). The estimation method was realized by the use of Ordinary Least Square (OLS). The data were collected through questionnaire technique, interviews, observation, and documentation. The sample taken in this study were 11 key persons consisting of academics, the private sectors, the government, and the communities.

The variables used in this study were dependent and independent variables. The dependent variable used was investment in the agricultural sector. On the other hand, the independent variables used were agricultural sector labor, agricultural sector GDP, Credit Interest Rate (SBK), and availability of land for agriculture.

The analytical method employed in this study was multiple linear regression analysis with estimation of Ordinary Least Square (OLS). The regression equation built in this study is as follows:

$$Y = \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + e$$

Notes:
Y   = Agricultural sector investment
β_0 = Constants
$\beta_1 X1$ = Credit Interest Rate (SBK) Variable
$\beta_2 X2$ = GRDP in the agricultural sector Variable
$\beta_3 X3$ = Labor in the agricultural sector Variable
$\beta_4 X4$ = Availability of land for agriculture Variable
e = error level

In addition, this study also used the Analytic Hierarchy Process (AHP) method with the aim of developing priority programs that must be included in an effort to increase investment in the agricultural sector in Central Java Province. Therefore, this study required several competent (key-persons) parties to determine program alternatives in an effort to increase investment in the agricultural sector in Central Java Province. Moreover, the arrangement of hierarchies needed to develop several programs in an effort to increase investment in the agricultural sector in Central Java Province which was offered by relevant stakeholders, namely:

Program 1: Availability of labor in the agricultural sector must be increased.

Program 2: Provide knowledge and skills for farmers to improve the quality of labor in the agricultural sector.

Program 3: Increase wages or salaries for agricultural sector workers.

Program 4: Improve the quality of agricultural products in Central Java Province.

Program 5: Increase the price of agricultural commodities in Central Java Province.

Program 6: Shorten the agricultural product chain in Central Java Province.

Program 7: Increase the availability of paddy fields to produce agricultural products

Program 8: Improve the quality of paddy fields that have been well irrigated to produce agricultural products

Program 9: Provide assistance in maintaining and maintaining paddy fields that have been well irrigated to farmers.

Program 10: Decrease in credit interest rates.

Program 11: Extension of credit period.

Program 12: Add credit facilities.

According to Saaty in Prajanti (2013: 85), in order to set priorities for elements in a decision problem, there is a need to make pairwise comparisons, namely each element is paired and compared with a specified criteria. The form of pairing comparisons was in matrix. The paired compared matrix filling was done by using numbers that describe the relative importance of an element above the others.

3. Analysis Results

In analyzing the factors that can cause low investment in the agricultural sector in Central Java Province, the researchers used the Ordinary Least Squares (OLS) method. Based on the regression results, the resulting model was as follows:

$$LogY = \beta_0 + \beta_1 X_1 + \beta_2 LogX_2 + \beta_2 LogX_3 + \beta_2 LogX_4 + \mu$$

$$LogInvestment = 16.31836 - 0.035582\ SBK + 0.445159\ LogPDRB - 0.630604\ LogTK - 0.076347\ LogKL + \mu$$

If Y is an investment in the agricultural sector, by seeing the coefficient value of 16,31836 in the regression results, it can be interpreted that if all the independent variables had a value of zero (0) then the amount of investment in the agricultural sector in Central Java Province was 16,31836 Rupiah.

The coefficient value (X_1) which was the Credit Interest Rate (SBK) was equal to -0.0355. This showed that if every reduction in credit interest rated by 1%, it will be able to increase investment in the agricultural sector by 0.0355 percent. For more, the variable coefficient (X_2), which was the Gross Regional Domestic Product (GRDP) of the agricultural sector gained 0.4451. This showed that if every increase in agricultural sector GDP was 1%, it will be able to increase investment in the agricultural sector by 0.4451 percent.

The coefficient value for (X_3), namely the agricultural sector labor was -0.6306. This showed that if every decline in the agricultural sector workforce was 1%, it can increase investment in the agricultural sector by 0.6306 percent. Furthermore, the coefficient value (X_4), namely the availability of land for agriculture was equal to -0.0763. This showed that if every decrease in land availability for agriculture was 1%, it will be able to increase investment in the agricultural sector by 0.0763 with the assumption of *ceteris paribus*.

In accordance with regression results, namely the value of F-count = 6.396448> F-table = 2.76, then the decision was the null hypothesis (H0) was rejected and the alternative hypothesis (Ha) was accepted. Therefore, the results of the F test stated that the independent variables namely credit interest rates, agricultural sector GDP, agricultural sector labor, the availability of land for agriculture in the form of irrigated land jointly had a significant effect on the dependent variable, namely agricultural sector investment in Central Java Province (Fuadi, 2013: 48).

The regression results indicated that the credit interest rate obtained t-count value of -1.772896, the agricultural sector labor obtained t-count value of -0.946233, and the availability of land for agriculture at -0.161984, while the t-table value of 2.060, so the loan interest, agricultural sector labor, availability of land for agriculture obtained a t-count value

(-1.772896, -0.946233, -0.161984 <2,060) respectively. Then, the decision was the null hypothesis (H$_0$) was accepted and the alternative hypothesis (H$_a$) was rejected. The results of the test stated that loan interest rates, agricultural sector labor, and the availability of land for agriculture did not have a significant influence on investment in the agricultural sector in Central Java Province. Meanwhile, GRDP had a positive and significant influence on investment in the agricultural sector in Central Java Province.

Based on the results of the regression analysis, the agricultural sector labor, credit interest rates, and the availability of land for agriculture did not have a significant influence on increasing investment in the agricultural sector in Central Java Province. This is supported by the research of G. Lachov (2005) with the title "Uncertainties Surrounding Investment in Agricultural Land in Bulgaria and Solution Using a Real Options Approach" which shows that an increase in investment in agricultural land in Bulgaria depends on the following factors: such as land prices in European countries, and increased efficiency due to new technologies, and the possibility of land in Bulgaria owned by foreign citizen.

3.1. Program Criteria and Investment Improvement Strategies in the Agriculture Sector in Central Java Province

Based on the tabulation obtained from the opinions of several key persons, the criteria for obtaining the agricultural sector labor (weight value 0.336) were the criteria that had the highest weight. Hence, the criteria for labor needed to be considered in increasing investment in the agricultural sector in Central Java so that investors would be willing to invest in the agricultural sector. The next criterion was the criteria for the availability of land for agriculture obtained (weight value 0.322), the GDP of the agricultural sector obtained (weight value 0.233), and the criteria for credit interest obtained (weight value 0.108). This can be seen based on the following figure:

Figure 3. Criteria for Increasing Agricultural Sector Investment

Inconsistency Ratio =0.03

Source: Primary Data processed, 2018

The results of AHP data processing were used to determine the priority aspects in providing information about aspects to improve or develop to increase investment in the agricultural sector in Central Java Province. AHP results were obtained from several key persons who were respondents in this study. The results based on AHP analysis showed that the government must pay more attention to the aspects of the agricultural sector labor because labor in the agricultural sector was still not optimal. Furthermore, the aspects that became the most and the least priority criteria will be elaborated into alternatives that can be prioritized in order to increase investment in the agricultural sector in Central Java Province.

3.2. Labor Aspect Criteria

Based on the results of the AHP analysis, it can be seen that providing knowledge and skills for labor in the agricultural sector were the most priority alternative in increasing the investment in the agricultural sector in the aspect of labor with a percentage of 60.9%. Furthermore, the second priority from the aspect of labor was an increase in wages or salaries for the agricultural sector workers with a percentage of 20.7%. And, the last priority to increase investment in the agricultural sector from the aspect of labor was the availability of agricultural sector labor with a percentage of 18.4%.

3.3. Aspects of Land Availability Criteria for Agriculture

According to the results of the study obtained from the AHP analysis, it can be seen that the alternative which gained the most important priority in increasing investment in the agricultural sector from the aspect of land availability for agriculture was increasing the availability of land to produce agricultural products with a percentage of 41.3%. Furthermore, the second alternative priority from the aspect of land availability for agriculture was to provide assistance in maintaining and maintaining well irrigated land with a percentage of 32.7%, and the last priority was to improve the quality of irrigated land for agriculture by 26%.

3.4. Aspect Criteria for Gross Regional Domestic Product (GRDP)

From the results of AHP analysis on aspects of GRDP, it was known that improving the quality of agricultural products was the most important alternative priority with a priority percentage of 40.7%. Furthermore, the second priority of the GRDP aspect was the aspect of shortening the marketing chain with a priority percentage of 37%, and the third priority of the GRDP aspect was to increase the prices of agricultural commodities by a percentage of 22.4%.

3.5. Aspect of Credit Interest Rates Criterion

By referring to AHP analysis, it showed that the first priority of the aspect of credit interest rates in an effort to increase investment in the agricultural sector was the reduction in lending rates by a percentage of 66.3%. Furthermore, the second priority of the loan interest rate aspect was the extension of the credit interest with a percentage of 17.8%. The last priority was the addition of a credit facility with a percentage of 15.9%, so the addition of this facility became a non-priority alternative compared to the other two alternatives in the aspect of credit interest rates.

3.6. Agricultural Sector Investment Priority Programs

The results of the overall analysis (overall) based on AHP revealed the highest priority and the lowest priority of several aspects of the criteria that can increase investment in the agricultural sector. Of the several alternatives there were three alternatives which turned into the main priorities and there were three other alternatives that were least prioritized in increasing investment in the agricultural sector. The most important alternative priority was to provide knowledge and skills for the agricultural sector workforce with a value of (0.163).

Furthermore, the second most important alternative priority was increasing the availability of land to produce agricultural products with a value of (0.156). Next, the most important last priority was to provide assistance in maintaining and caring for irrigated land area with a weight value of (0.124). The least prioritized alternative priority was the addition of a credit facility with a weighting value of (0.013). Furthermore, the second priority that belonged to the least priority was the extension of the credit period with a value of (0.014). For more, the last was an alternative increase in the availability of labor in the agricultural sector with a value of (0.49). Knowing the highest criteria and alternative priorities in increasing investment in the agricultural sector will help in developing strategies to increase investment in the agricultural sector in Central Java Province.

Hence, the criteria and alternatives produced using the AHP method can be used as the right policy that must be applied by the government in increasing investment in the agricultural sector in Central Java. The most important aspect must be considered by the government in increasing investment in the agricultural sector were, namely the aspect of labor by providing knowledge and skills for the workforce in the agricultural sector. Those needed to be done because the availability of skilled and educated labor in the Province of Central Java was still relatively small

The second aspect that must be considered by the government in increasing investment in the agricultural sector in Central Java Province was the aspect of the availability of land for agriculture by providing land to produce quality agricultural products. The third aspect that must be considered by the government in increasing investment in the agricultural sector was

the Gross Regional Domestic Product (GRDP) by increasing the added value produced by agricultural products through improving the quality of agricultural products and shortening the marketing chain for agricultural products. Furthermore, the last aspect that must be considered by the government was the aspect of lending rates by making low and relatively stable loan interest rates.

3.7. Obstacles and Solutions to Increase Investment in the Agricultural Sector in Central Java Province.

The agricultural sector in Central Java Province had many obstacles that until now have been an obstacle in the development of agricultural products in Central Java Province, among others: The first obstacle, in increasing investment in the agricultural sector, there was an obstacle in the availability of infrastructure in the agricultural sector. It was realized in the provision of physical infrastructure the agricultural sector which was still lacking. This was because the area of rice fields in Central Java from year to year has declined. In addition, the rice fields in Central Java Province could not be fully irrigated properly. This can be explained based on data from BPS showing that in 2017 rice fields in Central Java Province amounted to 991,524 Ha, however, the well-irrigated land area were 659,063 Ha.

The second obstacle was related to labor in the agricultural sector. Currently, from year to year the availability of labor in the agricultural sector was decreasing. This was due to the transition of traditional economic structures to modern ones which were originally engaged in agriculture now becoming a processing industry sector. In addition, the quality of human resources working in the agricultural sector was still relatively low. It was because workers who work in the agricultural sector are mostly old people who have low education. Whereas, the young generation who are highly educated do not want to work in the agricultural sector with hope that they will get a higher salary or wage if they work in the industrial sector compared to working in the agricultural sector.

The third obstacle was the lack of access to capital in the agricultural sector. This was because most farmers are still not prosperous. Thus, it was very difficult to get capital through the banks because banks and other financial institutions do not want to bear the risk that is too high. Hence, the role of financial institutions and banks in channeling credit to the agricultural sector can be said to be limited and still very small from the total share for loans that have been disbursed for all economic sectors (Prajanti, 2013: 23).

The last obstacle was the existence of central regulations with needs in the regions that have not been balanced. Therefore, it resulted in an imbalanced policy between the central government and the regional government.

The solutions that must be done by the government to overcome problems in increasing investment in the agricultural sector in Central Java Province, among others: Improving physical infrastructure in the agricultural sector by not making rice fields as entertainment places, housing, and industrial sites that will have an impact declining agricultural productivity in Central Java. In addition, it is needed to improve irrigation channels that have not yet run well and add irrigation canals to land areas that do not have irrigation channels.

Alternatively, the quality of labor in the agricultural sector needs to be improved. By providing knowledge and skills for workers who work in the agricultural sector, it is expected that that the workers can have skills in managing agricultural products. Furthermore, providing convenience to farmers in lending capital to banks and financial institutions. This solution can be conducted by giving very light interest to the farmers, and providing conditions that do not impose on farmers. Finally, there is a harmonization of central policies with regions such as the Province, District/City. It is done by way of deliberation and consensus in determining all policies that will be determined in increasing investment in the agricultural sector.

4. Conclusion

Based on the findings, the study found that the factors that can affect the low investment in the agricultural sector in Central Java Province is the Gross Regional Domestic Product (GRDP) variable. On the other hand, the analysis of Analytic Hierarchy Process (AHP) shows that labor is the main criterion in increasing investment in the agricultural sector in Central

Java Province. The next criteria are the criteria for the availability of land for agriculture, GRDP criteria, and the criteria for credit interest rates. Factors that hinder the strategy of increasing investment in the agricultural sector in Central Java are physical infrastructure, low human resources working in the agricultural sector, lack of access to capital. The solutions that can be done are by not making agricultural land as a housing and industrial place, improving the quality of labor in the agricultural sector, and providing convenience to farmers in borrowing capital from the banks.

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