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Analysis Of Factors Affecting The Income Of Soybean Farming

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Abstract

This study aims to determine the factors that affect the income of soybean farming. This research was conducted in Kulon Progo Regency with the number of respondents as many as 50 farmers. This study uses the Cobb-Douglas profit function with the technique Unit Output Price or UOP of Cobb Douglas Profit Function (UOP-CDPF). This research has been declared valid, reliable, the data is normally distributed, free from multicollinearity and heteroscedasticity problems, so that multiple linear regression analysis can be carried out. The results showed that the R^2 value was 36.7%, so the variation in soybean income could be explained by the eight independent variables and the rest explained by variables outside the model. The results of the F test show that the independent variables of seed prices, NPK fertilizer prices, manure prices, Gandasil fertilizer prices, pesticide prices, labor wages, land area and the rate of adoption of GAP (Good Agriculture Practices) together have an effect on soybean income. The t test results show that the increase in soybean farming income is influenced by the increase in labor wages, land area and the level of GAP adoption.

Keywords : Cobb-Dauglas, Profit Function, , Soybean, Income

A. Introduction

Soybean is one of the agricultural commodities that has received more attention from the government after rice and corn, especially for national food policy. Various soybean preparations are potential because they have relatively cheap prices but have high nutritional value. The development of soybean production from year to year shows a significant increase. The increase in soybean production is supported by various policies issued by the government to achieve food self-sufficiency, especially soybeans.

The level of consumption of soybeans and processed products in Indonesia has increased by up to 7 tons (BPS, 2019). The consumption pattern of the people that has changed to a healthier and vegetarian direction has led to an increase in consumption of processed soybeans which can replace animal protein. However, the increase in demand was not matched by an increase in the amount of soybean production. One of the factors for the low domestic soybean production is the large number of land use changes for soybean cultivation which have caused the business scale to become smaller, and soybeans have to compete with other strategic food crops such as rice and maize. Besides, this soybean plant more cultivated as a crop after rice. Therefore, in the majority of soybean production centers in Indonesia, almost no producer farmers place soybeans as the main crop.

In Indonesia 7 provinces in the last five years have become centers of soybean production with a total contribution of 79.98% or an average production of 403.18 thousand tons of national soybean production in the 2015 - 2019 period of 687.15 thousand tons. The main centers for national soybeans are located in the Provinces of East Java, Central Java, West Java, West Nusa Tenggara, Lampung and Aceh (Soybean Outlook, 2020).

KulonProgo is one of the largest soybean producers in the Special Region of Yogyakarta after Gunungkidul and Sleman Regencies. Soybean farming is used by the community as an alternate crop in the paddy fields after planting rice.

Table 1. Soybean Harvested Area, Production and Productivity inKulonProgo Regency 2016-2019

Years	Harvested Area (Ha)	Production (Ton)	Productivity (Kw/Ha)
2015	1.664,0	2.288	13,75
2016	2.780,7	4.247	15,27
2017	2.222,6	3.128,6	14,07
2018	2.121,0	2.865	13,50
2019	1.228,0	1.765	14,39

Source :BadanPusatStatistik, 2020

The focus of government programs to increase soybean production and productivity is contained in 2 (two) Operational Steps listed in the 2014-2019 Ministry of Agriculture Strategic Plan (Ministry of Agriculture, 2018), namely:

- Increase in planting area, through utilization and printing of 1 million hectares of new paddy fields, optimization of 1 million hectares of land, addition of 1 million hectares of dry land for soybeans and corn as well as for other agricultural products, increased cropping index (IP), utilization of abandoned land, and the application of the intercropping pattern.
- Increased productivity, through the application of integrated rice, corn and soybean crop management, provision of superior seeds for rice and corn, subsidies and provision of fertilizers, assistance for processing organic fertilizers of around 1500 units, development of 1000 independent seed villages, empowerment of seed breeders, assistance of agricultural tools and machinery 70 thousand units, network development and water optimization for 4.5 million hectares, post-harvest equipment support for around 30 thousand units, implementation of climate change adaptation and mitigation.

Arifin et.al (2019) researched the Analysis of Socio-Economic Factors Affecting Rice Farming Income in Sukorejo Village, Sukorjo District, Ponorogo Regency using a profit function analysis tool derived from the Cobb Douglas function with the Unit Output Price (UOP) or Cobb UOP technique. -Douglas Profit Function (UOP-CDPF) which has been normalized to a certain price, means that the profit and other variables are divided by the production price. The results showed that the independent variables that affect income are the price of urea fertilizer, the price of phonska fertilizer, and labor wages. While the independent variables that have no effect on income are the education variable, the variable number of family members, the price of organic fertilizer, the variable price of ZA fertilizer, and the pesticide variable.

Ariefin RF et al (2016) in their research regarding factors which factors affect the income of soybean farmers shows that the size of the farmer's income is significantly influenced by the prevailing price and the amount of production produced.

The legal basis for implementing GAP in Indonesia for food crops is regulated in the Ministry of Agriculture Regulation No.48 / Permentan / OT.140 / 10 / 2006.This is a guideline for conducting soybean cultivation at the right and correct farmer level to maximize farmer productivity and income. soybeans, quality improvement and food safety.This study aims to determine the factors that affect the income of soybean farming in KulonProgo Regency.

B. Methodology

In this study, the types and sources of data used are secondary data and primary data. Secondary data is meant as data obtained from literature and from related agencies. Primary data is data obtained from direct interviews with respondent farmers using a questionnaire. Before the instrument was given to the respondent farmers, the validity and reliability tests were carried out with the help of SPSS 16.0. An instrument that is given to respondent farmers, must first be tested for validity and reliability so that the data is valid and reliable. The validity test is carried out to measure the validity of the instruments used to measure what is intended according to the content, construct and criteria.

The selection of the research location was carried out deliberately (purposive sampling), namely deliberate sampling, selecting a group of subjects based on certain characteristics or traits that were considered to be closely related to previously known characteristics or characteristics of the population. This research was conducted in KulonProgo Regency, Yogyakarta Special Region with a total sample of 50 respondents drawn from 2 producing districts.The largest soybean in KulonProgo Regency is Nanggulan Regency and Galur Regency.

Validity (questionnaire) is calculated by a formula *Product moment correlation (Pearsonscorrelation).* Next from the formula *Product Moment correlation* then compare the correlationnumber with the critical score on the correlation table r value at a certain level (5%). If the correlation number is greater than the number in the table with the value of r = 0.632, then the question item is declared valid.

Reliability concerns the extent to which a measurement can be trusted because of its stability. An instrument with 2 or more answer choices is said to be reliable if in several times the measurement of the same subject (test-retest) results are obtained that are relatively the same or in one measurement with different instruments (equivalent) the results are relatively the same. An instrument with only two answer choices is said to be reliable if the ri>rt value, while for an instrument with more than two answer choices, it is said to be reliable if the Cronbach Alfa reliability coefficient is between 0.700.90 (Yusup, 2018).

The farmer adoption rate is calculated based on the total score of the application of each GAP scope based on the statement in the form of a checklist that has been filled in by the respondent. Each answer is associated with a form of statement which is expressed by the indicator Always (score 3), sometimes (score 2), never (score 1). Based on the scope of the GAP, farmers choose an adoption scale according to the conditions of the respondent farmer as follows.

Table 2.Details of the Scope of Soybean GAP

No	Scope	Adoption Rate Score	
		Minimum	Maximal
1.	Input	10	30
2.	Land Preparation	11	33
3.	Planting	5	15
4.	Fertilization	11	33
5.	Plant Protection	12	36
6.	Irrigation	5	15
7.	Harvest and Postharvest	5	15
Total RuangLingkup GAP		**59**	**177**

Source :Ministry of Agriculture Regulation No.48/Permentan/OT.140/10/2006

After the data has been collected from all samples, data tabulation is carried out on the adoption rate which is grouped based on these 7 scopes to find out the average GAP application of the total number of respondents which will be used as one of the variables affecting the income of soybean farmers.

To determine the effect of production factors and GAP on soybean farming income, the Cobb-Douglas profit function is used Unit Output Price or UOP of Cobb Douglas Profit Function (UOP-CDPF), which is a function that involves normalized production and production prices at a certain price,called Normalized Profit Function. The Cobb Douglas profit function has been normalized by the output price, transformed in the form of In (natural logarithm) to be as follows

$$\ln \pi^* = \ln \alpha^* + b_1{}^* \ln x_1 + b_2{}^* \ln x_2 + b_3{}^* \ln x_3 + b_4{}^* \ln x_4 + b_5{}^* \ln x_5 + b_6{}^* \ln x_6 + b_7{}^* \ln x_7 + b_8{}^* \ln x_8 + \mu$$

Description :

Π^*	=Soybean profits that have been normalized at the output price (Rp/ Ha)
α	= Value of the Constant
b_1, b_2, b_3, b_4, b_5	=Regression Coefficient
x_1	=Seed price normalized to the output price (kg/Ha)
x_2	= NPK fertilizer price normalized with output price (kg/Ha)
x_3	= Manure price normalized with output price (kg / Ha)
x_4	=Gandasil fertilizer price normalized with output price (gram/Ha)
x_5	=Pesticide prices that have been normalized with the output price (Ltr/Ha)
x_6	=Labor wages normalized at the output price (HOK / Ha)
x_7	=Land area (Ha)
x_8	=GAP Adoption Rate (Total score)
μ	= Mistake factor

Before analyzing the model, in order to get a good model or meet the requirements of multiple linear regression, previously testing the model with the classical assumption test was carried out. The classic assumption tests that are often used for cross section data types include normality, multicollinearity and heteroscedasticity tests. Meanwhile, to test the hypothesis using the OLS method for the F test and t test.

a. Normality test

The normality test was carried out to determine the normality of the data. One way to testfor for normality is a test Jarque-Bera(JB). This test is based on the taper coefficient (kurtosis and slope efficiency (skewness). If the value Jarque-Bera(JB) ≤ X 2 table then the residual value is stated to be normally distributed.
Formula JarqueBera is as follows.

$$JB = \frac{n}{6}\left(S^2 + \frac{(K-3)^2}{4}\right)$$

b. Multicollinearity

Multicollinearity is a condition where there is a linear relationship between the independent variables. A good regression equation does not contain more than one real relationship between the independent variables. Multicollinearity can be seen from the value tolerance and the opposite of Variance Inflation Factor (VIF). If the value of t olerance ≤0.10 or VIF value ≥ 10, then multicollinearity occurs and preferably.

c. Heteroscedasticity

Heteroscedasticity test was performed to determine whether the residuals were the same distribution or not. Heteroscedasticity is a condition in which the value of variance error term the independent variable does not have the same value for each observation. Heteroscedasticity test using White Heteroskedasticity test with the following test criteria.

- If the probability value at Obs * R-Squared> score critical value (α), then H 0 accepted, meaning that heteroscedasticity does not occur.
- If the probability value at Obs * R-Squared < score critical value (α), then H 0 rejected, meaning heteroscedasticity occurs.

Statistic test

To test the hypothesis using the OLS method, the F test and t test are also considered:

a. Statistical F test

The F test or coefficient test simultaneously is a test carried out to determine the effect of the independent variable simultaneously on the dependent variable significantly or not.

- If F count ≤ F table, then H 0 be accepted
  This means that the independent variables simultaneously have no significant effect on dependent variable.
- If F count> F table, then H 0 rejected
  This means that the independent variables simultaneously have a significant effect onthe dependent variable.

b. Statistical t test

The t test is used to determine the effect of the independent variable partially on thedependent variable. The test stages are:

- Determine the null hypothesis and alternative hypothesis
  Ho: b1 = 0 (no effect)
  Ha: b1 ≠ 0 (influential)
- Determine the level of significance, namely 0.01, 0.05 and 0.1
- Decision-making
  - If t count ≤ t table, then H0 is accepted
    This means that the independent variables simultaneously have no significant effect on the dependent variable.
  - If t count> t table, then H0 is rejected
    This means that the independent variables simultaneously have a significant effect on the dependent variable.

C. Findings and Discussion

Level of Adaptation of Good Agriculture Practices (GAP)

In this study, GAP was divided into several parts, namely input, land preparation, planting, fertilization, crop protection, irrigation, harvesting and post-harvest. The number of statement items used to measure the level of GAP adoption was 57 statements divided into 7 scopes. Each of these statementsadjusted with Regulations Minister Agriculture Number: 48/ Permentan/OT.140/10/2006 concerning guidelines for proper and correct cultivation of food crops.

The validity test using the Product Moment correlation coefficient from Karl Person shows that the statement instrument is valid with an r-count value greater than the r-table value of Critical Value Product Moment (0.2306) at the 5% significance level. Reliability test using the Alpha formula (α) from Cronbach shows that the value of Cronbach, s Alpha is greater than 0.6 so that it can be said that the variables used are reliable and consistent (reliable).

Table 3. Average Soybean GAP Implementation in KulonProgo Regency (50 Respondents)

No.	Scope	Score Level Aplication	Average
1.	Input	10 - 30	26,56
2.	Land Preparation	11 - 33	26,90
3.	Planting	5 - 15	10,40
4.	Fertilization	11 - 33	26,70
5.	Plant Protection	12 - 36	29,38
6.	Irrigation	5 - 15	13,30
7.	Harvest and Postharvest	5 - 15	13,90
Total GAP Adoption Rate		59 - 177	147,14

Based on Table 2, it can be seen that the average score of applying GAP by soybean farmers for the scope of input is 26.56, land preparation is 26.9, planting10.4, fertilization 26.7, crop protection 29.38, irrigation 13.3, harvest and post harvest 13.9. While the total application of GAP has an average score of 147.14 and is classified in the high category.

Soybean Productivity and Income

Soybean farming income is the ultimate goal in doing farming. Income is the revenue from all soybean farming activitieswhich is reduced by the total costs incurred during soybean production activities. Soybean farming produces the output in the form of dry soybean seeds.

Productivity and income in this study are during the planting season (May - June). The average productivity of soybean farmers in KulonPorgo Regency is obtained by dividing production by land area.

Table 4. Productivity, Revenue, Cost and Average Profits of Soybean Farmingper hectare in Nanggulan District and Galur District, KulonProgo Regency

Category	Value
Productivity (kg/Ha)	1.216,59
Revenue (1)	9.580.508,89
Cost	
- Seed	675.746
- NPK Fertilizer	229.445,2
- Manure	622.188,44
- Gandasil Fertilizer	176.272
- Pesticides	162.087
- Labor Outside Family	911.405
- Labor in the family	1.320.939
- Depreciatiion Cost	136.182
- Other Cost	1.041.380,758
Total Explicit (2)	3.818.524,830
Total Explicit and Implicit (3)	5.275.645,831
Income (Rp/Ha) (1 – 2)	5.761.984,10
Profit (Rp/Ha) (1 - 3)	4.304.863,06

Table 4 shows that the average productivity of farmers in KulonProgo Regency is 1,216.59 kg / Ha or 1.2 tons / Ha. The average profit of soybean farming is Rp. 4,304,863.06, - per hectare of the total revenue of Rp. 9,580,508,89,-/ Ha which has been reduced by the total explicit and implicit costs (seeds, NPK fertilizer, manure, Gandasil fertilizer, pesticides, labor, depreciation costs and other costs) of Rp. 5,275,645,831,-/Ha, while the farmer's income is Rp.5,761,984.10,-/Ha of the difference between the revenue and the explicit cost of Rp.3,818,524,830,-/Ha.

Factors that affect the income of soybean farming

Classic assumption test

Test assumption classic covers test normality, multicolinearity and heteroscedasticity, used to determine whether the regression equation used has accuracy in estimation, is unbiased and consistent.

a. Normality test

Normality testing using UjiJarque falls through Histogram-Normaity Test. If the data has value probability Jarque-Bera> Alpha 0.05, then the data is declaredto be normally distributed.

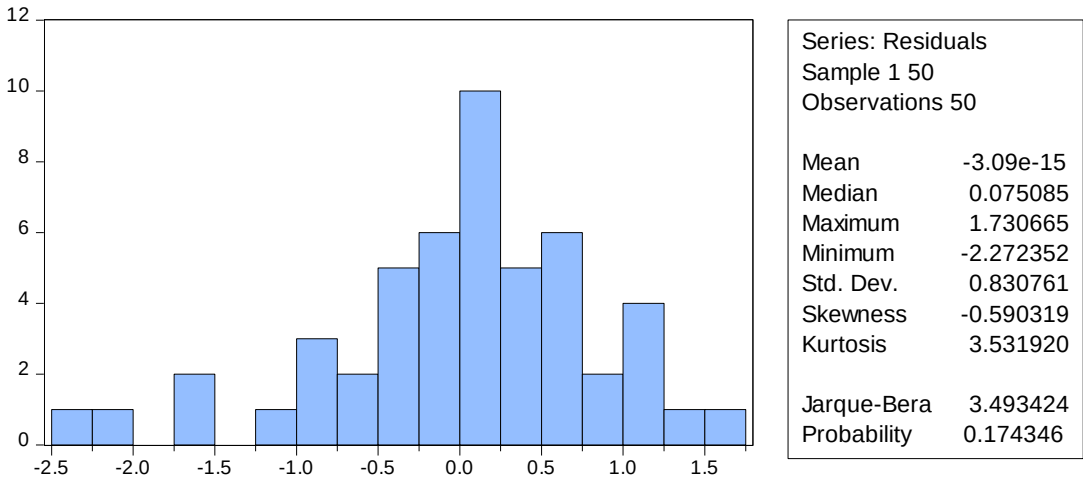

Figure 1. Normality Test Results of Factors Affecting Soybean Income

Based on Figure 5.3. shows that the Jarque-Bera value is 3.493 with a probability of 0.174>0.05 (95% confidence level) which means residual normally distributed.

b. Multicolinearity

Multicolinearity test is used to determine whether the independent variables in the regression equation are not correlated by looking at the tolerance value and the Variance Inflation Factor (VIF) value.

Table 5.Multicolinearity Test Results of Factors Affecting Soybean Income

No.	Variable	VIF Value
1.	Seed Price (X_1)	1,510
2.	NPK Fertilizer Price(X_2)	2,194
3.	Manure Price (X_3)	3,024
4.	GandasilFertilizer Price (X_4)	1,532
5.	Pesticides Price (X_5)	1,276
6.	Labor Wages (X_6)	2,171
7.	Land Area (X_7)	1,306
8.	GAP Adoption Rate (X_8)	1,099

In Table 5, it can be seen that all variables that affect soybean profits have a VIF value of less than 10, so it can be concluded that the regression model used is good because there are no correlation problems between independent variables or multicollinearity does not occur.

c. Heteroscedasticity

To determine whether there is a heteroscedasticity problem using the White test Heteroscedastisticity in the Eviews 9.0 program. if the value for Prob. Chi-Squared on Obs * R-Squared is greater than alpha 0.05, so the regression model is free of problems heteroscedasticity.

Table 6.Heteroscedasticity Test Results of Factors Affecting Soybean Income

Heteroskedasticity Test : Breusch-Pagan-Godfrey			
F-statistic	1,086521	Prob. F	0,3917
Obs*R-Squared	8,746012	Prob. Chi-Square	0,3642

Table 5.20. shows that the value for Prob. Chi-Squared on Obs*RSquared of 0.3542 is greater than alpha 0.05 which means that the regression model is homoscedastic or in other words there is no problem with the assumption of non-heteroscedasticity so that it can be concluded that the data on each of the independent variables in the model have homogeneous variances.

Statistic test

Hypothesis testing of the factors that influence soybean income uses multiple linear regression analysis by analyzing the coefficient of determination (R^2), T test and F test. The confidence level used in this study was 90% (α = 5%, α = 10%).

Table 7.Factors Affecting Soybean Income

Variable	Coefficient	Prob.
C	-8,537	0,339
Ln Seed Price (X_1)	0,423^{ns}	0,478
Ln NPK Fertilizer Price (X_2)	-2,727*	0,068
Ln Manure Price (X_3)	-2,747^{ns}	0,199
Ln Gandasil Fertilizer Price (X_4)	-0,271^{ns}	0,619
Ln Pesticide Price (X_5)	0,199^{ns}	0,453
Ln Labor Wages (X_6)	1,604*	0,071
Ln Land Area (X_7)	0,336*	0,076
Ln GAP Adoption Rate (X_8)	2,047*	0,096
R-squared	0,367	
Adjusted R-squared	0,243	
F-Statistics	2,971	
Prob (F-Statistics)	0,010	

Description : * = Significance Level 90%
ns = Non significant

a. F test

The F test or coefficient test is simultaneously carried out to determine the effect of the independent variable simultaneously on the dependent variable significantly or not. In Table 5.21. It can be seen that the F-count value is 6,599 with a probability value <α = 5%, namely 0.01. Thus it can be concluded that the independent variables, namely the price of seeds, the price of NPK fertilizer, the price of manure, the price of Gandasil fertilizer, the price of pesticides, labor wages, land area and the level of GAP adoption, together have an effect on soybean income.

b. T test

The t test is used to determine the effect of each independent variable on the dependent variable. The confidence levels used in this study were 99%, 95% and 90% (α = 1%, α = 5%, α = 10%). In Table 5.21, it can be seen that mathematically, the regression model between soybean income variables and the factors that influence it can be written in the following equation.

$$\ln \pi^* = -8{,}537 + 0{,}423 \ln X_1 - 2{,}726 \ln X_2 - 0{,}274 \ln X_3 - 0{,}271 \ln X_4 + 0{,}199 \ln X_5 + 1{,}604 \ln X_6 + 0{,}336 \ln X_7 + 2{,}047 \ln X_8$$

All of the variables used, only 4 variables have a significant effecton the benefits of soybeans and 4 variables that did not have a significant effect, namely age, number of dependents and availability of inputs.

Price of seeds (X_1)

In Table 7, it can be seen that the price of seeds has no effectsignificant to soybean income because the p-value of the seed price of 0.478 is greater than α, namely 0.1. The price of seeds in KulonProgo Regency on average at the farmer level is Rp. 6500 - Rp. 15,000 / kg. Most of the farmers use Grobogan variety seeds. This type of seed is superior seed so that efficient use of seeds will provide high yields. This is in accordance with the research of Sahara et.al (2016) which states that the price of seeds has no significant effect on the profits of soybean farming if the seeds used by farmers are in accordance with the needs so that no addition or subtraction is needed.

Price of NPK Fertilizer (X_2)

Table 7 shows that the price of NPK fertilizer has a significant effectfor soybean income at a significance level of 90% because the p-value of the fertilizer price is 0.06, which is smaller than α, namely 0.1. The regression coefficient value of -2,727, is negative, meaning that every 1 percent increase in the price of NPK fertilizer will reduce soybean income by 2.727 percent, assuming other factors remain (constant). This is because the additional costs incurred to buy NPK fertilizer will cause total costs to increase so that an increase in the price of NPK fertilizer will reduce the income received by farmers.Arifin (2019) stated that the results of the t test for the price variable for Phonska fertilizer (NPK) had a negative and significant effect. This is obtained from the results of the regression coefficient, which is -0.2900 with a probability of 0.100 (<0.1), which means that every 1% increase in the price of phonska fertilizer will reduce the profit of lowland rice by 0.2900%.

Price of Manure (X_3)

In Table 7, it can be seen that the price of manure has no significant effect significant to soybean income because the p-value of the price of manure is0.198 is greater than α which is 0.1. In fact, in the research location, the price of manure for allfarmers is the same, namely Rp. 500 / kg so the price of this manure is notgive effect to soybean income.This is in line with the research of Sahara et.al (2016) that the price of manure statistically has no significant effect on profits, meaning that the decrease or increase in the price of manure is not significant because the price of manure is relatively affordable for farmers. However, it does not mean that addition or reduction of manure is not necessary to achieve optimal plant growth.

Price of Gandasil Fertilizer (X_4)

The gandasil fertilizer helps in the formation process of the leaves, also helpsin the generative phase (flowering and fruiting). In Table 5.21, it can be seen that the price of Gandasil fertilizer does not have a significant effect on soybean income because the p-value of Gandasil fertilizer price of 0.618 is greater than α, namely 0.1. On average, soybean farmers in the research location use Gandasil fertilizer only 2.85 packs (100gr / pack) at a price of Rp.10,000 - Rp.32,000 / pack, so the costs incurred for purchasing Gandasil fertilizer are still relatively low so they do not have a significant effect. on the income of soybean farming in KulonProgo Regency.

Pesticide Prices (X_5)

In Table 7, it can be seen that the price of pesticides has no effectsignificant to soybean income because the p-value of pesticide prices is 0.454, which is greater than α, namely 0.1. This is possible because the average total cost incurred by farmers for pesticide use is only Rp. 36,680 so it does not have a significant effect on soybean farming income.According to Sahara et al (2016), the level of pest attack which is still below the economic threshold only requires relatively small preventive measures and does not increase production costs significantly.

Labor Wages (X_6)

In Table 5.21, it can be seen that the labor wage has a significant effectsignificant to soybean income at a significance level of 90% because the p-value of 0.07 is smaller than α, namely 0.1. The regression coefficient value is 1.604, positive, meaning that every 1 percent increase in labor wages will increase soybean income by 1.604 percent, assuming other factors remain (constant/Ceteris paribus). This is because 68% of the workforce used by petanai is family labor, while labor outside the family is only 32% of the total workforce used. This is in accordance with research conducted by Arifin (2019) which states that the labor wage variable has a significant effect on farm income at a significant level used of 0.1 with a 90% confidence level.

Land Area (X_7)

In Table 7, it can be seen that land area has a significant effect on soybean income at a significance level of 90% because the p-value of 0.07 is smaller than α, namely 0.1. The regression coefficient value is 0.336, is positive, meaning that every addition of 1 percent of land area will increase soybean income by 0.336 percent, assuming other factors remain (constant / Ceteris paribus). This is in accordance with the research of Sahara et.al (2016) which states that the planted area has a significant effect on the level of profit with a regression coefficient of 1.10. This means that by expanding the planting area, the plant population will increase, so it is expected to increase production and profits.

Good Agriculture Practices (GAP) (X_8)

Table 7 shows that GAP has a significant effect onsoybean income at a significance level of 90% because the p-value of 0.09 is smaller than α, namely 0.1. The regression coefficient value is 2.047, positive, meaning that every 1 percent increase in GAP applications will increase soybean income by2.047 percent assuming other factors remain (constant / Ceteris paribus). GAP is a general guideline in carrying out cultivation that is correct and precise, in order to obtain high productivity, good product quality, maximum profit, environmentally friendly and takes into account the aspects of safety, health and welfare of farmers, as well as sustainable production efforts. The adoption of this GAP covers all processes cultivation starts from providing input, land preparation, to harvest and post-harvest. The cultivation process affects production yields so that it affects the profits obtained by soybean farmers. This is in accordance with research from Fachruddin (2021) which compares the application of GAP to participating and non-participating farmers of the Smallholder Palm Oil Program which states that the application of GAP has a significant effect on farm income..

In fact, the initial stage of cultivation is like the use of inputs, the cultivation process has an influence on the success of a commodity. Commodities that apply proper and correct crop cultivation methods tend to have better quality, bigger, cleaner and healthier soybeans, thus having an impact on the income received by farmers.

D. Conclusion

Total application of GAP has an average score of 147.14 and is classified in the high category of the overall scope of the GAP adoption, namely input, land preparation, planting, fertilization, crop protection, irrigation, harvesting and post-harvest.

The increase in soybean farming income is influenced by the increase in labor wages, land area and the level of GAP adoption, while the price of NPK fertilizer has a negative effect on soybean farming income. . Regression coefficient value.

The rate of adoption of GAP has the greatest influence on soybean productivity, namely equal to 2,074, indicating that each additional 1 percent increase in GAP adoption will increase soybean productivity by 2.074 percent, assuming that other factors remain (constant).

It is necessary to increase the application of GAP especially in the planting process because this initial stage greatly affects the growth of soybeans. Planting should be done according to the recommendation with a distance of 40x15 cm and 40x10 cm, not only following the former rice planting. In addition, it is necessary to use superior varieties that are certified and have growth capacity> 85%, pure, healthy and clean to increase the income of soybean farmers.

E. References

Arief RF, Suswandi PE, Badjuri. 2016. AnalisisFaktor-faktor yang Mempengaruhi Pendapatan PetaniKedelai di Kecamatan Bangsalsari, Kabupaten Jember. Artikel Ilmiah Mahasiswa. Universitas Jember (UNEJ).

Arifin, M., Mahfudz, M., Hindarti, S. 2019. Analisis Faktor-Faktor Sosial Ekonomi yang Mempengaruhi Pendapatan Usahatani Padi Sawah Di Desa Sukorejo Kecamatan Sukorjo Kabupaten Ponorogo. *Jurnal Sosial Ekonomi Pertanian dan Agribisnis (Seagri). Vol. 7, No 1 (2019).*

[BPS] Badan Pusat Statistik. 2020. Luas Lahan, Produktivitas, Produksi Kedelai di Kulon Progo https://www.bps.go.id/ [Diakses 15 Februari 2020].

Fachrudin, B.,Yazid, M., Yunita. 2021. Analisis Perbandingan Penerapan GAP Pada Petani Peserta dan Non Peserta Program Kebun Kelapa Sawit Rakyat di Kabupaten Bangka. Jurnal KaliAgri Vol. 1, No.1 Januari 2021, hlm.23-32.

[Kementan] Kementerian Pertanian. 2018. Outlook Komoditas Pertanian Tanaman Pangan Kedelai.Pusat Data dan Sistem Informasi Pertanian, Kementerian Pertanian. ISSN: 1907-1507.

[Kementan] Kementrian Pertanian. 2020. Pedoman Outlook Kedelai.Pusat Data dan Sistem Informasi Pertanian, Kemnterian Pertanian.ISSN : 1907 – 1507.

[Kementan] Permentan No. 48/permentan/OT.140/10/ 2006 tentang Pedoman Budidaya Tanaman Pangan yang baik (Good Agroculture Practices). Jakarta.

Sahara, D., Oelviani, R., Kurnia R. 2016. Analisis Fungsi Keuntungan pada Usahatani Kedelai di Kabupaten Grobogan, Jawa Tengah. *Jurnal Pengkajian dan Pengembangan Teknologi Pertanian*, Vol. 19, No.2, Juli 2016: 85-92.

Yusup, Febrianawati. 2018. Uji Validitas dan Reliabilitas Instrumen Penelitian Kuantitatif. Jurnal Ilmiah Kependidikan Fakultas Tarbiyah. https://jurnal.uin.-antasari.ac.id. Vol 7, No 1 (2018).