The influence of socio-economic factors on sustainability avocado farming (Persea americana)

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Abstract. The potential of avocado in Indonesia is very promising, where market needs are far above existing production and supply. This production is directly related to the sustainability of the avocado itself, therefore the sustainability of avocado farming needs to be considered. The sustainability of the farming cannot be separated from the influence of socio-economic factors. The purpose of this study was to determine and measure the influence of socio-economic factors in influencing the sustainability of avocado farming. The research location was carried out purposively, and the location sampling was clustered. The method of determining the sample of respondents using stratified random sampling with a number of 125 avocado farmers. Retrieval of data, both independent and dependent variables, used direct data in the field. The data is scaled using the likert scale. Data analysis was using path analysis. The results of the path analysis showed that socio-economic factors had an effect on the sustainability of avocado farming, with a standardized regression coefficient of 0.35 and p value <0.05. All of these indicators have an effect with each coefficient value of 1.00; 1.12; 1.01; 1.03; 1.04. Based on these data, it can be concluded that socio-economic factors in the research area have an influence on sustainability, such as good production will lead to optimal prices, so that with optimal prices, the selling price will also be optimal as well. Likewise, with institutions and counseling, the existence of capital, and good relations between avocado farmers will have a direct effect on production.

1. Introduction

Avocado farming can be a side and main source of income for the people of Indonesia. These farms need proper management in using production factors efficiently. Inefficient use of production factors in avocado farming will result in low production and high costs, and ultimately reduce farmers' income. For farmers, farming activities are carried out not only to increase production but how to increase income through the use of production factors, because the addition of production factors often does not provide the income expected by farmers. The production of this avocado will continue as long as the sustainability of this farming is maintained. The sustainability of the farming is influenced by socio-economic factors. Socio-economy is the position or position of a person in a community group which is determined by the type of economic activity, education and income [1]. The positive impact of the social aspect for society in general is the availability of necessary facilities and infrastructure. examine whether if the business or project is carried out it will provide economic and social benefits to various parties or vice versa. This aspect needs to be considered, because the impact will be very broad. That is, how much the socio-economic aspect affects the sustainability of avocado farming. The purpose of this study was to
determine and measure the influence of socio-economic factors in influencing the sustainability of avocado farming.

2. Materials and Methods of Research

The location of the research was determined deliberately, namely in Limbangan District, Kendal Regency, Central Java Province. The location was chosen because Limbangan District is a center for avocado production. The results of avocado production in 2019 Limbangan District occupy the sub-district with the highest production [2]. A production of 12,220 quintals is produced in the sub-district out of a total production of 21,892 quintals. The sampling method was clustered with the criteria of respondent age 17 years and over. Farmers had avocado plants that were already producing, and had already made sales. The respondents were 125 avocado farmers spread across three villages, namely Gondang Village, Limbangan Village and Gonoharjo Village. The research was conducted in November 2020 using primary and secondary data. Primary data were obtained by direct interviews from avocado farmers. Secondary data was obtained from government agencies or related institutions by recording directly in the form of data from the Agriculture and Plantation Office of Central Java Province, as well as from the Kendal Regency Central Statistics Agency.

Data analysis was calculated using path analysis with AMOS 24.0 analysis tool. Path analysis is used to analyze patterns of relationships among variables. This model aims to determine the effect of a set of independent variables on the dependent variable [3]. This analysis was to calculate the influence between the indicators of the independent variable (Y2) on the dependent variable of sustainability (Y3). The independent variable of socio-economic factors consists of 5 indicators, including: Production (x1); Price (x2); Networking with fellow farmers (x3); Institutional and outreach (x4); and Capital Assistance (x5). The dependent variable for sustainability consists of 2 indicators, namely revenue (Y2) and income (Y3). Data was collected directly through interviews and notes to respondents in the field, then processed and scaled using a linkert scale.

![Path Analysis Diagram]

Figure 1. Estimation of Research Model Structure
3. Results and Discussion

3.1. Normality Test

The normality test was carried out on the research data. The data can be concluded to have a normal distribution if the CR skewness value is below the absolute price of 2.58 [4]. This test aims to ensure that the resulting parameter estimates are not biased so that they can provide the right conclusions. The model is declared to have met the normality assumption if it has a multivariate CR value in the range -2.58 < z < 2.58. The results of the variable normality test obtained a critical multivariate value of 2.84. The data requirement is that the data is normally distributed, the CR value is between -2.58 to 2.58. The value of 2.84 has not been included in normally distributed data, so the steps that must be taken are by using a bootstrapping technique. The value of the bootstrapping data processing results obtained by the Bollen Stine p-value is 0.179, which results in the p value of the overall model accuracy. By using conventional significance criteria (p = 0.05), it will be found that the p value generated by the model is more than 0.05 (p> 0.05), thus it can be concluded that the developed model is supported or in accordance with the data.

3.2. Test the validity

In measuring the validity of the research construct, it can be seen from the value of the loading factor. The loading factor used in the validity test of this study is ≥0.50, so items that have a loading factor of less than ≥0.50 are considered invalid and are not included in the measurement [5]. A loading factor greater than 0.30 is considered to meet the minimum level, a loading factor of 0.40 is considered better and in accordance with the rules of thumb used by the researchers, and a loading factor equal to or more than 0.50 is considered significant. The results of the data processed in this study are presented in Table 1. Based on Table 1, it can be seen that all factor loading for each indicator is greater than 0.50, that means all indicators are declared valid and model evaluation is acceptable.

| Item | Variable | Loading Factor (λ) | Information |
|------|----------|-------------------|-------------|
| X1   | Production | 0.712             | Valid       |
| X2   | Price     | 0.809             | Valid       |
| X3   | Network with fellow farmers | 0.815 | Valid |
| X4   | Institutional and outreach | 0.866 | Valid |
| X5   | Capital Assistance | 0.790 | Valid |
| Y2   | Reception | 0.836             | Valid       |
| Y3   | Income    | 0.549             | Valid       |

Table 1. Data of Instrument Validity Test Results

Source: Primary Data Processed (2020)
3.3. Reliability test
Reliability test is the extent to which measurement results using the same object will produce the same data. The reliability test was carried out jointly on all statements. The measurement of reliability in this study uses Construct Reliability (CR). There are also many studies that use Cronbach alpha as a measure of reliability, Construct Reliability (CR) is able to provide higher reliability than Cronbach alpha, so this study uses CR criteria [4]. Construct Reliability (CR) ≥ 0.70 indicates good reliability, while CR 0.60 - 0.70 is said to be acceptable provided that the validity of the indicators in the model is good.

Table 2. Results of Average Variance Extracted (AVE) and Construct Reliability (CR)

| Variable | Indicator | Loading Factor (λ) | Standar Loading^2 (λ^2) | Measurement Error | CR       |
|----------|-----------|--------------------|-------------------------|-------------------|----------|
| X1       |           | 0.712              | 0.507                   | 0.493             |          |
| X2       |           | 0.809              | 0.654                   | 0.346             |          |
| Y1       | X3        | 0.815              | 0.664                   | 0.336             | 0.878    |
|          | X4        | 0.866              | 0.750                   | 0.250             |          |
|          | X5        | 0.790              | 0.507                   | 0.493             |          |

Source: Data Analysis Results (processed), 2020
Based on Table 2, it is known that the CR value is 0.878. That means that the value is above 0.70, so all the variables in this diagram are feasible.

3.4. Path analysis (Path)

Figure 2. Path Diagram Estimation Results
Based on Illustration 2, it shows the standardized coefficient from one variable to another. This standardized coefficient has a standard value of 0-1, so that researchers can compare which one has the bigger role. Illustration 2 can be seen, the influence of socio-economic factors on the sustainability of farming is 0.35. This figure is positive, so the researchers can say that socio-economic factors affect the income of avocado farming in Limbangan District, Kendal Regency.

The results obtained from these figures show that the greater the value of socio-economic factors, the more positive impact on sustainability will be. Together, the socio-economic variables whose indicators consist of production, price, relationships with fellow avocado farmers, institutional / extension services, and capital assistance have a significant effect on the sustainability of avocado farming. These results are consistent with research from Usboko (2017) that socio-economic factors affect the sustainability of mustard vegetable farming in Mitra Timor Farmer Group [6].

Based on the factor analysis (CFA) in the path diagram estimation results (Illustration 1), the coefficient value of each indicator to the socio-economic factor variable is as follows: Production (X1 = 1.00); price (X2 = 1.12); relationship among farmers (X3 = 1.01); institutional and extension services (X4 = 1.03); and capital assistance (X5 = 1.04). The five indicators have proven valid and reliable in measuring socio-economic factors as variables in the study.

### 3.5. Influence between variables

Variable Socio-economic factors are the independent variables in this study. A direct relationship occurs between the socio-economic factor (F1) independent variable and the sustainability dependent variable (F2). The results of AMOS calculations show that sustainability is influenced by socio-economic factors. The path coefficient obtained is positive and the significance probability (p) is <0.05. This result can be said that the direct effect of the Socio-Economic Factors (FE) on Sustainability (KB) is 0.428. This figure means that the better the socio-economic factors, the positive impact on sustainability. Simultaneously, the socio-economic variables have a significant effect on the sustainability of avocado farming in Limbangan District, Kendal Regency.

The first indicator, namely production (X1). Production is closely related to agricultural products, especially the commodities obtained. This production indicator has a coefficient on path analysis of 1.00. This means that the production indicators have a direct effect on the socio-economic factor variables. Production affects socio-economic factors because the production produced can still be increased many times over. The increase occurred because there were still supporting factors for optimization such as agricultural intensification and extensification to increase production. With the increase in production, the welfare of farmers will also increase.

This socio-economic factor causes production to have a direct influence on the socio-economic factor variable. Indirectly, production indicators also affect the sustainability of avocado farming through these socio-economic variables. Nurlela (2019) in her research stated that agricultural production is influenced by socio-economic factors [7]. The results of the analysis using linear regression with the OLS method show that production directly affects the socio-economic factor variables.

The 2nd indicator is price. Price is the indicator with the largest coefficient value in socio-economic variables. This price indicator has a coefficient (1.12). If these prices tend to be stable and even increase, it is likely that the sustainability of this avocado farming will be carried out / continued. The price will also affect the income from this avocado farming. The higher the price / good, the income it will get will also be good / high. When the income is high, the farmers will continue to do this avocado farming. The price indicator in this study is in line with research conducted by Syanti (2009) "The effect of production costs and the selling price of oil palm fresh fruit bunches (FFB) on farmers’ income in KUD scope II" that simultaneously shows that the production costs and selling price of fruit bunch Fresh palm oil (FFB) has a positive effect on farmer income variables [8]. The more the opinion increases, the socio-economic influence will also increase.
The 3rd indicator is a network with fellow farmers. This indicator has a coefficient value of 1.01. This value means that the network with fellow farmers has a direct effect on socio-economic factors. The more extensive and well-established the network with fellow farmers is, the better the socio-economic factors will be. This study shows that farmers who have a relationship with fellow avocado farmers, sales will be easier, because helping, working together in sharing information, and information obtained from peer networks is easier and faster. Network indicators with fellow farmers affect socio-economic factors and indirectly affect the sustainability of farming. It can be assumed that the results of the research are in accordance with the theory of Nasution (2009) which states "The principle of social solidarity is mutual help, cooperation, sharing of crops, supporting village projects financially and in labor and others" [9].

The fourth indicator in the socio-economic factor variable is Institutional and Extension. From the results of data analysis, the coefficient value of the Institutional and Extension indicators is 1.03. This value means that the network with fellow farmers has a direct effect on socio-economic factors. The existence of counseling and institutions at the research location will affect the performance and mindset of farmers. The choice of varieties and in handling pests will be different when farmers do not join farmer groups or are involved in extension services. The results of this Indicator are consistent with the statement of Van Den Ban and Hawkins (1999) [10]. The statement reads that the more profitable extension method to be able to solve farmer problems is the group method because there is feedback that allows the reduction of misunderstandings between extension workers and farmers. This interaction provides an opportunity to exchange experiences and influence on the behavior and norms of group members.

The fifth indicator in the socio-economic factor variable is Capital Assistance. This capital initiative focuses on whether or not farmers have received capital assistance from the government or private sector. From the results of data analysis, the coefficient value of this indicator is 1.04. This value means that aid has a direct effect on socio-economic factors and indirectly affects the sustainability of avocado farming. Capital assistance is the second highest indicator after price, because farmers will continue to do their farming when they get capital assistance. Whether they lose money or not in the previous harvest period, when farmers get capital assistance, they will continue to do so. These results are in line with research from Wirawan (2015) that capital assistance has a positive and significant effect on the income of MSME players [11]. This means that the greater the revolving funds provided, the greater the income of MSME actors and this causes revolving funds provided by the government to be very helpful for the capital of MSMEs to further improve their business.

4. Conclusions
From the results of the analysis that has been carried out, the conclusion of this study is that socio-economic factors have an effect on the sustainability of avocado farming. All indicators are in the exogenous construct consisting of Production (x1); Price (x2); Networking with fellow farmers (x3); Institutional and outreach (x4); and Capital assistance (x5) has an influence on the independent variable itself. From this result, farmers can pay attention to any indicators that affect sustainability so that sustainability is created properly. All of these indicators have an effect with each coefficient value of 1.00; 1.12; 1.01; 1.03; 1.04. Based on these data, it can be concluded that social-economic factors in the research area have an influence on sustainability, such as good production will lead to optimal prices, so that with optimal prices, the selling price will also be optimal as well. Likewise, with institutions and counseling, the existence of capital, and good relations between avocado farmers will have a direct effect on production. If the production increases, the income will also increase which causes the farmers to continue their farming.

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