Factors Affecting Pepper Production in Tinondo District, East Kolaka Regency, Indonesia

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ABSTRACT

Pepper is a type of annual plant that is very important as a source of income for the people of East Kolaka Regency because it has been managed for generations. This study aimed to determine the factors that influence pepper production. There were 54 research respondents, determined using the Slovin method. The data analysis used is multiple linear regression analysis with the Cobb-Douglass production function. The results showed that the independent variables consisting of land area and amount of fertilizer significantly affected the production of pepper farming, as indicated by a significance probability value of less than 0.05. While the variable number of pesticides and the number of workers have no significant effect on the amount of pepper production as indicated by a significance probability value greater than 0.05.

Keywords: Factors Affecting, Production, Pepper, East Kolaka

I. INTRODUCTION

Pepper is the "*King of Spice*", or the king of spice plants, now an important world trade commodity. Pepper plays an important role in generating foreign exchange and providing employment, consumption, and industrial raw materials. As a foreign exchange earner, pepper ranks 4th after palm oil (CPO), rubber, and coffee. With an export value of more than 220 million United States dollars. Farmers involved in pepper farming and processing are around 600 thousand families, which support more than 2.5 million people.

A phenomenon in which the trend of Indonesian pepper exports shows unclear growth is being studied [1]. It can be seen that although the trend of Indonesian pepper exports shows growth, the average growth rate is lower than the average production volume growth rate [2],[3] where the average export volume growth rate is 9.22%/year [4],[5]. Allegedly, the relatively fast growth of Indonesian pepper and low consumption of domestic pepper could be an opportunity to increase the export volume of Indonesian pepper [6].

This underdeveloped export growth situation affected the share of Indonesian pepper exports in the international market, which fluctuated yearly, making Indonesia the second largest pepper exporter in the world [7],[8]. In contrast, from a production standpoint, Indonesia should have had better yield potential [9]. It is suspected that there are several factors behind Indonesia's pepper exports, including the competitiveness of Indonesian pepper in the world market [10],[11]. Weak or strong product competitiveness in the international market affects the size of the export volume of this raw material [12].

In the Southeast Sulawesi region, especially in the East Kolaka Regency, pepper is a type of annual plant that is very important for improving people's welfare. However, pepper farming is not much related to the processing industry, downstream industry (factor input industry), service industry, finance, and marketing [13],[14]. As a result, the production of pepper agribusiness has not managed to distribute added value optimally and proportionately, so there is no visible significance for increasing farmers' income [15].

Instability in the amount of pepper production in East Kolaka Regency occurs due to several factors such as the capital used in the production process, the area of land used by farmers in planting, the expertise of farmers in planting pepper, the amount of fertilizer used by farmers, the number of pesticides used by farmers, the amount of labor the work of plant disease factors and many other factors that become obstacles in the production process of pepper plants.

II.   METHODS AND MATERIAL

This research was conducted in the village of Solalutu, Tinondo District, East Kolaka Regency. Determining the research location was carried out purposively, considering that the area was a pepper-producing center in East Kolaka Regency. This research was carried out in 2023 using a survey method with two types of data, primary and secondary, which were obtained from respondents through interviews using questionnaires and institutions or agencies related to research. The finding data were analyzed using Cobb-Douglass multiple linear regression.

$$Y = \beta_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \varepsilon \dots\dots\dots\dots (1)$$

Where Y is the amount of pepper production, β_0 is a constant, $b_1, b_2, b_3,$ and b_4 is the regression coefficient, X_1 is the area of land, X_2 is the amount of fertilizer, X_3 is the amount of pesticide, X_4 is the amount of labor and ε is the error term.

This study's calculation tool or instrument is a computerized method using Statistical Packages for Social Sciences (SPSS) 20.0 For Windows.

III. RESULTS AND DISCUSSION

Production is one measure or indicator used to assess whether a farmer has succeeded in managing his farming activities or not. The greater the products produced, the more successful the farmer is in farming activities.

Assessing the effect of the use of production facilities on the number of products produced in pepper farming at the research location used the multiple linear regression method, namely by looking at the effect of the independent variables (land area, amount of fertilizer, number of pesticides and several workers) on the dependent variable (amount of pepper production). In detail, the results of data analysis using multiple linear regression are presented in Table 1.

Table 1. Factors Affecting Production of Pepper Farming in Tinondo District

Independent Variable	Coefficients (Beta)	t_{count}	Sign
Constant	1,698	3,831	0,000
Land area	1,260	5,198	0,037
Fertilizer Amount	1,192	6,089	0,022
Fertilizer Amount	0,392	1,995	0,052
Total Manpower	0,043	0,521	0,605
R-Squared	0,923		

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F_{count}	145,854	0,000
F_{table}	2,561	
t_{table}	1,677	
α	0,05	
n	54	

Source: Processed Data, 2023

Table 1 shows that a constant value of 1.698 indicates that if the land area (X_1), the amount of fertilizer (X_2), the number of pesticides (X_3), and the number of workers (X_4), the value is 0, then the amount of pepper farming production (Y) in the Village Solalutu is Rp. 1,698. The R-Squared value (R_2) is 0.923 or 92.3%. This shows that the percentage contribution to the influence of the independent variables (land area, amount of fertilizer, number of pesticides, and the number of workers) can explain 92.3% of the variation in the dependent variable (amount of production of pepper farming). The remaining 7.7% is explained by the variable not included in this research model.

A. Test F (Simultaneous)

The F test is used (simultaneous test) to determine whether the independent variables (land area, amount of fertilizer, number of pesticides, and the number of workers) simultaneously have a significant or insignificant effect on the independent variable (amount of production of pepper farming). In detail, the results of simultaneous regression coefficient testing can be seen in Table 1 above.

Table 1 shows that the F_{count} value is 145.854, and the F_{table} value is 2.561. Because the F_{count} value is greater than the F_{table} value (145.854>2.561) simultaneously, the independent variables (land area, amount of fertilizer, number of pesticides, and the number of workers) have a significant effect on the dependent variable (amount of production of pepper farming) in the Village of Solalutu, District of Tinondo East Kolaka Regency.

B. Test t (Partial)

The t-test is used to determine whether, in the regression model, the independent variables (land area, amount of fertilizer, number of pesticides, and the

number of workers) partially affect the dependent variable (amount of production of pepper farming).

C. Land Area

The results of the data analysis show that the calculated t_{value} of the land area is 5.198, while the t_{table} value is 1.677. Because the calculated t value is greater than the t_{table} value (5.198>1.677) and the significance probability value is less than 0.05 (0.037 <0.05), the independent variable land area (X_1) has a significant effect on the amount of pepper farming production (Y) in Solalutu Village, Tinondo District, East Kolaka Regency. The wider land use will cause the number of pepper trees that can be planted, so the number of products produced will also increase.

The results of the data analysis show that the larger the area of land used, the amount of pepper production obtained will also increase, assuming the other variables are constant (Ceteris Paribus). The regression coefficient value of the land area is 1.260, indicating that if the land area increases by 1%, the amount of pepper production will increase by 1.260 kg.

D. Fertilizer Amount

Place The results of the data analysis showed that the calculated t_{value} for the amount of fertilizer was 6.089, while the t_{table} value was 1.677. Because the calculated t_{value} is greater than the t_{table} value (6.089>1.677) and the significance probability value is less than 0.05 (0.022<0.05), the independent variable amount of fertilizer (X_2) has a significant effect on the amount of pepper farming production (Y) in Solalutu Village, Tinondo District, East Kolaka Regency. The use of appropriate organic fertilizers will have an impact on the more fertile pepper plants and will cause the amount of production produced also to increase.

The results of the data analysis show that the greater the amount of fertilizer used, the amount of production of pepper farming obtained will also increase, assuming other variables remain constant (Ceteris Paribus). The regression coefficient value of the amount of fertilizer is 1.192, indicating that if fertilizer increases by 1%, the amount of pepper production will increase by 1.192 kg.

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E. Pesticide Amount

Page The results of the data analysis showed that the t_{value} for the number of pesticides was 1.995, while the t_{table} value was 1.677. Because the calculated t_{value} is greater than the t_{table} value (1.995>1.677) and the significance probability value is greater than 0.05 (0.052>0.05), the independent variable, the number of pesticides (X_3) has no significant effect on the amount of pepper farming production (Y) in Solalutu Village, Tinondo District, East Kolaka Regency. Pesticides are one of the important production factors in farming activities, including pepper farming. Using the right pesticides will minimize the attack of pests on pepper plants, which will ultimately have an impact on increasing the amount of pepper production that can be produced.

The results of the data analysis show that the greater the number of pesticides used, the more pepper production obtained will increase, assuming the other variables are constant (Ceteris Paribus). The regression coefficient value for the number of pesticides is 0.392, which means that if the use of pesticides increases by 1 unit, the amount of pepper produced will increase by 0.392 kg.

F. Total Manpower

The results of the data analysis show that the calculated t_{value} of the number of workers is 0.521, while the t_{table} value is 1.677. Because the calculated t_{value} is smaller than the t table value (0.521<1.677) and the significance probability value is greater than 0.05 (0.605>0.05), the independent variable number of workers (X_4) has no significant effect on the amount of farm production pepper (Y) in Solalutu Village, Tinondo District, East Kolaka Regency. The results of the data analysis show that the greater the number of workers used, the amount of production of pepper farming obtained will also increase, assuming other variables remain constant (Ceteris Paribus). The value of the regression coefficient for the number of workers is 0.043, which means that if the use of labor increases by 1 unit, the amount of pepper production produced will increase by 0.043 kg.

IV. CONCLUSION

Land area (X_1) and amount of fertilizer (X_2) have a significant effect on the dependent variable, the amount of pepper farming production (Y), which is indicated by a significant probability value of less than 0.05. At the same time, the variables of the number of pesticides (X_3) and the number of workers (X_4) have no significant effect on the amount of pepper production (Y) in the village of Solalutu, Tinondo District, East Kolaka Regency, which is indicated by a significance probability value greater than 0.05.

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