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Provincial palm production analysis East Kalimantan 2016-2020

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A R T I C L E I N F O

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ABSTRACT

This research aims to determine the influence of labor variables and land area on palm oil production in East Kalimantan Province. The dependent variable used is Palm Oil Production, while the independent variables used are Labor and Land Area. The data used in this research is secondary data which examines data for the 5 (five) year period 2016 – 2020 with districts/cities in East Kalimantan Province. The research method used is panel data regression analysis. The results of this research are that the Labor variable has a significant and positive effect on Palm Oil Production in 10 Regencies and Cities of East Kalimantan Province, and Land Area has a significant but negative effect on Palm Oil Production in 10 Regencies and Cities of East Kalimantan Province.

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1. INTRODUCTION

In production activities, there are production factors in the form of inputs. Input and output are interconnected and closely related. To obtain optimal production results, there are two production periods, namely short term and long term. In the short run, there are fixed and variable inputs. The fixed input is capital while the variable is labor. In order for these activities to be more productive, the workforce can be increased up to a certain limit. If you exceed the limit, productivity will decrease. In the long run, capital and labor are variable inputs, so their values can change. If a producer wants to increase production output, he can increase production capital and labor. Palm oil is a superior commodity that has a strategic role for national development and Indonesia is one of the largest palm oil producing countries in the world. The following is a comparison of the amount of palm oil production on the island of Kalimantan.

According to Drs. Eko Harsono (1994: 9), Production is any human effort or activity that brings objects into a state so that they can be used for better human needs. Meanwhile, the definition of production is the center for implementing concrete activities for the procurement of goods and services in a business entity and company. According to Subri; 2003 in(Lestyasari, 2013)Labor is the population of working age (aged 15-64 years) or the total population in a country who can produce goods and services if there is a demand for their labor, and if they are willing to participate in these activities. Labor or manpower consists of the workforce and non-labor force. The labor force consists of 1) the working group, and 2) the unemployed group and looking for work. The non-labor force group consists of 1) the group attending school, 2) the group taking care of the household, and 3) the other group or Simanjuntak income recipients; 2001 in(Lestyasari, 2013). According to

Sumardjono; 2008 in(Nur, 2019)Land has two special characteristics, namely as an object and as a natural resource. Land becomes an object when it has been cultivated by humans, for example into agricultural land or can also be developed into urban land. The development of agricultural land to become an object must be carried out by the government through the provision of infrastructure.

In the production process, the number of workers needs to be taken into account not only in terms of labor availability, but also in terms of the quality of the labor and the type of labor. This is in line with research conducted by Amin Budiawan (2013), the results of his research show that if a company wants to increase the amount of production, the company will implement a policy by increasing the number of new workers. Thus, it can be concluded that human resources are still the main factor in increasing production value. The labor production factor has a positive influence on an industry because the labor factor is very much needed in the process of production activities. Production activities will stop if the required workforce is disrupted, thereby impacting the sales the company will receive.

Thus, labor factors will influence industrial growth. In agricultural production, land is not only seen based on its area but also the type of soil and its level of fertility. Fertile soil can certainly support agricultural productivity. On the other hand, arid soil is only suitable for certain types of plants. Soil type can also be judged from its location, whether it is in the lowlands or highlands. Land is a place for plants to grow, for livestock to live, and for farming as a whole. Therefore, land is an important production factor. Soil factors cannot be separated from the influence of the surrounding nature, such as sunlight, wind, rainfall, and so on (Dwiyatmo, 2017). Land or soil is a factor that has a very important influence on palm oil production as a means of growing crops for farmers in farming.

2. RESEARCH METHOD

Kalimantan Province. Where East Kalimantan Province is very dominant in oil palm. Therefore, this research was conducted to determine or analyze the influence of labor variables and land area on total palm oil production. The type of data in this research is quantitative data in the form of numbers. The data used is secondary data from 10 districts in East Kalimantan Province in 2016-2020 which is Panel Data, and the data analysis uses statistics from second sources or secondary sources from previous research. Data sources were obtained from BPS (Central Statistics Agency) in figures and the East Kalimantan Plantation Service. In this research secondary data is used to support the research process.

The operational definition of the variable in question explains the type of variables that will be studied with the aim of explaining the meaning of the variables used in the research indicators. In this research, the regression equation model regarding the Analysis of Labor and Land Area on Palm Oil Production in 10 Regencies/Cities of East Kalimantan Province used is as follows:

$$\mathbf{LogPDRBit = \alpha + \beta 1 LogTK1it + \beta 2 LogLL2it + eit}$$

Where :
GDPBit = Dependent Variable (Palm Palm Production)
α= Constant
β= Regression coefficient of each independent variable
TK = Labor
LL = Land Area
e = error
i = Regency/City
t = Time

3. RESULTS AND DISCUSSIONS

Result

Table 1. Random Effect Model

Variables	Coefficient	Prob
C	-8.760553	0.0000
Manpower_X1	17.15387	0.0000
Land_Area_X2	-11.81964	0.0000

Source: data processed with Eviews 9

Based on the results of the Random Effect Model panel data regression testing, it can be seen that the Random Effect Model equation is as follows: Production = -8.760553 + 17.15387 – 11.81964 + eit.

Selection of the Best Model

In selecting the best model type between Common Effect, Fixed Effect and Random Effect, this research used three tests, namely the Chow test, Haussman test and LM test.

Table 2. Chow test

Effects Test	Statistics	df	Prob
Cross-Section F	0.000000	-9.38	1,0000
Chi-Square Cross-Section	0.000000	9	1,0000

Source: data processed with Eviews 9

Chow test to choose between the OLS (Common Effect) method without dummy variables or the Fixed Effect method. From the results of the F test calculation, namely prob. 1.0000 > 0.05 significance level α=5%, then H0 is rejected and H1 is accepted, this means that the Fixed Effect model is the right model in this research.

Table 3. Hausman test

Test Summary	Chi-Sq. Statistics	df	Prob
Random Cross-Section	0.000000	2	1,0000

Source: data processed with Eviews 9

Based on the Hausman test results table, it shows that the probability value of the random cross section is 1.0000 or greater than 5% (0.05). By looking at these results it can be concluded that H0 is accepted and H1 is rejected. So in this Hausman test the best model is the random effect model. Because there is a difference in results between the Chow test and the Hausman test, it is necessary to carry out the third or final test, namely the Lagrange multiplier test.

Table 4. Lagrange Multiplier (LM) Test

	Cross-Section	Test Hypothesis Time	Both
Breusch-Pagan	6.250000	225,0000	231.2500
	-0.0124	0.0000	0.0000

Source: data processed with Eviews 9

Based on the Lagrange Multiplier test, the probability of Breusch Pagan = 0.0124. This value is smaller than α (0.05), so it was decided to reject H0. Thus, it can be said that the random effect model is more appropriate to use than the common effect model.

Based on the Chow, Hausman and LM tests above, the best model chosen was the Random Effect (RE) model for the Hausman and LM tests, while the Chow test chose the Common Effect (CE) model. The following are the results of processing using Random Effect (RE):

Table 5. Random Effect (RE) Estimation Results

Variables	Coefficient	Prob
C	-8.760553	0.0000
Manpower_X1	17.15387	0.0000
Land_Area_X2	-11.81964	0.0000
R-Square	0.898137	
Adjusted R-Square	0.893802	
F-Statistics	207.2013	
Prob (F-Statistic)	0.000000	

Source: data processed with Eviews 9

Production = -8.760553 + 17.15387 (Labor) – 11.81964 (Land Area)
The explanation is as follows:

1) The results of processing the regression test on the influence of labor on palm oil production obtained a value of 17.15387. This shows that when Labor increases by 1% it will reduce Palm Oil Production by -17.15387. Meanwhile, if Palm Oil Production decreases by 1%, the Open Unemployment Rate will increase by 17.15387, assuming other variables are considered constant.
2) The results of processing the regression test for Land Area on Palm Oil Production obtained a coefficient value of -1181964. This shows that when land area increases by 1%, palm oil production will decrease by 1181964, whereas if land area decreases by 1% then palm oil production will increase by -1181964, assuming other variables are considered constant.

Table 6. F-Statistics Test Results

R-Square	0.898137
Adjusted R-Square	0.893802
F-Statistics	207.2013
Prob (F-Statistic)	0.000000

Source: data processed with Eviews 9

Based on the table above, it can be seen that the f-statistic value obtained is 207.2013 with a value of df1 (k-1)=(3-1)=2, df2 (nk)=(50-3)= 47, and a significance level of <0.05. The degree of freedom value is 3.20, F-statistic (207.2013) > f-table (3.20). So, it can be concluded to accept H1 and reject H0. Meanwhile, the F-statistic probability value is 0.000000. This value is smaller than α = 5% or (0.05), so it can be decided to reject H0. Therefore, it can be concluded that the Labor and Land Area variables influence Palm Oil Production.

Table 7. t test results

C	-8.760553	-5.350243	0.0000
Manpower_X1	17.15387	8.73376	0.0000
Land_Area_X2	-11.81964	-6.325479	0.0000

Source: data processed with Eviews 9

For the Labor variable (X1), based on the table above, it can be seen that the t-statistic value is 17.15387 with a df value (nk) = (50-3) = 47, so the df value is 1.677, the t-statistic is (8.73376) > t-table (1,677). Meanwhile, the Prob t value is 0.0000. This value is smaller than α = 5% or (0.05), so it was decided to reject H0 and accept H1. Therefore, this means that labor has a positive and significant effect on palm oil production.

Meanwhile for the variable Total Land Area (X2), based on the table above it can be seen that the t-statistic value is -11.81964 with df (nk)=(50-3)=47, so the df value is 1.677, the t-statistic is (-6.325479) > t -table (1,677). Meanwhile, the Prob t value is 0.0000. This value is the same as α = 5% or (0.05), so it was decided to reject H0 and accept H1. Therefore, this means that land area has a negative and significant effect on palm oil production.

Table 8. R-Squared Test Results

R-Square	0.898137
Adjusted R-Square	0.893802
F-Statistics	207.2013
Prob (F-Statistic)	0.000000

Source: data processed with Eviews 9

Based on the table of Random Effect (RE) model regression results, the R-Squared value is 0.898137 or 89%. This means that the diversity of Palm Oil Production variables can be explained by the Labor and Land Area variables of 89%, while the remaining 11% is explained by other variables. outside the model under study.

Discussion

The Influence of Labor on Production

The Influence of Labor in the Palm Oil Plantation Sector on Palm Oil Production. Based on the research results, it is known that in general the workforce working in 10 districts and cities in East Kalimantan in 2016-2020. Based on the test results above, it can be seen that seen from the coefficient value, the workforce has a positive effect with a coefficient value of 17.15387, which means that if there is an increase of 1 % of palm oil workers will increase palm oil production, which means that labor has a significant influence. This is influenced by the production value of Palm Oil, where if the production value increases, companies will tend to increase labor, because labor is the main driver of production.

Thus, empirically the results of this research are in line with previous research by Putu Santi Virnayanti and Ida Bagus Darsana, where the research results obtained by workers had a positive and significant effect on the production of wooden sculpture craftsmen in the Sukawati sub-district, Gianyar Regency. In other words, the higher the number of workers, the higher the production produced.

Influence of land area on production

The influence of oil palm plantation land area on palm oil production. Based on the research results, it is known that in general the area of oil palm land in 10 districts and cities in East Kalimantan in 2016-2020, the test results above show that the land area variable has a negative effect with a value of -1181964, which means if there is an increase of 1% So the area of oil palm land will affect palm oil production. Land area has a negative effect due to population growth and the shift in commodities grown by farmers as well as decreasing crop production, this will of course become a focus of more attention on the development of the agricultural sector in an effort to maintain the increase and stability of palm oil production.

Thus, empirically the results of this research are in line with previous research by Kiky Henny Dwi Kharismawati and Pratiwi Dwi Karjati, where the research results of land area partially had a negative effect on rice production in 10 districts of East Java in 2014-2018.

4. CONCLUSION

Based on the results and discussion of the research that has been carried out, it can be concluded that the influence of the Labor and Land Area variables in Regencies and Cities in East Kalimantan Province in 2016-2020 is as follows; 1) The results of the Labor variable working in 10 districts and cities in East Kalimantan in 2016-2020 showed that the Labor variable had a positive and significant effect on Palm Oil Production. This is influenced by the production value, where if the production value increases, the company will tend to increase labor, because labor is the main driver of production. 2) The results of the land area variable for oil palm plantations in 10 districts and cities in East Kalimantan in 2016-2020 show that the land area variable has a negative effect and has an influence on palm oil production. Land area has a negative effect due to population growth and the shift in commodities grown by farmers as well as decreasing crop production, this will of course become a focus of more attention on the development of the agricultural sector in an effort to maintain the increase and stability of palm oil production.

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