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# The Effect of Palm Oil Plantation Expansion on Labor Absorption in Tebo Regency

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**ABSTRACT**

This research aims to analyze the effect of oil palm plantation expansion on labor absorption in Tebo Regency. This research was conducted in Tebo Regency with a literature study approach. The data used is secondary data with time series type for the period 2002-2023. The analysis method used is descriptive quantitative analysis and multiple linier regression analysis using Eviews 12 application. The results showed that simultaneously, the variables of production of oil palm plantations and FFB price ratio had a significant effect on labor absorption, including total labor and oil palm plantation subsector labor in Tebo Regency. Partially, the variables of production of oil palm plantations and FFB price ratio each had a positive and significant effect on labor absorption in Tebo Regency.

**Keywords:** Labor Absorption, Ekspansion, Oil Palm Plantation, Production, FFB Price Ratio

## INTRODUCTION

The plantation subsector is an important part of the agricultural sector that significantly contributes to the economy. In general, the primary goals or benefits of plantation activities on socio-economic aspects include improving the welfare of the surrounding community, increasing employment and job opportunities, and assisting regional development (Syahza, 2011). One of the potential plantation crops is oil palm. Oil palm plantations have become a significant provider of employment and a source of income for farmers (Afifuddin & Kusuma, 2007).

In general, expansion is an action or process of widening or enlarging something to make it broader, larger, or increased. Similarly, the expansion of oil palm plantations aims not only to increase the area of plantations but also to increase plantation production, which is a source of income, and this can be achieved through intensification and extensification. In addition, the expansion of oil palm plantations is also effect by the conversion of land use from rubber plantations to oil palm plantations, which is a current trend. One of the reasons is the fluctuating and often low price of rubber. Therefore, expansion can be interpreted not only as an increase in the area and production of oil palm plantations but also as a change in land use from previous uses to oil palm plantations (Puspitasari, 2020). The expansion of oil palm plantations in Tebo Regency has the potential to affect the number of workers.

The management of natural resources will always be related to employment opportunities and problems. Tebo Regency has potential resources in the agricultural sector, one of which is oil palm plantations, as evidenced by oil palm being the base sector and a leading commodity in Tebo Regency. Oil palm plantations also rank first with the highest production compared to other commodities and have the second-largest plantation area in Tebo Regency. In the last 22 years, the production and area of oil palm plantations, as well as the price of FFB (Fresh Fruit Bunches), have experienced fluctuations that tend to increase. In addition, there are prices of other commodities such as rubber prices. This needs attention because it has the potential to affect labor absorption. Based on the above description, this study aims to analyze the effect of oil palm plantation expansion on labor absorption in Tebo Regency.

## RESEARCH METHOD

This research takes Tebo Regency as the scope of the research area, because Tebo Regency has considerable potential in cultivating oil palm commodities and oil palm plantations are one of the dominating sub-sectors of Tebo Regency's plantation sector, which is a priority and base sector.

This research uses secondary data in the form of time series data for the period 2002-2023 obtained through library research. The data sources used in this study come from official government institutions, namely the Central Statistics Agency (BPS) of Jambi Province and Tebo Regency, the Department of Plantation of Jambi Province and Tebo Regency.

The data analysis method used in this research is descriptive quantitative. To answer the problems in the study using multiple linear regression analysis and using the Eviews 12 application as a data processing tool and using time series data in the form of cumulative data. In this study, 2 regression models are used to answer the research problems. The multiple linear regression formula used in this research is as follows:

1) The Effect of Oil Palm Plantation Expansion on Total Labor Absorption in Tebo Regency

$$LnY_1 = \beta_0 + \beta_1 LnX_1 + \beta_2 LnX_{2\,(t-1)}\, e$$

2) The Effect of Oil Palm Plantation Expansion on Labor Absorption in The Palm Oil Plantation Sub-Sector in Tebo Regency

$$LnY_2 = \beta_0 + \beta_1 LnX_1 + \beta_2 LnX_{2\,(t-1)}\, e$$

Informations:
Ln = Natural Logarithm
$Y_1$ = Total Labor Absorption in Tebo Regency (soul/people)
$Y_2$ = Labor Absorption in The Palm Oil Plantation Sub-Sector in Tebo Regency (farmer/household)
$X_1$ = Production (ton)
$X_2$ = Fresh Fruit Bunches (FFB) Price Ratio
$\beta_0$ = constant
$\beta_1$, $\beta_2$ = regression Coefficient
e = error term
(t-1) = Lag data/ previous period data

The classical assumption test is used in this study so that the regression model theoretically produces appropriate parametric values. The classical assumption tests carried out consist of Multicollinearity Test, Normality, Heteroscedasticity and Autocorrelation. As for the statistical test, it is carried out to determine the effect of the independent variable on the dependent variable. Consists of $R^2$ test, F test and T test.

## RESULTS AND DISCUSSION

### The Effect of Oil Palm Plantation Expansion on Total Labor Absorption in Tebo Regency

Based on the results of the classical assumption test consisting of multicollinearity test, normality test, heteroscedasticity test and autocorrelation test, it was found that there was no linear relationship between each independent variable, the data in this study were normally distributed, the model was homoscedastic, and the variables in the model were not correlated with changes in time or it could be said that the regression model passed these assumptions so that the regression model or estimator variables were suitable for testing in multiple linear regression analysis.

Based on the results of the model evaluation, it was found that the independent variables, namely oil palm plantation production and the FFB price ratio (in the previous year), were able to explain the variation of the dependent variable, namely total labor absorption, by 86%. This was reinforced by the results of the F test, which obtained a Prob (F Statistics) value of $0.000000 < \alpha = 0.05$, so Ho was rejected and $H_1$ was accepted. This means that the variables of oil palm plantation production and the FFB price ratio in the previous year simultaneously had a significant effect on total labor absorption. Based on the results of the partial test (T-test), the variables of oil palm plantation production and the FFB price ratio in the previous year each had a significant effect on total labor absorption in Tebo Regency.

**Model Estimation Test Results**

Table 1. Results of Multiple Linear Regression Analysis of the Effect of Oil Palm Plantation Expansion on Total Labor Absorption in Tebo Regency

Dependent Variable: LN_Y1
Method: Least Squares
Date: 10/02/25 Time: 21:11
Sample: 2002 2023
Included observations: 22

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 8.058828 | 0.459096 | 17.55369 | 0.0000 |
| LN_X1 | 0.345354 | 0.035204 | 9.810161 | 0.0000 |
| LN_X2 (t-1) | 0.123970 | 0.050969 | 2.432255 | 0.0251 |

| | | | |
|---|---|---|---|
| R-squared | 0.876902 | Mean dependent var | 11.87068 |
| Adjusted R-squared | 0.863944 | S.D. dependent var | 0.207247 |
| S.E. of regression | 0.076445 | Akaike info criterion | -2.178378 |
| Sum squared resid | 0.111032 | Schwarz criterion | -2.029599 |
| Log likelihood | 26.96216 | Hannan-Quinn criter. | -2.143330 |
| F-statistic | 67.67438 | Durbin-Watson stat | 1.351648 |
| Prob(F-statistic) | 0.000000 | | |

*Source: Eviews 12 (processed data), 2025*

Based on the results of the analysis above, the regression equation can be formulated as follows:

$$LnY_1 = 8.058828 + 0.345354\ LnX_1 + 0.123970\ LnX_{2(t-1)}$$

- **The Effect of Oil Palm Plantation Production on Total Labor Absorption in Tebo Regency**

Based on the data processing results, it is known that the variable of oil palm plantation production has a positive and significant effect on total labor absorption in Tebo Regency. The coefficient value obtained is 0.345354, which means that if oil palm plantation production increases by 10%, total labor absorption will increase by 3.4%. The findings in this study are in line with previous research conducted by Wahyu Putri Almi (2019), which states that oil palm plantation production has a positive and significant effect on labor absorption in Rokan Hulu Regency. If the production of oil palm plantations increases, more labor is needed, including direct labor on plantations such as farmers and employees of plantation companies (private and state), and indirect labor involved in supporting activities such as transportation, trade, processing industry, provision of fertilizers and plantation tools as well as other service activities in the palm oil agribusiness supply chain, so that it can contribute to increasing total labor absorption in Tebo Regency.

- **The Effect of FFB Price Ratio on Total Labor Absorption in Tebo Regency**

Based on the results of the regression analysis, the FFB price ratio variable in the previous year (Lag data) has a positive and significant effect on total labor absorption in Tebo Regency with a significance level of 5%. The coefficient value obtained is 0.123970, which means that if the FFB price ratio in the previous year increases by 10%, it will increase total labor absorption in Tebo Regency by 1.2%. This can also be interpreted as if in the previous year the price of FFB tends to rise while the price of rubber falls, it will contribute to increasing total labor absorption in Tebo Regency because when the price of FFB rises in the previous year, farmers or people will consider decisions and be motivated to increase production and investment both in expanding plantation and processing industries in the coming year. To do this, more labor is needed in various activities in the plantation (planting, maintenance, and harvesting) and non-plantation (processing industry, transportation, and trade). Similarly, when rubber price are low, it can lead to the expansion of oil palm plantation due to the conversion of rubber land because it is assumed that oil palm is more economically profitable. Thus, this has the potential to increase the number of oil palm farmers and generally increase labor demand in the oil palm plantation subsector or activities, thereby impacting the total labor in Tebo Regency.

**The Effect of Oil Palm Plantation Expansion on Labor Absorption in The Palm Oil Plantation Sub-Sector in Tebo Regency**

Based on the results of the classical assumption test consisting of multicollinearity test, normality test, heteroscedasticity test and autocorrelation test, it was found that there was no linear relationship between each independent variable, the data in this study were normally distributed, the model was homoscedastic, and the variables in the model were not correlated with changes in time or it could be said that the regression model passed these assumptions so that the regression model or estimator variables were suitable for testing in multiple linear regression analysis.

Based on the results of the model evaluation, it was found that the independent variables, namely oil palm plantation production and the FFB price ratio (in the previous year), were able to explain the variation of the dependent variable, namely the absorption of labor in the oil palm plantation subsector in Tebo Regency by 87%. This was reinforced by the results of the F test, obtained a Prob value (F-Statistic) of 0.000000 < $\alpha = 0.05$, so Ho was rejected and $H_1$ was accepted. This means that the variables of oil palm plantation production and the FFB price ratio in the previous year simultaneously had a significant effect on the absorption of labor in the oil palm plantation subsector. Based on the results of the partial test (T-test), the variables of oil palm plantation production and the FFB price ratio in the previous year each had a significant effect on the absorption of labor in the oil palm plantation subsector in Tebo Regency.

**Model Estimation Test Results**

Table 2. Results of Multiple Linear Regression Analysis of the Effect of Oil Palm Plantation Expansion on Labor Absorption in The Palm Oil Plantation Sub-Sector in Tebo Regency

Dependent Variable: LN_Y2
Method: Least Squares
Date: 10/20/25 Time: 22:55
Sample: 2002 2023
Included observations: 22

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 2.168928 | 0.819777 | 2.645756 | 0.0159 |
| LN_X1 | 0.665005 | 0.062861 | 10.57900 | 0.0000 |
| LN_X2 (t-1) | 0.194478 | 0.091012 | 2.136835 | 0.0458 |

| | | | |
|---|---|---|---|
| R-squared | 0.888016 | Mean dependent var | 9.596652 |
| Adjusted R-squared | 0.876229 | S.D. dependent var | 0.387997 |
| S.E. of regression | 0.136502 | Akaike info criterion | -1.018833 |
| Sum squared resid | 0.354022 | Schwarz criterion | -0.870055 |
| Log likelihood | 14.20716 | Hannan-Quinn criter. | -0.983785 |
| F-statistic | 75.33388 | Durbin-Watson stat | 1.040057 |
| Prob(F-statistic) | 0.000000 | | |

*Source: Eviews 12 (processed data), 2025*

Based on the results of the analysis above, the regression equation can be formulated as follows:

$$LnY_2 = 2.168928 + 0.665005\ LnX_1 + 0.194478\ LnX_{2(t-1)}$$

- **The Effect of Oil Palm Plantation Production on Labor Absorption in The Palm Oil Plantation Sub-Sector in Tebo Regency**

Based on the results of data processing, it is known that the variable of oil palm plantation production has a positive and significant effect on labor absorption in the oil palm plantation subsector in Tebo Regency. The coefficient value obtained is 0.665005, which means that if oil palm plantation production increases by 10%, it will increase labor absorption in the oil palm plantation subsector by 6.6%. The findings in this study are in line with previous research conducted by Julianto Sitompul (2019), namely oil palm plantation production has a positive and significant effect on labor absorption in Kampar Regency. In addition, similar results were also obtained from research by Novira Asri (2024), namely the amount of production has a positive and significant effect on employment absorption. High oil palm plantation production has a real impact on the welfare of oil palm farmers because the wider and ore productive the land managed, the greater the income earned, thus increasing the attractiveness of the oil palm plantation business and motivating people to cultivate and manage oil palm plantations, thereby affecting the growth of the number of

oil palm landowners. In addition, the higher the oil palm plantation production, the ore labor is needed, including direct labor in the plantation such as harvesting and plant maintenance workers.

- **The Effect of FFB Price Ratio on Labor Absorption in The Palm Oil Plantation Sub-Sector in Tebo Regency**

Based on the results of the regression analysis, the FFB price ratio variable in the previous year (Lag data) has a positive and significant effect on labor absorption in the oil palm plantation subsector in Tebo Regency in the form of farmers with units (household). The coefficient value obtained is 0.194478, which means that if the FFB price ratio increases by 10%, it will increase labor absorption in the oil palm plantation subsector by 1.9%. This can also be interpreted that if in the previous year the price of FFB tends to rise while the price of rubber falls, it can increase labor absorption in the oil palm plantation subsector in Tebo Regency. This is because people will consider decisions and be motivated to cultivate oil palm plantations and convert land use and profession from rubber plantation to oil palm plantations in the coming year. In addition to the higher income from oil palm farming, other reasons people convert land to oil palm plantations are the lighter work of farmers, the relatively high price of oil palm, which enables farmers to meet theirs daily needs, in the increase in assets, as well as the fact that during the land conversions process, many farmers create job opportunities for the community (Harahap et al., 2024). Therefore, the expansion of oil palm plantations due to land conversion triggered by low rubber prices increases the number of workers of farmers in the oil palm plantation subsector.

## CONCLUSION

Simultaneously, it shows that together the variables of oil palm plantation production and FFB price ratio have a significant effect on labor absorption, including total labor and oil palm plantation subsector labor. Partially, oil palm plantation production and FFB price ratio each have a positive and significant effect on total labor absorption and oil palm plantation subsector labor in Tebo Regency.

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