

ABSTRACT

Riau Province is the largest oil palm-producing region in Indonesia, where smallholder oil palm plantations play an important role in supporting the regional economy. Despite facing challenges such as forest and land fires that occur almost every year, smallholder oil palm production in Riau Province has shown an increasing trend. This condition indicates that other factors may also influence smallholder oil palm production. Therefore, this study aims to analyze the effects of the number of farmers, farm size, rainfall, and forest and land fires on smallholder oil palm production in Riau Province during the 2015-2024 period.

This study employed secondary panel data covering 11 regencies/cities in Riau Province from 2015 to 2024, with a total of 110 observations. The data were obtained from Statistics Indonesia (BPS), the Directorate General of Estates, and other relevant institutions. The analysis was conducted using panel data regression based on the Cobb-Douglas production function in its natural logarithmic form. The best estimation model was selected through the Chow test, Hausman test, and Lagrange Multiplier test, with the Random Effects Model (REM) identified as the most appropriate model.

The results indicate that, simultaneously, the number of farmers, farm size, rainfall, and forest and land fires have a significant effect on smallholder oil palm production. Partially, the number of farmers and farm size have a positive and significant effect on smallholder oil palm production, while rainfall and forest and land fires have no significant effect. These findings suggest that an increase in the number of farmers and the expansion of farm size are the main factors driving higher smallholder oil palm production in Riau Province. Therefore, the government is expected to continue improving farmers' capacity and support the development of smallholder oil palm farming through extension services and the strengthening of farmer institutions to enhance productivity and ensure the sustainability of the smallholder oil palm plantation sector.

Keywords: *smallholder oil palm production, number of farmers, farm size, rainfall, forest and land fires, panel data regression.*