

**INDUSTRIAL TRAINING REPORT  
AT  
PEJABAT RISDA DAERAH KULIM,  
LOT 541 JALAN ASAAD,  
09000 KULIM,  
KEDAH DARUL AMAN**

**A STUDY ON TREND AND MODELLING FOR MONTHLY NATURAL  
RUBBER PRODUCTION FROM SMALLHOLDING SECTOR IN MALAYSIA**

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## ABSTRACT

Natural rubber is an important agricultural commodity in Malaysia. It was planted in Malaysia for more than three decades. Today, Malaysia is the third largest rubber producer in the world and the fifth largest consumer of rubber, and among the world's largest exporter of rubber products. However, the instability of the production of natural rubber (NR) posts a significant risk to producers, traders, consumers, and others involved in the production and marketing of NR. Thus, it is crucial for decision makers to statistically and accurately project the production of NR. So, the main focus of this study aims to forecast the monthly natural rubber production from smallholding sector in Malaysia for next two years from January 2014 until December 2015 by using the best model. In order to achieve the stated objectives, the Univariate Modelling Techniques and Box-Jenkins Methodology were used. All the best models of forecasting for NR production were identified and selected based on the minimum of Mean Square Error (MSE) and Mean Absolute Percentage Error (MAPE) value. Data collected were analyzed using Microsoft Excel, SPSS Statistics 20 and Minitab 16 software. The finding found that the best model to forecast natural rubber production from smallholding sector in Malaysia using Univariate Modelling Techniques was Holt-Winters' Trend and Seasonality (Multiplicative). Whereas, the best Box-Jenkins Methodology suggested that  $SARIMA(3, 1, 1)(1, 1, 1)_{12}$  was the best model. In order to determine the best model that suit the series well, comparison of Holt-Winters' Trend and Seasonality (Multiplicative) and  $SARIMA(3, 1, 1)(1, 1, 1)_{12}$  were implemented. Based on the comparison, it shows that Holt-Winters' Trend and Seasonality (Multiplicative) has the lowest value of MSE and MAPE. Hence, the result of the study imply that Holt-Winters' Trend and Seasonality (Multiplicative) forecasting method was a better alternative approach for predicting natural rubber production. The forecasting result showed a slightly decreasing trend over the period from January 2014 until December 2015. Hope, forecasting the future production of natural rubber through the most accurate models can help the Malaysian government as well as the production in natural rubber industry to perform better strategic planning and also to help them in maximizing revenue and minimizing the natural rubber production.

\**Keywords:* Natural Rubber Production, Smallholdings, Time Series, Forecasting, Univariate Modelling Techniques, Box-Jenkins Methodology.

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