ABSTRACT

International Crude Palm Oil (CPO) prices fluctuate due to various global factors, such as demand and supply, trade policies, and world economic conditions. Therefore, accurate forecasting methods are needed to provide insights into the most suitable approach for handling CPO price volatility in the global market. This research compares Autoregressive Integrated Moving Average (ARIMA) and Adaptive Neuro-Fuzzy Inference System (ANFIS) methods in modeling and forecasting international CPO prices. ARIMA excels in handling linear time series data but struggles with nonlinear patterns. On the contrary, ANFIS, which integrates fuzzy logic and artificial neural networks, is more flexible in capturing complex and nonlinear relationships within the data. This study utilizes monthly CPO price data from January 2008 to December 2023, with model performance evaluated using sMAPE. The optimal ARIMA model identified is ARIMA(0,1,1), while the best ANFIS model is built using the AR lag components from ARIMA(1,1,0) as inputs, specifically Z_{t-1} and Z_{t-2}, with Grid Partitioning and Triangular membership functions (3 memberships per input). The ANFIS model produced better accuracy than ARIMA, with an sMAPE of 3,37%, making ANFIS the best method in this study. The forecasting results for 2024 indicate a downward trend in CPO prices, with values decreasing each month.

Keywords: *Crude Palm Oil (CPO) Price, Time Series Forecasting, ARIMA, ANFIS*