

ABSTRACT

Curly red chili is one of the top five vegetable commodities with the highest production volume, commanding significant economic value and continuously growing demand. North Sumatra Province stands as the second largest curly red chili production center in Indonesia. The price of curly red chili tends to exhibit considerable fluctuations over time. These frequent fluctuations indicate the presence of volatility, which reflects an inherent instability in its pricing dynamics. The ARIMA method is applied due to its capability in capturing time series data patterns once the stationarity assumption is satisfied. However the ARIMA model presents limitations when applied to data exhibiting heteroscedasticity, particularly in data characterized by high fluctuations. The ARCH-GARCH method enables the model to accommodate time-varying volatility in time series data. In this study, the ARIMA-GARCH method was adopted as it allows for modeling that captures both the mean pattern of the data and its volatility characteristics. This study utilizes daily price data of curly red chili in North Sumatra Province covering the period from October 1, 2025, to March 31, 2026. The ARIMA(1,1,0)-GARCH(1,1) model was obtained with an AIC value of -14.93914 . The selected model satisfies the independence assumption, and no remaining ARCH effects were detected in the model residuals. Therefore, it can be concluded that the ARIMA-GARCH method is capable of effectively modeling curly red chili prices in North Sumatra Province.

Keywords: Curly red chili, North Sumatra Province, curly red chili price, fluctuation, time series data, ARIMA-GARCH, modeling