

ABSTRAK

Harga cabai merah keriting merupakan salah satu komoditas pangan yang sering mengalami fluktuasi sehingga sulit diprediksi. Kondisi tersebut dapat memengaruhi pendapatan petani, aktivitas perdagangan, dan kestabilan pasokan di pasaran. Oleh karena itu, diperlukan metode peramalan yang mampu menghasilkan prediksi harga secara akurat. Penelitian ini bertujuan untuk menerapkan metode *Autoregressive Integrated Moving Average* (ARIMA) dan *Gated Recurrent Unit* (GRU) dalam memprediksi harga cabai merah keriting di Kota Lhokseumawe, serta membandingkan tingkat akurasi kedua metode tersebut. Data yang digunakan berupa data historis harga harian cabai merah keriting yang diperoleh dari PIHPS Nasional. Metode ARIMA diterapkan melalui tahapan uji stasioneritas, differencing, analisis ACF dan PACF, serta estimasi model hingga diperoleh model terbaik ARIMA (1,1,1). Sementara itu, metode GRU diterapkan melalui proses normalisasi data, pembentukan *sequence*, pelatihan model, dan proses prediksi menggunakan data testing. Evaluasi model dilakukan menggunakan nilai *Mean Absolute Error* (MAE) dan *Mean Absolute Percentage Error* (MAPE). Hasil penelitian menunjukkan bahwa metode GRU memiliki tingkat akurasi yang lebih baik dibandingkan metode ARIMA karena menghasilkan nilai error yang lebih kecil. Selain itu, penelitian ini juga berhasil membangun *dashboard* menggunakan *Python* dan *framework Flask* untuk menampilkan data harga, grafik tren, dan hasil prediksi kedua metode.

Kata Kunci : *Auto Regressive Integrated Moving Average* (ARIMA), *Gated Recurrent Unit* (GRU), Prediksi Harga, Cabai Merah Keriting, *Time Series*.

ABSTRACT

The price of curly red chili is a food commodity that often fluctuates, making it difficult to predict. This condition can affect farmers' income, trading activities, and the stability of supply in the market. Therefore, a forecasting method capable of producing accurate price predictions is needed. This study aims to apply the Autoregressive Integrated Moving Average (ARIMA) and Gated Recurrent Unit (GRU) methods to predict the price of curly red chili in Lhokseumawe City, and to compare the accuracy levels of the two methods. The data used is historical daily price data for curly red chili obtained from the National PIHPS. The ARIMA method is applied through the stages of stationarity testing, differencing, ACF and PACF analysis, and model estimation until the best ARIMA (1,1,1) model is obtained. Meanwhile, the GRU method is applied through data normalization, sequence formation, model training, and prediction processes using data testing. Model evaluation is carried out using the Mean Absolute Error (MAE) and Mean Absolute Percentage Error (MAPE) values. The results show that the GRU method has a better level of accuracy than the ARIMA method because it produces a smaller error value. In addition, this study also succeeded in building a dashboard using Python and the Flask framework to display price data, trend graphs, and prediction results of both methods.

Keywords: *Auto Regressive Integrated Moving Average (ARIMA), Gated Recurrent Unit (GRU), Price Prediction, Curly Red Chili, Time Series.*