RICE PRICE PREDICTION SYSTEM IN CENTRAL JAVA USING LONG SHORT-TERM MEMORY (LSTM) METHOD

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ABSTRACT

Unstable rice prices often pose challenges for the government in maintaining food security and for farmers seeking a stable income. The purpose of this research is to develop a rice price prediction system for Central Java using the Long Short-Term Memory (LSTM) method. LSTM was selected due to its capability to capture non-linear patterns and long-term dependencies present in time series data, such as rice prices. The system was constructed using daily rice price data obtained from the National Strategic Food Price Information Center (PIHPS Nasional) website, along with daily weather data sourced from the BMKG website in Central Java, covering the period from 2017 to 2024. The LSTM model architecture comprises three LSTM layers, each with dropout, followed by one Dense layer. Model performance was evaluated using three metrics: Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and Mean Absolute Percentage Error (MAPE). The findings of the study demonstrated that the rice price prediction model utilizing LSTM exhibited satisfactory performance, as evidenced by the evaluation metric values, including MAE of 0.141, MAPE of 1.256%, and RMSE of 0.205.

Keywords*: Rice price, food security, long short-term memory (LSTM), machine learning, prediction, artificial intelligence technology*