

Abstract

The increase in the price of basic commodities in East Java has a significant impact on the economic conditions and welfare of the community, especially for low-income groups. To address the challenge of frequent fluctuations in the prices of basic commodities, this study developed a price prediction model for nine major commodities by comparing two machine learning approaches: *Long Short-Term Memory* (LSTM) and *Extreme Gradient Boosting* (XGBoost). Historical price data from 2020 to 2024 were analyzed to understand price trend patterns and dynamics. Model performance was evaluated using the MAE, RMSE, and MAPE metrics to measure the accuracy of each approach. The results of the study show that LSTM consistently produces lower prediction error values than XGBoost for almost all commodities, with visualizations showing the closeness between actual data and prediction results. For example, for the commodity *Medium Rice*, LSTM recorded an MAE of 0.0303 and a MAPE of 0.25%, while XGBoost produced an MAE of 0.3342 and a MAPE of 2.75%. A similar pattern is observed in other commodities such as *White Crystal Sugar*, *Premium Packaged Oil*, and *Broiler Chicken Meat*, which demonstrate LSTM's superiority in capturing time dynamics. These findings indicate that the LSTM model is superior in understanding complex and seasonal price fluctuation patterns. The LSTM model was then used to predict staple food prices throughout 2025, showing a relatively stable price trend, despite slight fluctuations in some commodities. These results are expected to serve as a basis for the formulation of price stabilization policies, supply management, and more adaptive household economic planning in the East Java region.

Keywords: Basic Food, East Java, LSTM, Price Prediction, XGBoost.