

ABSTRACT

COMPARISON OF *HOLT-WINTERS EXPONENTIAL SMOOTHING* METHOD AND *SEASONAL AUTOREGRESSIVE INTEGRATED MOVING AVERAGE* (SARIMA) METHOD IN RAINFALL FORECASTING IN LAMPUNG PROVINCE

By

Andi Hari Yanto

This research compares two forecasting methods, *Holt-Winters Exponential Smoothing* and *Seasonal Autoregressive Integrated Moving Average* (SARIMA) on rainfall data in Lampung Province from 2011 to 2022. The *Holt-Winters* method is used with an additive approach, while SARIMA is developed with a combination of (p,d,q) orders and seasonal (P,D,Q) based on ACF and PACF analysis. Based on the evaluation using *Mean Absolute Error* (MAE) and *Root Mean Square Error* (RMSE), the SARIMA method with the SARIMA model (2,0,3) (0,1,1)₁₂ is proven to be better with MAE and RMSE values are smaller than the *Holt-Winters* method. The rainfall forecasting using the SARIMA method for the next 6 months shows a decrease in rainfall until June 2023.

Keywords: forecasting, rainfall, *Holt-Winters*, SARIMA, model evaluation.

ABSTRAK

PERBANDINGAN METODE PENGHALUSAN EKSPONENSIAL *HOLT WINTERS* DAN METODE *SEASONAL AUTOREGRESSIVE INTEGRATED MOVING AVERAGE* (SARIMA) PADA PERAMALAN CURAH HUJAN DI PROVINSI LAMPUNG

Oleh

Andi Hari Yanto

Penelitian ini membandingkan dua metode peramalan yaitu Penghalusan Eksponensial *Holt-Winters* dan *Seasonal Autoregressive Integrated Moving Average* (SARIMA) pada data curah hujan di Provinsi Lampung dari tahun 2011 hingga 2022. Metode *Holt-Winters* digunakan dengan pendekatan aditif, sedangkan SARIMA dikembangkan dengan kombinasi orde (p,d,q) dan musiman (P,D,Q) berdasarkan analisis ACF dan PACF. Berdasarkan evaluasi menggunakan *Mean Absolute Error* (MAE) dan *Root Mean Square Error* (RMSE), metode SARIMA dengan model SARIMA $(2,0,3) (0,1,1)_{12}$ terbukti lebih baik dengan nilai MAE dan RMSE yang lebih kecil dibandingkan metode *Holt-Winters*. Peramalan curah hujan dengan metode SARIMA untuk 6 bulan ke depan menunjukkan penurunan curah hujan hingga bulan Juni 2023.

Kata kunci: peramalan, curah hujan, *Holt-Winters*, SARIMA, evaluasi model.