

ABSTRACT

Blast disease (*Pyricularia oryzae*) is a major threat to rice productivity, particularly in Lamongan District, which is the largest rice-producing area in East Java. The spread of this disease is influenced by climatic factors such as temperature, rainfall, and humidity. This study aims to develop a prediction model for blast disease outbreak area using the Long Short-Term Memory (LSTM) algorithm, utilizing climatological data and historical data on blast disease outbreak area from 2019 to 2024 in Bojonegoro District. The research methodology employs the CRISP-DM approach, which includes the following stages: business understanding, data understanding, data preparation, modeling, evaluation, and deployment. The model was trained for five geographical regions with evaluation using the MAPE, MAE, and sMAPE metrics. The evaluation results showed that the Central region had the highest prediction accuracy with an sMAPE value of 18.7%, while the Southern region showed the lowest performance with an sMAPE of 31.4%. The model was then implemented into a web-based dashboard using the Streamlit framework. This dashboard allows users to input climatological data and obtain disease outbreak predictions for the next four months. This system is expected to serve as a decision-making tool for early mitigation and support the implementation of precision agriculture at the local level.

Keywords: LSTM, Blas Disease, Prediction, Climatology, Lamongan