ABSTRACT

Household food security is a critical issue in East Nusa Tenggara (NTT), a province characterized by high levels of vulnerability. This study aims to predict household food security status using machine learning methods by comparing the performance of Regresi Logistik, Random Forest, XGBoost, and a Stacking Ensemble Learner (SEL). The SEL model combines the three classifiers as base models with Regresi Logistik serving as the meta model. The dataset is derived from the 2023 SUSENAS survey and has undergone pre-processing. The dependent variable represents household food security status, while the independent variables capture socioeconomic characteristics. The results indicate that Random Forest is the best-performing single model, achieving an F1-score of 66.3% on the testing data, followed by XGBoost at 65.2% and Regresi Logistik at 64.5%. The SEL model yields a slightly higher F1-score of 66.4%, though the improvement is not substantial. Further optimization through threshold tuning increases the F1-score to 71.1% and recall to 90.4%, making the model significantly more sensitive in detecting food-insecure households, despite a decline in precision. Overall, the tuned SEL model is the most effective approach for identifying vulnerable households and holds strong potential as a decision-support tool for planning food security interventions in NTT.

Keywords: Household Food Security, East Nusa Tenggara (NTT), Regresi Logistik, Random Forest, eXtreme Gradient Boosting (XGBoost), Stacking Ensemble Learner (SEL)