

ABSTRACT

FORECASTING SUGARCANE YIELD USING MACHINE LEARNING ALGORITHM

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Sugarcane is one of the main commodities that plays strategic role inside the economic role in Indonesia. East Java reaches 52% of total sugarcane production, which makes it the largest sugarcane producer in Indonesia. On the other hand, climate become the most crucial part of sugarcane growth. A new framework needs to be built to forecast sugarcane yield through the use of nearest precipitation point as well as temperature data since existing research focused on using other parameters to predict the crop yield.

The objective of this research is to develop a model that is able to predict sugarcane yield based on the monthly average precipitation, temperature, and previous year's yield. The machine learning algorithms to be used are Linear Regression, Multi Layer Perceptron, and Support Vector Regression. The dataset consists of the sugarcane yield data in East Java from 1976 to 2019. The result of the models based on both algorithms are then compared and reviewed in order to see which one has better accuracy between the two methods.

Experiments have been done to compare the models using Linear Regression, Multi Layer Perceptron, and Support Vector Regression. The results were 3. Multi Layer Perceptron performs 26.5% better compared to Multiple Linear Regression for MSE value in the test dataset. Multi Layer Perceptron also performs better with 8% and 3.4% gap compared to Support Vector Regression for both MSE train and test dataset. Support Vector Regression also perform 24% much better compared to Multiple Linear Regression on MSE value from using test data. Percentages within each values are calculated manually.

Keywords: Sugarcane crop yield, Neural network, Multi Layer Perceptron, Linear Regression, Support Vector Regression