ABSTRACT

PREDICTING SOYBEANS YIELD IN CENTRAL JAVA USING CLIMATIC PROPERTIES AND AVERAGE PRECIPITATION THROUGH NEURAL NETWORK

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Soybeans is one of the most consumable commodities behind rice and maize in Indonesia. The Indonesian government has tried multiple times to be self-sufficient in their soybeans production but to no avail and to make up for the deficit in supplies, they rely on imports. There have been several research on predicting the crops yield production using machine learning and as such this research will try to emulate it on the soybeans' yield production in Indonesia, particularly in Central Jaca, as it is where one of the most influential soybean productions is in Grobogan, Central Java.

The research will use the climatic properties such as the temperature, humidity, and the solar radiation exposure alongside the production of the previous year and the monthly precipitation as the input for the machine learning model. Datasets are obtained from NASA's LaRC POWER project for climatic dataset, and various Indonesian government agencies for the soybean's dataset.

The machine learning methods that are used in this research are Multi Layered Perceptron (MLP) and Multiple Linear Regression (MLR), with MLP being able to outperform MLR with a testing RMSE value of 0.239, whereas MLR's testing RMSE value of 0.385.

Keywords: Agriculture, Machine Learning, Prediction, Multi-Layered Perceptron, Artificial Neural Network, Soybeans