

Red Onion Price Prediction Using Random Forest Regression Machine Learning Model for Jaffna District

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Red onion is one of the important commercial vegetable crops grown in Sri Lanka. It is widely cultivated in many regions of the country, but its prices are unstable in Sri Lankan markets due to supply and demand. The price fluctuations cause substantial economic losses for farmers and consumers due to improper price prediction techniques followed by Jaffna farmers. Red onion Farmer usually cultivates the onion in a specific season in Jaffna. Farmers have been facing losses for the last ten years because of weather conditions, fertilizer prices, USD exchange rates, Seeds prices, labour costs, transportation costs, demand for development and utility, biological lag, government price controls, and competitive product prices. The research focused on analysing certain factors were date, USD exchange, Rainfall, labour cost, and competitive product as big onion market price, fertilizer price and red onion price. Data is collected from January 2017 to December 2021. The consideration factors data were pre-processed and analysed by the Google Colab tool. The correlation of the data to the red onion prices indicates USD exchange rates of 19%, Rainfall at 14%, Labour cost at 21%, competitive product at 34%, and Fertilizer price at 16%. Different Machine Learning models were used to predict the accurate red onion price such as Linear Regression with lasso regression, Auto Regressive, and Random Forest Regression. The Random Forest Regression shows significant price prediction accuracy of 88.46% compared with the existing red onion price. The model gives more accuracy, and it will be helpful for farmers to get yield profit.

Keywords: machine learning, random forest regression, red onion price prediction