A seasonal ARIMA model to forecast monthly potato yield in Sri Lanka

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The potato is an extensively cultivated tuber crop in the world. In Sri Lanka, cultivation has been established in four regions: Nuwara Eliya, Badulla, Jaffna and Puttalam. The objective of this paper is to analyze and forecast the monthly potato production in Sri Lanka. The monthly data from December 2005 to November 2017 were considered for this study and it consisted of 144 observations including 10 missing values. The missing values were estimated using missing value imputation techniques. Since the time series plot of potato yield shows a clear seasonal pattern, it was decided to fit a Seasonal Autoregressive Integrated Moving Average (SARIMA) model. The best fitted model was SARIMA (0,0,1)(1,1,1)₄ which resulted in the minimum Akaike’s Information Criterion (AIC). It depicted the best performance out of all the suspected models. The forecasting accuracy of the above model was measured with Mean Absolute Error (MAE) which was 1.96. Therefore, it can be concluded that the SARIMA model is accurate in predicting the monthly potato yield in Sri Lanka. The model would be important to all the stake holders of potato cultivation in the country.

Keywords: SARIMA, AIC, ACF, PACF