

**Abstract No: PP-01**

### **Forecasting the chilli production in Kurunegala district**

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In Sri Lanka about 27.1% of its working population is engaged in agriculture, which occupies about 7.54 % of the Gross Domestic Production (GDP). Chilli plays a major role in sustainable agriculture production. However, due to climatic changes, the pattern of chilli production has changed drastically during the past few decades in the Kurunegala district and has severely affected agricultural production. Therefore, this study aims to detect the pattern of the production and forecast and predict the factors impacting on the production during both Yala and Maha seasons from 2001 to 2019. Yearly production of Chilli had been decreasing during Yala and Maha seasons. But, there had been a big change in the production during the Yala season from 2014 to 2017. And also there was a change in the Chilli production level during Maha season from 2013 to 2019. Due to the volatility in the yearly production, a best time series model is selected for forecasting the Chilli production. It was founded that, a best time series model ARIMA (0, 1, 1) fitted for forecasting the Chilli production during the Yala season and ARIMA (0, 1, 2) model fitted for forecasting the chilli production during the Maha season. Moreover, the adequacy of the fitted best model has been tested using Ljung-Box test and Correlation matrix test. Both seasons, the long-term future forecast production values have increased. Another study was carried out to find out the significant factors affecting the productivity of the chilli in both the Yala and Maha seasons. Temperature, rainfall, relative humidity and cloud cover are the significant factors of affecting chilli production. The multiple linear regression analysis shows that temperature, relative humidity and cloud cover have been the significant factors of the chilli production during the Yala Season and the rainfall has been a significant factor of chilli production during Maha season. Kurunegala is categorised under an intermediate zone, therefore all climatic parameters affect a medium level and they help to achieve maximum production of crops that are cultivated in this district.

**Keywords:** Augmented Dickey-Fuller test, Autoregressive integrated moving average (ARIMA) model, Forecasting, Ljung-Box test, Multiple linear regression.