

DEVELOPMENT OF A TIME-SERIES MODELLING METHODOLOGY TO FORECAST CROPPING TIMES OF PADDY IN THE BATTICALOA DISTRICT USING CLIMATIC DATA

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Abstract

Climate is a key driver of paddy production. Extreme rainfall often causes problems in paddy production in Batticaloa district. Advance knowledge of the likely climate and its impact on production could add value to paddy production management. A climate forecasting approach that incorporates paddy production of the Batticaloa district is presented in this study. Rainfall series and their corresponding extreme event processes are analyzed in order to study the annual climatic evolution and variability. Incorporation of long term monthly rainfall and temperature data in the ARIMA analysis proved to be a very valuable technique in agricultural planning. Two broad statistical approaches were used in this analysis; one based on inference of the entire time series and the other by correlating the paddy and climate processes. Furthermore, the inference from the analysis of rainfall records using ARIMA and the predictive information based on the response rainfed paddy farming approach have been combined to study different scenarios of rain water balance/availability and paddy production. A diagnostic criterion that retrospectively assesses the onset and withdrawal dates of the Yala and Maha seasonal rainfall is derived based on an equation from the Punyawardena (2002) study. The results indicate that there are relationships between rain onset dates and seasonal rain amounts and duration. Furthermore, the time series analysis of temporal data reveals a teleconnective relationship between El Niño- Southern Oscillation (ENSO), Southern Oscillation Index (SOI) and Batticaloa rainfall.

Key words: ARIMA, forecasting, rainfall, scenario, time of planting

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