

Trend in Occurrences of Extreme Temperature Events of Anuradhapura District in Sri Lanka

E.P.R.H.H.W. Nilmalgoda^{1*}, G.E.M. Wimalasiri², J.B.D.A.P. Kumara² and A.D. Ampitiyawatta²

¹ Department of Bio-Systems Technology, Faculty of Technology, Sabaragamuwa University of Sri Lanka, P.O Box 02, Belihuloya, Sri Lanka

² Department of Export Agriculture, Faculty of Agriculture, Sabaragamuwa University of Sri Lanka, P.O Box 02, Belihuloya, Sri Lanka

Abstract

Extreme climatic events are increasing because of climate change and thus likely to influence global agricultural production. Regional assessments on various abiotic factors and its influences on biological entities in diverse geographic locations are needed for understanding uncertainties. Most climate impact studies rely on changes in means of meteorological variables, such as temperature, to estimate potential climate impacts, including effects on agricultural production. However, extreme meteorological events such as a short period of abnormally high temperatures, can have a significant harmful effect on crop growth and final yield. The characteristics of daily temperature time series, specifically mean, variance and autocorrelation, are analyzed to determine possible ranges of probabilities of certain extreme temperature events with changes in mean temperature of the time series. The extreme temperature events considered are motivated primarily by agricultural concerns, particularly, the effects of high temperatures on rice production in Anuradhapura district in North Central Province of Sri Lanka. Trends in extreme daily temperature were analyzed for thirty years from 1975 to 2005 for Anuradhapura district for two major seasons for paddy production, *Yala* and *Maha*. Daily average temperatures were calculated using daily minimum and daily maximum temperatures and separated into two seasons. The 90th percentile was used as the reference value as an extreme temporal value. Number of occurrences above the 90th percentile was cumulated yearly and analyzed for a pattern from 1975 to 2005. These trends in extreme temperatures showed considerable consistency across the study area. The study reveals a positive correlation between the years and the occurrences of extreme temperature events for both *Yala* season and *Maha* seasons with *p* values of 0.03 and 0.04, respectively. From a statistical point of view, the occurrences have been increasing throughout the time series in Anuradhapura district and will detrimentally affect the crop production specially for rice production in the area.

Keywords: Climate, Extreme temperature, Paddy, *Maha*, *Yala*,

*Corresponding Author: helitha@tech.sab.ac.lk