STATISTICAL ANALYSIS OF RAINFALL AND TEMPERATURE IN KANDY AREA TO STUDY THE EFFECTS ON DISASTERS

C. A. Walawwatte

Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka.

Monthly Rainfall and Temperature data for 60 years (1952-2011) for Kandy District, in Sri Lanka, were used in this analysis to detect the rainfall trend in the area and to see whether there are impacts of Global warming, and to find correlation of rainfall and temperature and to find a method of forecasting rainfall status in the area. In order to find the distribution of rainfall in the area "EASY FIT" software was used. Monthly, seasonal and annual data were fitted using easy fit. Log Normal Frequency Distribution for rainfall data of Katugastota Meteorological station (7°33′N 80°63′E) is fitted for three cases; annual maximum values of monthly data series, rainfall values of annual average South West Monsoon (SWM) Season and actual annual rainfall values. Descriptive analysis of each of the set criteria revealed that the monthly mean rainfall for Kandy area is 373 mm, and mean annual rainfall for Kandy is 1846 mm. SWM mean rainfall is 127 mm which is very low precipitation when compared with the other monsoonal rainfall. The rainfall series was divided into 10-year overlapping sub-periods1952-1961, 1957-1966 through 2002-2011 and the Cramer's test was then used to compare the means of the sub-periods with the mean of the whole record period. The results of the test revealed that there is a recent decrease in the annual rainfall series especially in the sub-period 1992-2001. On the other hand in the recent 2002-2011period, months of February, May, June, July, August, September and December records decreasing in precipitation. It clearly indicates the low precipitation in SWM seasons. Those are the critical months for agricultural production in the area. It is recommended that agricultural planning and government policies in the area should be based on recent rainfall trends. Seasonal trend analysis revealed recent decreasing trend in 3 out of 4 seasonal rainfalls in the area. Kandy is getting increasing pattern of rainfall in 1st Inter Monsoon (IM) seasons. Monthly linear trend analysis discovered the tendency of monthly rainfall in the Kandy District. The results of the monthly linear trend lines further revealed that the remarkably reducing in the annual rainfall yield is predominantly as a result of the substantial decline in February, May, June, July, August, September, October, and December rainfall. Temperature analysis revealed the general tendency of increase of mean annual temperature. During the period of 1952-2011, mean annual temperature has increased approximately by 0.8^0C at the rate of $.013^0C$ per year. Annual average rainfall was separately checked with Mean annual temperature, average maximum annual and average minimum annual temperature to find any interrelationship between rainfall and temperature. Pearson correlation coefficient provided sufficient evidence that there is a correlation with Temperature and rainfall in the area.