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Severity and Frequency of Occurrence of Wet and Dry Events in the IL_{1a} Intermediate Zone of Sri Lanka

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Abstract

The changes in the climate patternshave caused significant impacts on the socioeconomic parameters. Sri Lanka, as an agricultural country, has to pay more attention to extremes and alterations of climate patterns for the sustainable planning and management of water resources to facilitate agriculture.Thus, the analysis of the shifts and trends of the climate patterns with respect to severity and the frequency of occurrence of wet and dry eventsis vital for a proper and sustainable planning and management of water resources.Hence, periodic variations of such climate extremes in a locality of intermediate zone (Rathmalagara in the IL_{1a}zone) was studied to evaluate the trends and severity of climate extremes using the Standardized Precipitation Index (SPI) which has proven to be useful in evaluation and prediction of such events due to its simplicity and effectiveness. Daily rainfall data for fifty years (1961 to 2011) from the Rathmalagara rain gauging station located within the IL_{1a}agro ecologicalzone was used in this study. Monthly accumulated rainfalls for each month of the considered periods (1961-1985 and 1986-2011) were used as the input to the SPI calculation and the variation of rainfall depth and SPI in both the intervals were plotted with respect to time.The events were ranked into five classes based on the severity of each events and the occurrence percentage of each wet and dry event was calculated. The climate events in the recent year period of 1986-2011 indicated only a slight reduction in both dry events (1.52%, 0.76%, 1.52% reduction in normal dry events, moderate droughtsand severe droughts) and wet events (4.29%, 0.71% and 0.71% decreaseinnormal wet, severe wet and exceptionally wet events) when compared to the significant climate events of the past (from 1961 to 1985). Thus the results suggest a hindering in the occurrence of climate extreme events at present when compared to the significant climate extremes recorded in the past. Hence, a more uniform climate pattern with less severe extreme events (both wet and dry) in terms of both severity and frequency of occurrence could be predicted for IL_{1a} zone, in accordance with SPI.

Keywords: Climate change, SPI, Intermediate zone, Severity, Frequency, Wetness, Dryness