SPATIO-TEMPORAL ANALYSIS OF RAINFALL DISTRIBUTION IN KURUNEGALA DISTRICT, SRI LANKA

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ABSTRACT

Climate change affects every country in various ways. Impact of climate change on water resources may be positive or negative, depending on the geographical region. Agricultural sector especially in developing countries is likely to be the most vulnerable sector to climate change as it largely depends on rainfall distribution. Investigating the spatio-temporal dynamics of rainfall has become very crucial in managing water resources efficiently for sustainable development. Analysis of climate variables become vital to assess climate induced changes and to suggest feasible adaptation strategies, particularly in agricultural based countries and to mitigate the impacts of extreme weather hazards. Kurunegala is one of the major agricultural districts in Sri Lanka. Managing the water resources for sustainable development has become great challenge to the water managers due to erratic rainfall distribution in this area. In the above context, the present study was aimed to analyse the spatio-temporal variations in rainfall distribution in Kurunegala district. Historical rainfall data collected from four gauging stations were subjected to both mathematical and statistical analysis. In addition, annual and seasonal trends of rainfall, meteorological drought conditions and recent changes in rainfall distribution were studied.

Rainfall distribution in the study area showed high spatio-temporal variations. Bathalagoda showed highest mean annual rainfall of 1843 mm. Mean annual rainfall of Wariyapola, Mediyawa and Siyambalagamuwa were 1629 mm, 1315 mm and 1222 mm, respectively. This district received higher rainfall in April, October and November. Compared to other regions, moderate distribution of rainfall was observed at Bathalagoda. In other regions, rainfall was concentrated only in certain months.

Annual rainfall at both Wariyapola and Siyambalagamuwa showed significant decreasing trend at 5% significance level. Bathalagoda showed increasing trend while Mediyawa showed decreasing trend. Southwest monsoonal (SWM) and 2nd inter-monsoonal (IM2) rainfall showed decreasing trend in all regions in this district. Further, trend of SWM rainfall was significant at both Wariyapola and Siyambalagamuwa. Mediyawa and Bathalagoda showed increasing trend in both 1st inter-monsoonal (IM1) and northeast monsoonal (NEM) rainfalls. Further, all stations except Bathalagoda showed negative trend in number of rainy days and it was significant at Siyamabalagamuwa in *Maha* season. Number of rainy days at Wariyapola and Siyambalagamuwa showed decreasing trend while Mediyawa and Bathalagoda showed increasing trend in *Yala* season.

Severe drought conditions were experienced in the recent years at Wariyapola, Mediyawa and Siyambalagamuwa. At Mediyawa and Siyambalagamuwa rainfall highly deviated the long term mean. Rainfall distribution showed cyclic pattern over the time in all regions. However, amount of rainfall received in the recent years was lower than immediate past decade in all regions except Bathalagoda. Taking proper management decisions based on rainfall distribution pattern is necessary for efficient management of water resources while ensuring sustainable crop production.

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