

Spatial Trends of Intensity of Rainfall Extremes over Sri Lanka

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The occurrence of extreme rainfall events with higher intensity is becoming a common phenomenon in most parts of the world and it is an exigent challenge to adapt the changing climate. The World Meteorological Organization defines few indicators to calculate the intensity of rainfall extremes and it is of timely importance to identify the trends of these dry extremes as a country. This study mainly focused on ascertaining the spatial trends of intensity of rainfall extremes over Sri Lanka for the period of 1981 to 2010. Extremes are identified using daily rainfall data using RClimDex 1.0 package. This study applies five intensity indicators including Total Wet Day Precipitation (PRCPTOT), Very Wet days (R95p), Extremely Wet days (R99p), Maximum 1-day Precipitation (Rx1day) and Maximum 5-day Precipitation (Rx5day). Non-parametric Mann Kendall test is used to detect the trends and their significance. All the stations record an increasing trend in case of PRCPTOT excluding Nuwara Eliya. Among them, Colombo, Rathmalana, Anuradhapura, Badulla, Baticaloa and Trincomalee show a significant increasing trend. Trend of R95p seems significant and increasing in Badulla and Baticaloa whereas Nuwara Eliya and Rathnapura show a decreasing trend although the trend is not significant. Only Katunayaka and Rathmalana show significant increasing trends in R99p. The trends in Puttalam, Nuwara Eliya and Rathnapura are not significant decreasing trends. Rathmalana depicts significant increasing trend in case of Rx1day. Rx5day predicates significant increasing trends in Batticalo, Colombo, Hambanthota, Rathmalana and Trincomalee. In conclusion, Rathnapura and Nuwara Eliya are highlighting with decreasing trends in almost all the indicators. And a higher influence from the extremes can be seen in Western Province including Colombo, Rathmalana signing a shift of the adverse impacts towards Western Province from Rathnapura and subordinates. On the other hand Baticaloa and Trincomalee are also highly vulnerable for adverse impacts caused by the intensified rainfall. These spatial trends should be focused in decision making and planning related to disaster management and implementing strategies for climate change adaptation within the country.

Keywords: Extreme rainfall events, Intensity indicators, Spatial trends, RClimDex, Non-parametric Mann Kendall trend test