

CLASSIFICATION OF SRI LANKA INTO METEOROLOGICALLY HOMOGENEOUS REGIONS

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Abstract: This study exemplifies the regionalization of Sri Lanka into meteorologically homogeneous regions. The rain gauge stations established in Sri Lanka have not been continuously established across the country and are very limited. Rain gauges are high in wet zone areas and low in other areas. Very few rain gauges were established in the northern part of the country. Therefore, meteorologically homogeneous regions are important for flood frequency analysis, and regional intensity duration frequency curves. Regional analysis provides important precision rather than single or geographically close locations. Sri Lanka has been classified into meteorologically homogeneous regions using the Words cluster analysis, discordancy measure and heterogeneity measure. In the context of this study, total precipitation data of 352 stations operated by the meteorological and irrigation departments have been used for cluster analysis. Initially, Sri Lanka was classified into six regions using rainfall indices of mean annual rainfall, annual maximum mean rainfall, southwest monsoon mean rainfall, northeast monsoon mean rainfall of the daily recorded 352 stations and 3-hour and 6-hour intensity for the 5-year return period of 50 number of hourly recorded rain gauge stations along with the latitude, longitude and altitude. The discordancy of the clustered six regions was analysed by discordancy measure. Subsequently, the heterogeneity of the non-discordant regions was examined by the heterogeneity measure. Initially developed six regions were regrouped to form meteorologically homogeneous 11 regions which satisfied the non-discordant and heterogeneity criterion. Finally, Sri Lanka has been classified into 11 meteorologically homogeneous regions. The homogeneous regions can be used to conduct frequency analysis and regional studies related to the tank cascade systems.

Keywords: Cluster analysis; Discordancy; Heterogeneity; Homogeneous region