

Terrain dependency of rainfall & temperature climatology of Sri Lanka

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Spatial climatologies are of immense importance for future planning and implementation of developmental activities in many sectors. Climatologies are usually calculated or averaged within a given time period. The 30-year period from 1961 to 1990 is taken as the averaging period in the present study. Observed climatological data are available at stations maintained by the Meteorological Department and other organizations, which are irregularly scattered over the island. Rainfall is observed at a fairly higher number of stations (about 260), while temperature is observed only at a lesser number of stations (about 20).

Several methods are already available for interpolating climatological patterns over the island using data observed at these specific locations. The previous methods generate patterns making use of only the climatological parameters. In the present study, a new method, which incorporates both observed climatological data and elevation data, was adopted to take into account the terrain effect. A software package ANUSPLIN developed by the Australian National University (ANU), Australia was used for this purpose, which interpolates noisy multi-variate data using thin plate smoothing splines. Observed station data of Rainfall, Maximum and Minimum Temperatures are interpolated into a finer grid (500 meters X 500 meters) using ANUSPLIN, which takes the elevation as an independent variable. Elevation data for the interpolation was obtained from the Digital Elevation Model (DEM) developed by USGS.

In view of the country's complex terrain, inclusion of terrain dependency feature for the climatological parameters with a finer grid is essential to obtain more reliable and acceptable representation of the climatological fields over a concerned area. Variation of both maximum and minimum temperatures with the elevation is clearly reproduced over the mountainous areas, in the central parts of the island. Interpolated climatological patterns well agree with the previously generated patterns, but give a more representative pattern especially in highlands where direct observation are lacking.

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