

Development of Climate Change Indicative Parameters for Sri Lanka Using Daily Rainfall Data

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Rainfall pattern in Sri Lanka shows high seasonal and inter-annual variability. Many climate change studies have indicated the future changes in rainfall pattern of the country. Therefore, decision making should be oriented towards adaptation for this probable change in rainfall pattern in the future and estimation of the possible indicative parameters is an urgent need. Within this background this study was undertaken to develop climate change indicative parameters for Sri Lanka for a Thirty-year period (1986 – 2015). Daily rainfall data for this period was obtained in 103 locations representing three major climatic zones; Dry, Wet and Intermediate. Ten rainfall related climate change indicative parameters were derived using daily rainfall data to emphasize the extreme rainfall anomalies. Microsoft Excel was used for the calculations and deriving the parameters. The developed parameters basically evaluate the dry and wet extremes such as number of wet/dry days in wettest/driest years, highest consecutive dry and wet spells and the heavy rainfall events during recent thirty years. Additionally, some important facts of rainfall in agriculture such as assessing the wet/dry days and heavy rains vary within a month also have been considered in developing the parameters. Accordingly, ten different maps of those parameters were developed through Inverse Distance Weighted (IDW) interpolation method in Geographical Information Systems (GIS) to visualize the spatial distribution. A web application was developed using online GIS with data display and map overlay functionality. ArcMap 10.5, ArcGIS Pro and online GIS was used for the purpose. The trend of rainfall in Sri Lanka for any location during the study period can be visualized on this platform. These indicators are helpful to identify the rainfall extremes which cannot be identified with indicators developed using weekly, monthly or annual rainfall data. According to the maps, wet zone in Sri Lanka is highly vulnerable for floods and prolong wet spells while dry zone is vulnerable for droughts. The developed maps can be used for a wide range of applications such as agricultural planning and management, crop suitability analysis, disaster preparedness, city planning, climate extreme analysis, environmental conservation, etc.

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