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Trend Analysis of Rainfall: A Climate Change Paradigm

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Abstract : Climate Change refers to the change in climate for extended period of time. Climate is changing from the past history of earth but anthropogenic activities accelerate this rate of change and which is now being a global issue. Increase in greenhouse gas emissions is causing global warming and climate change related issues at an alarming rate. Increasing temperature results in climate variability across the globe. Changes in rainfall patterns, intensity and extreme events are some of the impacts of climate change. Rainfall variability refers to the degree to which rainfall patterns varies over a region (spatial) or through time period (temporal). Temporal rainfall variability can be directly or indirectly linked to climate change. Such variability in rainfall increases the vulnerability of communities towards climate change. Increasing urbanization and unplanned developmental activities, the air quality is deteriorating. This paper mainly focuses on the rainfall variability due to increasing level of greenhouse gases. Rainfall data of 65 years (1951-2015) of Safdarjung station of Delhi was collected from Indian Meteorological Department and analyzed using Mann-Kendall test for time-series data analysis. Mann-Kendall test is a statistical tool helps in analysis of trend in the given data sets. The slope of the trend can be measured through Sen's slope estimator. Data was analyzed monthly, seasonally and yearly across the period of 65 years. The monthly rainfall data for the said period do not follow any increasing or decreasing trend. Monsoon season shows no increasing trend but here was an increasing trend in the pre-monsoon season. Hence, the actual rainfall differs from the normal trend of the rainfall. Through this analysis, it can be projected that there will be an increase in pre-monsoon rainfall than the actual monsoon season. Pre-monsoon rainfall causes cooling effect and results in drier monsoon season. This will increase the vulnerability of communities towards climate change and also effect related developmental activities.

Keywords : greenhouse gases, Mann-Kendall test, rainfall variability, Sen's slope
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