

TREND ANALYSIS OF METEOROLOGICAL DATA - A CASE STUDY

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ABSTRACT

Various of parts of the world are facing change in climate. This may be due to anthropogenic activities like greenhouse gas emissions or by natural climatic conditions like volcanic eruptions and solar variations. Due to increase in greenhouse gases in the atmosphere the incoming and outgoing radiations are affected that are part of the Earth's energy balance and as a result the climate of earth is also changing. The pattern of precipitation and temperature, the directions of winds, ocean currents are changing this also has a direct impact on climatic activities i.e. the meteorological variables. Increase in temperature is more in Northern hemisphere than over the equatorial regions. According to the IPCC 2007 report, the global mean surface temperature have risen by $0.74^{\circ}\text{C} \pm 0.18^{\circ}\text{C}$ over the last 100 years from 1906-2005. The temperature is increasing rapidly in last few years but 2008 was the coolest year after 2000. According to the IPCC (2007), 2005 was the warmest year followed by the 1998. In India monsoon does not show any significant trend but according to Hingane et al. 1985, in India the annual mean temperature has increased by 0.42°C during the last 100 years. Increase in temperature is more in northern India as compare to other parts of India.

In this study, past 100 years (1901-2002) temperature and precipitation data of seven districts of northeast Rajasthan have been analysed. The trend in temperature and precipitation over northeast Rajasthan is examined using linear regression method, Kendall correlation test, Spearman Rho test and Mann Kendall test. By applying the linear regression method it is generally observed that the climate is changing in the selected districts. However, a critical analysis of the data and the coefficient of correlation, it is found that the indicated trend

from linear regression method are not giving a true representation of the trend of temperature and precipitation of the selected seven stations. The Spearman Rho method shows the rising trend in precipitation in all selected districts except in Bikaner but by this method temperature does not show any trend. The Mann Kendall and Kendall test shows no change in temperature and precipitation in the selected districts.