Change in Temperature and Precipitation Over India and Its Homogeneous Zones During 20th Century

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Mean monthly temperature and precipitation over All-India and its seven homogeneous regions, viz., West Himalaya (WH), Northwest India (NWI), North Central India (NCI), Northeast India (NEI), West Coast (WC), East Coast (EC) and Interior Peninsula (IP) are used in the present study for the period of 1901-2000. We have mainly focused annual and seasonal changes in mean monthly temperature (Tavg), mean maximum temperature (Tmax) and mean minimum temperature (Tmin). Each year was divided into four principal seasons, viz. winter, pre-monsoon, monsoon, and post-monsoon. The percentages of significant trends obtained for Tavg, Tmax and Tmin in the different seasons are presented. The analysis shows that the annual mean temperature, mean maximum temperature and mean minimum temperature are increasing approximately at the rate of 0.40°C, 0.65°C and 0.40°C per 100 years respectively. As far as different homogeneous region are concerned, the analysis shows that the WH, NWI, NCI, NEI, WC, EC and IP show a rising trend of approximately 0.53°C, 0.07°C,0.41°C, 0.55°C , 0.67°C , 0.42°C and 0.45°C per hundred year respectively. The largest temperature rising are found over the WC and minimum over NWI. The seasonal mean temperature increases by 0.51°C/100 in the winter season, 0.31°C/100 during pre-monsoon season, 0.12°C/100 in monsoon season and 0.79°C/100 during post-monsoon season. The analysis also illustrates that the Tmax and Tmin have a largest rising at the rate of 1.13°C/100 and 0.19°C/100 over the WC. Where as over the NWI mean maximum temperature increase at rate of 0.41°C /100 while mean minimum temperature decreases at the rate of 0.26°C/100 respectively .

Precipitation anomalies are plotted, and it is observed that annual Precipitation has rising trend of 39.64mm. The seasonal Precipitations has decreased by 6.67mm (1901-2000) for the winter season, increased by 5.07mm $(1901\text{-}2000)^{-1}$ for the pre-monsoon season, , increased by 29.35mm (1901-2000) for the monsoon season, increased by 11.97mm C (1901-2000) for the post-monsoon season. On a regional basis, stations of East Peninsular India (EPI), North West India (NWI), West Peninsular India (WPI) show a rising trend of 44.59mm, 79.95mm, 153.74mm and North Central India (NCI), North Mountainous India (NMI) , , South Peninsular India (SPI) , North East India (NEI) show a falling trend of 23.31mm, 38.49mm, 9.84mm, 44.60mm respectively