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RESEARCH ARTICLE

EFFECT OF URBANIZATION ON TEMPERATURE TREND OVER INDIA.

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Abstract

India is a developing country and urbanization is one of the major concern for human health and environment in India. No doubt urbanization changes human life but it has adverse effect on temperature. Due to land use land cover change, there is an impact on temperature. In this paper we have made an attempt to study temperature trend over last 110 years in india. The study has also been done season wise and our study reveals an increase in minimum temperature but not much effect on maximum temperature.

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Introduction:-

Rapid urbanization is one of the major concern of 21st century. Agricultural land is transforming into residential and industrial land. Land use and land cover is changing due to human activities along with industrial waste. No doubt, industrialization and urbanization change human life and their living style. India is a developing country and to get growth rate of 9-10% it is important to set up new industries and smart cities. But to get this gowth keeping environment in mind is very important. Due to this urbanization, Urban heat island is created. High amount of deforestation, increase uses of concrete, asphalt,tar etc,increase in build up land altered the surface energy balance and this is one of the major reason for temperature change in recent years. To get growth, keeping environment and health safety will be a major challenge for India.

Cayan and Douglas[1] study done over south western united states for a period of 1930 – 1980 reveals that urban heat island is a nighttime phenomena i.e. the effect will be more on minimum temperature as compare to maximum temperature. Thomas[2] also have done the studies over United stated and states that annual mean temperature is increasing due to urbanization. His study was based on climate records for the period 1901-1984.One more study done over Rome for a period of 1782 - 1975 also reveals that the effect is more on minimum temperature [3,4]

This clearly indicates that Urban Heat island is one of the major cause for temperature change so in Indian context we are trying to study the change in temperature.

Data:-

The study will be based on All India Seasonal and Annual Mean Temperature data series. Which is released Under National Data Sharing and Accessibility Policy (NDSAP). The contributor for this data are Ministry of Earth Sciences India Meteorological Department (IMD).

Result and Analysis:-

The time series shows a warming over India during the recent years.

Fig 1 is showing the annual temperature from 1901 to 2014. As we can see from Fig. 1 that temperature is showing increasing trend.

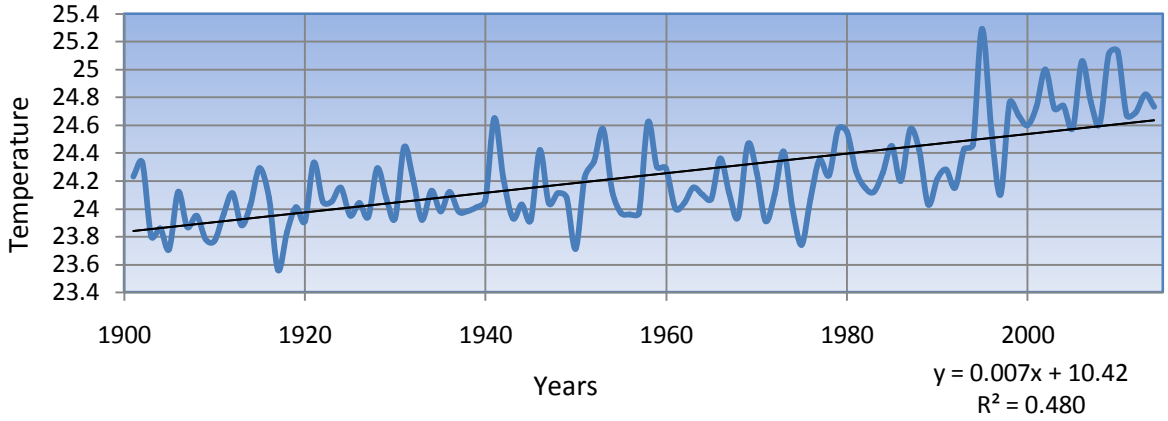

Fig 1:- Annual Temperature from 1901 to 2014 over India.

Fig 2,3,4 and 5 are showing the seasonal variation in temperature along with trend line and equation of line.

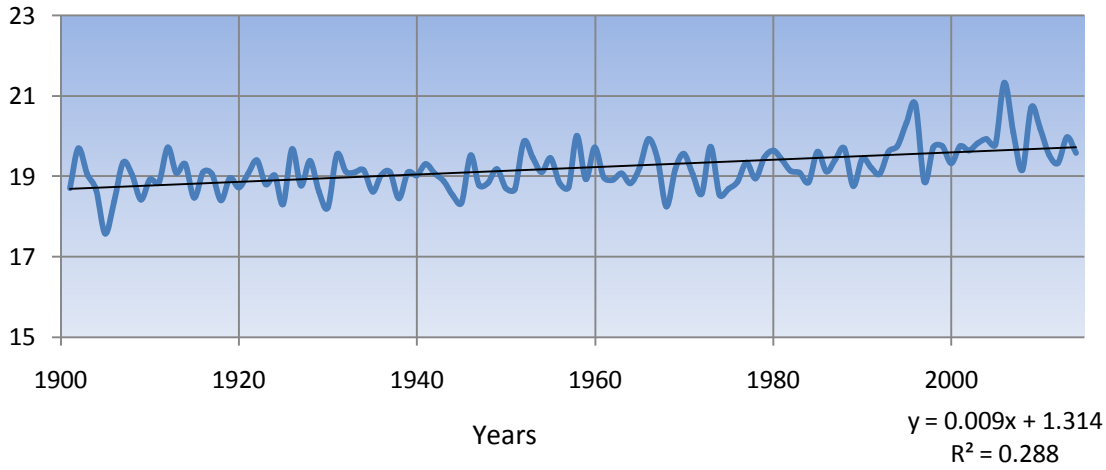

Fig 2:- Seasonal Temperature(Jan-Feb) from 1901 to 2014 over India.

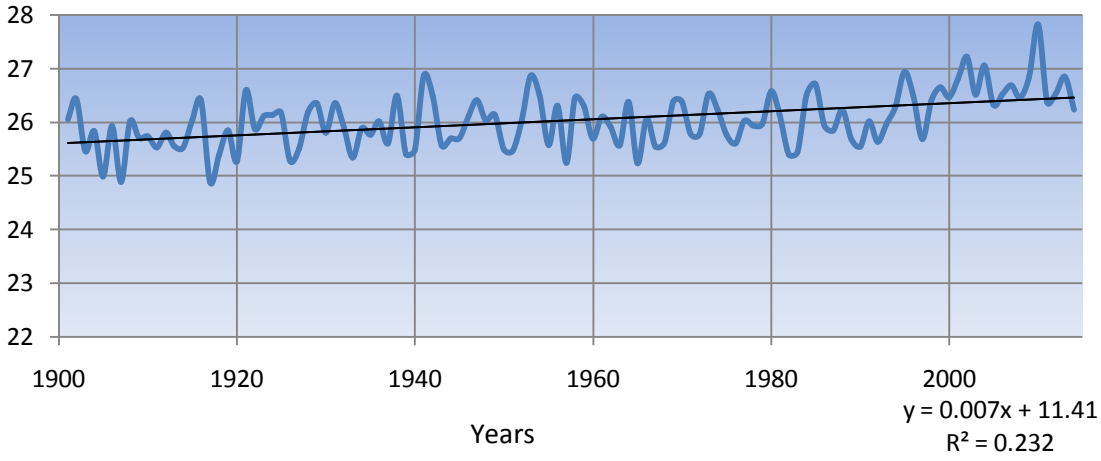

Fig 3:- Seasonal Temperature(March - May) from 1901 to 2014 over India.

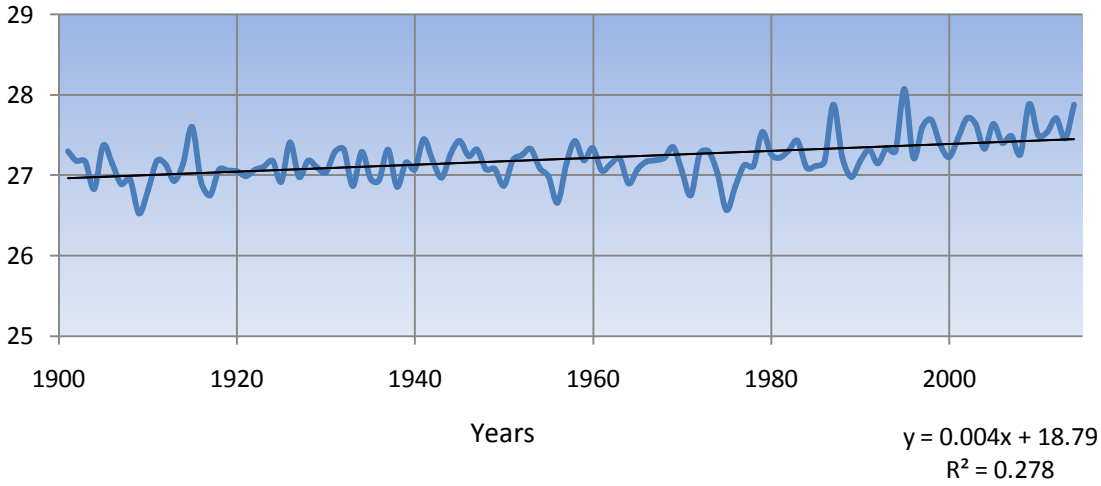

Fig 4:- Seasonal Temperature(June - Sep) from 1901 to 2014 over India.

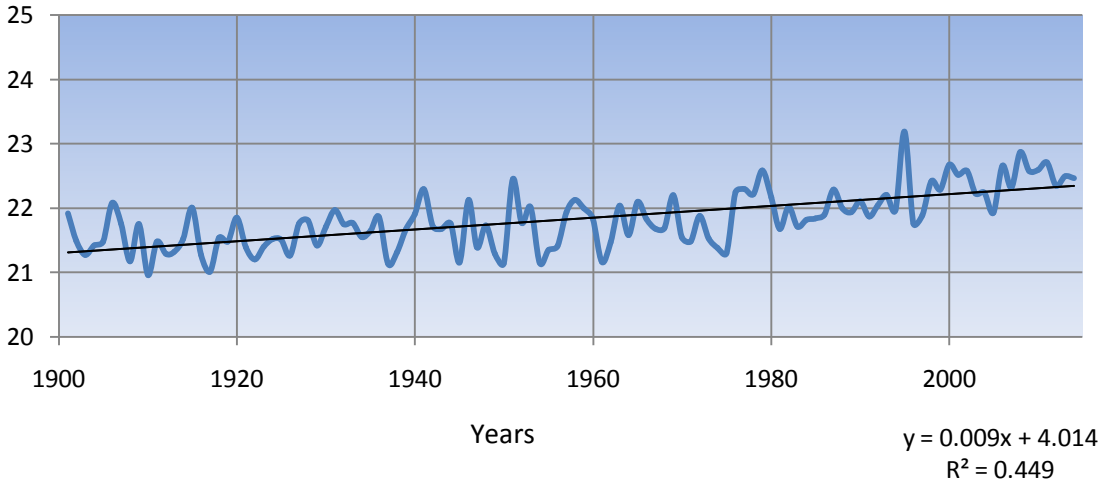

Fig 5:- Seasonal Temperature(Oct - Dec) from 1901 to 2014 over India.

Conclusion:-

The above analysis is showing that temperature is showing an increasing trend in all seasons with maximum increase from Oct to Dec. This means that the minimum temperature is rising and there is not much effect on maximum temperature. Mean temperature is also increasing because of increase in minimum temperature.

Acknowledgment:-

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