

# Climate and air pollution impact on wheat crop over Eastern Indo Gangetic Plains of India

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Rapid urbanization and economic development in India has led to an increase in the air pollution which in turn may affect the ecosystem such as crop production. The present study is aimed to analyze the long term variability of climate variables (Temperature maximum (TMAX), Temperature minimum (TMIN), Rainfall (RAIN) & Solar radiation (SRAD)) from 1986 to 2015 and satellite retrieved aerosol optical depths (AOD) from 2001 to 2015 during the wheat season over the Eastern Indo Gangetic plains of India. The study focuses on to examine the possible implications of aerosols loading on the wheat crop yield (rabi season). A decreasing trend in TMAX and TMIN was noted in the crop growing season. The long term variation in the SRAD had a significant influence in declining the solar radiation over the region. The statistical (regression) model suggests that there is an influence of aerosols on climatic parameters which indirectly had affected the wheat yield. For every unit increase in AOD, a decrease in TMAX, TMIN and SRAD was recorded. The influence of aerosols on wheat crop yield had declined the yield by 2%. The present analysis may be crucial in terms of establishing the potential impact of changing climate and air quality on regional food security and therefore, must need to be considered in policy decisions.

Keywords: IGP, Climate, AOD, Regression, Wheat

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### **ABSTRACT**

Rapid urbanization and economic development in India has led to an increase in the air pollution which in turn may affect the ecosystem such as crop production. The present study is aimed to analyze the long term variability of climate variables (Temperature maximum (TMAX), Temperature minimum (TMIN), Rainfall (RAIN) & Solar radiation (SRAD)) from 1986 to 2015 and satellite retrieved aerosol optical depths (AOD) from 2001 to 2015 during the wheat season over the Eastern Indo Gangetic plains of India. The study focuses on to examine the possible implications of aerosols loading on the wheat crop yield (rabi season). A decreasing trend in TMAX and TMIN was noted in the crop growing season. The long term variation in the SRAD had a significant influence in declining the solar radiation over the region. The statistical (regression) model suggests that there is an influence of aerosols on climatic parameters which indirectly had affected the wheat yield. For every unit increase in AOD, a decrease in TMAX, TMIN and SRAD was recorded. The influence of aerosols on wheat crop yield had declined the yield by 2%. The present analysis may be crucial in terms of establishing the potential impact of changing climate and air quality on regional food security and therefore, must need to be considered in policy decisions.

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