

Analysis of Impact of Air Pollution over Megacity Delhi Due to Agricultural Biomass Burning in the Neighbouring States

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Abstract : The hazardous combination of smoke and pollutant gases, smog, is harmful for health. There are strong evidences that the Agricultural waste burning (AWB) in the Northern India leads to adverse air quality in Delhi and its surrounding regions. A severe smog episode was observed over Delhi, India during November 2012 which resulted in very low visibility and various respiratory problems. Very high values of pollutants (PM₁₀ as high as 989 $\mu\text{g m}^{-3}$, PM_{2.5} as high as 585 $\mu\text{g m}^{-3}$ and NO₂ as high as 540 $\mu\text{g m}^{-3}$) were measured all over Delhi during the smog episode. Ultra Violet Aerosol Index (UVAI) from Aura satellite and Aerosol Optical Depth (AOD) are used in the present study along with the output trajectories from HYSPLIT model and the in-situ data. Satellite data also reveal that AOD, UVAI are always at its highest during the farmfires duration in Punjab region of India and the extent of these farmfires may be increasing. It is observed that during the smog episode all the AOD, UVAI, PM_{2.5} and PM₁₀ values surpassed those of the Diwali period (one of the most polluted events in the city) by a considerable amount at all stations across Delhi. The parameters used from the remote sensing data and the ground based observations at various stations across Delhi are very well in agreement about the intensity of Smog episode. The analysis clearly shows that regional pollution can have greater contributions in deteriorating the air quality than the local under adverse meteorological conditions.

Keywords : smog, farmfires, AOD, remote sensing

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