

Variability of Particulate Matter Concentrations During Dense Winter Fog Period in Northeastern Pakistan

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Persistent fog during winter has become a severe problem across the borders of South Asia in socio-economic context. It has caused severe health and visibility problems resulting in huge number of casualties and economic loss. Atmospheric pollutants, especially fine aerosol particles are responsible for the formation of intense fog. These aerosol particles result from combustion processes in vehicle, domestic and during industrial activities. Recently, the number of sources has increased thus contributing more towards increasing intensity and

toxicity caused by the foggy conditions. Especially, the energy crisis across the South Asian countries has resulted in use of a mix of fossil fuels (biofuel, solid waste, coal, natural gas) with several question marks on their quality and renewability to deal with energy demands. The increased emissions of fine particles have provided more condensation nuclei. PM₁₀ and PM_{2.5} samples were collected at Lahore and Faisalabad sites during the winter 2015 /16 and 2016 / 17. At Faisalabad day time PM₁₀ concentrations were found to be ranged from 200 - 600 $\mu\text{g m}^{-3}$ while PM_{2.5} were 100 - 300 $\mu\text{g m}^{-3}$ while night time concentration of 790 $\mu\text{g m}^{-3}$ were observed for PM₁₀. While at Lahore due to high moisture contents night time concentrations of PM₁₀ were ranged from 500 $\mu\text{g m}^{-3}$ to 2500 $\mu\text{g m}^{-3}$. Correlation with ground based satellite AOD were also observed.

Key words: Smog, Particulate matter, AOD, atmospheric pollution