Environmental Science : An Indian Journal

Short Communication | Vol 16 Iss 6

An analysis of air quality status over an industrial city from past years and its impact on health aspects

Bindu G1 and Prabha R Nair2

Nansen Environmental Research Centre, India, Vikram Sarabhai Space Centre, India

Due to rapid industrialisation and urbanisation, Kochi (9°58' N, 76°17' E) needs due considerations in pollution point of view. The pollution level in terms of concentration of SO2, NOx and suspended particular matter (SPM) shows high values with frequent abnormal values. To study the total effect of all these pollutants, Oak Ridge Air Quality Index (ORAQI) was calculated using monthly mean data. The results showed considerable deterioration in air quality over the years with the index showing one to three levels of deterioration over different zones. Analysis of meteorological regimes over the area pointed out that the city is highly susceptible to high pollution load. Wind, mixing height and ventilation coefficient showed lower values throughout the year, which shows meteorological conditions are not favourable for dispersion of pollutants over this coastal station. The gravimetric estimates of PM10, sampled from different locations in Kochi, showed concentrations above the air quality standard. Chemical analysis of these aerosol samples for anionic and cationic species was done using ion chromatography, atomic absorption spectroscopy (AAS) and inductively coupled plasma atomic emission spectroscopy (ICP-AES). Estimates of water soluble component, mineral dust and organic carbon contribute to 26-48% of aerosol mass. Statistical analysis of chemical composition data revealed anthropogenic components to be the dominant factor, with mineral dust being the second factor. At all the experimental locations, SO4 2- was the most dominant species, indicating the strong anthropogenic influence. As a preliminary study on health impact, we focused on the ARI Acute Respiratory Illness (ARI) cases in children. There are certain pockets which showed more incidence of ARI, which is evidently related to pollution problems. Anthropogenic activities linked with the orientation of the coast and sea breeze have link with the ARI cases surrounding the area.

Note: This work was partially presented at 5th Edition of EuroSciCon Conference on Environmental Science and Engineering Expert scheduled during October 29-30, 2018 Budapest, Hungary