

Air Quality Trends and Variation Patterns of Air Pollutants in the City of Colombo

¹Jayaratne, R.n.r., ²Ileperuma, O.A.

¹Central Environmental Authority, ²Department of Chemistry, University of Peradeniya

ABSTRACT

Clean air is an essential basic need of all living beings and purity of air we breathe is an important factor of human health. Continuous ambient air quality monitoring in Sri Lanka has been started in January 1997 using two fixed automated ambient air quality monitoring stations, located in front of Colombo Fort Railway Station and in Colombo Meteorological Department premises. As information gathered from air quality monitoring and analysis are vital components of air quality management, the comprehensive analysis of air quality monitoring data has been done on all collected valid data of major air pollutants [one hour average concentrations of nitrogen dioxide, sulfur dioxide, carbon monoxide, ozone and 24 hour average concentration of particulate matter less than 10 microns in aerodynamic diameter (PM-10)] was scientifically analyzed in this research using basic statistical parameters.

Trends over the period from 1997 to 2001 indicated that pollution levels with respect to sulfur dioxide, nitrogen dioxide and PM-10 were slowly increasing. Carbon monoxide shows decline trend during over this period. Slightly increasing trends of sulfur dioxide and nitrogen dioxide with slight decreasing trends of carbon monoxide and PM-10 was shown over the period from May 2003 to December 2006.

Approximately 95 % of concentration values of air pollutants at both monitoring stations are below the National Ambient Air Quality Standard values. However one hundred and seventy seven occurrences of

exceedences from the National Standard value have been recorded with respect of sulfur dioxide at th Colombo Fort Monitoring Site.

The 24-hour average concentration of PM-10 exceeded the USEPA standard at one occasion. However, the annual average of PM-10 exceeds the annual standard stipulated by USEPA in all the years during the monitoring period.

Almost same seasonal variation patterns were shown for all measured air pollutants. High concentrations of air pollutants observed during the dry period and low concentrations observed during the wet period. Pollutants concentrations are higher in the North East monsoon period than in the other periods.

The diurnal pattern of concentrations of air pollutants indicates that mobile sources are the major contributor for air pollution in the Colombo city. In general the concentration of air pollutants are higher during the weekdays than weekends.