

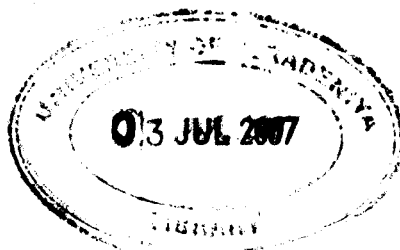
C
363.7
JAY

AIR QUALITY TRENDS IN THE CITY OF COLOMBO

A THESIS PRESENTED BY

R.N.R.JAYARATNE

to the Board of Study in Environmental Science of the
POSTGRADUATE INSTITUTE OF SCIENCE



in partial fulfillment of the requirement

for the award of the degree of

MASTER OF PHILOSOPHY IN ENVIRONMENTAL SCIENCE

of the

**UNIVERSITY OF PERADENIYA
SRI LANKA**

2005

607464

AIR QUALITY TRENDS IN THE CITY OF COLOMBO

R.N.R.Jayaratne

Environmental Pollution Control Division

Central Environmental Authority

Robert Gunawardana Mawatha

Battaramulla

Sri Lanka

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 was started in January 1997 using two fixed 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 is a vital component of air quality management. As comprehensive analysis of air quality monitoring data has not been done up to now, 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 (average, 25th & 75th percentiles, minimum, maximum).

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 decreasing trends of sulfur dioxide and nitrogen dioxide with slight increasing trend of carbon monoxide and PM_{10} was shown over the period from May 2003 to June 2004.

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 were recorded with respect of sulfur dioxide at Colombo Fort Monitoring Site. Rapid

decreasing of sulfur dioxide concentrations can be observed since January 2004 as a result of reducing the Sulfur levels in Sri Lanka auto diesel from 0.5% to 0.3%.

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.

