

TRENDS OF AIR POLLUTANTS, NITROGEN DIOXIDE (NO₂), SULFUR DIOXIDE (SO₂) AND PM_{2.5} IN MAJOR CITIES OF SRI LANKA

**Premasiri H D S¹, Perera N K P M M¹, Liyanaarachchi P D¹,
Dissanayaka D M M R¹**

¹ Environmental Studies and Service Division, National Building Research
Organisation, Sri Lanka
sarith_nbro@yahoo.com

Abstract

Air pollution in major cities has become a serious problem in Sri Lanka. The motor vehicles on road and the fuel consumption have increased at a tremendous pace contributing to major part of the air pollution in urban landscapes. Many studies show close link of urban growth and increased air pollutants; Oxides of Nitrogen (NO_x), unburned Hydrocarbons, Oxides of Sulphur (SO_x), Carbon Monoxide (CO), and Particulate Matter &etc. Long and short term exposure to air pollutants result different human health impacts mainly respiratory and cardiovascular diseases, a wide range other health complications and responsible for increased rate of morbidity and mortality. Due to critical health risks associated, reducing atmospheric concentration of these pollutants by emission control is a top priority in urban air quality management.

This study was done to assess trends in ambient concentration of three main air pollutants namely Nitrogen Dioxide (NO₂), Sulphur Dioxide (SO₂) and Particulate Matter (PM_{2.5}) in 8 major cities of Sri Lanka namely Colombo, Kandy, Gampaha, Kalutara, Galle, Rathnepura, Kurunegala and Anuradhapura. These cities are located in varied geographical, environmental setting in different urban pressures. Demographically, more than 50% of the country's population is concentrated in these cities exposing widely to air pollution risk. Both active and passive sampling monitoring techniques approved by expert organizations for air pollution monitoring were used in the study. Passive air quality monitoring technique for SO₂ and NO₂ and active sampling was used for PM_{2.5}. Sampling locations were strategically selected to represent both high traffic and low traffic areas measurements done from 2012 to 2017 (5 years) for NO₂ and SO₂ and two months in year 2017 for PM 2.5.

The results are comparable with previous studies showing high pollutant concentrations in congested city centers having high traffic and low concentrations in peripheral landscapes with low urban growth and traffic. Presence of pollution sinks represented by wetlands, water ways and green cover appear influencing on reducing concentration

of both SO₂ and NO₂ while signifying strong influence of climatic the geographical factors. The temporal pollutant concentration trends synchronize well with efforts on air pollution emission reduction efforts with a notable reduction in all cities. Nevertheless, subsequently increased concentrations of the two pollutant in 2016 & 2017 compared to that of 2015 show a clear link to increased traffic fleet resulted from the reduction of fuel prices, removing tax reliefs on hybrid vehicles, and efforts on urban expansion with light regard to urban air quality management.

Key words: Urban Air Quality, Annual Average, Vehicle Emission