

IDENTIFICATION OF AIR POLLUTION POTENTIAL AREAS AND ITS TEMPORAL AND SPATIAL PATTERN OF THE CITY OF COLOMBO-APPLYING GIS

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Abstract

Effects of air pollution are universal. It threatens the health of city dwellers and deteriorates environment affecting long-term productivity. Therefore, this study was oriented to identify the sources and sinks of air pollution and its contribution to the ambient air quality in the Colombo Municipal Area using Geographical Information Systems (GIS).

Colombo, the commercial and the administrative capital in Sri Lanka is about 37.3 sq Km in size, is about 5.7 percent of the total land area of Colombo district and carries the highest populated density in Sri Lanka. In this study Ambient Exposure Levels of NO₂ were compared against Socio-Economic Factors which contribute to the generation of Nitrogen dioxide such as population density, housing density, traffic flow, building density, undeserved settlements, and urban land use and also sinks of Nitrogen dioxide such as water bodies, parks & playgrounds and vacant lands.

The spatial variations of monthly exposure levels of ambient NO₂ level in Colombo city and neighboring areas during the period of North-East monsoon were analyzed using the spatial interpolation technique and compared against spatial distribution of positive and negative factors. In this study the Air quality monitoring data was obtained from the Continues Air Quality Monitoring Programmed of the National Building Research Organization (NBRO). Since the air pollution

sources are different feature types (point, line, polygon etc.), all the data were transformed into 1km grid using GIS techniques. Finally a statistical analysis was done based on the cell (Grid) values to study the relationship between air quality and socio-economic factors.

Multivariate techniques was used for the identification of the correlations and found that the land transport was highly correlated with ambient NO₂ concentrations. In addition, building and population densities, housing and underserved settlements are also significantly correlated.