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Urban Air pollution and Vulnerable Area

An Alternative Approach using Remote Sensing and GIS: A Case Study in the City of Colombo, Sri Lanka

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ABSTRACT

Air pollution is a critical problem of urbanization and industrialization all over the world and there is no exception in Sri Lankan context where it has created number of problems in its capital city of Colombo. General public and the institutions concerned in this sector have conducted various studies in order to evaluate the air quality in relation to the changes associated with socio-economic and physical development factors. The study has examined the spatial variation in NO_2 and SO_2 concentration pertaining to air pollution and some areas have been identified as vulnerable areas.

GIS technology has been used for various factors to display the spatial distribution pattern of air pollution. Other factors such as topographic features, weather conditions of the area have been considered even though in large areas climate may change within a short period. Air pollution is not similar every where due to land use pattern, surface temperature, vertical & horizontal space of the buildings and urbanization process.

With regard to analysis, GIS model, spatial analysis, Regression analysis and many algorithms were used to represent the air pollution by using secondary data and also ERDAS IMGINE 9.2. The methods of analysis of air pollution are very useful because of high resolution images, influential thermal bands which can detect the urban heat of the area. Other visible range sensors have been used for the Normalized Difference Vegetation Index (NDVI).

This study is based on the spatial distribution pattern of air pollution. It was therefore possible to draw maps for highly vulnerable sites by using multi criteria analysis.

Using GIS technology it is possible to analyse these variations in spatial terms as well as examine the vulnerability of the city using ArcGIS, Arc MAP and ERDAS IMGINE 9.2.