

The assessment of ambient air pollution trend in Klang valley, Malaysia

ABSTRACT

This study aims to explore the trend of ambient air pollution (i.e. PM₁₀, CO, NO₂, O₃) within the eight selected Malaysian air monitoring stations in Klang valley of five years database (from 2007 to 2011). It integrated statistical analysis to compare the air pollution database with the recommended Malaysian Ambient Air Quality Guidelines (MAAQG) standard and to determine the association between pollutants and meteorological factors. The geographical information system (GIS) software was used to assess the spatial trend of air pollutants across the north-east and south-west monsoons and the Principal Component Analysis (PCA) to determine the major sources of the air pollution. The statistical analysis showed the hourly trends (1-hour averaging time) of PM₁₀, CO, O₃ and NO₂ in the Klang Valley were below the MAAQG standard. Klang recorded the highest concentration of PM₁₀, while Petaling Jaya recorded the highest concentrations of CO and NO₂ and Shah Alam recorded the highest O₃. The 24-hour data for PM₁₀ was found to exceed the MAAQG throughout the five-year period. All pollutants were positively correlated with each other with the exception of CO and O₃. Meteorological factors, i.e. ambient temperature, wind speed and humidity were also significantly associated with the pollutants. The spatial distribution map indicated that the PM₁₀ levels remain highly concentrated during the south-west monsoon (hot and dry season), while the CO levels were highly concentrated during the north-east monsoon (wet season). NO₂ and O₃ were highly determined during the first inter-monsoon.

Keyword: Ambient air pollution; Spatial; Principal component analysis; Monsoon; Klang valley