

## **Using geo-statistical analysis to profile the Spatial Pattern of Air Pollution Phenomena in Peninsular Malaysia**

Siti Hajar Ya'acob\* & Abdul Hamid Mar Iman

Sustainable Science Program, Faculty of Earth Science, Universiti Malaysia Kelantan Jeli  
Campus, Locked Bag No.100, 17600 Jeli, Kelantan, Malaysia

\*Corresponding author Email: hajar.y@umk.edu.my

Baseline important information related to atmospheric pollution is regularly obtained from continuous ambient air monitoring activity across the country. However, spatially pattern characterization using geo-statistical analysis is in need to better profile the air pollution phenomena. This research attempts to apply spatial statistics by employing GIS in providing evidence of underlying spatial contribution to potentially air pollutants concentration accumulation. Air pollutants variables within 16 years observation (2000-2015) from 37 fixed monitoring stations across Peninsular Malaysia were assessed. Initial analysis was performed to profile the air pollutants using different spatial interpolation model, spatial autocorrelation and subsequently modeling the spatial relationship in ArcGIS software version 10.4. Generally, kriging interpolation model was chosen as compared to IDW based on the RMSE value that closest to 1. The RMSE value from kriging model for PM<sub>10</sub>, SO<sub>2</sub> and O<sub>3</sub> were 7.8096, 0.015 and 0.0028 respectively. Only SO<sub>2</sub>, NO<sub>2</sub>, and CO showed significant p-values of Z-score from Getis-Ord general G and Moran's I calculation ( $p < 0.05$ ). The initial profiling through GIS based approach able to identify relevant patterns that show areas to be targeted for effectively governs later. Hence the profiled contaminated sites either belongs to a hotspot or cold spots can be prioritized for future prediction of air pollution impact. The outcome would benefit authority and decision makers for minimizing the loss of air pollution data quality as well as on guard the public health concern without significant financial burden

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