

## **Analysis of urban morphological effect on the microclimate of the urban residential area of Kampung Baru in Kuala Lumpur using a geospatial approach**

### **ABSTRACT**

As a Malay Agricultural Settlement established in 1900, Kampung Baru which is located in Kuala Lumpur, has become a subject of prolonged national interests in terms of economic, social, environment, and political issues along with the pressure of modern and future development. This study investigated the urban morphological impact of Kampung Baru on the intensity of urban heat island (UHI) by developing a smart geodatabase for urban climatic mapping. The database provided baseline data which was crucial to unveil the spatiotemporal characteristics of UHI in Kampung Baru. Determination of the urban heat island intensity (UHII) in Kampung Baru was carried out through two approaches, mobile and fixed measurements. In a period of six days, the mobile measurement was conducted within the target area at night using a motorcycle equipped with the temperature and relative humidity data logger while the fixed measurement was conducted using the similar equipment installed at a school building in the area. Building height data were also collected while building footprints were digitized using a topographical map and the satellite image was used as the base map. To estimate the UHII, the reference data for rural temperature was obtained from the Malaysian Meteorological Department (MMD). All of the data were analyzed using ArcGIS to portray the temperature pattern in the study area. The analysis revealed the presence of UHI effect in Kampung Baru at the average building height of six to ten metres. The results of the fixed measurement showed an island-like local maximum in the study area with the average and maximum UHII values of 4.4 °C and 6.0 °C, respectively. The results from the mobile measurement also showed that the highest temperature was recorded in Kampung Baru rather than in the surrounding areas of different land-use types throughout the observation days. The spatial temperature distribution in the study area also showed that the most affected part was the south-west of Kampung Baru which is surrounded by tall buildings. The findings of this study could be utilized in the planning of new development in the city of Kuala Lumpur.

**Keyword:** Urban heat island; ArcGIS; Urban climatic mapping; Mobile measurement