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Quantifying the Air Temperature Reduction with Greenery in UiTM Shah Alam : A Microscale Study

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Abstract

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Abstract

Growth in cities population has caused urban sprawl which is the key factor in the issues of high temperatures as well as UHI in many countries. This issue has affected the urban microclimate as well as the indoor and outdoor conditions of human thermal comfort. This issue is also aggravated by the replacement of natural greenery area with building and other man-made features. For that reason, greening the cities, as part of bioclimatic concept of build environment, could be the way to decrease the outdoor temperature and making the surrounding more comfortable. To understand this issue further, ENVI-met software was used to simulate all activities either natural or man-made to attain accurate prediction and evaluation for microclimate changes in certain area. For this study , the simulations were run in three scenarios of pavement, asphalt pavement without plants (scenario 1), concrete pavement without plants (scenario 2), and asphalt pavement with plants (scenario 3). Plants were design in area surrounding the building and in courtyard consisting of pine trees and hedges of 2 metre height. The result shows that greenery plants can influence air temperature and airflow in the surrounding thus improving thermal comfort in the area. Existing plants can decrease temperature from 0.5°C to 2.3°C and air velocity become slower at 0.05 m/s to 0.15 m/s. Overall, although the changes are at small scale, it is shown that plants are able to improve microclimate surrounding better towards thermal comfort standards. © Published under licence by IOP Publishing Ltd.

Engineering controlled terms
Air ; Asphalt mixtures; Asphalt pavements; Population statistics; Surveying; Thermal comfort; Urban growth

Engineering uncontrolled terms
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