An Investigation of the Significant Criteria of Vegetation Selection in Designing Urban Nodes

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Abstract

The fast growth underway in developing tropical urban regions has led to the progressive decline of life in urban public spaces. Without responsive design guidelines for outdoor places, human activities have dramatically changed the urban fabric of developing tropical cities. The continuously allocation of land development to building and construction has led to a ‘concretised’ urbanscape resulting in a significant rise in air temperature and surface heating in a phenomenon called urban heat island (UHI). The effect of UHI has made cities almost unbearable for urban residents to be present in urban spaces. However; new effort is being made to reduce the effect of UHI in tropical cities by injecting urban green into the cityscape to create a thermally comfortable outdoor ambience in order to re-establish life outdoors. To ascertain comfortable conditions in tropical cities, appropriate plant species capable of significantly cooling the outdoor air temperature need to be selected.

This paper identities, investigates and analyses the significant criteria of tree selection in urban nodes. Two node intersections in the urban spaces were selected based on vegetation types and design arrangement. Natural light intensity was measured using a lux meter at the two node intersection taking readings and three different locations within each area. This data was validated using a photographic shadow casting study in which the shadow cast was measured. All readings were taking at different hours during the day. The results revealed that the vegetative cover type and design arrangements significantly influences the amount of sunlight penetrating through to the space and shadow casted on the ground at the node intersections.

Keywords:
Outdoor Thermal Comfort, Urban Heat Island, Vegetation Type, Design Arrangement, Sunlight Penetration, Shadow Casting