Title:
Investigation of thermal effects in different local climate zones of Dar es Salaam, Tanzania

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Abstract
Dar es Salaam city is one of the current rapidly urbanising metropolises in Africa, experiencing a hot - humid climate nearly throughout due to its coastal location in the tropics. Urban areas usually experience different urban forms depending on their existing topography and urbanisation. In order to understand the nature and characteristic of its urban thermal pattern, micrometeorological measurements were performed in various urban areas representing different local climate zones (LCZ). Alongside measurements, thermal sensation interviews were conducted concurrently at two locations (i.e. at a park and a beach) to assess the human thermal perception and their adaptation to the local climate. The urban effects on thermal structure were modelled using the ENVI-met model by varying the meteorological parameters. Several adaptation measures were also considered and it was revealed that an urban setting with vegetation and water bodies exhibit significant reduction in human thermal stress. The neutral thermal comfort range as interpreted using the Physiologically Equivalent Temperature (PET) was found to be a bit higher to that experienced in mid-latitude regions. However, the existence of multi-cultural backgrounds in many fast growing cities like Dar es Salaam limit the local adaptation to the climate hence calling for various adaptation measures to ensure thermal comfort and quality of life in hot-humid urban areas.