

Identification of Thermal Hot Spots in Urban Areas through Establishing Heat Index in Support of Mitigation Plans to Counteract Urban Heat Island (UHI): A Case Study in Colombo Urban Area – Sri Lanka

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The creation of thermally comfortable microclimates in urban environments is very essential for human well-being. This study was conducted to assess the outdoor thermal comfort by establishing Heat Index (HI) values and identifying thermal hot spots in Colombo urban city of Sri Lanka. Fourteen sites (14) with different urban designs were selected purposively which were highly populated during daytime. Daytime temperature and humidity values of selected locations were collected to calculate HI values. Further, questioner surveys were conducted among 168 individuals purposively to evaluate the thermal perception of people who exposed to outdoor thermal conditions. Five study sites (Borella, Colombo Fort, Maradana, Wellawaththa, Liberty junction) out of 14 selected study sites were identified as thermal hotspots in Colombo. The average day time HI value for Colombo city was 37.36°C during the study period. The observed HI values were varied between 40.35°C-33.82°C. The highest average day time HI value was observed at Maradana (40.35°C) and lowest HI at Thummulla (33.82°C). The questionnaire survey was revealed most of the study sites consisted of uncomfortable outdoor thermal conditions and people prefer windier, shady, and low temperature outdoor micro climatic conditions in Colombo. The study was revealed that the most important feature of public spaces is the availability of shade due to the intense solar radiation. It is important to promote an urban design that creates shade and ventilation.

Keywords: Heat index; Outdoor thermal comfort; Thermal hotspot; Urban micro-climate