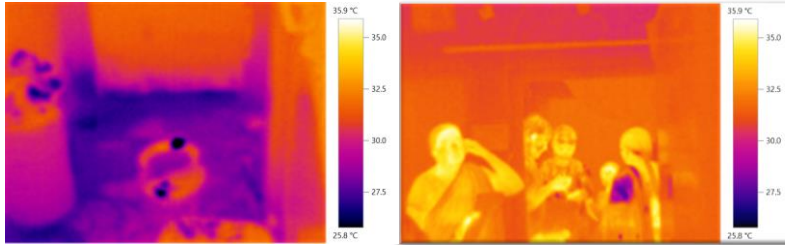


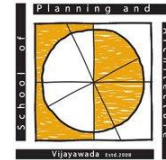
Thermal Comfort study for mitigating heat stress through climate responsive planning: A case study of Vijayawada

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Introduction

There exists a well established relationship between heatwaves (extremely high temperatures) and human mortality. Despite the prevention measures, heatwaves represent a real risk to vulnerable population. In this case study, the impact of heatwaves in identified case pockets of Vijayawada has been carried-out, by studying the indoor and outdoor thermal conditions, and occupant behaviour. The idea is to demonstrate the relationship between thermal comfort and heat stress indices and evolve simple adaptation strategy for mitigating the adverse impact of heatwaves.

Objective

- To document the local climate, morphological setting, and building physics characteristics of the case area.
- To carryout perception survey of the occupants and record field measurement (temperature/humidity/air flow velocity)
- To assess the existing heat stress condition for demonstrating the relationship between thermal comfort and heat stress indices (PPD, PMV, UTCI) and heat index chart are derived
- To suggest adaptation strategy for mitigating the adverse impact of heatwaves

Case Status

Data has been gathered from a Case Study Area of 65m X 135m in Vijayawada, in terms of meteorological weather data (such as temperature, air flow velocity and humidity), building physics parameters (such as building size, typology, aspect ratio, construction material, WWR), and physical characteristics (such as the envelope) Data has been mapped, and occupant behavior collected through perception surveys and semi structured interviews (on clothing, activity, adaptive strategies etc). Field measurement (with Testo 480) have been taken and design strategies are in process of development.

Preliminary Findings

- Two different scenarios of comfort are emerging, w.r.t. low-rise housing and apartment units.
- Perception of extreme heat conditions and heat-waves are varying based on gender
- Vegetation is playing a crucial role in determining the local microclimate
- Building material and natural ventilation is crucial Indoor air quality seems to be poor, needs quantification, as it may have associated health issues.

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