



# Building **Resilient** Urban Communities

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# Case Study Analyses

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## Upcoming Events

- **Site Visits** in the Netherlands

Following are the case studies described in the newsletter:

Partner Institution	Case Study
SPAB	Case Study I: Craft, Culture and Community: Learning Resilience from the Ziro Valley
SPAB	Case Study 10: Enhancing Institutional and Community Resilience to Climate Change Impacts in Jodhpur City: Heat Stress
SPAV	Case Study 3: Urban Heat and Spatial Dynamics: Planning towards Climate Resilience, a case of Bangalore
SPAV	Case Study 8: Thermal Comfort Study for Mitigating Heat Stress through Climate Responsive Planning and Design



# Case Study Briefs

## School of Planning and Architecture, Bhopal, India

### Craft, Culture and Community: Learning Resilience from the Ziro Valley

#### Introduction

With the discourse of sustainability as the predecessor and SDGs forming its backdrop, the Urban Resilience discourse has now entered into its third-generation, Socio-Ecological Resilience (UN Habitat, 2017). However, the role of culture still has the potential to be underscored through case studies. The above position aligns with the emerging inclination of 'resilience thinking' towards acknowledging the plurality and investigating interconnections and interdependencies within and beyond cities. (UN Habitat 2017, pp. 9). At present, as the state of the Resilience Literature is defined through formal structures, agencies and actors; there is an opportunity to put forward the indigenous knowledge systems in the body. With the unique proposition of human and nature interaction, co-existence of formal political structures and traditional tacit anthropological systems, the Ziro Valley from Arunachal Pradesh offers opportunities to look into the Cultural aspects through its integrated practices and continuums, to evolve towards a next paradigm in the Urban Resilience discourse. The local practices of urban agriculture, livelihood systems and

worldview, natural resource consumption, water and forest conservation, cultural conflict resolution offers unique narratives in the part and whole of Urban Resilience systems.

#### Objective

With the objective to illustrate the resilience principles and systems, grounded in the cultural continuums of Ziro Valley, the case study employs qualitative methods, including the design ethnography and socio-cultural-technical system mapping with field visits and interviews to come up with a rooted and indigenous version of Urban Resilience.

#### Preliminary Findings

Unique Human-Nature relationship patterns which have shaped the cultural practices - The indigenous knowledge systems spans across the scales of design, from designing object to spaces, from cultural rituals to agriculture.



*Architecture and nature at Ziro Valley*

## Enhancing Institutional and Community Resilience to Climate Change Impacts in Jodhpur City: Heat Stress

### Key Findings

- The major threat due to rising temperature and heat, relates to health issues
- The increasing built up areas and decreasing green cover, if not addressed, may evolve into a threat in coming years. It requires to be addressed through progressive adaptation strategies, involving community and effective governance.
- While formulation of policies, there is a need to prioritize action plans for addressing local level causes of heat stress. This is important to address the concerns of vulnerable areas and to resolve issues like loss of biodiversity in the city.
- Evaluation and monitoring of actions for ground level activities should also ensure that various stakeholders are accountable for their actions. Increasing heat is not considered as factor, having future implications, at local level for developing building byelaws and development control regulations. Use of local material and adaptive construction techniques is not being emphasised in such regulations.



***Coping with Heat Stress in Peripheral Areas of Jodhpur City***

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***Declining Traditional Construction Practices***

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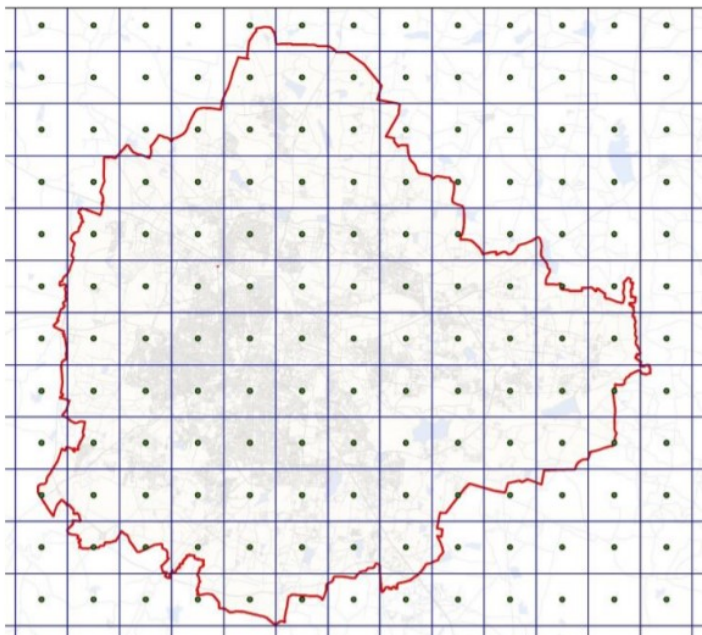


## School of Planning and Architecture, Vijayawada, India

### Urban Heat and Spatial Dynamics: Planning towards Climate Resilience, a case of Bangalore

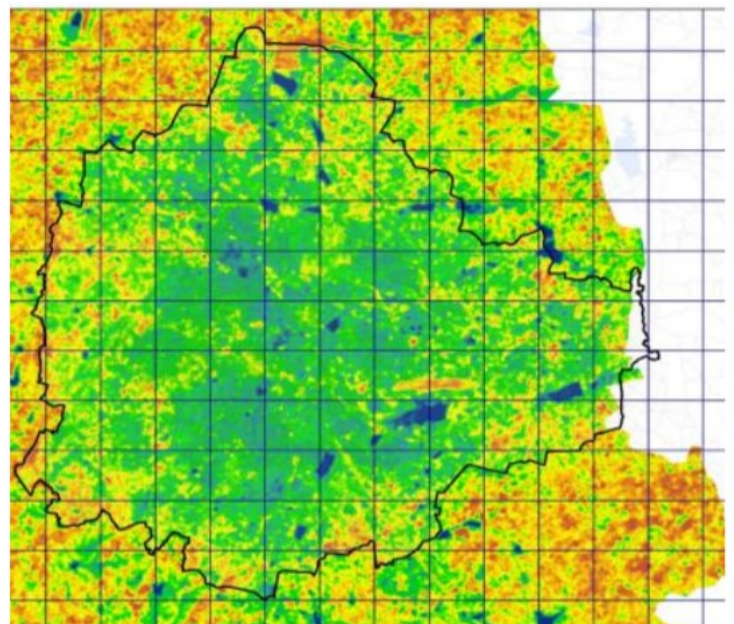
This study attempts to find empirical relations between urban built up, urban green spaces, urban blue patches and the formation of urban heat stress zones. It attempts to establish linkages between changing urban morphology and heat stress zones at the sub-city level to bring out the need to have heat resilient city planning strategies. Data is assimilated on geospatial format for grids of 500m X 500m for entire Bangalore Municipal Area for six control parameters of resilience to heat stress, i.e., (i) Population Density (ii) Vegetation Index/Green Cover, (iii) Water Index/ Blue cover, (iv) Built Index/Building Density, (v) Land Surface Temperature,

and (vi) Land Use. The heat stress zones are computed for the city using composite weighted index method on spatial format. They are observed to be having proximity and relation to high built density compared non-built up zones. Water and green index are also found having a negative degree of influence over the spread of the heat stress zones. The study establishes spatial and statistical relations between the heat stress zones and the physical characteristics of Bangalore. The study ends with a discussion of how such findings can be used in urban planning to decide future city functions.



***The city divided into grids.***

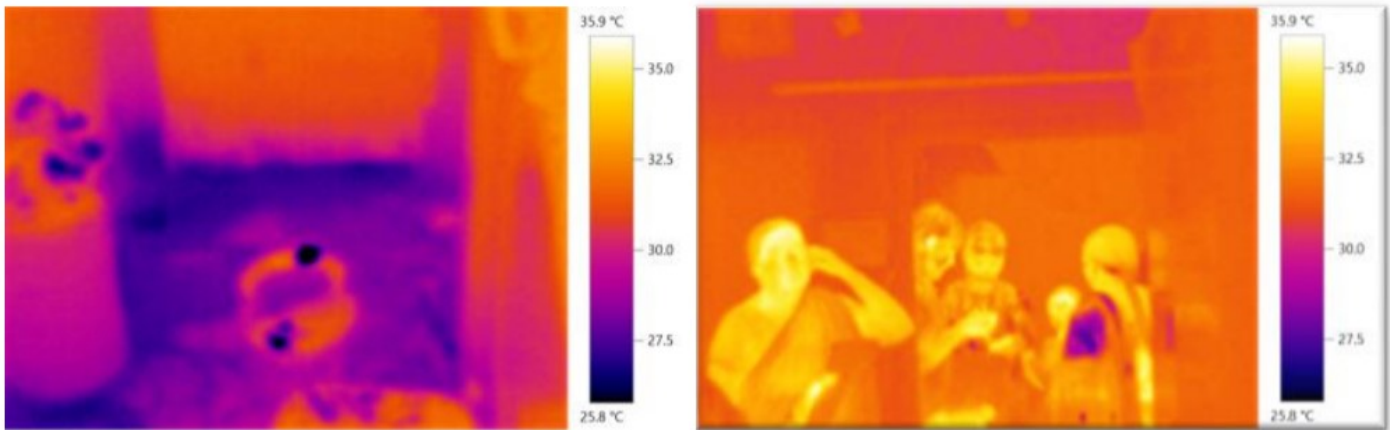
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***GIS analysis of Bangalore***

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## Thermal Comfort Study for Mitigating Heat Stress through Climate Responsive Planning and Design



**Thermal imagery** © 2019 SPA, Vijayawada

In India, the planning and design of low-income housing has historically been dominated by politics with cost of the unit and quantity being prioritized over quality and comfort. In a country that experiences different climatic conditions throughout the year, buildings need to be responsive to the local climate that helps in improving the thermal comfort of the inhabitants. The need for such intuitive planning and design become all the more relevant in places like Vijayawada where the ambient temperature is above 30 degrees for more than half of the year. Further, the thermal environments in the informal sector are often neglected while planning and design of low-income housing settlements. This case study is focused on understanding, mapping and drawing planning & design guidelines for accessing and improving the thermal conditions of New Rajarajeswari Peta a low-income rehabilitated housing settlement in Vijayawada. Archetype characterization of case area was carried out and eighteen archetypes were narrowed down for further documentation and thermal perception study. Documen-

tation of building for recreating virtual models of case houses were carried out through primary survey. Qualitative interviews on selected cases were performed along with recording thermal sensation votes. Testo-480 and thermal imager camera were used for measuring temperature, humidity, air velocity and iso-thermal images respectively, during the course of documentation. Design-Builder and GIS were used for simulating thermal environment and mapping the case area respectively. The results indicate that as much as three-degree temperature change can be archived by changing the layout, opening sizes, increasing ventilation rate and material properties of these houses. Further, the perception of heat in low-income housing settlement had varied response as against the general perception. The findings of the study shall help the architects, planners and decision makers in making an informed design decisions while planning and designing of low-income housing settlements.

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**NEXT ISSUE:****Topics**

- Report on Symposium 3 - "Training Needs for Urban Resilience in India"
- Report on Symposium 4 - "Defining New Planning and Design Paradigm"