NP3006
URBAN OBJECTS AND PRECINCTS AND THEIR PERFORMANCE UNDER URBAN HEAT SCENARIOS

Research Question

The research seeks to develop a tentative model for the representation of UHI complexity. The aim is to fill a gap for a comprehensive approach describing the UHI phenomenon.

Methodology

In line with the definition of “Grounded Theory” by Strauss and Corbin (Corbin, 2008), the research began with an area of study, the UHI phenomenon, but not with a precise question. The theory itself is emerging now from the literature review codification and conceptualization. As in the design-thinking process the study advances iteratively, alternating the prototyping of the theory with the collection of data and the coding process. The conceptualization of the phenomenon feeds back to earlier stages, creating a looping thinking process.

Results

The dissertation proposes the development of a matrix for assessing the UHI mitigation measures and adaptation processes needed to retrofit suburbs and shape urban growth. It will do thus by:

• describing the cities’ components;

• assessing cities’ components performance;

• evaluating the relative potential of a range of interventions at each scale to mitigate UHIs.

Table 3.2 offers an overview of the UHI matrix. The central section of the diagram represents the articulation of the classes of parameters influencing UHI. They are classified based on their set-theoretic membership to one of the three principal urban systems and sub-systems (categories) and to a geographical scale (class); additionally an extra quality has been added based on the capacity of each parameter to implement one of the “Sustainable Development Goasls” (SDGs – Figure 2) (UN, 2016).

Conclusions

A correct interpretation of the UHI phenomenon requires a holistic view, envisaging the city as a complex system; the “complex systems” paradigm is a powerful approach for studying cities as emergent phenomena (Alberti, 2016) and their internal relationships and dynamics that are still unknown (Kohler, Tannier, Blond, Aguejdad, & Clappier, 2017).

← Figure 2: Selected UN Sustainable Development Goals (SDGs) based on their addressing of UHI.

Anticipated impacts

Investigating the urban heat island phenomenon to facilitate the transition to a low carbon city model.

The assessment matrix represents an exportable model ultimately organised following the UN Sustainable Development Goals (SDGs) international framework; it could apply to a diverse set of scenarios (Image 1) giving local governments the opportunity to create a best practice approach to both assess and combat urban warming.

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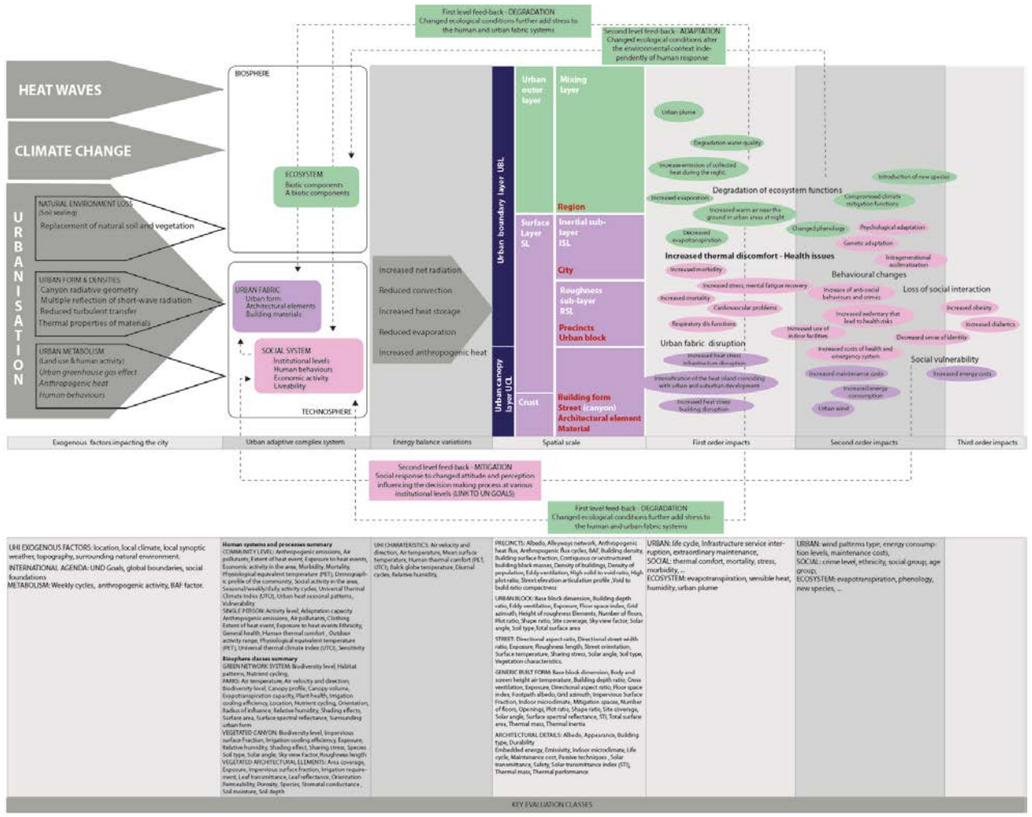

← Figure 1: UHI complex system analysis

Figure 3: Graphic interpretation of the evaluation of the UHI parameters at different scales ↓