

Reduced Heat Stress Due to Urban Green? Assessment of ecosystem services for well-being of residents in urban districts

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„HeatResilientCity“ – The Project

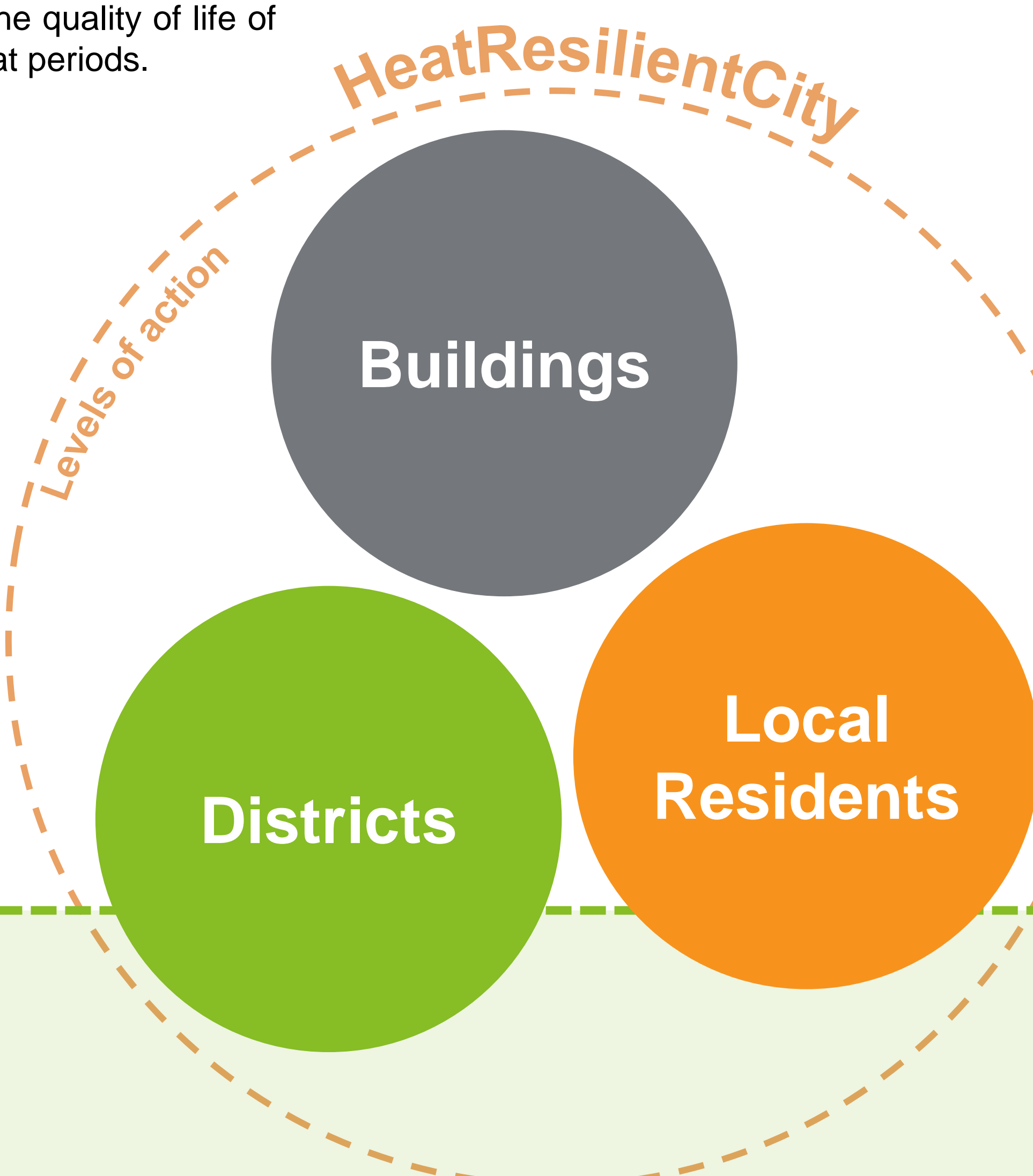
Rising heat stress is one of the most prominent and wide-reaching consequences of climate change, particularly in densely populated urban districts. At the same time, the mitigating effect of urban green spaces on the local climate is being impaired by extended periods of extremely high temperatures and by ongoing soil sealing. This has resulted in an increased frequency of high temperatures in cities both in open spaces as well as inside buildings. Hence, city dwellers are increasingly exposed to high temperatures that severely affect their quality of life and well-being.

The project “HeatResilientCity” (HRC) analyses the vulnerability to heat periods of two city districts in Germany. These so called real-world laboratories are located in the cities Dresden and Erfurt. At the project's heart are adaptation measures that aim at improving the quality of life of local residents in their districts and buildings during heat periods.

HRC deals with:

- the residential-oriented development, implementation and assessment of adaption measures to reduce heat stress in green spaces and buildings
- conflicting aspects of urban development under changing climatic conditions
- the increase of not only the acceptance but also the effectiveness of measures for climate adaption

In this context, the work in the real-world laboratories is organized on three levels of action, namely “local residents”, “buildings” and “districts”. Each level has corresponding actors, activities and effects.



Ecosystem Services on the District Level

Regarding the district level, one important aspect is to assess and improve the diverse services that urban ecosystems provide for city dwellers during heat periods. Beside the cooling effect supplied by e.g. vegetation or water bodies, there are many more so called “ecosystem services” (ES) to be considered when analyzing urban green (e.g. recreation, erosion control). In view of the altering climatic conditions the functionality of urban ecosystems and the provision of ES are of high importance to preserve and improve the city dwellers' well-being.

The real-world laboratories in Dresden and Erfurt represent two different kinds of city structures, that are common also in other German cities:

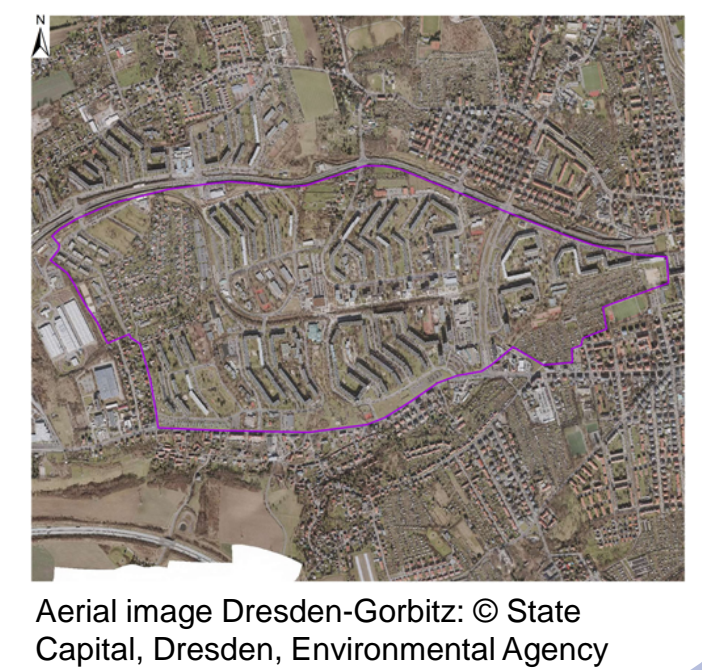
Erfurt - Oststadt

- The neighborhood was created around the turn of the 20th century
- Typical block building structures with enclosed courtyards



Dresden - Gorbitz

- District is characterized by residential buildings from the 1970s
- Typical prefabricated high-rise construction and public shared green yards

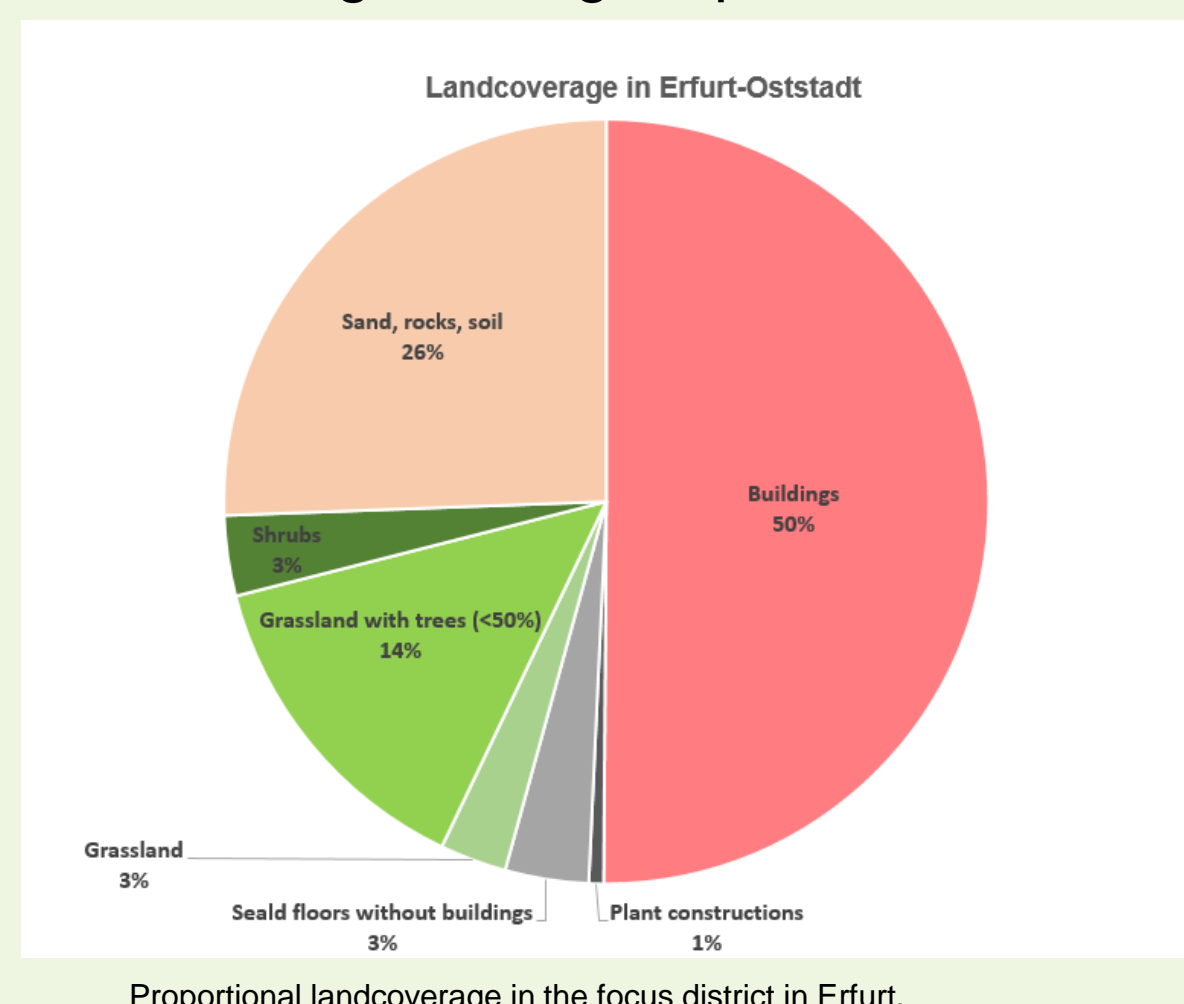


Ecosystem Service Approach

ES of the green spaces in the real-world laboratories of HRC will be identified and analyzed. Then, possible alterations of ecosystems and their services will be assessed based on simulations of local climate. Taking these results and the findings from the other levels of action, adaption measures to reduce heat stress will be implemented and tested in buildings and open spaces.

I. Identification of Ecosystems

The identification of existing ecosystems in the focus districts is one of the first steps within the project work. One challenge is to detect ecosystems on a small scale. Therefore we conducted the following working steps:



- Reviewing and analyzing geo data and planning documents of the study sites
- Combining several datasets to obtain information on ecosystems in the districts
- Defining ecosystem types

II. Evaluation of Conditions

The provision of different ES depends on the conditions and qualities of the existing ecosystems. For this purpose we executed the following working steps:



- Designing a registration sheet for mapping ecosystems and their conditions and qualities
- Mapping and verifying of ecosystem types in the field
- Systematical recording of ecosystem type conditions and qualities

III. Assessment of ES

The assessment of selected ES is based on the generated data of the mapping and GIS work and is made qualitatively and quantitatively. The following working steps are to be done:



- Assessing supply and demand for several ES
- Detecting spaces of high and low supply/demand of ES
- Assessing temperature reduction due to urban green
- Developing appropriate measures for heat stress re-reduction

Project Partners:



www.heatresilientcity.de

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