Development of climate adaptation measures as a participative process involving citizens in a neighbourhood in Berlin, Germany

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Introduction

A participatory approach to involve citizens and other local stakeholders in the development of climate adaptation measures is tested within the "KiezKlima" project (English: "Neighbourhood climate") for the urban quarter "Brunnenviertel-Brunnenstrasse" in Berlin, Germany. The three-year project (10/2014 – 09/2017) is collaboratively carried out by partners from science, planning, consultancy, administration, and district work within the framework "German Strategy for Adaptation to Climate Change" (DAS).

KiezKlima
Gemeinsam für ein besseres Klima im Brunnenviertel

Project aims, methods and results

Aims

The project builds on existing structures and strategies of a Neighbourhood Management to:

- involve local stakeholders (residents, non-profit organisations, housing company, private enterprises) in the process of developing climate adaptation measures,
- raise awareness concerning climate change, weather events, and adaptation.

Evaluation

- Evaluation of all participative measures in terms of challenges, benefits, requirements and success.
- Development of a guideline for knowledge transfer.

Climate analyses

- Characterisation of past (e.g. Fig. 1) and projected future climate conditions in Berlin and the pilot area (Fig. 3, pink outline).
- Microclimatic simulations using the SOLWEIG model (Lindberg et al., 2008) to identify hot spots during summer (Fig. 2).

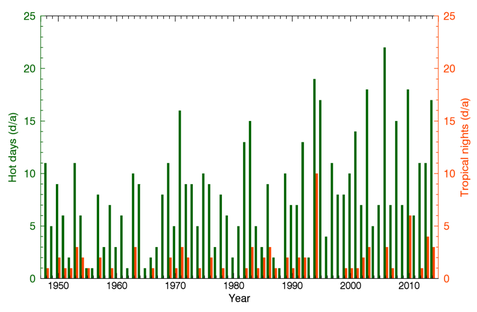

Fig. 1: Hot days ($T_{max} \geq 30°C$) and tropical nights ($T_{min} \geq 20°C$) per year at Berlin-Tempelhof.
Data source: Daily climate data, DWD.

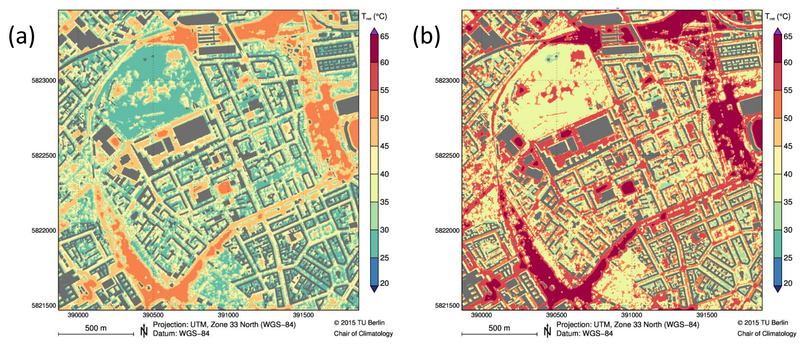

Fig. 2: Mean radiant temperature T_{mrt} during (a) summer months (JJA) and (b) days with heat warnings in 2010 at 14:00 UTC+1.

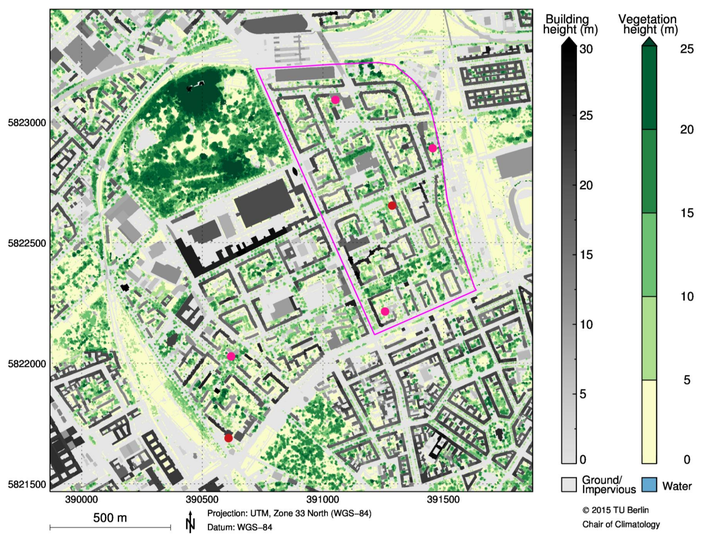

Fig. 3: Urban quarter "Brunnenviertel" in Berlin with the pilot area (pink outline). Measurement sites are marked with dots.
Data source: Berlin Environmental Atlas, 06.10, SenStadtUm.

Participation

Participative measures to involve stakeholders on three levels:

(a) Information: Neighbourhood management, public relations, interviews, street fairs, guided tours.

(b) Involvement: Interviews and questionnaires, planning for real, knowledge pool, meteorological measurements.

(c) Decision-making: Workshops.

Fig. 5: PR work (left) and scientific experiments with children (right) at local street fairs. © S. Walz, I. Markus.

Measurements

- Meteorological measurements at six sites (Fig. 3, dots, Fig. 4), including four sites at kindergartens.
- Additional indoor measurements at kindergartens with real-time data access.
- Bio-meteorological measurements at selected locations and during selected short-term periods.

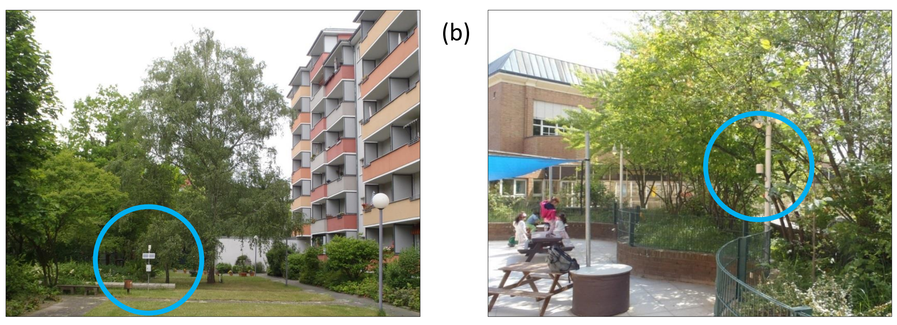

Fig. 4: Two of the six newly installed measurement sites : (a) in a representative courtyard, (b) at a local kindergarten. Sensors are marked with blue circles.
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Adaptation measures

- Development and planning by identifying problematic spaces (e.g. Fig. 6) and potential locations.
- Evaluation in terms of effectiveness.
- Discussion and decision-making of potential measures with stakeholders.
- Implementation of selected measures in cooperation with stakeholders.

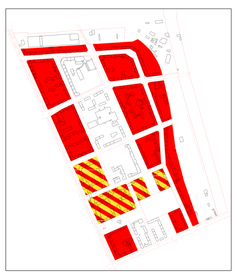

Fig. 6: Problematic spaces concerning supply with green spaces (red) and intensification of utilisation (yellow). Data source: Berlin Environmental Atlas, 06.05, 04.11.2, SenStadtUm.

Fig. 7: Growing botanic infrastructure as a potential adaptation measure.
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Outcomes

- Guideline with recommendations for participatory development of climate adaptation measures, transferable to other urban districts in Germany.
- Implementation of climate adaptation measures within the pilot area in cooperation with local stakeholders.
- Increased awareness amongst stakeholders and a more resilient neighbourhood against weather and climate events.

References: Lindberg, F., B. Holmer, S. Thorsson (2008): SOLWEIG 1.0 - Modelling spatial variations of 3D radiant fluxes and mean radiant temperature in complex urban settings. *Int. J. Biometeorol.* **52** (7): 697-713.

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