Green infrastructure strategies for climate change and the promotion of biodiversity in urban areas

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Adaptation via urban green infrastructure (UGI) can significantly reduce the UHI effect and stormwater runoff while contributing to climate change mitigation by reducing cooling energy demands and enhance biodiversity. Still these different goals are rarely considered together. The Centre for Urban Nature and Climate Change Adaptation, funded by the Bavarian Ministry of the Environment and Consumer Protection, seeks to address these challenges in an inter- and transdisciplinary approach.

The benefits of UGI scenarios for outdoor as well as indoor thermal comfort and buildings' energy demand were assessed by coupling microclimate modelling (EnviMet) with thermal building simulation (IDA-ICE). The methodological approach has been tested at neighbourhood level for an urban block in Munich, Germany, representing a typical urban fabric with a high degree of compactness and surface sealing.

Results showed the varying effectiveness of UGI measures (e.g. street tree plantings, greening of courtyards, green roofs and facades) in reducing the potential for indoor overheating during hot summer days. The impact of GI on cooling measures at building level (e.g. cross ventilation, chiller) will be shown. Potentials and limitations for enhancing biodiversity under the different UGI scenarios were explored based on field data and a literature review.

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