



Federal Institute for
Research on Building,
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Preventive stormwater management for urban flash floods and overheated cities - A joint municipal task

Extreme weather events such as heavy rainfall, drought and heat waves are increasing challenges for cities. They require a citywide, preventative urban water management. The case study-based research project shows how cities can prepare for more frequent and increased flood and drought events and how urban water management can be an integral part of urban development.

Project duration: November 2012 - December 2014

Background

Climate change is bringing about an increasing number of extreme weather events that imply heavy rainfall and long periods of hot weather. Cities and urban regions are particularly vulnerable to the effects of extreme weather because they can cause immense material damage to infrastructure and buildings and endanger the lives of many people.

In addition, the high degree of impermeable surfaces and compact development in high-density areas intensifies the incidence of urban flooding, heat accumulation and drought. Severe local or regional precipitation puts a strain on sewer systems and outfalls until they are unable to take any more water rainfalls running off in torrential streams flooding low-lying areas, detention basins, cellars, underpasses and even underground tunnels.

Such extreme rain events have occurred more frequently in recent years. In addition, heat waves, as occurred in the summer of 2003, lead to prolonged dry periods and, especially in dense inner cities, to increased temperatures that cannot be compensated for by night-time cooling. Long periods of heat result in damage to the urban infrastructure causing enormous health problems and – as in the case of the extreme summer heat of 2013 – they can also lead to fatalities.

These extreme weather situations, which have already been observed and are expected to increase in the future, make the sensitive and forward-looking management of rainwater in cities a necessity. Water-sensitive urban development is a challenge for both growing cities and the primacy of urban development as well as for shrinking regions with few resources. Water-sensitive urban development is designed to reduce vulnerability and the potential for damage due to extreme rainfalls within the urban area by increasingly integrating urban development and urban water management (Benden and Siekmann 2009, Benden 2013).

Many stakeholders from the political sector, from public administrations and various associations have already recognised the need for action. In practice, however, project approaches and the implementation of management measures are still confronted with a variety of barriers and a lack of acceptance on many levels. As long as no damage has occurred, the subject is often excluded from everyday politics and governance. The main reasons for this are that adapting to climate change is (still) not an obligation and that other tasks appear to be more pressing. A legal framework and a scope for action as well as tools and good examples of projects that already exist are still often largely unknown. This also applies to existing municipal case studies concerning flood management and water-sensitive urban development.

Objectives

It was therefore the goal of this case study-based research project to convince cities and municipalities of the need for more initiative and the implementation of flood and heat prevention measures as well as to identify and document good examples and concepts in this field. On this basis, strategies and instruments for water-sensitive urban development at the local level were developed. In doing so, it was necessary that measures for water-sensitive urban development and heat prevention also contribute to preventing drought, as is the case with the "sponge city" principle. It was also important to show ways in which the topic of climate adaptation could be more strongly integrated into concepts, plans and procedures within cities and municipalities.

The project was carried out by bgmrBecker Giseke Mohren Richard Landscape Architects, Berlin (V-Prof. Dr.-Ing. Carlo W. Becker, Dipl.-Ing. Sven Hübner) and Engeneer Corporation Prof. Dr. Sieker mbH, Hoppegarten (Prof. Dr.-Ing. Heiko Sieker, Dr.-Ing. Stefano Gilli, Dipl.-Ing. Mike Post).



Additional Information



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