

On the Path to the Development of Blue-Green Neighborhoods

Stormwater Management in Residential Neighborhoods Using Blue-Green Infrastructure

Abstract

Cities around the world are grappling with the problem of flash floods. Although the development of blue-green infrastructure is recognized as an effective strategy for adapting to climate change, the pace of change is slow. A significant part of urban areas is occupied by multi-family housing, where surface stormwater management solutions can be implemented within the required biologically active area.

The aim of this research is to analyze the possibilities of using BZI by architects in shaping stormwater management systems after excluding stormwater from the definition of wastewater in water law. This paper proposes that **BZI for stormwater management in residential neighborhoods should be a required element of land development and the subject of architectural design.**

In the initial section, I outline the research problem, objectives, and scope of the work. The first chapter is an analysis of the interdisciplinary state of research, examining the development of the concept of blue-green infrastructure in the scientific literature and identifying a research gap in the disciplines of architecture and urban planning. Stormwater management is a component of the urban water cycle, which in turn is part of the natural water cycle. This determines the division of labor into three fundamental parts: directions of BZI development, tools for BZI development, and the shape and form of BZI. These are related to the division of responsibility for its development. Within the framework of **development directions**, I examine the global and European principles for adapting to climate change based on the development of BZI. In the next chapter, I analyze the national situation and the **tools available to local governments** in shaping pro-environmental policies aimed at developing BZI. In the next section, I analyze the design process and the elements that directly influence **the shape and form of BZI** in residential developments. I define a stormwater management system (SGWO), which identifies the water source, elements that direct surface runoff, and elements that intercept surface runoff for infiltration, temporary, or long-term retention. The system's most important function is to utilize stormwater as a valuable resource. Transdisciplinary analyses enabled me to analyze the land use of selected residential developments and describe SGWO parameters, particularly retention capacity and SGWO range. In the summary, I attempted to synthesize the research results, including **conclusions and an assessment of the factors contributing to and hindering the development of SGWO.**

A significant contribution to this research is made by transdisciplinary analyses using the Scalgo Life platform. SGWO integrates the need to increase urban retention capacity with the development of green spaces in residential developments.