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Abstract of PhD Thesis

'ROLE OF BLUE-GREEN INFRASTRUCTURE AND ECOSYSTEM SERVICES IN A PROCESS OF SUSTAINABLE SPATIAL DEVELOPMENT OF MAIN POLISH CITIES'

Agnieszka Kowalewska

This thesis concerns the integration of ecosystem services and blue-green infrastructure (BGI) into spatial planning. Ultimately, such process is expected to lead to sustainable urban development in both spatial and environmental aspects. The main purpose of it is to support implementation of Agenda 2030 SDGs' - especially Goal 11, in terms of sustainable human settlement planning and management, access to green areas, resource efficiency, mitigation and adaptation to climate change, as well as cities' resilience to disasters and to contribute to the improvement of people's quality of life.

Against a broad theoretical background concerning the principles of sustainable urban planning, as well as BGI and the concept of ecosystem services, case studies were presented, including an analysis of studies of the conditions and directions of spatial development and other documents currently in force in the subject area in big Polish cities. The case studies made it possible to identify gaps in planning practice, which the author proposes to fill with the help of the model presented in the work, which is the backbone of a universal construct understood as a way (algorithm) of proceeding.

The proposed model includes a matrix assessment of urban areas in terms of their potential to provide ecosystem services and the demand for these services, as well as principles for further balancing them spatially. From a planning point of view, it is a method of evaluation of urban areas in terms of their predispositions to form a city-wide BGI system. The proposed way of analysis makes it possible to identify areas that provide the services, as well as areas that show deficits in terms of access to them. Balancing ecosystem services makes it possible to optimize the functional and spatial structure of cities in terms of an overall share of BGI, as well as the distribution of BGI areas within walking distance of residential areas. This will make it possible to indicate the directions of spatial development of the BGI system of cities in terms of the designation of new areas and the formation of links between them. In light of that, the next step would be to determine the ways and principles of development of the areas forming the blue-green infrastructure according to their potential.

The entire process shall lead towards sustaining the spatial and environmental structures of the city, which will ensure the achievement of appropriate proportions of land use, allowing "preservation or restoration of natural balance and proper living conditions" (according to the provisions of the Polish Environmental Protection Law, Article 72 paragraph 2).

The model, due to its general nature, is characterized by flexibility in both the typology of sites, the set of services analyzed and their evaluations. It represents the author's response to the shortcomings present in both the state of knowledge and planning practice with regard to the subject of the work, and allows adaptation to various local conditions.

Key words: ecosystem services, blue-green infrastructure, spatial planning, matrix assesment, valorization of urban areas, adaptation to climate change, quality of life.

AKowalewska