

123 Where green is greener? Multi-data approach for typology of urban green spaces

Marta DEREK¹, Sylwia KULCZYK¹, Edyta WOŹNIAK², Tomasz GRZYB¹, ¹University of Warsaw, Faculty of Geography and Regional Studies, Poland. ²Polish Academy of Sciences, Space Research Centre, Poland

As the global level of urbanization is rising, with 74% of Europeans living in urban areas (United Nations, 2018), public green spaces located within urban and peri-urban zone remain the most accessible (and sometimes unique) option of direct contact with nature. Such a contact can provide a variety of immaterial benefits for humans, identified as Cultural Ecosystem Services (CES). Like other Ecosystem Services (ES), CES are vulnerable to external impacts, such as urbanization processes. However, unlike other types of ES, cultural values of ecosystems or landscapes are irreplaceable: once destroyed, cannot be restituted (Plieninger et al., 2013). Therefore, their proper management is the issue of a great importance. CES are co-production of environmental features and cultural practices, what results in a constant need for new methodological solutions based on interdisciplinary approaches. Understanding patterns of CES flow is recognized as crucial for effective landscape management and policy development (van Zanten et al., 2016).

Hegetschweiler et al. (2017) found out that studies which had examined CES in urban areas tend to focus on supply or demand factors, but rarely establish links between one another. The need of further research on linkages between different types of green infrastructure, a variety of forms of their use as well as on gained benefits is also underlined by O'Brien et al. (2017). Such an approach requires combining natural and social data together. In this study we address this challenge.

The aim of the research is to develop a typology of public green spaces (hereinafter PGS) in an urban zone, basing on the character of CES flow. As this flow can be influenced by management, it is important to propose an approach which will include a variety of data reflecting natural features of PGS as well as preferences and behaviours of its visitors. A typology of urban green areas can help in successful management especially on the urban zone level, where a more holistic and integrated approach is needed.

In this study, we address three interconnected types of CES: recreational, educational and aesthetical services; all recognized as important CES by the most popular ES classifications (MEA, TEEB, CICES). Warsaw Urban Zone, understood as the city of Warsaw and its border zone (18 municipalities which border the capital city) will be used as an example. We will focus on green spaces that are publicly accessible and cover at least 2 ha. According to Zick et al. (2009) this is the minimum size of green area that allows an adult person for active recreation and brings a chance for isolation from urban buzz. We adopt a hierarchical approach and connect a set of different data, both natural and social, into the analysis; namely:

- Data reflecting a spatial context of PGS. A place of PGS within the structure of green areas in Warsaw Urban Zone (e.g. isolation, patch cohesion), as well as their accessibility for potential users (e.g. population within different distance zones), will be taken into account;
- Data reflecting an ecological context of PGS. The size, shape, land cover diversity and presence of unique natural objects will measure physical availability. Presence in social media and/or events organized in PGS will reflect its intellectual availability;
- Data reflecting a social context of PGS. This demand side of using green areas will be shown by data from a survey undertaken on a representative sample of 1000 residents of Warsaw Urban Zone, and will indicate, among others, the activities and preferences towards PGS (see Figure 1).

This multi-data approach (and, consequently, a multi-method approach) will result in developing eight different typologies of PGS, each based on specific spatial, ecological and social contexts (Figure 1). Spatial diversity of all the gathered characteristics will be analyzed. It will serve to identify relations between public green spaces and their users within the urban area. Finally, by merging the created eight

typologies, the final typology of urban public green spaces based on the character of CES flow will be

developed, and shown on the map of Warsaw Urban Zone.

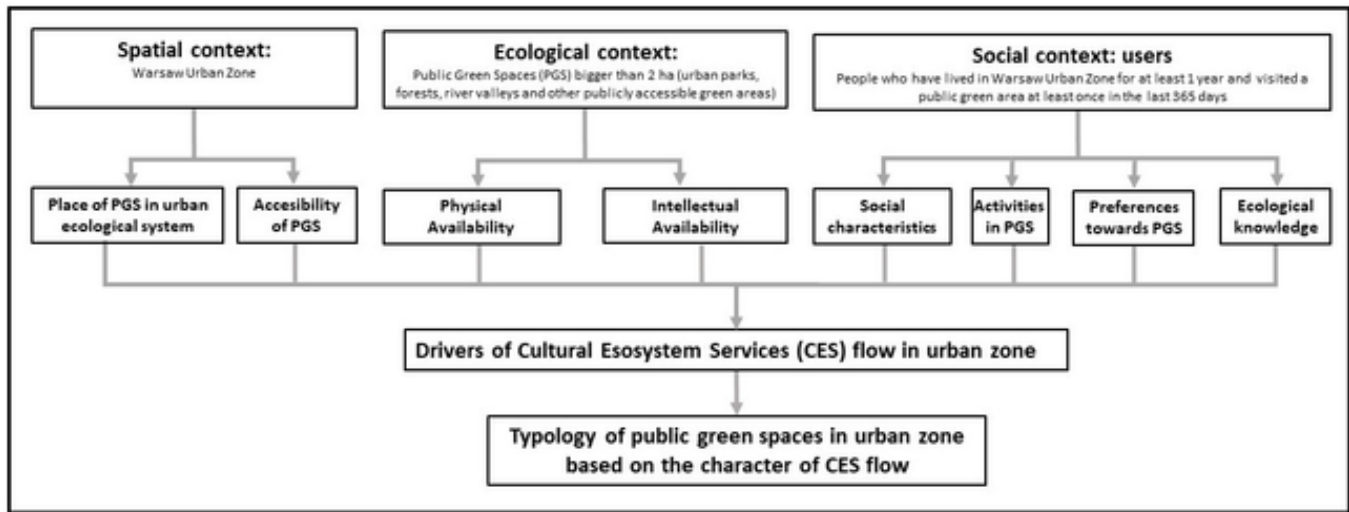


Figure 1. The scheme of the research

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