Greenspace Justice in Vienna: A Research through Design Approach

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1. Abstract

Urban greenspaces (UGS) help cities and their population cope with the consequences of climate change and have a vital positive effect on people's health and well-being. Public greenspaces are therefore an essential component of urban infrastructure. The City of Vienna offers a high proportion of public greenspaces. However, these are not evenly distributed and not necessarily accessible or affordable for all citizens. To achieve greenspace justice, it is crucial to provide equal access and usability that meets people's needs. The present work contributes to the debate by including issues of equity and justice in the context of public greenspaces. A Research through Design (RtD) approach is used to design and sketch out an ideal situation for the provision of public greenspace. The requisite measures are then developed to achieve these ideal conditions. In this paper, we present the first methodological steps in an unconventional approach to creating new perspectives on existing policy and planning frameworks and developing innovative strategies to improve greenspace justice in cities.

2. Introduction

Public urban greenspaces (UGS) are an important environmental resource owing to their numerous positive effects on people's health and well-being and their environmental benefits which have been widely studied and recognized (see Hunter et al. 2019; Bowler et al. 2010). It is a common assumption that the positive effects of UGS benefit the entire urban population equally (Calderón-Argelich et al. 2021). However, an observation of the spatial distribution of greenspaces in conjunction with socioeconomic parameters reveals a different picture. Neighborhoods with a high quality of life and greenspace close to home are not necessarily accessible or affordable for all citizens. As different studies indicate, low-income, socially disadvantaged, or marginalized groups are more likely to live in neighborhoods that have less urban greenspace in their immediate living environment (Anguelovski 2016). As these groups tend to live in high-density residential areas, which are often additionally affected by pollution, heat stress, or poor air quality, they are in greater need of the health benefits and environmental resilience of public greenspaces (Ward Thompson et al. 2016). To ensure a physically and psychologically sound living environment, greenspaces close to home must be available for all residents. At the same time, a well-balanced supply must be ensured so that an improvement in greenspace provision does not lead to undesirable social effects, such as displacement or an increase in the cost of local housing (green gentrification) (Cucca 2020).

In its strategic guidelines, the City of Vienna states that it will ensure attractive and usable public space for all inhabitants in their neighborhood and sets standards for greenspace provision. In a catchment area of 250 m, each inhabitant should have at least 3.5 m^2 of greenspace at his or her disposal (Vienna City Administration 2015). In addition, the city also develops criteria that define the quality of stay (Vienna City Administration 2018). However, these benchmarks are not always

achieved, especially in the existing, dense city. Inequalities in greenspace accessibility have been particularly exposed by the COVID-19 lockdowns and the increased need for nearby recreation and recovery (Reinwald et al. 2021).

In this publication we present the methodological steps of an ongoing investigation commissioned by the Vienna Chamber of Labor (Arbeiterkammer Wien). The study sets out to identify recommendations for specific action to improve greenspace justice across Vienna. Referencing two densely built-up and socioeconomically vulnerable areas in Vienna, the present study seeks to determine how their current undersupply of greenspace can be addressed by applying an RtD approach (Prominski and Seggern 2019). This publication provides insights into the methodological research process by presenting one of the design proposals developed.

3. Background and Literature Review

There is a small but growing body of scholarship in Europe covering the topic of greenspace justice (Rutt and Gulsrud 2016), mostly by exploring the accessibility to and distribution of high-quality urban greenspaces in relation to age, religion, ethnicity, and population density (see Wen, Albert, and Haaren 2020; Kabisch et al. 2016; Kabisch and Haase 2014; Comber, Brunsdon, and Green 2008). Yet, issues of equity and justice in the decision-making around UGS are largely absent in research and practice (Rutt and Gulsrud 2016). To ensure the positive effects of greenspaces for the population, many European cities provide threshold values for greenspace (Kabisch and Haase 2014). These standards typically recommend both a minimum area of greenspace per local resident and a maximum distance that any resident should travel to reach their closest greenspace (Kimpton 2017). However, these are usually only of a recommendatory nature and are aimed at urban development projects. In the existing city, it is argued, there is not enough available space owing to the different interests that converge in a limited area. The understanding of greenspace justice is clearly broader than the above-mentioned distributive approach, which focuses on the fair allocation of benefits and access to them for all social groups. In analogy to the socio-environmental justice concept developed by Kabisch and Haase (2014), greenspace justice also includes procedural and interactional justice. Greenspace justice can thus be described in three dimensions:

- *Distributive justice* refers to the equal availability, accessibility, and attractiveness of public greenspace for different population groups within a neighborhood. “Availability” relates to whether public greenspaces exist close to where people live; “accessibility,” to whether people can freely reach and enter UGS, with respect to both physical and psychological barriers; and “attractiveness,” to whether UGS meet the expectations of their users, with regard to the available amenities and activities, landscape metrics, and biodiversity (Kronenberg et al. 2020).
- *Procedural justice* is concerned with the fair integration of all affected groups into UGS planning and decision-making processes—regardless of ethnicity, national origin, income, or educational level (Kronenberg et al. 2020; Kabisch and Haase 2014). Also referred to as participatory justice, it involves participatory and inclusive decision-making processes that are linked to the transparent and sincere participation of residents (Calderón-Argelich et al. 2021). It also includes all the formal and informal frameworks that allow for bottom-up participation or support in the implementation of users’ design and usage ideas. According to Rutt and Gulsrud (2016), critically evaluating decision-making processes, including

differentiated power relations, is an important aspect of procedural justice that needs to be explored.

- *Interactional justice* means that representatives of different identities, behaviors, attitudes, perceptions, and values are free to use UGS without facing discrimination. Even though a UGS is available and accessible, it does not mean that it fulfills the needs of its users. Differences in age, gender, cultural background, and educational status influence perceptions of greenspace, and thus the potential for people to engage with such spaces (Lennon, Douglas, and Scott 2017). The recognition of different behaviors, attitudes, perceptions, and values is a precondition for interactional justice.

The growing need for more intensive development in urban areas raises questions regarding how and where greenspaces might fit into this concept of a high-density compact city and how their provision can be managed as just as possible (Kabisch et al. 2016). The method of designing is particularly suitable for proposing possible futures for complex entities such as urban landscapes (Prominski 2019). Processes and tools that we use as designers can serve as a research tool. The main objective of the paper is to present methodological steps of the applied RtD approach. It further reflects on the extent to which the design process in the study is suitable for gaining generally applicable knowledge.

4. Method and Data

The study aims to elaborate possibilities for action in urban planning for equitable greenspace provision based on site-specific design concepts developed for two areas of Vienna. For this, we use the method of RtD proposed by Prominski and Seggern (2019). The inclusion of design processes in knowledge production proves to be a useful enrichment of knowledge when it comes to answering socially and spatially relevant questions in a practice-oriented and application-related way (Prominski 2019). Alternatives can be drafted and demonstrated on the basis of design-oriented research. In order to meet scientific requirements, the applied RtD process involves the following methodological steps:

Literature analysis: First, a scoping review of the literature is conducted through searches of academic and gray literature to identify concepts and aspects of greenspace justice. Literature in English and German is searched via sources of scientific literature, namely Scopus and Web of Science. In addition, the current state of greenspace provision in Vienna and internationally is investigated, as well as urban policies and tools that support greenspace justice. In selecting the literature, the focus is on the European context.

Selection, analysis, and mapping of study areas: For the design concepts, two areas in Vienna are selected that show a lack of greenspace supply and fulfill various socioeconomic criteria relevant to the topic, such as income, population density, and age. In terms of greenspace equity, confined living space and limited ability to afford private open spaces or trips to distant recreational destinations appear relevant, as these areas have an increased need for greenspaces close to home. The site selection is based on existing socioeconomic data and spatial information in cartographic representations that are publicly accessible and thus generally comprehensible. Data sets from Open Data Austria, Statistics Austria, and the City of Vienna serve as a basis and are combined with GIS software. The analysis of the selected areas is based on publicly available data material of the City of Vienna, such as aerial photographs, zoning and development plans, multipurpose

maps, geographic information content. Missing information is supplemented by site visits. The mapping is carried out according to selected criteria (current greenspace supply and structure, building structure, local supply, and social infrastructure, potential areas for greenspace design). As an interpretative representation of reality aimed at exploring development potentials, mapping is already an analytical step in design-based research.

Design process: For these two selected sites, design proposals are developed that attempt to give a specific spatial-design response to the issue of improving greenspace justice. In a co-creative workshop, experts from urban planning, district management, spatial planning, geography, landscape planning, and landscape architecture jointly develop designs at a conceptual level. These designs are represented using a computer-aided design program and further detailed by the authors.

Process analysis: The individual measures are subjected to a reality check to analyze the required steps in the planning, implementation, and maintenance process. Relevant actors, strategies, and instruments are identified and described on the basis of research into Viennese planning and legislative documents. These factors are related to one another in a process of visual illustration using a graphic design program. The analysis seeks to examine the implementation process from the different dimensions of greenspace justice. Critical points and potentials are identified. Recommendations for action are then formulated using good-practice examples from the literature.

5. Results

This chapter draws on examples to present the application of the method described above. Figure 1 illustrates the methodological steps applied in the design and analysis process for one of the study areas.

Site selection: Two sites in Vienna were selected based on the superimposition of maps and data sets (Figure 2). The superimposition shows that the densely populated, inner-city areas are the very ones that are undersupplied with green space. By including the criteria of living space in m² per person and annual net income, the selection was narrowed down to those areas that are already outside the higher-income inner districts. Of the areas identified, two locations of about 10 ha each were chosen in Vienna's 10th district (Favoriten) and 15th district (Rudolfsheim-Fünfhaus).

Site analysis: The site analyses provided an understanding of the place and a basis for the design process. They also revealed further inequalities: trees in the public space are currently not evenly distributed across the area (Figure 3). In terms of numbers, there are approximately 36 inhabitants for every tree in the public space of the study area. To provide every inhabitant with one tree, around 2,310 additional trees must be planted within the area, including public and private space. This analysis subsequently led to existing gaps being closed with tree plantings in the design process.

Design process: The design exercise was conducted in collaboration with experts and stakeholders: an ideal situation of public greenspace provision was envisioned and sketched for the specific site, taking into account the results of the site analyses. Issues of equitable provision and distribution, accessibility, quality, and usability of public greenspaces were addressed on a conceptual level. The designs focus on the conversion of streets into greenspaces points to a high spatial potential in the existing city and the importance of an equitable distribution of street space (Figure 4).

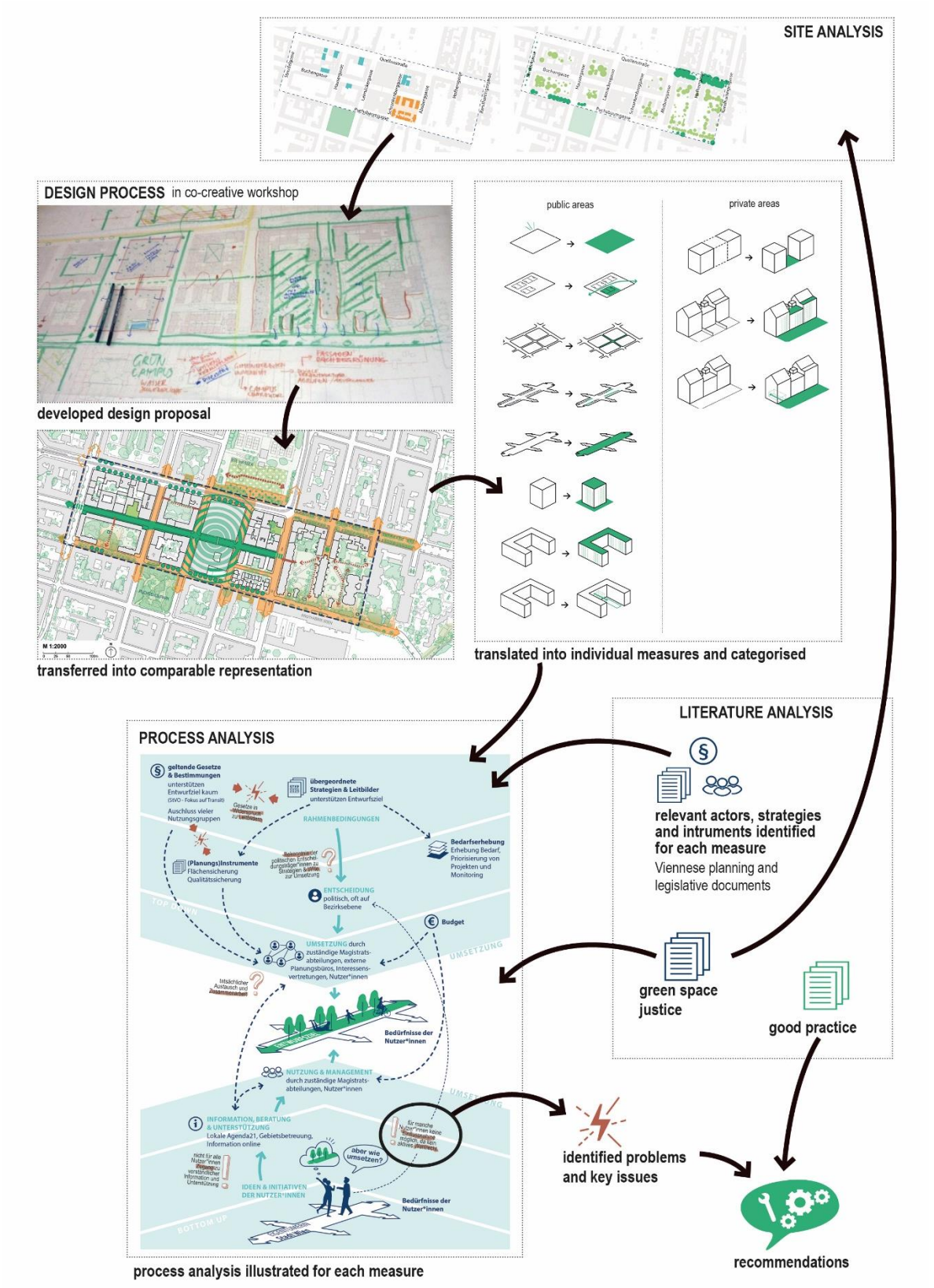

Figure 1. Methodological steps in the design and analysis process for the study area in Vienna's 10th district. Source: authors.

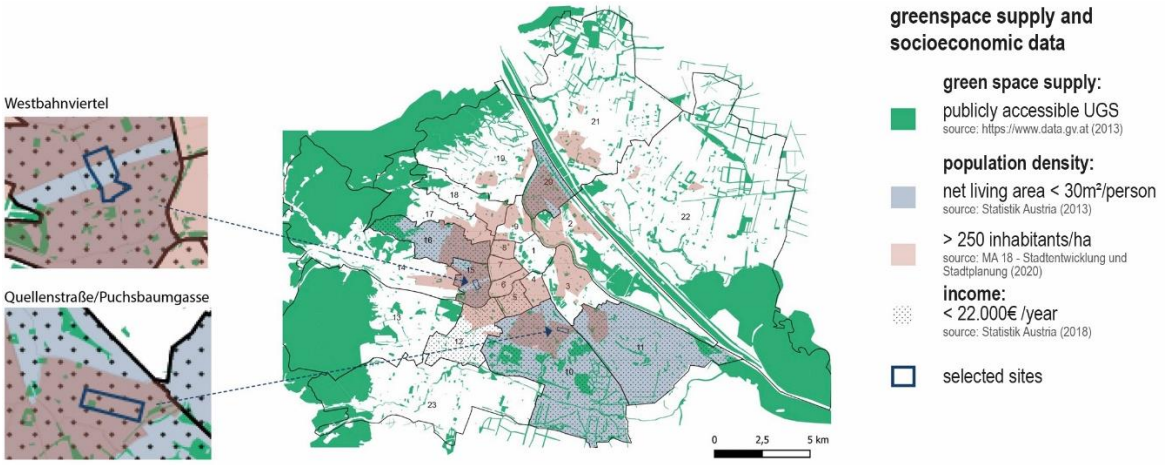

Figure 2. Site selection based on greenspace supply and socioeconomic data. Source: authors.

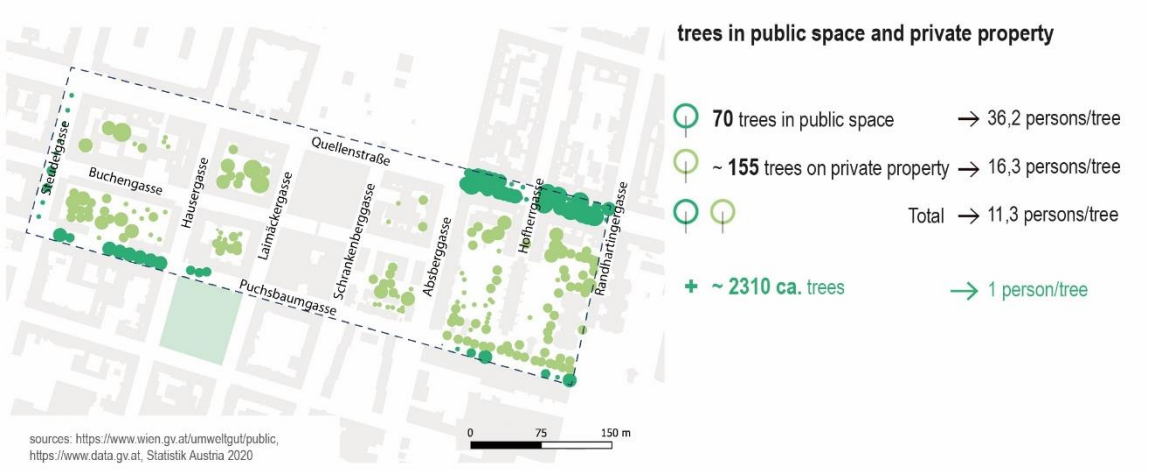

Figure 3. The site analysis illustrates unequal distribution of trees in public space. Source: authors.

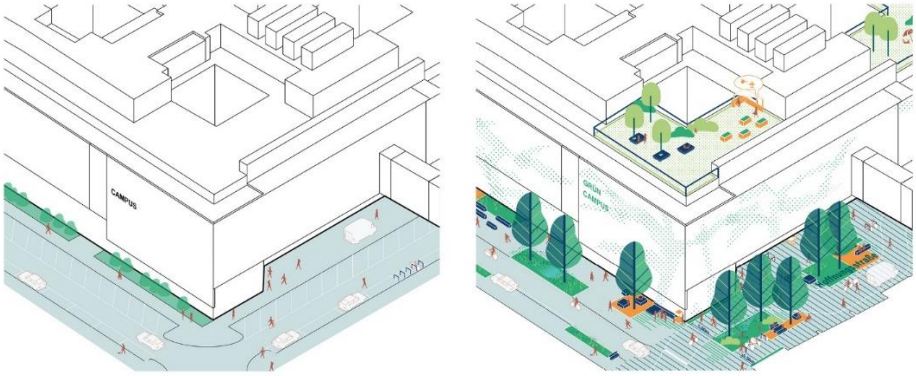

Figure 4. Detail of the existing situation (left) and a developed proposal (right). Source: authors.

Process analysis: Subsequently, the existing and necessary conditions for the implementation of the design were analyzed. For this purpose, a schematic step was introduced in which the site-specific actions were translated into generalized measures and summarized in a catalogue (Figure 1). The identification of these individual measures proved to be an important step, which facilitated the analysis of the implementation process of the designed visions. The multitude of different actors, ownership structures, and associated planning and legal documents could then be broken

down to individual measures and investigated, whereby procedural and interactional justice was also taken into account when screening municipal planning and policy documents. The relationships and dependencies were worked out and identified using a graphical representation. This allowed for a critical evaluation of decision-making processes, including nuanced power relations, which represents an important aspect of procedural justice. In reflecting on the literature, one key finding is that although individual measures can improve greenspace supply locally, equitable and just distribution needs to be addressed citywide and include socioeconomic factors.

6. Discussion and Conclusion

The design process carried out in this study served to develop and concretize images geared to the improvement of greenspace provision in two selected areas of Vienna. The production of knowledge was enhanced by the inclusion of a site-specific dimension. The development of different scenarios and their projection and communication through plans and visual representations facilitated reflection on the impacts of the respective transformation options. Prominski (2019) stresses the importance of RtD in meeting scientific demands and criteria, owing to the specific and projective nature of design. In our case, the methodological step of process analysis made it possible for the proposals to be considered and rechecked in light of scientific findings from the literature. The new insights so gained were fed back into the process analysis. This gave a meta-level to the site-specific proposals, allowing for generalization, which is especially important when the recommendations for action are being formulated. One limitation we faced in our design setting was the integration of procedural justice and interactional justice dimensions in the design process. These aspects were addressed to some extent in the process analysis for the implementation of each measure. Despite this limitation, the unconventional RtD approach of first creating an ideal situation allowed us to go beyond existing regulations and property constraints. Future alternatives focused on greenspace justice allowed a reassessment and evaluation of the current situation. The site-specific design proposals served as a methodological step. To achieve justice, citywide consideration and action is required, especially at the political level. RtD seems a promising approach for creating new perspectives on existing political and planning frameworks and for developing innovative strategies to improve greenspace justice.

7. References

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