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Improving Participation in Green Infrastructure Planning

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ABSTRACT

Green infrastructure is a strategic planning concept that is able to address environmental, social and even economic problems by supplying a variety of benefits for society. Especially in times of public financial crises and spatial transformation, it is important to ensure that those services are high quality to guarantee that they will provide the intended benefits by integrating stakeholders' knowledge and experience into green infrastructure planning. Active stakeholder participation leads to legitimate and informed future planning that accounts for society's needs. This paper investigates participation approaches of six green infrastructure investments in Belgium, the UK, Germany and the Netherlands. The major aim is to explore how and when participation should take place to optimize participation in green infrastructure planning. This is achieved by surveying the stakeholders involved and conducting stakeholder discussions to identify their views on the participation approaches employed and their integration into the planning process. We found that stakeholders were generally satisfied with how they were involved but desired a broader and more tailored mix of approaches. Furthermore, we found several Arnstein gaps, which lead us to conclude by suggesting recommendations that are helpful for successful participation in green infrastructure planning.

KEYWORDS

Green infrastructure; participation; Arnstein gap; stakeholder interview; stakeholder discussion

1. Introduction

Green infrastructure is both a strategic planning concept and an implementation approach. According to the European Commission, green infrastructure can generally be defined as a strategically planned network of high-quality natural and semi-natural areas that include other environmental features and is designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban settings (European Commission, 2013). At present, cities in particular are experiencing substantial transformations due to economic and demographic change and the urbanization processes such change entails. This leads to complex environmental problems and challenges, such as pollution, the loss of biodiversity, overpopulation and land consumption. Moreover, due to their dense housing, working and information networks, cities provide a remarkable

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foundation for new forms of governance and planning that are able to develop solutions to complex environmental problems (Young & McPherson, 2013). As a concept for strategic spatial planning, green infrastructure can cope with and respond to these societal changes and challenges (Albrechts, 2013; Roe & Mell, 2013; Young & McPherson, 2013). On the ground, green infrastructure is able to address social, environmental and economic issues through the provision of ecosystem services and the benefits of these services such as recreation, species protection and quality of place (Faehnle *et al.*, 2014; Kabisch, 2015). This highlights that green infrastructure is highly relevant for the quality of life in our cities and regions (Rymsa-Fitschen *et al.*, 2014).

Just as gray infrastructure requires steady financial support and maintenance to serve its function, green infrastructure requires the same support to provide the multiple benefits it is capable of delivering to society (Young & McPherson, 2013). This is why green infrastructure is becoming increasingly important for society. At the supranational and national level, this is already well recognized, for example, the European Commission enforces effective green infrastructure planning by developing guidance for planning and implementation (see European Commission, 2013). Despite this, many city planners still regard green infrastructure as of limited relevance, as it does not, in contrast to gray infrastructure, generate any direct financial revenue such as taxes (Mackrodt & Helbrecht, 2013). Thus, cutting resources for green infrastructure planning and management is common, as the benefits of green infrastructure investments are not easy to capture or to transfer (Hanley & Barbier, 2013). Importantly, research stressed that urban green is a relevant urban amenity in delivering urban quality of life (TEEB, 2010). In this paper, we focus on the relevance of participation in delivering efficient green infrastructure planning. This is a serious issue in planning practice, as the problems outlined above may result in a lower consideration and integration of stakeholders' input. However, due to green infrastructure's considerable societal benefits, all groups of society should have a say in its planning and implementation to ensure that it meets their requirements. This highlights the need for efficient participation, as local stakeholders' expertise can advance our understanding and therefore the outcome of green infrastructure efforts (Mackrodt & Helbrecht, 2013; Faehnle *et al.*, 2014).

Participation and a suitable approach for improving green infrastructure planning and management are needed (Southern *et al.*, 2011; Luyet *et al.*, 2012), as stakeholders desire greater voice in the planning and design of green infrastructure. Such strategic approaches remain rare and efforts to institutionalize environmental or 'green' governance are underdeveloped. The issue is how to embed participation in decision-making (Scott, 2011). This is especially the case in green infrastructure planning, as stakeholders' preferences and values regarding their environment are valuable information for decision-making (Faehnle *et al.*, 2014). The relevant questions in this context are *who?*, *when?* and *how?* (Luyet *et al.*, 2012). The consideration of the appropriate stakeholders at the proper phases of the planning process and the choice of suitable participation tools are essential. This leads to the complex question of what an ideal participation process in green infrastructure planning should be. Luyet *et al.* (2012) discuss the *who?* and the *how?* of stakeholder involvement, while we mainly address the *when?* and the *how?* by relating our analysis to typical green infrastructure projects. This paper provides evidence to gain insights into the wide range of participation concepts and addresses the questions of what conceptual elements to choose, when and why by presenting examples of different green infrastructure case studies and evaluating their participation approaches. To optimize participation in green infrastructure

planning, we present lessons learnt from green infrastructure projects in Belgium, Germany, the Netherlands and the UK and propose recommendations for successful participation in green infrastructure planning and management. As participation remains an ongoing process that is developing in theory and in practice, new aspects and methods consistently appear. Thus, it is becoming an increasingly complex subject that always needs to be adopted in a manner that accounts for the context (Luyet *et al.*, 2012). Therefore, we wish to contribute to the development of participation in this field by illustrating green infrastructure stakeholders' views on participation. A key element in our investigation is how stakeholders perceive participation in the planning processes of the presented green infrastructure projects. As Faehnle *et al.* (2014) note, stakeholders' perceptions of their input to the green infrastructure planning process are relevant and underresearched.

In the following section, we frame green infrastructure and explain the need for participation in its planning and delivery, introduce Arnstein's ladder of participation (Arnstein, 1969) and relate certain participation methods and tools to it that are relevant for green infrastructure planning and management and finally discuss participation. Thereafter, we describe the case studies of green infrastructure projects from Belgium, Germany, the Netherlands and the UK and their participation approaches. Then, we explain the methodology we employed to investigate stakeholders' perceptions of the participation concepts. The results' section provides the findings of our analysis and presents stakeholders' views on how participation should be organized. The findings are discussed in the light of the need for innovative participatory approaches in green infrastructure planning and management and more general problems of participation such as 'implementation gap' and 'Arnstein gap.' We conclude with recommendations for successful participation in green infrastructure planning and management.

2. Participation in Green Infrastructure Planning and Management

Healey already noted 1992 that issues related to environmental planning are increasing. Therefore, she calls for a more democratic, communicative and dialog-based way of strategic planning, which is based on the principle of mutual learning among participants of the environmental planning process (Healey, 1992). Strategic planning was invented to address the shortcomings of traditional land-use planning such as thinking in administrative levels, focus on land-use control, its formality and the neglect of public participation and to guide spatial changes (see Albrechts, 2004; Albrechts & Balducci, 2013; Kunzmann, 2013). According to Healey *et al.* (1997) and Kunzmann (2000), Albrechts and Balducci (2013, p. 18) define strategic spatial planning 'as a transformative and integrative public-sector-led co-productive socio-spatial process through which visions or frames of reference, justification for coherent actions, and means for implementation are produced that shape, frame and reframe what a place is and what it might become.' They clearly point out that one principle of strategic planning is to involve relevant stakeholders in order to embed their knowledge and engagement in the planning process to make planning legitimate and comprehensive.

A way to conceptualize strategic planning is the creation of spatial, transformative strategy making (see Healey, 2008). Healey defines four interacting dimensions of spatial strategy making of which one is 'Enlarging intelligence' (Healey, 2008, p. 442). Describing this dimension, Healey emphasizes that local knowledge 'of those who live, work and enjoy themselves, suffer or invest in a place, those who manage it, argue about it, and get involved

in collective action on its behalf' (Healey, 2008, p. 448) is an essential resource. Strategic planning can be linked to the concept of sustainable development as yonder describes a beneficial strategy for ecological, economic and social issues related to spatial development. Green infrastructure can be clearly identified as an approach to strategic planning and spatial strategy making (Rouse & Bunster-Ossa, 2013). Accordingly, Benedict and McMahon (2002) set out the involvement of stakeholders such as communities, private landowners, public agencies and conservation organizations as one fundamental principle to the planning of green infrastructure.

There is no unique definition or understanding of participation, although a variety can be found in the literature (see Luyet *et al.*, 2012; Maier *et al.*, 2014). We employ the definition of the World Bank (1996), which defines participation as 'a process through which stakeholders' influence and share control over development initiatives and the decision and resources which affect them' (World Bank, 1996, p. xi), as this definition adopts a clear, bottom-up perspective on the participation process.

The potential of properly implemented participation schemes is well known, and innovative methods and tools are continuously developed to improve the potential of stakeholder participation in green infrastructure planning and management. The basic approach to participation is Arnstein's ladder of participation (Arnstein, 1969). Arnstein uses the metaphor of a ladder to structure the levels of involvement between public bodies and citizens that increase with each rung. Originally, Arnstein (1969) suggested three main types of participation (Nonparticipation, Tokenism and Citizen Power) in the ladder that includes eight rugs. To date, many have adopted the principle of the ladder not only for citizen involvement but also for communicative stakeholder participation processes in general and have revised it by extending or changing several rungs to detail the degrees of involvement and to consider the more explored and developed participation approaches employed at present (see Mackrodt & Helbrecht, 2013; Williamson & Parolin, 2013; Cerar, 2014). Especially, at high levels of involvement, diverse methods have emerged over time and, in particular, methods addressing higher levels of involvement, such as citizen control or public empowerment, have been developed (Luyet *et al.*, 2012; Cerar, 2014). In line with Luyet *et al.* (2012), we use five levels of participation: information, consultation, collaboration, co-decision and empowerment (see Table 1). While the information level is defined as simply describing the project to stakeholders, consultation goes one step further and solicits their opinions, which may be considered in decision-making (Luyet *et al.*, 2012). Collaboration is similar to consultation but guarantees that stakeholders' suggestions are considered. Co-decision implies that the public body and stakeholders work together to reach consensus, and empowerment means that all decision-making power is delegated to the stakeholders; here, the public body may only act as a moderator. Related to the levels of involvement, there is a range of common participation methods that are potentially able to achieve certain levels of involvement (see Table 1). The selection of the methods in Table 1 is based on the case studies' participation approaches and assessed related to their reachable level of involvement according to Luyet *et al.* (2012).

The main question concerns which identified stakeholders should be involved at various degrees of participation. The answer to this question is crucial for the choice of the participation method and has a substantial impact on the entire participation process. The implementation of an inappropriate degree of involvement may result in conferring an inappropriate level of power to a stakeholder and in a non-suitable participation technique.

Table 1. Participation methods and their potential level of involvement.

Methods	Level of involvement				
	Information	Consultation	Collaboration	Co-decision	Empowerment
Newsletter					
Reports (Press Campaign)					
(Interactive) Website					
Open Space Method					
Opinion Survey					
Presentation, Public Hearings, Symposia					
Site Visit / Exploratory Walk					
Meeting					
Round Table					
Social Media					
Charrette					
Geospatial/ Decision Support System					
Focus Group					
Workshop					
Performative Participation					

Source: adapted from Luyet *et al.* (2012).

Unfortunately, there is no standard approach for selecting the correct participation method or tool, but Luyet *et al.* (2012) provide a list of factors for consideration. The discrepancy between the desired and achieved levels of stakeholder participation that are held by project leaders and engaged stakeholders is defined as the so-called 'Arnstein Gap' (see Bailey & Grossardt, 2010).

Another horizontal layer that could be added to the five-step ladder model is 'performative' participation. This term describes physically active stakeholders and expert-led interventions in the public realm through use of materials such as community gardening (Turnhout *et al.*, 2010; Mackrodt & Helbrecht, 2013). The difference from the typical, primarily communicative participation approaches, such as round tables or meetings, is performative participation's focus on joint designing and implementing on the ground. Importantly, performative participation is possible at all levels of involvement. Characteristics of performative participatory planning are materiality, outcome focus, open outcome and audience-orientation. It is particularly suitable for green infrastructure projects because of the availability of sufficient public space and the opportunities green areas offer for stakeholders to actively design and act spatial in a do-it-yourself manner. Thus, it is an ideal adaptation strategy for the current challenges in planning, such as limited resources or brownfields being designated for interim uses and art in public spaces by supporting coproduction among stakeholders (see Turnhout *et al.*, 2010; Mackrodt & Helbrecht, 2013). Performative participation supplements the classic communicative approaches to participation by providing an alternative opportunity for individuals become involved in planning and for planners to receive feedback. Due to its characteristics, it has considerable potential to activate the public, especially hard-to-reach groups, as specific knowledge, including language-related knowledge, is not required, and many other approaches favor well-educated individuals. Nevertheless, performative participation has limitations, as its success is dependent on the engagement of stakeholders and the openness of local planners (Mackrodt & Helbrecht, 2013).

In addition to this innovational concept in face-to-face interaction, the Internet offers a new communication and design platform for participation, and geographic information

systems that permit public participation may have significant potential in this regard (Brown, 2012; Mackrodt & Helbrecht, 2013). However, there is no evidence that technology is improving the quality of participation especially as particular groups of stakeholders that have no access to or are reluctant to use information technology are excluded from those participation methods (Brown, 2012; Luyet *et al.*, 2012). In contrast, web-based approaches like visualizations or social media help to activate those stakeholders that are technically oriented and therefore mainly interacting via these channels (Williamson & Parolin, 2013) and can be used in all phases of planning (Bizjak, 2012).

Participation may not only provide advantages for decision-making but can also be regarded critically. General reservations related to participation arise due to the provision of insufficient resources to conduct it, insufficient knowledge of methods and approaches among both government and stakeholders, and the problem of identifying and selecting appropriate stakeholders to participate (Rydin & Pennington, 2000; Maier *et al.*, 2014). Most important, there is no evidence that participation achieves its intended goals (Newig & Fritsch, 2009; Scott, 2011; Maier *et al.*, 2014). Thus, the efficacy of participation is questionable, especially because it is time- and cost-consuming (Rydin & Pennington, 2000; Southern *et al.*, 2011; Luyet *et al.*, 2012). Specifically, broad participation and the use of diverse methods may be democratic but can also lead to vague and toothless results, which seem inefficient or contradictory and can therefore hardly be used in decision-making (Maier *et al.*, 2014). The limitations of each method must be considered, and even the use of a combination of methods does not guarantee solutions to policy problems. Even among decision-makers, there is no consensus regarding when stakeholder participation and its results are most important (Scott, 2011). Maier *et al.* (2014) report that despite the need for and trend toward wider stakeholder participation, this demand is 'hardly affecting the ideologies and interests of the involved groups' (p. 166). Within a participation process, new issues may occur, and thus, problems may increase instead of being solved (Luyet *et al.*, 2012; Maier *et al.*, 2014). The process itself may be unfair and is potentially susceptible to manipulation due to different power relations between the stakeholder groups (Southern *et al.*, 2011; Luyet *et al.*, 2012; Maier *et al.*, 2014). This can generate a relevant fear of power and a loss of accountability in the public sector in favor of the private or semi-private sector (Luyet *et al.*, 2012; Young & McPherson, 2013).

Additionally, the so-called 'participation myth' (Scott, 2011, p. 691) or 'pseudo participation' (Maier *et al.*, 2014, p. 173) is an issue. The phenomenon describes the popular practice among public authorities of providing for minimal participation to fulfill their responsibilities without actually considering results when devising policy. It appears that planners and decision-makers do not take stakeholders' local knowledge seriously enough to consider it, despite that stakeholders' experiential and local knowledge should be understood as an essential resource in a holistic planning approach to green infrastructure (Faehnle *et al.*, 2014). This demonstrates that the quality and type of participation is highly dependent on the planners' and decision-makers' attitudes toward participation and how they implement it (Mackrodt & Helbrecht, 2013). Stakeholders' primary motivation for participating in a green infrastructure planning process should be the opportunity to influence that process (Faehnle *et al.*, 2014). Thus, implementation gaps and Arnstein gaps should be avoided, as proactive and well-defined deliberative approaches are more likely to influence policy than are reactive and ill-suited participation strategies. Instead, participation is often exploited for strategic reasons, as it is generally assessed with respect to its strategic importance

among stakeholders, meaning that the true impact of participatory approaches that integrate stakeholder input into decision-making is debatable (Scott, 2011).

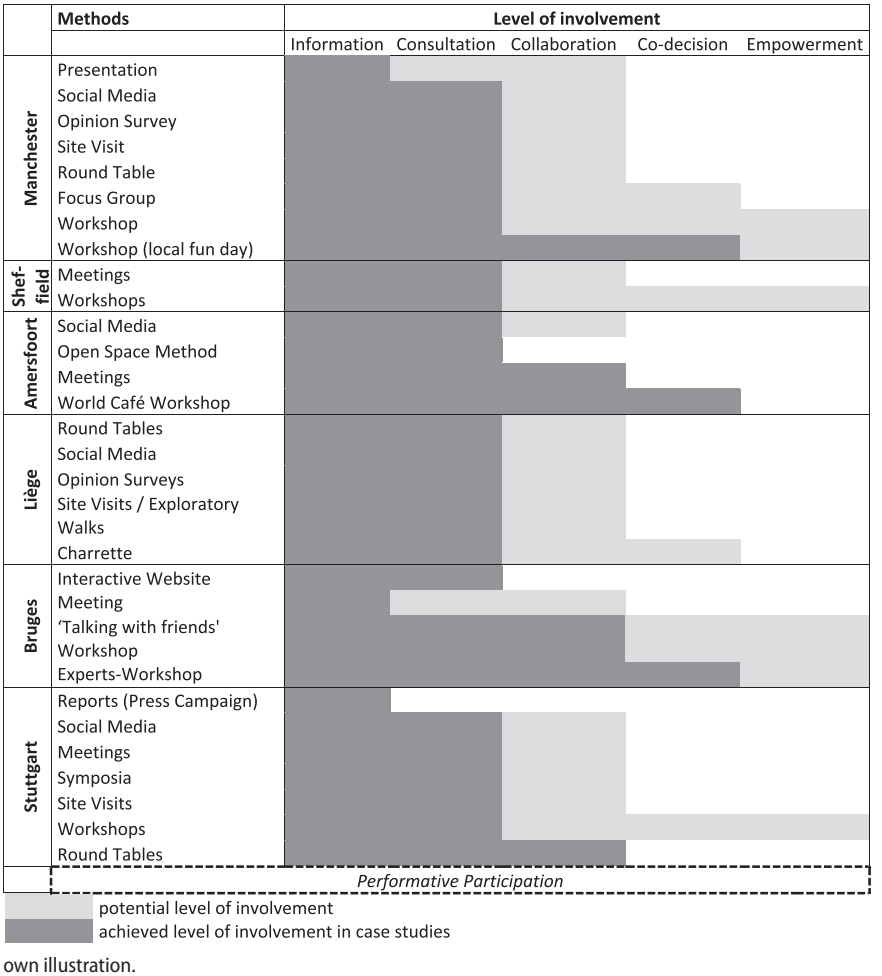
It is essential to understand that participation is context driven: cultural, political and historical contexts have important consequences for the choice and success of a participation strategy (Luyet *et al.*, 2012). When applied in a tailor-made manner, stakeholder participation has many advantages such as the delivery of better policy outcomes in the form of improved conditions for environmental and green infrastructure development and valid information that can be applied in implementation, in contrast to traditional top-down decision-making models (Luyet *et al.*, 2012; Faehnle *et al.*, 2014; Maier *et al.*, 2014). The improvement of decisions made using 'expert' knowledge due to input from the individuals who are affected by a decision and are most aware of the local spatial context is especially valuable (Scott, 2011). Faehnle *et al.* (2014) note that this local knowledge of the environmental conditions of the place and perceptions of them, e.g. those of residents' associations, can enhance understandings of ecosystem services and benefits. By adopting such participatory approaches, planners can determine stakeholders' willingness to develop and maintain green infrastructure (Faehnle *et al.*, 2014). Furthermore, participation can democratize decision-making and justify it while providing transparency for stakeholders (Rowe & Frewer, 2000; Scott, 2011; Luyet *et al.*, 2012; Maier *et al.*, 2014). It is essential to find a balance between the risks of not having all stakeholders involved and the high complexity and costs that the process entails if one adopts a substantial and long-term participation approach (Luyet *et al.*, 2012).

Despite the critique regarding participation's impacts on policy, it is nevertheless important to inform policy-makers of the growing concern with and critiques of certain participation approaches they use and to offer suggestions regarding which approaches to employ and how to embed their findings in policy (Scott, 2011). A key to successful participation is to obtain support from the accepted, most powerful and well-connected stakeholders by convincing them of the practical value of a project to activate other stakeholders. This is a long process and requires building trust (Southern *et al.*, 2011). Then, local stakeholders' knowledge of green infrastructure and professional planners' knowledge should jointly form policy, as both types of knowledge and perspectives are weak when considered in isolation (Faehnle *et al.*, 2014). Finally, evaluating participation is important in improving future participation approaches, specifically, understanding of its impacts on stakeholders (for evaluation criteria, see Luyet *et al.*, 2012, p. 216).

3. Case Studies

The case studies investigated in this article were an inherent part of an international research project intended to demonstrate how local involvement in strategic green infrastructure planning can improve social cohesion and planning efficiency. Although the case studies spread across four different countries, they all involve green infrastructure planning and its strategic planning processes. Here, the nature of public participation varies as much as spatial planning systems, and is equally affected by the specific historical, cultural and governance issues in the different countries (see EIPP, 2009; Rymsa-Fitschen *et al.*, 2014; Wilker *et al.*, 2015). In spite of this, it has to be taken into consideration that every local planning process is affected by its arrangement in the legislation and regulations of the particular country. This paper focuses on participation in green infrastructure projects itself

Table 2. Case studies' applied participation methods and their (potential) level of involvement.



Source: own illustration.

and especially on the lessons learnt which can be drawn out of the comparable analysis of the different approaches to participation, not on issues related to planning culture in the different countries which certainly will have an influence on participation practices. The following section provides an overview about what kind of green infrastructure project was implemented within each case study and which participation concept (in chronological order) was used by the project manager to engage the different stakeholders. The case studies employed common and novel participation methods in green infrastructure planning and management. Table 2 illustrates the methods employed in the case studies and the level of involvement they achieved in comparison with the potential level of involvement as outlined in Table 1.

An investment program in Manchester (UK) represents a meanwhile approach to urban land management that transforms unused plots into community spaces. The need for Manchester to grow more of its own food and be less dependent on importing food from outside of the City has been identified as one of the priority actions in Manchester's Climate Change Action Plan – *Manchester A Certain Future* (Manchester City Council, 2009). In

response to this, the City Council's Environmental Strategy Group set up a working group to discuss the process that would be required for taking forward meanwhile sites to a stage where communities would be invited to participate in the development of these sites as temporary community food growing spaces. The idea of the meanwhile site investments is to involve communities and local authority partners to deliver short- to medium-term benefits for residents while establishing clear lines of communication. These types of vacant sites tend to be in deprived areas, where hard-to-reach groups and residents are excluded from the regeneration process. Thus, the aim of the project is to empower these groups, build new relationships and break down communication barriers, improve social cohesion and, more generally, to create sustainable communities. The investigated investment site was not selected by the City but by a local volunteer who established a steering group to develop the site as a food growing site. Following informational presentations concerning the site and opinion surveys to assess initial ideas, focus group interviews and workshops were held to refine opinions and requirements. Round table discussions were part of these workshops. Throughout the process, social media was used to inform the public and a site event workshop (local fun day) was established to work on the site. This participation concept was pinpointed to use a variety of methods to get hard-to-reach groups actively involved in the project. Therefore, the main aim was to inform people and consult them about their needs for a meanwhile use site. Reason for this was to end up having a site that will be accepted and used by stakeholders. While the early planning phases were more technical and expert-led in nature, a higher level of involvement could not be reached based on a lay and low interest community. To support an uptake in interest, the local fun day was used to show the first investment elements that then were modified by the people doing active gardening as an aspect of co-decision (see Table 2).

Sheffield's (UK) investment site is an example of open/green space provision, as part of the *South Yorkshire Green Infrastructure Strategy* (South Yorkshire Forest Partnership, 2011), which directs limited resources to realize multiple benefits and address current sustainability weaknesses. The investment site was a derelict and underused site within a deprived city-center community; as a result, it was identified as a key site in Sheffield's 'Breathing Spaces' program to provide green infrastructure in the city center. Since 2012, several meetings and workshops have been held with the local community—residents and 'friends of' groups—to discuss land transfer and the maintenance and design of the new park. Parallel to the Manchester case study, the major objective of the participation concept was to inform and consult people about their needs. In contrast, no actions have been undertaken to collaborate or interact more intensively with local stakeholders.

The investment in the city of Amersfoort (Netherlands) involves transforming a former hospital site into a new city park while expanding the adjacent city park. In this case, the municipality and citizens act as equal partners in the redevelopment project. To provide a structure for this partnership, a Core Group was formed that includes representatives from all relevant stakeholder groups. The key-essence in this procedure is that there is no bottom-up or top-down approach, but a genuine cooperation at an equal level of authority, in which all stakeholders together aim to reach a goal via creative discussions and workshops to generate ideas and arrive at a joint plan. The Core Group has provided updates on the goals and ideas of the project, the requirements and limitations relating to time and money to the citizens via social media platforms and a series of meetings that allowed the public to respond to these ideas and plans for the park. Furthermore, open space methods and world

cafes were used at the meetings to share participants' ideas on subthemes in small groups (see Table 2). Over eight months, a Redevelopment and Management Plan was developed. Due to this concept of understanding the mutual interests of administration and other stakeholders, the participation methods used were mainly part of the decision-making process and therefore show a relative high level of involvement of stakeholders. They were not only asked about opinions and perceptions, but they were also enabled to decide on their own within the democratic decision rules of the Core Group.

The investment in Liège (Belgium) involves the revitalization of a park, which includes green spaces around a former military fort. Accordingly, the park is part of the City Project (2012–2022), a strategic action plan developed by the City of Liège, which was accompanied by an extensive participatory process. The development of the park contributes to this plan in developing green spaces, recreational spaces and sports and cultural facilities. Round tables and workshops were employed for consultation of stakeholders to analyze the current situation and to develop references and prospective scenarios applicable to the site (see Table 2). Another part related to level of consultation was to conduct site visits and activating opinion surveys, online or as paper surveys, helping to identify the uses, practices, perceptions, needs and wishes of the citizens. Furthermore, participation methods such as charrette and various activities employed in partnership with the surrounding schools (education works, exercises, etc.) have been used for consultation in the planning process. To promote interest in the debate about the planning process and to encourage the distribution of information, a social media platform was established.

The Green Transport Link in Bruges (Belgium) concerns a participation-led development of a buffer zone—as an accessible green corridor—that is part of a massive infrastructure connection in close proximity to a village. During the planning process, the planners decided to pursue community involvement and participation and a participation process that involved the inhabitants of the village and additional stakeholder groups was begun to determine the needs of the village. During a meeting with residents, the project and participation process were explained and the residents were familiarized with the concept of 'talking with friends' workshop. In preparation for these sessions, a stakeholder analysis was conducted and local key stakeholders were contacted and asked to organize 'talking with friends' workshops in which they invited citizens to their homes. The sessions were summarized by a member of the project group using simplified 3D-visualisations that included the group's suggestions for the site's functions. In that way, public administration did a first step in collaborating with stakeholders. Subsequently, an experts' workshop was organized to identify a consensus design for the site. Here, stakeholders were invited to actively co-decide on the most favorite designs for the green corridor. Finally, a second residents' meeting was held to present all outcomes, and the participants were asked to offer their opinions on the consensus design. They could do so by submitting their remarks via the project's website. The outcome was a conceptual plan for the buffer area. This conceptual plan is now the basis for the spatial implementation plan for the buffer area, which will be developed by the City of Bruges.

The 'Industrial Heritage Route' is part of a master plan series intended to direct green infrastructure development to different landscape areas in the Stuttgart region (Germany). The aim is to create a route that showcases and connects the most important industrial heritage sites and several specially designed open spaces. Furthermore, the investment project is intended to be a participatory process that informs and involves the local public

and collects their views, ideas and knowledge to increase the public support for the route. Those objectives demonstrate that the main interest of the regional planning authority was to consult stakeholders and to get them informed. The more general aspects on the route were already decided on as part of a regional master plan. Sixteen municipalities and two counties cooperated on and contributed to this voluntary, bottom-up participation process to elaborate the concept from 2009 to 2011. As a first step, municipalities, counties, historians and local experts were invited to site visits, workshops, symposia and local meetings to jointly elaborate the concept of the route. Further, local experts were invited to informal regular round tables to be informed about the project, to share their ideas and to establish a network. To reach the broader public, a press campaign was launched that provided information about the project and invited the public to contribute to the route with their stories concerning industrial heritage. Additionally, a weblog was created where individuals could upload their stories, pictures, opinions and ideas.

4. Methods

To analyze the participation concepts employed in the case studies, we applied a two-stage approach intended to combine anonymous surveys on participation methods (stage 1) with stakeholders' operating experiences (stage 2) related to the methods and case study concerned. This empirical approach was conducted to reach two objectives. On the one hand, questionnaires have been used to collect information on standardized topics, for example, the knowledge of certain participation methods or the ranking of particular approaches. On the other hand, discussion-based sessions have been used to derive information on content which referred to the individual case studies to provide extended knowledge on stakeholder settings and decision-making processes. In these sessions, a project manager always attended, so that reflections on the participation process could be discussed based on motivations and objectives of the funding body. Together, both steps lead to the conclusions that we elaborate on. Due to this, results of the steps will not be explained separately but in an integrated discussion.

With respect to the different types of investments, actors and green infrastructure planning processes, and thus the individual participation approaches, it was extremely important to combine survey data with discussion results. This improved our understanding and knowledge of a particular planning process and the participation approach embedded in it, as well as stakeholders' opinions of these aspects. Additionally, we used secondary data on the strategic planning process and its background for each investment that we obtained from the project manager responsible. Our approach offers the opportunity to listen to and understand local stakeholders and learn about their attitudes, which are essential aspects of green infrastructure planning (Faehnle *et al.*, 2014).

The survey from stage one was separated into three main topics: participation approaches that respondents have experienced in the past, what the shape of future participation should be and promising supportive tools (e.g. social media, GIS, 3D visualization) that could be used in stakeholder participation. The discussions in stage two build upon the findings and participants' experiences at their respective case study sites. The aim was to have the participants discuss and respond to the following research questions: (1) How has participation in the particular investment been conducted so far? (2) Which participation methods were used and how did you participate? (3) Are you happy with the results of participation so

Table 3. Number of participants per case study.

	Participants
Manchester	4
Sheffield	6
Amersfoort	7
Liège	8
Bruges	11
Stuttgart	14
Total	50

Source: own calculation.

far? Respondents and participants were not given any information to explain participation methods or tools to not bias results as the first questions focused on the acquaintance of participation methods. Still, the terms of the participation methods and tools were mentioned.

Both stages were conducted in a meeting context that resembled a focus group interview concept and were held in each case study region. The investment partners selected the participants according to who the partners believed the relevant actors were. Due to this, the sample is self-selected and not representative. We see this rather as an asset than a drawback of the approach taken as the main objective of this paper is to elaborate on the particular case studies.

Guided by this approach, the next section outlines the results for each case study. Due to the variety of information collected on the participation processes, we present information on the individual approaches, stakeholders' perceptions and reflect this within the logic of the Arnstein ladder concept.

5. Results

For each case study, the results of the stakeholder interviews will be compared with the results of the stakeholder survey. In each paragraph, we discuss the difference between the experienced levels of involvement with the desired levels. By this, we identify case study-specific possible Arnstein gaps.

The multiple-case study approach was based on an embedded approach (Yin, 2009), i.e. several different cases were analyzed using the same structured approach in the interviews and in the survey. Following the approach described above, the results presented in this chapter are derived from an overall sample of 50 individuals who participated in the stakeholder interviews and survey (see Table 3). Although this sample is too small to derive generalizable information, we are able to conclude on differences and commonalities in participation of the green infrastructure projects based on stakeholders' expectations, perceptions and roles. The individual sample sizes are in line with other research papers based on stakeholder interviews (see Llausàs & Roe, 2012; Young & McPherson, 2013; Morphet & Clifford, 2014). Nevertheless, due to this relatively small sample size, only the main results can be extracted and summarized. Accordingly, more detailed statistical methods cannot be used (Yin, 2009).

Throughout the interviews in Manchester, respondents stressed that due to the use of social media and the involvement of key players in the local neighborhood, it was possible to mobilize hard-to-reach groups to participate in the development of the food growing site. This multi-channel approach (standard participation measures combined with social

media) allowed the project leaders to effectively raise awareness. The highly performative nature of the on-site activities that were held was identified as another key asset of the participation process. All major stakeholders meetings and other special events (e.g. fun days) were located on-site. In the stakeholder interviews, this combination of traditional methods, supported by 3D visualizations, and novel, performative approaches was identified as the key driver of success. The 3D visualizations have been identified to have a high potential to help people more clearly understand the design options for green space projects than two-dimensional drawings and plans. In the case of the Manchester investment, results indicate that stakeholders as well as administration were willing to cooperate and to interact intensively. So, a wide set of participation methods was conducted. In the near future, public administration will further enforce the participation concept on the meanwhile sites by more intensively using stakeholders' ideas to reform the local plans.

The results of the stakeholder survey supported these impressions. The site visits and round tables are the participation methods with which the interviewees were most familiar, followed by focus group interviews and workshops. They also rank those methods as effective in the relevant project phases that were conducted. Linking this to the interviews, the positive evaluation of the classical approaches seems to be driven by the site-based and performative nature of their implementation in Manchester. Another interesting issue is that survey participants showed a clear preference for participating at very early stages of project planning. Thus, beyond the participants' highly positive evaluations of the general approach, their wish to be involved in participation a higher degree from the beginning of project planning was equally important. Although stakeholders were involved on a relatively low level compared to the possible degree (as indicated in Table 2), people did not rate this as having a negative impact on the planning process. The success of this case study was therefore based on the interactive nature of stakeholder involvement. Despite this, stakeholders still stated to want at least to co-decide on future planning issues. As mentioned above, due to the positively rated experience while collaborating, the participation concept will integrate this aspect in future interactions.

The second UK case study in Sheffield included a notably different group of participants: a group of (voluntarily attending) students, living close to the park. The students commented on the methods and tools used for the development of the 'breathing space' site. They emphasized that social media is a key instrument in involving not only young but also 'busy' people. Those stakeholders could easily access information on public investments via their mobile devices. Nevertheless, those social media approaches need to be advertised more intensively to create the necessary public awareness. Interestingly, the stakeholder group discussants stressed that a good approach to participation always pairs social media approaches with face-to-face interaction.

Parallel to the results in Manchester, the students that discussed the Sheffield project offer a highly positive evaluation of classical methods such as focus group interviews and workshops, which offer a huge potential for intense interaction between all relevant stakeholders. In addition, they also supported the integration of social media into participatory approaches and the use of 3D and other technical visualization tools. Their view on the project phases that should be most relevant for participation differed substantially from that of the other respondents. The students had a relatively higher interest in timetables and financial figures than in influencing design or implementation. Nevertheless, the interviewees stressed for them a better fitting participation concept would have included more

open methods (e.g. interactive workshops) to enable stakeholders to get better involved in the planning stages they are interested in.

Regarding the Dutch case of a park extension in the city of Amersfoort, the stakeholder group consisted of a mixed group of participants: neighbors, members of the core group and city employees. Most important, the group agreed that the unique approach to the park development, in which a group of stakeholders makes decisions in collaboration with the city administration, was very helpful in delivering acceptable results. In addition, social media tools supported the project's activities. The discussants in the stakeholder group discussions endorsed this combination of a group of active citizens and an open information policy as a blueprint for future projects. It also has to be stressed that a consistent theme in these discussions was that those novel participation methods always need to be supported by standard approaches such as workshops and site visits. Regarding tools, respondents enjoyed the informative power of a social media side, but they would also like to see more 3D models included in the process, for example, by embedding such models in a web viewer. Specifically, participants stressed the power of 3D visualizations to share ideas and to empower many stakeholders to understand the development of green spaces.

The results of the survey did not provide any significant new information regarding participation methods. Here, participants again rated classical approaches quite highly on efficiency and would like to have more web-based supportive elements included in the participation process. In Amersfoort, participants reported an equal interest in being involved in both early and late stages of project development and decision-making. Interestingly, stakeholders stated that they would like to have a permanent influence on the development and maintenance of 'their' park. This should be secured by prolonging the participation concept conducted in the planning of the project and by opening the process for entries of other interested stakeholders. The results show that in this case study, the stakeholders see their requirements on involvement met; there is no Arnstein gap.

The stakeholder group in Flanders, Belgium, consisted of inhabitants of the village, who were engaged in the participation process through organizing and participating in 'friends of' groups; the stakeholder group also involved members of the city administration. All agreed that the approach adopted in the project was highly effective in maintaining the public's interest and in collecting their ideas. The small group meetings from the 'friends of' scheme were regarded as particularly helpful in activating multiple stakeholder groups. Participants stressed that this helped less confident participants in the larger workshops to have an opportunity to contribute to the development of a plan for the green corridor. Regarding the tools employed, they proved an important asset, as there were artists who sketched the ideas and results at every meeting as the lively discussions progressed. This novel approach to visualization is a key element that participants would recommend including in future projects. To them, this way of quickly visually summarizing results is a very good way to make plans accessible for a wide scope of stakeholders. Nevertheless, they believed that having a supportive social media activity would have helped to improve information flows.

The generally positive evaluation of the participation process indicated by the results of the stakeholder interview was confirmed by the survey. Here, participants demonstrated their appreciation of the overall design and the small group session approach by ranking workshops and charrettes relatively highly. Again, respondents expressed their desire to not only have input in the implementation phase but also in the design phases. This opinion

highlights the match of peoples' perceptions on local participation with the level of involvement public administration offered to them.

In the stakeholder group in Liège, local residents and representatives from the city administration and local NGOs all provided input. The decisive element of the project in Liège is that a wide range of participation methods was employed, including walks, workshops, surveys, charrettes and opinion surveys. Discussants in the stakeholder group endorsed this as an important element of success for local participation, as there was substantially more involvement than participants were accustomed to experiencing in local participation projects. They highlighted that this approach helps to increase involvement among stakeholder groups in the project process from a traditional low level to the level of consultation. Nevertheless, there were elements of the participation approach used in Liège that the respondents did not enjoy. They stressed that information regarding the results of meetings/workshops needs to be more actively promoted. Participants suggested that members of the city administration needed to use the social media platform more intensively. Similar to this critique, participants recommended avoiding long time lags between participatory measures and the publication of their documentation/results. Some stakeholders felt lost during the participation process due to this problem. Participants in the stakeholder group stated that the efforts of the city administration to engage many members of the public in the project development are quite new to Walloon citizens. When asked for their recommendations for future projects, stakeholder group participants stressed the importance of events held at the investment site, to allow the public to interact and become informed. Those performative participation approaches should be embraced by standard methods such as workshops and social media information platforms. Some stakeholders stressed that a social media approach can never replace face-to-face events because in an anonymous online discussion, topics are often not related to the investment or are tangential. Taken together, stakeholder expressed a desire for a higher level of involvement in future projects, which should go up to co-decision, which could be achieved through more interaction on-site. The results of the stakeholder survey mirrored the ratings obtained from the other Belgian case study.

In the case study in Stuttgart, all participants in the discussion session were members of local public administrative bodies who were asked to comment on the project of introducing a regional 'industry heritage route.' As planning professionals, they will have a different mindset related to stakeholder participation than other groups. They should be aware of its threads and opportunities and will have made their personal experience with participation. In the interactions with the local municipalities, the regional planning authority mainly consulted stakeholders to inform their regional strategy. In later phases, where design alternatives have been presented, stakeholders were asked to collaborate to identify the best way of representing the industrial heritage route. In this special context, discussants stressed that it is most important to identify the relevant stakeholders who need to be involved and to activate the interests of those stakeholders by involving them in the process. As in the other case studies, the participants highlighted that a mix of participation methods is crucial for successful project implementation. Only such an approach can address many different stakeholder groups using standard face-to-face approaches, survey and information tools and social media and Internet platforms. The increasing demand for and focus on online-based instruments of participation was a particular subject of critique because many social groups are not used to or interested in Internet-based information.

6. Discussion

The results display similarities as well as dissimilarities between case studies' participation approaches and their level of involvement perceived by different stakeholders. This discussion highlights those aspects in more detail and summarizes key issues and tendencies that can be derived from the surveys and interviews, which were subsequently complemented by feedback from the project coordinators, to reveal lessons on how and when to integrate stakeholders in the green infrastructure planning process. Furthermore, arguments in favor of and against participation (see Section 2) from the debate are reflected by means of the case study results.

As illustrated in Table 2, stakeholders were engaged in the case studies by a wide range of methods while the range, mixture and level of involvement differ between the case studies. However, a common pattern in the discussion and survey findings can be identified for all six case studies considered here. Generally, stakeholders in the case study projects rated the applied participation approaches relatively high. The results indicate that many stakeholders in the investigated green infrastructure projects were familiar with most traditional participation methods such as workshops and round tables. They generally have positive opinions of these methods, but like the idea of extending and expanding those using new tools such as social media or 3D visualization to give the public more alternatives for involvement. Stakeholders from all case studies, except from Sheffield, point out that a combination of different approaches to stakeholder engagement to reach all important stakeholder groups was key to success. As outlined in Section 2, this is accurate and in line with the literature, but also costly and time-consuming, which explains why in Sheffield only a few methods were applied. There is also the issue of organizing and linking all participation actions in a multi-channel concept to keep the combination effective and target-oriented (see Section 2). The project in Liège faced this problem, as it was difficult to integrate all participation results and inform the other stakeholders of the conclusions. Gaps in the participation process that reduced stakeholder engagement were an issue. The project coordinators highlighted in the feedback discussion that results of participation processes have to be fed back, integrated and repeatedly discussed with stakeholders. Otherwise, individuals may quit the process and the entire communication and governance process will have to be restarted, as was reported by the project in Sheffield. In Bruges and Stuttgart, the project managers mentioned similar problems that resulted from the time between the participation measures being excessive. Thus, members of the public were waiting for responses to their input without knowing what to expect. The findings show that continuity of participation is identified as being important by both project managers and engaged stakeholders.

Supporting tools for involvement was one major component in the case studies' participation concepts. Social media was applied in all case studies except in Sheffield and Bruges (see Table 2) and mainly appreciated or called for by stakeholders. However, stakeholders also critiqued the application of social media, pointing out that it should only be used together with face-to-face approaches and noting that it excludes stakeholders groups (see Section 2). In Amersfoort, the project manager made negative experiences with social media, as it consumed substantial time and money to maintain the social media website, such as responding to comments, keeping it updated, etc. Therefore, he decided not to use it regularly in future projects. He was reluctant to widely employ social media for collaboration but had no such reluctance in using it for providing information. The project managers of

the other case studies applying social media also used it until the level of consultation, but were more enthusiastic about the new opportunities this tool provides while mentioning that one should be careful employing it. The project coordinator for the project in Sheffield, for example, noted that 3D visualizations could have been used more regularly to discuss design alternatives with the stakeholders at different planning stages not only for different planting options. He was afraid to involve stakeholders by means of 3D visualizations very early and to a higher degree than consultation because their opinion might differ too much from the view of authorities and his resources for participation were very limited. Capitalizing on this opportunity of visually developing ideas in conjunction with local populations to directly influence the design was appreciated in Bruges, as participants could place proposals on a map to indicate their design preferences. The project manager in Stuttgart also found the use of visualizations at the local level very helpful in addition to the classical formats.

According to the findings, the dimension of performative actions (see Section 2) is particularly helpful in inspiring the mixture of methods to develop participation at all involvement levels, as the participants assigned good ratings to green infrastructure projects that included performative elements in the planning processes. This is, for example, the case for the community gardening project in Manchester, which was liked by all stakeholders, most likely because they planned and implemented it themselves. The results of the Liège case study indicate that participation events and actions on site are very welcome by the stakeholders. In Sheffield, where active participation played a minor role, stakeholders suggested an expanded approach for future projects. In other case studies, regular events on the site were part of the participation approach and popular among the stakeholders.

All of the case studies presented here employed a range of methods; however, it seems that the structure underlying the participation process could be improved. This means that there are deficiencies regarding the point at which a participation approach is initiated, the group involved and the purpose of the approach. It appears that the methods were not used to their full potential to guarantee a high degree of involvement according to stakeholders' desires (Arnstein gap), as most participation approaches stopped at the consultation stage, while others stopped at the collaboration stage (see Table 2). The reasons for this varied, including: limited resources for an extensive participation concept in Sheffield; planning culture in Liège, where participation is rarely carried out to a higher level than consultation; partly low interest of the local community in Manchester; and the obstacles of regional planning in Stuttgart. The core group in Amersfoort is the only example in which ideas were directly raised by stakeholders who asked the municipality to collaborate with them on an equal basis in the development of the park. Although the results are not particularly different from those planned by the city planners alone, the responses were positive and the project enjoys a high level of acceptance, as participants are satisfied with their involvement. This governance structure with high stakeholder involvement was needed to stop the long-lasting protest of the stakeholders against the plans of the municipality and consider the participation efforts for the creation of a redevelopment and management plan. Here, local expert knowledge was highly integrated to produce tangible results to ensure genuine, rather than 'pseudo,' participation (see Section 2). The manager of the Stuttgart project had the same experience, as the inclusion of historical experts to gain additional knowledge on historical contexts from the beginning of the project was successful. The experts, in turn, felt that they had introduced the idea themselves. They can find their advice considered in the regional strategy and on the ground. In the Manchester case, decision-making was partly

done collectively and some measures were only considered by stakeholders, while in Bruges, the artist directly sketched stakeholders' ideas to let them see the results of their discussions.

The key results of the analysis relating to the planning stage when participation should be carried out are highly contradictory. Although stakeholders are highly involved in the late planning stages, they would also like to participate to a greater extent in idea collection and planning phases. Project managers often only informed or consulted with stakeholders in those phases. Only at later stages, i.e., design or implementation, were members of the public invited to collaborate or co-decide. Thus, especially at early stages, there appears to be an Arnstein gap. The gap between possible levels of participation and achieved levels of participation is the widest during the early planning stages such as idea collection and design. In our case studies, this gap increasingly declines as the projects move to later planning stages such as planning and implementation. However, while some stakeholders enjoyed being early and highly involved or intended this for the next project, not all do so. In Bruges, Liège and Sheffield, earlier and higher involvement was not asked for. It is not clear whether this was because stakeholders were content with the level of involvement or because they were not aware of the alternatives to participation.

Nevertheless, this shows that the case studies' stakeholders want to be presented the choice of being involved at an early stage and given the option of co-decision in the project and during subsequent stages, and even present a tendency toward empowerment. The Arnstein gaps identified in the early planning stages were clearly identified by the stakeholders and should be closed using suitable participation approaches that allow a high degree of involvement.

Based on our findings, we developed notes for successful participation in green infrastructure planning. Although transferring best practices in participation processes is difficult and will not guarantee success in new cases due to differences in context that must be considered (Luyet *et al.*, 2012), we believe that deriving lessons learnt from our case studies might help others to take a step in the right direction.

- A mixture of different, tailored approaches to stakeholder engagement increases the possibility of suitably addressing all relevant stakeholders.
- Continuity of participation is important to keep stakeholders motivated and to ensure that the process remains on track while potentially saving time and funds.
- Openness about new tools that should be considered such as e-participation enabled by social media, GIS, etc.
- Performative participatory approaches help to practically involve stakeholders, especially hard-to-reach groups.
- A high degree of involvement allows stakeholders to shape the project and feel a sense of responsibility and increases acceptance while providing planners with justifications for their activities.
- Allow early involvement to let stakeholders shape the project from the start.

7. Conclusion

This research paper explores important elements of a participatory approach to green infrastructure planning. We do so using results from a transnational comparison of case studies in four different European countries. The focus of the analysis was on obtaining a deeper

understanding of the *when?* and *how?* of participation in green infrastructure planning, which remains underresearched in planning practice.

We derived our results by analyzing stakeholder interviews and discussions and relating those to the planning processes and participation approaches employed in the case studies using the lens of the ladder of participation. This two-step approach let us combine individual survey data with group discussion data and gave the stakeholders the opportunity to both think solely and argue together about participation. The results indicate that stakeholders are highly supportive of a combination of classical methods of participation with contemporary tools such as social media or visualizations and performative approaches. Conversely, we identified Arnstein gaps in the early stages of participation. In general, stakeholders would prefer up to two levels more involvement than applied. They would like to be involved in the planning of green infrastructure projects to a greater extent (e.g. collaboration or co-decision). In our case studies, the participation methods used at those stages were partly not fully exploited to activating a high degree of participation. Therefore, our main suggestion for further improvements in green infrastructure planning is to implement highly interactive participation methods at very early stages of the planning process. This is not straightforward to implement in practice. Nevertheless, investing in improving the participation process provides substantial benefits in the form of more efficient interaction and better accepted projects.

One important aspect of a planning process is becoming increasingly important: maintenance. We did not address this issue in this paper because the projects in our case studies were at earlier stages of implementation. However, the topic of the long-term management of green infrastructure sites through the use of pinpointed management vehicles is an important topic for further research in participatory planning for green infrastructure. Long-term management represents considerable potential to save public money while improving the ownership and acceptance of a project in the local community via participation.

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