



ELSEVIER

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Urban Forestry & Urban Greening

journal homepage: www.elsevier.com/locate/ufug

Multidisciplinary collaboration and understanding of green infrastructure Results from the cities of Tampere, Vantaa and Jyväskylä (Finland)

Elisa Lähde^{a,*}, Mina Di Marino^b^a Department of Architecture, Aalto University, School of Arts, Design and Architecture, P.O. Box 16500, FI-00076 Aalto, Finland^b Department of Urban and Regional Planning, Faculty of Landscape and Society, Norwegian University of Life Sciences, P.O. Box 5003, No-1432 Ås, Norway

ARTICLE INFO

Keywords:

Green Infrastructure
Multi-disciplinary collaboration
Urban green development
Urban greening practices

ABSTRACT

Over the last few decades, the concept of Green Infrastructures (GI) has been studied in several disciplines such as landscape architecture, landscape ecology and planning. However, scholars are still debating the best approaches to enhance the understanding of GI amongst practitioners. Indeed, a multi-disciplinary collaboration is needed to move beyond any obstacles to the development of GI. This paper presents a literature review that focuses on the barriers which still limit the adoption of GI, the concept of multifunctional GI, and the need for collaborative groups of professionals. In particular, the study explores the three Finnish cities of Vantaa, Tampere and Jyväskylä, which are currently addressing new GI strategies and introducing the Urban Green Infrastructures within the built environment. The study presents the results from a multi-disciplinary collaborative process that consisted of a pre-questionnaire, learning activities, workshops, as well as a post-questionnaire. 23 official practitioners (architects, landscape architects, engineers and experts in natural sciences) from the city planning departments as well as four researchers in landscape architecture and urban planning were involved in the collaborative process. The results show that an understanding of GI gradually evolved amongst participants. The findings also reveal that rigid planning practices still represent obstacles to the development of GI. Hence, new urban planning approaches to the GI are needed, as well as more concrete actions involving stakeholders. New activities should be used when developing GI, such as learning about GI, proposing GI strategies and actions, as well as reflecting on existing planning tools.

1. Introduction

Several disciplines have contributed to studies on Green Infrastructure (GI), such as landscape architecture, landscape ecology, and more recently, urban and regional planning. Furthermore, definitions of GI have been influenced by research conducted in the USA, UK, and Europe (Mell, 2016). Since the early 2000s, it has been defined as an interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas, as well as greenways, parks and other conservation areas (Benedict and McMahon, 2001, 2006).

Lately, within the arena of scientific debate and policies, (see e.g., the European Commission, 2013) it has been stated that “GI enhances and synergizes benefits provided by nature” (Hansen and Pauleit, 2014, p. 516).

GI is considered to be “an interconnected green space network (including natural areas and features, public and private conservation lands and other protected open spaces), that is planned and managed for its natural resources and values and for the associated benefits to the population” (Benedict and McMahon, 2012, p. 3). While North

American academics and practitioners emphasize the ecological function and value of GI, in the European context, scholars state that GI has been mainly used to tackle some urban issues, such as the high density of urban developments (Mell, 2016; Laforteza et al., 2013).

In the European policy framework, GI has been defined as “a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services” (ES) (e.g., supporting soil formation and habitat and cultural services) in both rural and urban settings (European Commission, 2013, p. 3). A more comprehensive definition embraces additional aspects, “GI has been lately considered as ‘an ecological and spatial concept for promoting ecosystem health and resilience, contributing to biodiversity conservation, and benefiting humans by promoting the delivery of ecosystem services. It incorporates green spaces (or blue, if aquatic ecosystems are involved) and other physical features in terrestrial (including coastal) and marine areas” (European Environment Agency, 2014, p. 10).

Within the existing literature, GI has been referred to by various terms, such as spatial and ecological connectivity, multifunctionality,

* Corresponding author.

E-mail addresses: elisa.lahde@aalto.fi (E. Lähde), mina.di.marino@nmbu.no (M. Di Marino).<https://doi.org/10.1016/j.ufug.2018.03.012>Received 12 July 2017; Received in revised form 28 February 2018; Accepted 13 March 2018
1618-8667/ © 2018 Elsevier GmbH. All rights reserved.

interdisciplinary collaboration, and the delivery of ecosystem services (Lennon et al., 2016; Baró et al., 2015; Hansen and Pauleit, 2014; Ahern et al., 2014; Benedict and McMahon, 2012). GI has been used for enhancing the connectivity of green spaces (e.g., between parks, forest areas, wetlands and gardens). Spatial connectivity can support ecological conservation as well as the benefits for humans associated with GI, such as health, well-being and recreational activities (see the overview given by Lennon et al., 2016). Referring to multifunctionality, “GI planning considers and seeks to combine ecological, social, and economic/abiotic, biotic and cultural functions of green spaces”, all types of green and blue spaces, such as natural and semi-natural areas, water bodies, public and private green space, including parks and gardens. This GI approach can be used for individual GI elements, a network of linked GI elements as well as an interlinked network of GI elements on the regional level (Hansen and Pauleit, 2014, p. 516).

In addition to ensuring its multifunctionality, a strategic and integrated GI process could help to guarantee multiple perspectives are included, such as those of ecosystem services and stakeholders’ (Green Surge, 2015; Meerow and Newell, 2017). From the perspectives of urban and regional planning as well as landscape architecture, GI has often been acknowledged as a strategic approach to improve urban life in metropolitan regions and cities (e.g., challenges of urban sustainability and resilience) (Ahern et al., 2014). However, this has not always been reflected in concrete plans, resulting in scholars still debating on the best approaches to develop GI in metropolitan areas (Lafortezza et al., 2013). In this context, this study embraces the possibility that GI can help in creating a shared planning vision for networks of natural and semi-natural areas including related benefits (e.g., ecological, social, and spatial) (see e.g., European Commission, 2013).

Furthermore, as part of the ongoing scientific debate on GI approach, scholars have recently introduced the concept of Urban Green Infrastructure (UGI) which is a type of GI used within urban settings. UGI is “the interconnected web of vegetated spaces like street trees, parks and peri-urban forests that provide essential ES in densely populated areas” (Pearlmutter et al., 2017, V). The GI embodies the idea that the ES are vital to the cities, and within this approach, the UGI provides multiple benefits to people in the urban environment. While “the GI can have a major role creating spatial and functional interconnections between natural areas located in cities and surrounding rural areas” (Quintas, 2015, p. 189), UGI is a strategic network of planned and unplanned urban green and blue spaces, including street trees, parks, green roofs, green facades, rain gardens, urban forests and wetlands that provide essential ecosystem services in cities (Norton et al., 2015; Green Surge, 2015). UGI helps to develop living conditions by delivering Urban Ecosystem Services (UES), such as protecting air quality, regulating storm water, as well as supporting the diversity of species and contributing to the wellbeing of people (TEEB, 2011). The implementation of UGI can aid in facing several urban challenges (such as air pollution, temperature reduction and loss of urban biodiversity) (Norton et al., 2015).

By embedding this concept of UGI, this study touches on the current challenges in landscape and urban planning.

Despite the awareness that cities depend on healthy natural and semi-natural environments to provide a variety of benefits, there are still obstacles to the development of UGI (e.g., the ways in which to improve UGI in the planning system, as well as the ways to update and advance the existing green space planning). Planning UGI is not only a top-down strategic planning approach, but new forms of interaction need to be further explored between government bodies, citizens and other non-state actors (e.g., universities and institutes of research) (Green Surge, 2015), thus resulting in this call for a new understanding of GI multidisciplinary and collaborative approaches.

Although the development of UGI requires a multidisciplinary approach, there are still professional silos that limit an effective multidisciplinary collaboration (Lennon et al., 2016, Ahern et al., 2014). Recently, scholars have stated that conducting collaborative processes

as well as creating constant feedback and reflections might further GI understanding amongst stakeholders within landscape and planning practices (Hostetler et al., 2011). However, further attention should be paid to the outcomes from multidisciplinary collaboration between academics and practitioners, as well as practitioners themselves (e.g., constant feedback, reflections and new approaches on GI).

Collaborative processes have been tested in the fields of landscape ecology and landscape planning. On mentioning a collaborative process, Nassauer and Opdam (2008) proposed a social learning of mixed science-practice groups that can be used to support practitioners when handling scientific knowledge. The co-production of knowledge is meant to be grounded on a transdisciplinary approach, which suggests that science alone cannot solve the problems (Nassauer and Opdam, 2008). This approach can be used to review the current science-practice relationships, as well as create new collaborative processes for each situation by involving (in addition to landscape ecology and landscape planning) several disciplines, such as social and economic sciences (Opdam, 2010).

More recently, the need for multidisciplinary collaborative process has been brought to the attention of the landscape and urban planning debate in order to share learning and understanding of GI (Lennon et al., 2016; Faehnle et al., 2014; Ahern et al., 2014; Kopperoinen et al., 2014; Lafortezza et al., 2013). Lennon et al. (2016) developed a specific toolkit to promote GI thinking between engineers, landscape architects, ecologists and heritage officers in order to embed a GI approach into spatial planning practices. The workshop was used as a tool to explore the degree of familiarity with the GI approach, as well as helping participants to move beyond professional barriers and create an informal learning arena (Lennon et al., 2016).

In this context, researchers can be seen as facilitators when collaborating with planners and local governments in outlining policies and programs for the development of GI (Hostetler et al., 2011). Collaborative processes should involve a wider range of stakeholders in landscape and urban planning, landscape architecture, ecology, architecture and urban design (Ahern et al., 2014). However, there are still difficulties from the researcher’s perspective to provide notions and tools adequate to the implementation of GI. The mechanisms to transfer GI knowledge from research to practice need to be further investigated. In this context, it is also important to understand that the introduction of the GI to several disciplines, such as landscape architecture, landscape planning, urban planning, engineering, and urban design, does not occur in a straightforward manner. There are professional, cultural, planning and political contexts where the new knowledge on GI is challenged by the status quo of expertise (Di Marino and Lapintie, 2018).

We argue that there is a further need to explore new forms of the multidisciplinary collaborative process (of learning and understanding of GI and proposing GI strategies and practices) which support different types of expertise, both academics’ and professionals’, thus enabling the transfer of the understanding of GI within existing and new planning practices. This multidisciplinary collaborative process can result in a mutual understanding and learning amongst practitioners and researchers. This process can be viewed as a mutual learning process that requires new trust, a multidisciplinary environment and new tools of active collaboration between researchers and practitioners. Thus, the paper addresses the following research question: How does a multidisciplinary collaboration between practitioners themselves, as well as between practitioners and researchers, support the understanding and development of GI within the new urban development?

To address the research question, the study presents a comprehensive literature review which, first, focuses on the understanding of GI, in particular on the barriers that still limit the adoption of GI within spatial planning; secondly, on the concept of the multifunctionality of GI and the need for collaborative groups of professionals. Furthermore, the study explores the three Finnish cities of Vantaa, Tampere and Jyväskylä. The reason for selecting these three cities is that there is a

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات