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Moving forward in implementing green infrastructures: Stakeholder perceptions of opportunities and obstacles in a major North American metropolitan area

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ABSTRACT

Urbanization poses both challenges and opportunities for the management of urban ecosystems globally. In the Greater Montreal Area (GMA), a major North American urban area where green infrastructure (GI) implementation is in its early stage, there are challenges in maintaining provision of ecosystem services due to urban expansion and climate change impacts. In response, stakeholders in the GMA are trying to further integrate the GI concept into planning practices and have participated in focus groups to discuss various approaches to implementing the GI concept. This paper addresses stakeholder perceptions of the opportunities and obstacles related to natural ecosystem management in the GMA. We discuss the way in which participants perceive the prospect of the GI concept to influence discourse and policy about environmental planning. We found plural perspectives on GI yet there was a broad consensus regarding problems in bringing planning tools in line with socio-ecological processes. This research provides a novel contribution by showing how the concept of GI informs narratives about metropolitan green space and environmental planning. The narratives of most research participants emphasised: 1) that efforts to protect and enhance the urban ecosystem should be approached within a coherent social and ecological framework at the scale of the metropolitan area, and 2) that GI planning needed to rely on collaborative and participatory approaches to enhance ecosystem services at all scales of the GMA.

1. Introduction

The concept of green infrastructure (GI) is increasingly popular among urban policy makers and planners worldwide who are faced with the multiple challenges raised by urban expansion and climate change (Baptiste et al., 2015; Emmanuel and Loconsole, 2015; Horwood, 2011). Most definitions of GI emphasise that it was introduced as a planning concept to improve “urban green space systems as a coherent planning entity” (Tzoulas et al., 2007, p. 169, citing Sandström, 2002). The coherence in planning to insure quality and quantity of interconnected and multifunctional green spaces is what we retain as the central aspect of this concept (Tzoulas et al., 2007;

Benedict and McMahon, 2006). Although definitions vary somewhat depending on context and objectives, GI is well integrated in discourse on urban planning by many groups in developed countries that promote an integrated and participatory vision of green space management at the scale of metropolitan areas (Lovell and Taylor, 2013). Case studies provide contrasting narratives about the ways in which GI informs stakeholders involved in urban planning. According to some, GI often conflicts with more traditional urban development approaches focused on functionalist¹ planning criteria (Ahern, 2013). For others, the focus on infrastructure in GI resonates with pre-existing planning rationales, appearing both useful and applicable within ongoing bureaucratic processes (Cowell and Lennon, 2014; Rydin, 2010). The Greater

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¹ According to the dominant theory of functionalist urban planning, functions such as residence, work and leisure were treated as discrete elements and the zoning of these functions in the city insured their separation. The functionalist stance usually involves orthogonal planning so as to anticipate the needs and requirements of the different groups of users (Attoe and Logan, 1989).

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Montreal Area (GMA) offers a useful complement to existing case studies because discussions of GI are at a relatively early stage. Despite some attention to ecological connectivity, there is limited integration of the GI concept in official documents at the metropolitan scale, and stakeholders have only recently mobilized to discuss coherent planning of GI at the GMA scale (Bissonnette et al., 2017; Dupras et al., 2015). This is in contrast to jurisdictions where GI is well integrated in policies, such as in the GI and Biodiversity Strategies of the European Union (Čivić and Jones-Walters, 2014; Raymond et al., 2017).

Although discussion about ways to integrate the GI concept into planning practices at the GMA scale is relatively new, urban sprawl and ecosystem degradation have been major issues in recent decades (Dupras and Alam, 2015; Nazarnia et al., 2016). Loss of natural environment is a widespread concern in the GMA, and many stakeholders have become involved in the debate over the best approach to move forward with the development of GI (Dupras et al., 2015; David-Suzuki Foundation and Nature Action Québec, 2012). Even though significant efforts have been initiated by the City of Montreal (Di Marino and Lapintie, 2017), the GMA faces numerous challenges in the implementation of regional scale governance for environmental planning. This is also due to the fragmented governance in the GMA (Boudreau et al., 2006; Dupras et al., 2015). As such, the GMA case has global significance, in so far as it resonates with other metropolitan areas that also are early in the process of mobilizing GI in planning discourse and policy, while facing complex governance issues (Cowell and Lennon, 2014).

The potential of the GI concept to shape environment planning policies can usefully be analysed in the framework of a discourse coalition: “the ensemble of a set of story lines, the actors that utter these story lines, and the practices that conform to these story lines, all organized around a discourse.” (Hajer, 1993, 47; Horwood, 2011). A discourse coalition rests on bottom-up collaborations that foster the emergence of a policy narrative that can translate into dominant institutional practices. In this context, our paper seeks to better understand how residents and stakeholders in the GMA tell their stories of opportunities and constraints for GI planning. Our paper is based on two workshop events that gathered researchers and practitioners in the field of urban ecosystem management and planning, along with citizens with an interest in GI. Focus groups were organized and participants asked to discuss their views of the potential for GI to help develop and enhance the provision of ecosystem services in the GMA.

Working with transcripts from the workshops and with a review of relevant literature, we analyze how stakeholders perceived opportunities and obstacles to the implementation of GI planning policies in the GMA. More generally, we discuss the potential of the GI concept to influence policies about regional scale environmental planning in major urban regions. We briefly review literature on GI as a participatory process with the capacity to shape policy for urban ecosystem management, and then present and analyze the data about GI perspective in the GMA that was collected during our two workshops. In our analysis, we build on previous research that touched on some of the obstacles encountered in the attempt to promote the development of GI (Byrne et al., 2015; Dupras et al., 2015; Matthews et al., 2015). More precisely, our analysis shows that stakeholder narratives can be organized around two main categories: 1) potential for integrating green infrastructures within planning tools; and 2) issues of collaboration and public participation in the implementation of green infrastructures in planning processes. Finally, we discuss the potential of the GI concept to influence policies that improve multifunctional planning within an integrated governance framework.

2. Green infrastructure as a participatory approach?

This research distinguishes between GI as a concept, and GIs as a large spectrum of practices in urban environmental planning. Although this distinction is often blurred in narratives, we are mainly interested

in GI as a concept that can influence coherent environmental planning at the scale of the GMA. According to the theory of discourse coalition, coherent GI planning can become institutionalized in policies and practices by fostering a discourse with sufficient rhetorical power that “central actors are persuaded by or forced to accept...” a GI perspective (Hajer, 1993, p. 48). As stated by Shapiro (1981, 130), such a discourse can “establish norms for developing conceptualizations that are used to understand a phenomenon”. The concept of a discourse coalition has the potential to organize efforts to affect policy changes despite there being a plurality of sometimes conflicting interests and values in play (Fischer, 2003, 102). Studies indeed affirm that GI perspectives can become embedded in planning practices through a storyline that reconciles different interests and values (Horwood, 2011, 967). For example, GI would have become integrated within planning practices in Dublin, Ireland, when a discourse coalition emerged among planning practitioners and allied professionals (Cowell and Lennon, 2014, 273).

The GI perspective on planning draws together a wide array of initiatives driven by a variety of stakeholders (Amati and Taylor, 2010; Evans and Freestone, 2010), a contrast to older green belt initiatives that have been criticized for their arbitrary boundaries and organization around a single function (i.e. forest conservation, agriculture, fresh water provision, etc.). As a result, centrally planned green belts have become less socially acceptable (Amati and Taylor, 2010; Thomas and Littlewood, 2010). Building a discourse coalition in support of GI perspectives is more consistent with contemporary participatory approaches to urban planning and multifunctional land use. This shift from top-down zoning approaches to bottom-up approaches can be related to a renewed emphasis on public participation to facilitate reconciliation of plural interests and values (Allmendinger, 2017, 144). The GI concept presupposes just such an approach responsive to a range of environmental, social and economic constraints and opportunities (Evans and Freestone, 2010; Lennon, 2015a).

Concepts such as GI tend to provide urban planners with integrative and operative planning concepts that move beyond dichotomies between urban and natural areas to enhance ecosystem services (Erixon et al., 2013). Some metropolitan experiences show that GI planning is compatible with map-based representations managed with existing planning tools (Cowell and Lennon, 2014). Moreover, the notion of infrastructure in GI is usually considered to be sufficiently broad to allow an explicit link to economic development policy, which can highlight the economic benefits of urban ecosystem management (Horwood, 2011). The decision processes involved with GI naturally tend “...to identify and secure multifunctional, connected areas of green space, predicated on their ability to deliver environmental, social, and economic benefits” (Cowell and Lennon, 2014, p. 265). Yet the GI concept does not prescribe specific means to achieve these benefits, which are often open to social deliberation through participatory processes.

Because of its multifunctional characteristics and the multiple benefits sought, GI planning is usually based on enlarged participatory processes including a broad range of stakeholders (Čivić and Jones-Walters, 2014; Mabelisa and Maksymiukb, 2009; Madureira and Andresen, 2014). In many urban settings, GI includes a large array of related initiatives by both government and civil society that can act synergistically, such as green roofs, small-scale conservation projects and ecological networks (Taylor et al., 1995; Yokohari et al., 2000). The plural, participatory dynamic involved in building a discourse coalition on GI initiatives within metropolitan areas often leads to policy enhancing multiple ecosystem services such as urban heat island mitigation and rainwater management (Thomas and Littlewood, 2010; Wright, 2011). To help expand this potential breadth, recent research seeks to better map out the plurality of meanings and values attributed to ecosystems in GI planning (Kati and Jari, 2016; Raymond et al., 2017). In this way, the social processes underlying bottom up initiatives such as local ecological corridors can be better understood to scale up ecosystem service provision and conservation.

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