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Review

Aligning fragmented planning structures through a green infrastructure approach to urban development in the UK and USA

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ABSTRACT

Globally green infrastructure (GI) planning has developed with alternative conceptual and implementation viewpoints. In the UK and USA this has led to the establishment of a dual narrative; one identifies a set of conceptual principles within the wider global GI debate, whilst the second focusses on localised interpretations of these principles within divergent delivery approaches. Such plurality adds a level of complexity to the development of GI policy and subsequent investments, which can be understood if both narratives are debated simultaneously. A number of factors have influenced this process; the most prominent being the dislocation between GI policies, practice and funding. This paper addresses this fragmentation proposing that a 'policy-implementation' gap exists within national and sub-national planning practice which limits the transferability of global principles into delivery. Therefore although the conceptual understanding of GI is grounded in the global literature, greater variability is evident in the application of these principles within localised (i.e. national, regional and sub-regional) planning. The paper extends this debate through a discussion of whether a consensus for the conceptual advancement and implementation of GI is a necessary aim of its development. It concludes that such plurality of understanding is both a positive and negative attributes of GI planning, highlighting the complexity of attempts to align global and local development narratives for GI.

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Introduction

The rapid development of green infrastructure (GI) in the UK and USA since the late 1990s provided scope for planners, in both locations, to reframe their approaches to urban planning. Over the subsequent decade the application of GI has diversified to address a range of terrestrial and water based development issues. This has led to variability in the use, and discussion of GI, lowering the level of consistency in its debates, and subsequently, hindering its mainstreaming within centralised (i.e. national) policy narratives. As a consequence, although a cascading of GI principles and actions are evident in its development, the policy structures and delivery mechanisms that support this process lack consistency, limiting to some extent, a consensual understanding of GI, globally and locally.

Evaluations of the development, meanings and use of GI in urban planning have been made since the concept came to prominence through the President's Council on Sustainable Development in 1998 (Mell, 2010), the Conservation Fund and the USDA Forest Service in 1999 (PCSD, 1999; Hellmund and Smith Somers,

2006), and the Environmental Protection Agency (EPA) (Rouse and Bunster-Ossa, 2013). However, due to specific geographical applications, consensus of its meaning (as a concept and of its benefits) has not, to date, been achieved (cf. Wright, 2011; Mell, 2013). In part, this is due to the interaction of normative political and spatial approaches to landscape management, but also reflects the varied nature of urban planning in the UK and USA, illustrating the complexity of situating GI development, when the structures that support planning policy are in a constant state of change.

In North America, and specifically in the USA, this process is focussed predominately on water systems and ecological resource management (Benedict and McMahon, 2006; Weber et al., 2006); whereas, in the UK GI planning has focused on establishing an integrated approach to landscape management addressing social, economic and environmental change (Kambites and Owen, 2006; Thomas and Littlewood, 2010). Although such distinctions suggest that a fragmented interpretation of GI has been developed, over the last five years (2010 onwards), a coalition of GI meaning has become increasingly visible within planning discourses in the UK and USA (Mell, 2013).

One consistent constraint to the development of such a consensus has been the influence of changing planning policy structures. In both the UK and USA prominent advocacy organisations have

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attempted to integrate GI within policy and delivery structures but with limited success (Allen, 2012; Kambites and Owen, 2006; Lerner and Allen, 2012; Thomas and Littlewood, 2010). As Mell (2010) illustrated a number of prominent environmental advocacy agencies, in both the UK and USA, have engaged with the development of a GI planning agenda; however, there has been a variable, and in some senses, a more 'passive' approach from government. 'Throughout this paper' are used to describe governmental environmentally focussed organisations, Non-Governmental Organisations (NGOs), and Environmental NGO (ENGOS), which influence policy and delivery strategies. Advocacy agencies are organisations which have effectively (or otherwise) lobbied policy and decision-makers to acknowledge, and latterly, engage with the growing GI evidence base. Delivery agencies are organisations specialising in implementing GI. Local government can also be considered delivery agents if they implement development plans either internally or in collaboration with other agencies. Therefore, although planning policy can be considered multi-directional, the potential pluralism of its focus makes it difficult for advocacy agents to target delivery in line with government mandates. Changes in government policy, co-operation and funding, have also been highlighted as barriers to effective GI implementation (Beatley, 2000).

To address these issues this paper examines the development of GI and its application in the UK and USA. Through an evaluation of each nation's implementation of GI, the paper argues that both nations have experienced changes to the process of planning; shifts which are reflected in how planners address GI. The paper proposes that although its antecedents have established a *globalised* understanding of what GI is, the implementation of these principles, within individual nations and/or regions, has been increasingly *localised*. They include: *sustainability, multi-functionality, accessibility, connectivity, urban focussed, advocate led policy formation and implementation*.

Through a re-interpretation of the diverse conceptual principles of GI, this paper discusses whether a 'policy-implementation gap' exists, to illustrate the fluidity of GI policy-application. The development and application of GI in the UK and USA are subsequently used to assess whether it is viable to promote a consensual approach to the pluralistic discussions of GI. Through an examination of the opportunities and constraints placed upon GI development, this paper reflects on how the multi-directional: read *pluralistic*, nature of planning is being influenced by a constantly changing policy arena. Although the paper makes reference to the evolving GI research agendas in Europe and Asia, these locations are not discussed in the evaluation. They are presented as evidence of the fluidity of the implementation gaps between the conceptual foundations of GI and its delivery. By reflecting on the influence of policy structures and advocacy stakeholders within the praxis of GI, this paper debates whether this 'gap' can be addressed.

Review methodology

The following paper does not present, or propose to use, a singular definition of GI, as it recognises plurality to its meanings and uses exists between the UK and USA. In the context of this paper GI can be considered as a concept for strategically planning and managing green and open space as a functional network at different spatial scales and is based on a number of specific but varying principles (see Fig. 1). This reflects the fluidity of expression, which has become increasingly visible in *global* (i.e. international discussions), as well as, *localised* (i.e. national, regional and local) interpretations of GI. 'Global' GI debates promote a discreet discussion of a small number of globally accepted principles, whereas 'local'

discussions are more nuanced and focussed on national, regional or sub-regional delivery objectives (see Fig. 1). Such diversity is evident in the language used to describe GI, where synonyms are used extensively, to promote a range of GI principles. Throughout, this paper uses green space and urban greening, as metonyms for GI, although it should be noted that the underlying principles outlined by Mell (2010) are used to contextualise such use.

This paper, the figures (1, 2 and 3) and discussions presented within it, offers a global review of the current position of GI planning expressed within the academic and 'grey' (practitioner-government) literature. There is, to date, no standardised process for such a review, illustrated by the diversity of GI documents reviewed. The following discussion therefore does not propose to present a systematised evaluation or analysis of all available GI material. This paper does however, through a process of selective documentary review, identify comparability of GI thinking between sources using a content analysis of the published documentation and stakeholder/actor discussions. Materials were reviewed based on following criteria:

- Academic articles published and accessible online and/or in hard copy,
- Grey (policy, guidance and strategic) documentation published/adopted by the relevant bodies and available online or in hard copy format,
- All documents had been published prior to 2010 (and supplemented with 2010–2014 documentation),
- All documents were available in English.

A content analysis was conducted using an assessment of how GI was *used*, *phrased* (including synonyms) and *applied* within academic, policy, guidance and strategic delivery documents (grey literature). It also reflected on how these issues were explored in academic papers. The documents reviewed are not exhaustive, but represent a cross-section of the material published on GI planning and are shown in Fig. 1. It was not possible within the parameters of this paper to evaluate all GI documents published in each of the regions shown in Fig. 1 due to the time constraints placed on the scope of the paper. Where possible the most cited/high profile documents were reviewed, supplemented with documents produced by governments and key advocacy agents. The principles shown in Fig. 1 were identified by assessing the main objectives, development and conceptual characteristics, terminology and focus of GI use within the documents reviewed. The analysis in Fig. 1 is based on a 'traffic-light' system, where green presents an extensive use of a principle, amber a moderate use, and red a weak use. The analysis discussed in this paper is therefore exploratory in nature.

The analysis shown in Fig. 1 draws extensively on an evaluation undertaken by Mell (2010) who reviewed the development of GI up to 2010. This has been updated for the evaluation presented in this paper by incorporating documentation/articles published between 2010 and 2014. This highlights a time specific use/development of GI principles, but also provides an additional geographical context to this process. Fig. 1 highlights that a number of principles: *sustainability, multi-functionality, accessibility, connectivity, urban focussed*, and *advocate led policy formation and implementation*, are used most frequently, promoting the view that these could be characterised as 'globally' important. The principles shown in amber and red therefore represent more nuanced interpretations of GI discussions.

The principles noted above are deemed to be discussed extensively if they were highlighted in both Mell's initial work and the evaluation presented in this paper. To supplement this documentary analysis additional discussions and correspondence with practitioners and academics in the UK, Europe, USA and Asia

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