



Research Paper

A mixed methods approach to urban ecosystem services: Experienced environmental quality and its role in ecosystem assessment within an inner-city estate



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HIGHLIGHTS

- A science-led ecosystem services (ES) assessment is contrasted with qualitative data.
- ES and dis-services (EDS) are experienced through co-production and co-construction.
- Aspects contributing to perceived liveability condition how ES and EDS are experienced.
- Experienced ES and EDS highlight reasons for unequal access to urban ES.
- Equitable ES delivery requires context sensitive assessment of ES and community needs.

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ABSTRACT

This paper contributes to the notion of ecosystem services (ES) and dis-services (EDS) through an exploration of how they are experienced in an inner-city neighbourhood. We contrast the findings of a science-led assessment with qualitative interview and visual data from the residents of the Woodberry Down Estate (London, UK). We use the ontology of co-production and co-construction to understand how material and interpretative factors condition the translation of identified service-providing units (SPUs) into directly experienced ES and EDS. Findings demonstrate that aspects contributing to the perceived liveability of a neighbourhood also condition the experienced ES and EDS. In our case study, the history of the estate translates into subjective feelings of safety which influence whether individuals access parts of the regenerated estate. While the regeneration project provides a broad range of new and improved SPUs with significant ES potential, the access and recreational functions these offer are especially appreciated for the increased opportunities for social interaction and visitors they provide. However, new SPUs such as landscape vistas and formal gardens that attract people are also assigned further significance as markers of new divisions among social housing residents. We suggest that in order to realise the much-prophesised health and wellbeing benefits of urban ES in an equitable manner, a science-led approach to designing and assessing potential ES should be accompanied by a context-sensitive assessment of community needs and liveability aspects.

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1. Introduction

The language of ecosystem services (ES) goods and benefits (MEA, 2005) and ecosystem dis-services (EDS) has been evoked in an attempt to establish an integrated and equitable approach to

engaging with environmental values in policy (CBD, 2000). However, it is a language established and empowered by scientific knowledge of ecosystems which risks oversimplifying both the ecological and institutional premises of the human-nature interface (Barnaud & Antona 2014; Menzel & Teng 2010; Noergaard 2009). By their definition urban ecosystems are produced by humans – from planned, managed formal parks to the natural re-vegetation of built infrastructure – and are appropriated and experienced in multiple ways (Swyngedouw 2009; Williams 2014). With increasing

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attention focusing on the role of urban blue-green spaces in contributing to quality-of-life e.g. in primary health care (Elley, Kerse, Arroll, & Robinson, 2003), public health (Maas et al., 2009), mental health (Sugiyama, Leslie, Giles-Corti, & Owen, 2008) and overall urban liveability (Ravez 2015), there is an urgent need to better understand how urban ecosystems are experienced.

This paper contrasts reductive scientific and qualitative data to demonstrate how the exploration of experienced environmental quality in an inner-city neighbourhood can generate a fuller understanding of how ES relate to liveability and wellbeing in an urban context. Underpinned by the service cascade model (SCM; Haines-Young & Potschin 2009), adapted through the inclusion of the service providing unit (SPU) concept (Andersson et al., 2015) and a use value attribution step (Spangenberg, von Haaren, & Settele, 2014), a science-led assessment of urban ecosystem SPUs and potential ES is accompanied by a qualitative analysis of visual and interview data of local residents' experiences of environmental quality in the same area. We develop a categorisation of urban SPUs, and potential ES and explore the ways in which these resonate with what urban residents perceive as the function and quality of their local environment (van Dorst 2012; Pacione 2003; Zube, Sell, & Taylor, 1982). Our aim is to explore whether and how these epistemologically different approaches to environmental quality can combine to better inform the design and assessment of urban ES.

2. 'Experienced environmental quality' and ES

The language of ES derives from an understanding that ecosystems provide a range of services, goods and benefits that are critical to sustaining life e.g. oxygen, food, water and psychological benefits (MEA 2005). The ES discourse is increasingly contributing to notions of sustainability in the urban context and influencing the design of urban space and the valuation of land (Ravez 2015; TEEB 2011). Whilst some literature distinguishes between directly experienced (mainly provisioning and cultural, that directly contribute towards meeting a human need) and indirect (mainly supporting and regulating) ES (Fischer & Eastwood, 2016; Daniel et al., 2012), most ES literature overlooks the role of subjective needs and interests and the social and political context in which ES are identified, experienced and engaged with (Barnaud & Antona 2014; Fischer & Eastwood 2016). For example Barnaud and Antona (2014) stipulate a constructivist ontology that recognises ES as a social construction where humans actively part-take in the production of ES, thereby engaging norms, values and expectations that are subjective but also contingent on social and political context (Murdoch 2001). This resonates with the literatures on experienced environmental quality and perceived liveability that contribute to addressing this lack of understanding of the contingency and subjectivity of human engagement with nature (van Dorst 2012; Lejano 2011; Pacione 2003; Zube et al., 1982). In these literatures environmental quality (framed as liveability or as experienced landscape quality) is conceptualised as a dynamic function of the interaction of material environment-related, social and subjective personal characteristics, recognising that these condition how benefits or dis-benefits derived from environmental features come into being (Tyrväinen, Mäkinen & Schipperijn, 2007; Zube et al., 1982). van Dorst (2012) for example stipulates a definition of sustainable liveability of urban neighbourhoods that encompasses health and safety; prosperity and equality among residents; social cohesion; control over social interactions and the physical environment; and contact with the natural environment. All components condition perceived liveability and many relate to each other, for example equality and the ability to control social relations contribute to social cohesion and vice-versa, and safety plays a central role in perceived access to nature (van Dorst 2012).

We adopt this constructivist, dynamic conceptualisation of environmental quality and direct ES and EDS which flow from the daily activities of local residents and their interactions with natural and built entities (Murdoch, 2001). Like Fischer and Eastwood (2016) we view direct ES and EDS as co-produced, where humans tangibly contribute in their production (e.g. when undertaking recreational activities) and co-constructed, where different meanings are assigned to these experienced services rendering them either beneficial services or dis-services, depending on the individual and the social context in which they are experienced. We therefore suggest that directly experienced ES and EDS are integrated into (and contingent on) the social fabric of urban life, and draw agency from the material and interpretative associations that order it (De Landa 2006; Gandy 2006; Williams 2014). Hence, we argue that any ES based approach should integrate environmental quality not only as measurable units, based on a reductive science-led assessment of biophysical structures (defined here as units of interacting biotic and abiotic components) and their functions in context, but simultaneously as an experienced quality hinging on material and interpretative factors.

Recent ecosystem assessment approaches have begun to embrace some of this complexity and offer good scope for integrating a more qualitative epistemology. Of these, the SCM (Haines-Young & Potschin, 2009) and the concept of SPUs (broadly a 'grouping' of biophysical structures by land cover) (Andersson et al., 2015) with the potential to deliver ES, has gained traction in the literature. For example, the SCM was recently adopted as a key element of a systematic framework consultatively developed by academics and EU Member State representatives to enable a consistent approach to implementing the mapping and ecosystem assessment components of the EU Biodiversity Strategy (EC, 2011). Recognising its limitations with regard to addressing societal issues, various authors have looked to further develop the SCM. Spangenberg et al. (2014) propose adding a 'use attribution step', suggesting that biophysical structures generate potential ES with their translation into actual benefits dependent on local circumstances. These points of translation render the SCM particularly adept for the integration of a more interpretative, parallel epistemology to better represent the production and function of ES and EDS. Andersson et al. (2015) take a different approach to contextualising the flow of ES from ecosystems to people, expanding the concept of SPUs to consider how internal dimensions (e.g. spatial and temporal scale) and external forces (e.g. access rights) influence their performance. Having identified SPUs as potentially providing ES, the authors develop a framework which incorporates these mediating factors to reveal whether and how identified ES potential is translated into actual ES. Whilst Andersson et al. (2015) refer to 'perceptions', their discussion features mainly cultural variations in preferences for particular features/functions. This is a useful refinement, but its implementation does not reveal anything about whether accessible ES are actually accessed, who accesses them – and crucial in debates around 'inclusive cities' – who does not, nor how identified ES/EDS are co-produced by local communities which experts later perceive as ES beneficiaries. Recent research by Fischer and Eastwood (2016) focuses on interactions between ES and people, and develops a framework which distinguishes between the co-production of ecosystems, ES and the attribution of meaning to these structures and services (co-construction). Whilst this study starts to unpick individual-ES experiences/interactions in a systematic way, our research builds on and extends this by co-locating a science-led methodology linking biophysical structures and functions to ES potential and a social science-led methodology exploring the translation of biophysical structures/functions to directly experienced ES and EDS.

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