



Review

Research challenges for cultural ecosystem services and public health in (peri-)urban environments



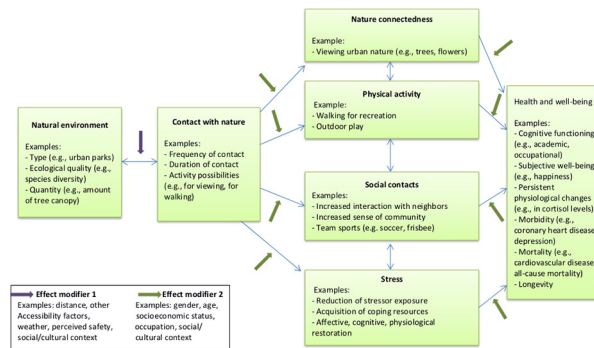
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HIGHLIGHTS

- Concerns positive public health impacts of urban nature's cultural ecosystem services (CES).
- Discusses global development trends' implications for the provision and demand of CES.
- Discusses current research and key research questions for a new research agenda.

GRAPHICAL ABSTRACT



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ABSTRACT

Urbanization is a global trend, and consequently the quality of urban environments is increasingly important for human health and wellbeing. Urban life-style is typically associated with low physical activity and sometimes with high mental stress, both contributing to an increasing burden of diseases. Nature-based solutions that make effective use of ecosystem services, particularly of cultural ecosystem services (CES), can provide vital building blocks to address these challenges. This paper argues that, the salutogenic, i.e. health-promoting effects

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of CES have so far not been adequately recognised and deserve more explicit attention in order to enhance decision making around health and wellbeing in urban areas. However, a number of research challenges will need to be addressed to reveal the mechanisms, which underpin delivery of urban CES. These include: causal chains of supply and demand, equity, and equality of public health benefits promoted. Methodological challenges in quantifying these are discussed. The paper is highly relevant for policy makers within and beyond Europe, and also serves as a review for current researchers and as a roadmap to future short- and long-term research opportunities.

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**1. Introduction**

Modern societies face many challenges in their efforts to pursue sustainability under economic stress, demographic and social pressures, political instability and conflict, as well as global environmental change. Urban environments are beneficial to human health and wellbeing in that they provide improved economic possibilities and better access to health care. At the same time, the quality of environment may be low in urban areas, and urban life-style is associated with low physical activity and possibly increased levels of mental stress as well as non-communicable chronic diseases. Likewise, changing and potentially fast increasing burdens on human and non-human health from infectious and other communicable diseases, including emerging diseases, zoonoses, and pandemic outbreaks, are closely associated with urban environments in Europe as well as in other continents (Degeling et al., 2015; Sikkema and Koopmans, 2016). Nature-based solutions (NBS) that make effective and efficient use of ecosystem services (ES), can provide vital building blocks to address health related challenges, such as improving health equity and maintaining social cohesion.

This paper aims to examine the provision of health and well-being through CES as a scientific and policy and planning issue. Our findings relate to the Sustainable Development Goals (SDGs) (United Nations, 2015), especially “Good Health and Well-Being” (the 3rd goal) and “Reduced Inequality” (the 10th goal). Furthermore, the arguments developed in the paper also fit well within the discussion on new health concepts, including EcoHealth (Charron, 2012; Wilcox et al., 2004), ecological public health (Lang and Rayner, 2012), planetary health (Whitmee et al., 2015), and One Health (Gibbs, 2014; Wallace et al., 2015; Keith et al., 2016) which is a further development of One Medicine. Although these health concepts differ in detail, they share a common focus on integrating and emphasizing the links between ecosystems, domestic and wild animals and other non-human organisms, and human health. Although this paper uses Europe as an example, most of the synthesis of current literature and discussions of

future research challenges are applicable to cities and countries in general.

Until now, the focus of studies on urban ES has been mainly on provisioning and regulating services, such as food production, air quality improvement, heat stress amelioration, and water management. However, the salutogenic, i.e. health-promoting effects of cultural ecosystem services (CES) should not be overlooked and deserve more explicit attention (see e.g., Andersson et al., 2015). CES differ from the other categories of ES in that they are primarily the non-material outputs of ecosystems, for example, providing opportunities for recreation, physical activity, socializing, restoring capacities. Unfortunately, such outputs are more difficult to observe, measure, and value (Milcu et al., 2013). Despite the challenges in quantifying CES, these services remain of considerable importance (TEEB, 2016).

The salutogenic orientation is also relevant as a complement to the traditional risk factor based approach to health. It emphasizes health as a positive entity, a dynamic process of development, a multifaceted psychosomatic condition of the whole individual, and a social phenomenon (Antonovsky, 1996).<sup>2</sup>

This paper will focus on final ecosystem services (ES), which are the services that most directly affect human well-being, irrespective of whether the ecosystems generating these final ES are natural, semi-natural, or artificial (Haines-Young and Potschin, 2013). In addition, we focus on primary services, i.e. services with a direct (spatial) link to an ecosystem. That is to say that, for instance, creating a painting from directly experiencing the ecosystem is included in the scope of our paper, but activities such as watching nature documentaries or viewing artistic expressions inspired by nature are for the most part excluded. The former activities can be beneficial to health, as suggested also by the biophilia hypothesis (see e.g. Kellert and Wilson, 1993). The latter activities do not have a direct, physical, or spatial link with the service-providing ecosystem. Primary final CES can only be

<sup>2</sup> See also the definition used by WHO.

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