



## Review

## Exploring global scientific discourses on urban forestry

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## ABSTRACT

The concept of urban forestry is addressed from a discursive perspective, with focus on identifying and describing various scientific discourses, their strength and development over time and on different continents. This work can help obtain a deeper understanding of the scientific discourses in terms of identifying research trends and reasons behind these trends, as a possible way forward for research. Scientific publications ( $N=519$ ) issued during the period 1988–2014 (and as listed in the SCOPUS database) were analysed with the aims to 1) systematically identify and describe scientific urban forestry discourses, 2) discuss implications of these findings for scientific practice, and 3) propose ways forward. Six discourses of various strength and geographical distribution were identified. Scientific production was found to be dominated by North American and European authors with modest contributions from authors from other continents. Scientific discourses proved mostly expert driven and reflecting the positivist scientific paradigm. Prevailing managerial orientation and absence of qualitative approaches indicate a lack of deeper understanding of human–environment relations. Studies related to active participation of citizens and partnerships in urban forestry have been missing. More emphasis should be placed on the testing of existing, and developing new methods and modalities of public participation, and on the value of civic involvement for the decision making. Moreover, a more solid evidence base is needed for benefits from urban forests, while economic aspects of biodiversity and other ecosystem services are still insufficiently explored. Study findings also call for more research on urban forest governance and relation between urban forest benefits and existing policies (e.g. climate change adaptation, energy policy or health).

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## Introduction

Broad consensus exists on the multiple benefits urban forests provide accompanied with growing body of scientific evidence (e.g., Roy et al., 2012). Yet no consensus exists on the precise meaning of the terms ‘urban forests’ and ‘urban forestry’ (UF) (Randrup et al., 2005). The most quoted definitions of UF reflects high expectations for the field, encompassing an inclusive perspective of the urban forest as representing various types of green space, long term planning, provision of multiple benefits, dialogue between various disciplines and creation of partnerships among stakeholders (Randrup et al., 2005). However, the existence of various meanings and practices of UF implies existence of various discourses in the field of UF.

The last two decades have shown increasing interest in the role of discourses and many studies show influence of discourses

on environmental and forest-related policy making and politics (Hajer and Versteeg, 2005; Arts and Buizer, 2009; Arts et al., 2010; Lawrence et al., 2013). A recent review of forest-related discourse studies showed that political science approaches to discourse analysis (DA) were the most popular (Leipold, 2014). Nevertheless, DA of the UF concept has not been systematically done so far.

There are many conceptions of what discourse is, and there are many approaches to DA (Arts and Buizer, 2009). Discourse is embedded in language and refers to meaning shared with others (Hajer and Versteeg, 2005; Dryzek, 2005). Discourse is described as: “An ensemble of ideas, concepts, and categorisations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities.” (Hajer, 1995, p. 44).

This definition also reveals some of the discourse building blocks – ideas, concepts and categorisations that are subject to DA together with storylines, assumptions, symbols or metaphors. Discourses are dynamic. They interact, overlap, compete with each other and change over time, are not necessarily homogeneous, but show great durability (Arts et al., 2010). DA is useful for identifying how a

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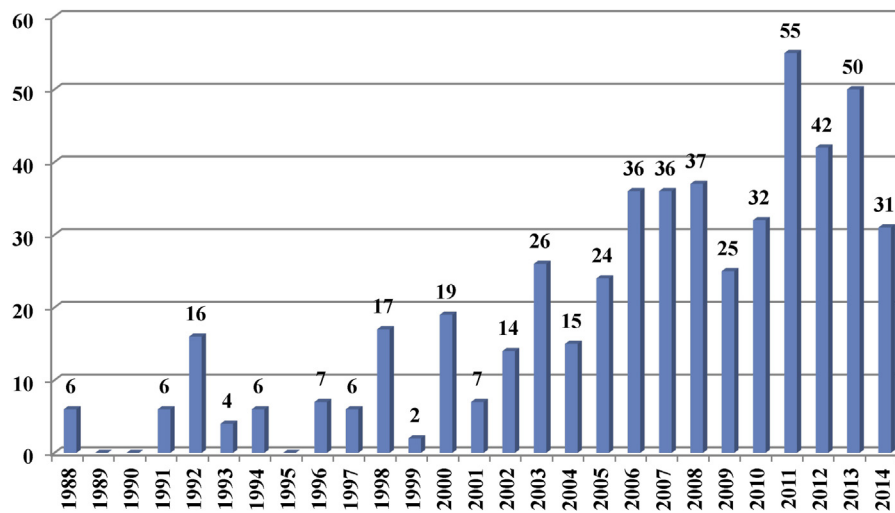


Fig. 1. Distribution of papers based on the SCOPUS search by the key word "urban forest\*" in the period 1988–2014.

certain problem is structured, what solutions are offered and by whom, and in what historical, cultural or political context (Hajer and Versteeg, 2005).

Starting with the assumption that various discourses on UF exist, and focusing on discourses as featuring in the scientific literature, the aims of the paper are to 1) systematically identify and describe scientific UF discourses, 2) discuss implications of these findings for scientific practice, and 3) propose ways forward for research. Scientific discourses were taken into account due to availability of scientific publications in databases in comparison to looking into urban forestry practices at large that are locally specific and not collected in databases.

## Methods

### Description of the sample

Scientific papers were retrieved on 28 June 2012 and again on 12 December 2014 (in order to update the search with recent studies) through the SCOPUS database by using the key word "urban forest\*" in the title, abstract or key words in a predefined set of journals deemed the most relevant for UF, namely Arboriculture and Urban Forestry (until 2006 the Journal of Arboriculture - JoA/AUF), Urban Forestry & Urban Greening (UFUG), Landscape and Urban Planning (LANDUP) and Forest Policy and Economics (FPE). JoA/AUF and UFUG specifically include topics related to "trees in the urban environment" and "urban and peri-urban woody and non-woody vegetation" respectively, in their aims and scope. The rationale behind pre-selecting FPE and LANDUP was that the authors were aware that several influential articles on urban forestry had been published here, with the former linking urban forestry primarily to forest policy and economics, while the latter provides a context of landscape, urban ecology and urban planning. The SCOPUS search yielded 519 hits for the period 1988–2014 and annual distribution shows constant gradual increase in number of publications over time (Fig. 1).

The timeframe of the search was not predefined. It should be noted that some years of JoA are not covered in SCOPUS; for these years papers were searched for by using the same key words and downloaded directly from the journal's webpage. SCOPUS was selected instead of e.g., Web of Science (WoS) since specific, highly relevant journals to the field of urban forestry (JoA/AUF and until 2009 also Urban Forestry & Urban Greening) were not listed in WoS. The other included journals appear in both SCOPUS and WoS. The

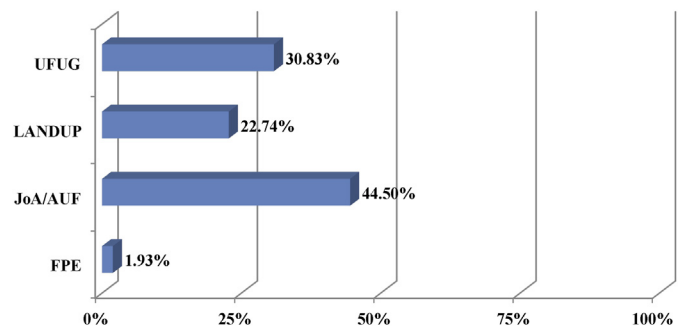


Fig. 2. Distribution of papers per journal in the period 1988–2014 ( $N=519$ ) (FPE = Forest Policy and Economics, JoA/AUF = Journal of Arboriculture/Arboriculture and Urban Forestry, LANDUP = Landscape and Urban Planning, UFUG = Urban Forestry & Urban Greening).

authors are aware that not all papers on urban forests/forestry were included in this study, but consider that included papers represent a sample of the whole population of scientific articles related to this topic. Almost half of the papers were published in the JoA/AUF (Fig. 2). This is not surprising taking into consideration the North-American origins of the urban forestry concept and the fact that FPE and UFUG were established only in 2000 respectively 2002; which coincides with the increase in overall number of papers (Fig. 3).

The majority of the papers were written by North-American authors (almost all USA based), when affiliation of the first author was taken into account, followed by European authors, especially from the year 2000 onwards, while an increasing scientific production of Asian authors was noted recently (Fig. 4).

First author affiliations comprised 39 countries, with the USA and Canada representing more than 60% of all papers. In Europe, the Nordic countries and the UK represented almost two thirds of the papers. Elsewhere, Japan, China and Australia were best represented (Fig. 5). In 18 countries only one or two papers were identified in the given period.

### Data analysis

Two rules were established for analysis of retrieved papers. First, full papers were used instead of only abstracts. Secondly, a 'one paper one discourse' rule was adopted, implying that one paper could be allocated to one discourse only, according to the aim to identify ideal-typical discourses, quantify their strength based on the number of publications attached to certain

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