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Benefits of urban parks – a systematic review of the evidence

By Matilda Annerstedt, Anders B. Nielsen (both Swedish University of Agricultural Sciences, Alnarp), Sreetheran Maruthaveeran and Cecil C. Konijnendijk (both University of Copenhagen; Sreetheran also Forest Research Institute Malaysia)

Parks have many benefits, but how far has science progressed in providing the evidence for different benefits? Ifpra's Scientific Task Force is heading a systematic review of the most reliable scientific literature. In this article, a group of experts carrying out the review provides an update on this work.

At Ifpra's World Congress in Hong Kong, the decision was taken to set up a new Scientific Task Force (STF). One of the main activities of this Task Force is to provide state-of-the-art knowledge on different aspects of parks. A major challenge is of course to find *scientific proof* for the benefits provided by urban parks, benefits that we often take for granted. In order to make sure that parks are part of political agendas at different levels, *sound evidence* of park benefits has to be provided. This need can be met by a review of existing scientific literature (best external evidence), carried out in a systematic way. By applying a systematic method the usefulness of such a document will increase, since the findings will meet the standards for evidence-based decisions (Fig. 1).



Figure 1. Evidence Based Decisions (EBD)

A systematic review

What aspects of a systematic review guarantee its applicability for EBD? First of all it assures a collection of *all* empirical evidence in accordance with pre-specified eligibility criteria. Every concept used in the review is clearly defined from start, minimizing the risk for bias and subjective opinions. In addition the methodology follows certain rules, making the process fully transparent and reproducible, hence increasing the validity and reliability of the work. In combination with the quality assessments of the findings this assures a strong and objective knowledge-base (Higgins, 2008), which can be used for decisions and for promoting park values in policies. A systematic review is one possible pathway to narrowing the science-policy-gap (Bradshaw and Borchers, 2000), a gap that may typically exist in the park sector.

The process of establishing a high quality systematic review of such a multidimensional topic as urban parks and their benefits requires an interdisciplinary approach. The STF founded a group consisting of four researchers from three different universities, representing four nationalities. The scientific backgrounds of the group members cover (urban) forestry, medicine, landscape architecture and landscape planning, providing a solid expertise base for the evidence evaluation.

Based on the literature and our own experience, we chose a relatively inclusive definition of urban parks – “Delineated open space areas, mostly dominated by vegetation and water, and generally reserved for public use. Urban parks are mostly larger, but can also have the shape of smaller ‘pocket parks’. Urban parks are usually locally defined (by authorities) as ‘parks’.” – where maybe the last sentence says it most – a park is what we call a park. Concepts such as urban woodlands or urban forests were excluded from this review. Every single benefit will also have its specific definition.

The review will result in a report with a general background text, introducing the concepts and why this work is important. After a description of the methods a comprehensive report of the findings will follow, giving the results per each benefit group, including quality assessments and extraction of found evidence and where knowledge is still missing (so called research gaps).

To structure the search, urban park benefits were categorized in groups. These groups may eventually be elaborated upon or combined:

- Health and wellbeing
- Tourism
- Social cohesion
- Biodiversity
- Air pollution reduction
- House prices (and other economic benefits)
- Recreation
- Climate mitigation and adaptation
- Water protection and regulation
- Aesthetics, quality of living environment
- Business, branding, investments
- Cultural-historical aspects

Methodology

To ensure a sound methodology certain keywords, or search terms, were chosen. For each benefit specific search terms were selected, while the terms for urban parks were the same for all benefits: “urban park*”; “city park*”; “green space*”; “green area*”, with the * indicating a ‘wild card’, i.e. any ending of the word possible, hence all terms that include the first part of the keyword will be included. Through varied combinations of keywords we managed to cover a broad and extensive amount of scientific literature on well-defined benefits of urban parks. We decided to restrict ourselves to peer-reviewed articles, published in reputable scientific journals, in order to be more certain about the quality of the studies to be included.

We performed the search in two different databases – Scopus and Web of Science, where most relevant literature should be included. We also used the method of snow-balling, meaning that we included relevant additional articles identified through e.g. literature lists in the articles found. This mirrors our aim to find *all* relevant and useful evidence on every topic. We gathered either original research papers, reporting a scientific study on the actual benefit, or former systematic reviews.

In any systematic review of this kind one needs to set a few limitations, to make the work practically achievable. We decided to restrict ourselves to English literature. This implies a risk of missing a few studies published in for example any Asian language. To our knowledge, though, this decision will not have a major impact on the final outcome of the review's results. We also decided to keep a time limit, and mainly focus on research published from year 2000 and after. The emphasis will thus be on most up-to-date studies and, if relevant, older studies should be referred to in the more recent work.

To standardize what necessary information to extract from the found articles we used a so called extraction sheet which included among other topics: study design, benefit(s) documented, main results, and geographical scope.

Initial findings

So far only preliminary results on a few of the benefits have been compiled. These include numerical data on health benefits of urban parks. From an initial number of hits (958) a number of 133 potential papers have been selected based on appraisal of title and/or abstract. One could make an extrapolated estimation that around 30 papers will come out as end result. These papers remain to be assessed for scientific quality and grade of evidence. The benefits dealt with are often related to lower levels of stress and better mental health and general wellbeing, as well as increased levels of physical activity.

A search on the impacts of parks on house prices identified 27 articles derived from an initial number of 259. The outcome measure mostly used was hedonic pricing, but also willingness to pay, and expert evaluation, and GIS analysis were applied. A preliminary quality assessment tells that there is moderate to strong evidence that parks (more than other green spaces) increase prices of nearby houses. In a few cases a negative price effect was found, due to features such as noise, fear of crime etc.

Another topic is the benefits regarding social cohesion. This is a topic that may be difficult to 'measure' scientifically. We believe, though, that some of the social cohesion benefits are also reflected from the health and recreation perspective. In the review only six relevant articles were identified for this topic. It provides some evidence that parks stimulate social interactions, also across cultural groups and among young people.

Finally a much larger topic comprises parks' biodiversity benefits. In total 441 papers boiled down to 73 studies to include. General findings from these results give that most studies consider only one species and only rarely is flora and fauna studied in combination. The evidence suggests that parks are urban biodiversity hotspots and urbanisation is a main driver for biodiversity loss. Parks also have higher biodiversity than other urban green spaces, and both park size and park age show positive correlation with biodiversity.

A crucial aspect of a systematic review is the researchers' quality assessments of the found articles. This will demonstrate what amount of strong evidence exists, as well as what amount of less strong. Altogether this must be considered before any conclusions can be drawn about what specific

benefits that actually do meet the criteria for evidence based decisions. Hence we will follow strict guidelines to ensure a valid quality assessment. These guidelines in principal grade articles in accordance with certain quality criteria. Those criteria deal with issues such as selection bias, mode of randomisation, research method, objectiveness of the study, and confounding control.

The systematic review will be completed by September of this year, with the report being launched at the Ifpra European Congress in Basel.

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