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## The concept of cultural ecosystem services in urban areas

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**Abstract:** The article presents major issues related to the development of cultural ecosystem services in urban areas. Major advantages related to urban development in the context of making the concept for development of such services effective are shown. The authors start with the overall characteristics of ecosystem services. Then by analyzing the cultural aspect of ecosystem services and their impact on human well-being, the authors narrow the phenomenon. Further in the article, they focus on presenting the importance of „green space”, while making a reference to cultural ecosystem services.

**Keywords:** ecosystem services, cultural ecosystem services, urban area, green areas, urban green

### 1. Introduction

Areas of particular natural value are among the principal elements of urban space (Jaroszewska-Brudnicka and Brudnicki, 2011). It may be envisaged that nature within urban areas will become the key factor for most of the society. It is therefore important to recognise the principles of this environment. Certainly, areas with prevalent urban green have various functions and can be used for multiple entertainment purposes. It is therefore important to learn about their role, maintenance, and most importantly, their protection to ensure high quality of functions they provide (Sutkowska, 2006).

Green urban areas such as parks, green rooftops and botanic gardens ensure many

ecosystem services. Undoubtedly, green space enhances physical activity, mental well-being, and general public health of city residents (Wolch et al., 2014).

The article focuses on defining the role of ecosystem services, particularly their cultural aspects in urban space. It also highlights their impact on human well-being. The article points to the interplay of individual factors, affecting the well-being of people visiting green urban areas. The article is a review and builds in particular on the analysis of documents from Millennium Ecosystem Assessment (MEA, 2005) and literature on ecosystem services and in particular, the cultural ecosystem services.

### 2. Ecosystem services

The last few decades saw a spectacular growth of interest in ecosystems, environment or ecosystem functions. Early references to the concept of functions, ecosystem services and their economic value date back to the mid-1960s and the early-1970s (Helliwel, 1969). In recent years, there has also been an increase in the number of publications on benefits provided by the environment to the public (Groot et al., 2002; Hansen and Pauleit, 2014).

The Millennium Ecosystem Assessment (MEA) is one of the main documents on widely understood issues regarding ecosystem services. It is an international report, the purpose of which is to provide specific information and propose solutions for decision-makers and the public. It describes the implications (costs) of changes in ecosystems for human well-being and options for early actions to address these changes. It contains

frequently asked questions, slideshow presentations, posters, tables, maps, data, and many more. In recognizing ecosystem services provided by natural environment, it is a common practice to adapt a general definition as proposed in the Millennium Ecosystem Assessment, according to which “ecosystem services are benefits people obtain from ecosystems”. Therefore the notion of “ecosystem services” is usually construed as nature’s contribution to various goods and services, which, in economic terms, would typically be classified into three different categories: (1) “goods” (e.g. products obtained from the environment, such as harvested resources or water), (2) “services” (e.g. recreational and tourism benefits, habitat functions) and (3) cultural benefits (e.g. spiritual and religious beliefs, values of cultural heritage (Barbier et al., 2011)). Additionally, in the report, ecosystem services were initially categorized in four broad types, and this categorization is widely used in science as well as in popular science (Wolf, 2013). The benefits are the following:

- provisioning services – this group includes natural resources both renewable and non-renewable, livestock products and agricultural crop products,
- regulating services – they relate to various ecosystem functions, including biological regulation, protecting against natural hazards and atmospheric composition modification,
- habitat services - these include ecosystem processes necessary to produce the other services. This group may include water cycle, circulation of elements, sustaining genetic diversity,
- cultural services – conditional on individual perception of every human being, they include arts, spirituality, recreation as well as science and education (MEA, 2005).

Over the period of ten years, following the publication of the MEA report, a great number of publications appeared, in which authors attempted to define ecosystem services and their functions. Many of the publications concerned ecosystem contribution and its functions to human well-being (Burkhard et al., 2012).

Costanza et al. (1997) provided a definition of ecosystem services prior to the Millennium

Ecosystem Assessment, which they defined as: “the benefits people obtain directly or indirectly from ecosystem functions”. They had already at that time defined and classified ecosystem services and highlighted their functions. Among them, we also find cultural function, which they defined as “providing opportunities for non-commercial uses”. Among the examples of cultural functions, they included the following functions: ethical, artistic, educational, spiritual and scientific values. They also highlighted that these values are linked to subjective feelings of individual human beings (Costanza et al., 1997).

Similar observations regarding ecosystem services are expressed by Müller and Burkhard (2012) as they define them as “direct or indirect contribution of ecosystem structures and functions”. Moreover they point out to the fact that the benefits people obtain from ecosystems are social and economic in nature and affect human well-being (Müller and Burkhard, 2012). Benefits for human health and well-being clearly linked to the environment may be determined with regard to perception and preferences, regeneration and recreation, landscape perception and emotions. In addition, direct health services were already granted while staying in natural environment, when using ecosystem services (Völker and Kistemann, 2011).

In the Millennium Ecosystem Assessment (2005) human well-being was defined as multidimensional, including health, basis for living a good life, good social relationships, security and the freedom of choice and action (cited after Dłużewska, 2016a). Relationship between ecosystem services and human well-being are illustrated in Figure 1. Although the typology shown in Figure 1. was taken from Haines-Young and Potschin (2009), it is based on data from the MEA.

Another important point that must be looked at when analyzing the diagram above is that habitat services have a different effect on human well-being than the other categories of services. This issue was addressed by Boyd and Banzhaf (2005), who concluded that it is difficult to differentiate, based on literature, between services generating mechanisms and services alone. This arises from the complexity of processes and mechanisms that generate this service category.

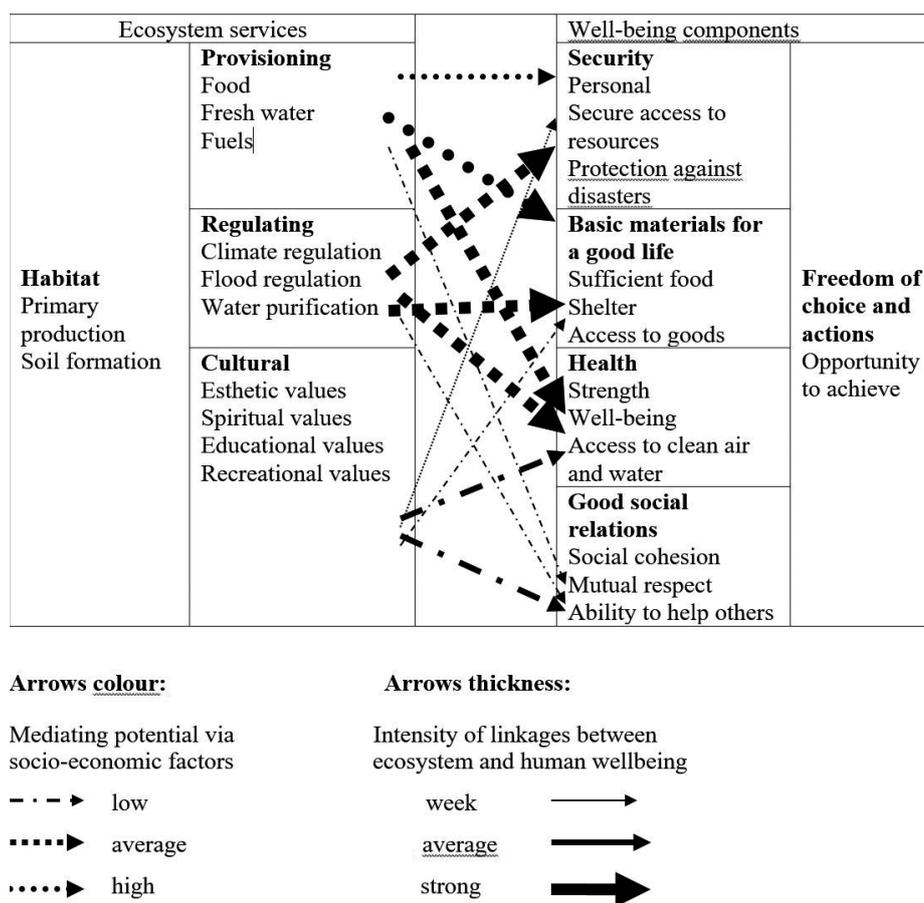


Figure 1. Relationship between Ecosystem Services and Human Well-being (source: MEA, 2005)

### 3. Cultural ecosystem services

The Millennium Ecosystem Assessment (MEA, 2005) defined ecosystem services as “non-material benefits people derive from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and esthetic enjoyment, including, for instance knowledge systems, social relations and esthetic values”. Another definition clearly differentiating between services, benefits and values states that cultural services are a sort of ecosystems contribution to non-material benefits (e.g. experiences, opportunities) people derive from the human-nature relationship (Chan et al., 2011). Cultural benefits people obtain from ecosystems also include spiritual, religious beliefs and the value of cultural heritage (Barbier et al., 2011). It is often the case that definitions highlight individual content characteristics. Elements recognized as cultural ecosystem services and their character are shown in Table 1.

Every category of ecosystem services has different characteristics with some of the them showing certain similarities in terms of those characteristics. Nevertheless, given the differences, cultural ecosystem services cannot be valued. This is due to their specific nature. It is difficult to carry out economic valuation of esthetic and spiritual characteristics. Still, by virtue of their non-market character, they are highly appreciated (Gee and Burkhard, 2010). These services apart from the recreational and esthetic values (Chan and Ruckelshaus, 2010) are rarely covered by economic indicators such as, for instance, real estate prices (Milcu et al., 2013). Unfortunately since they are particularly difficult and debatable in terms of monetary valuation they have been overlooked in most cases when planning and managing ecosystem services (Dłużewska, 2016b). In some cases, however, these non-material dimensions

**Table 1.** A list of cultural ecosystem services including individual elements (source: La Notte A. et al., 2007)

List of ecosystem services according to CICES	Cascade framework step	Systems Ecology category	Assessment technique
Experiential use of plants, animals and land in different environmental settings	Service	Information	Geospatial models/complex indicators
Physical use of land-/seascapes in different environmental settings	Service	Information	Geospatial models/complex indicators
Aesthetic	Service	Information	Geospatial models/complex indicators
Education	Service	Information	Complex indicators
Heritage, cultural	Service	Information	Complex indicators
Entertainment	Service	Information	Complex indicators
Scientific	Service	Information	Complex indicators
Symbolic	Service	Information	
Sacred and/or religious	Service	Information	
Existence	Value		
Bequest	Value		

(changes of mainly psychological nature) may be of greater importance to people than material benefits. Fishing, for instance, provides

food but in most cases, it is also a pastime activity and thus have a spiritual meaning (Chan et al., 2011).

#### 4. The impact of cultural ecosystem services on human well-being

The Millennium Ecosystem Assessment (MEA, 2005) attempted to show the relationship between ecosystem services and human well-being yet it failed to do it in the manner to facilitate decision-making. It means that the report focused solely on presenting the links between the environment and well-being without explaining to what extent it was likely to impact decision-making (Chan et al., 2012).

The notion of human well-being is complex, controversial and continues to evolve. The links between human well-being and ecosystem services are even more complex and complicated. Although some of the links are well-known, many remain poorly-understood and controversial (Balmford et al., 2005). Ecosystem services are undeniably necessary yet insufficient for human well-being. People are social, hierarchical and thinking beings. Context, expectations, relationships, and social standing all affect the subjective well-being in many ways (Butler and Oluoch-Kosura, 2006). However such services provide many important factors

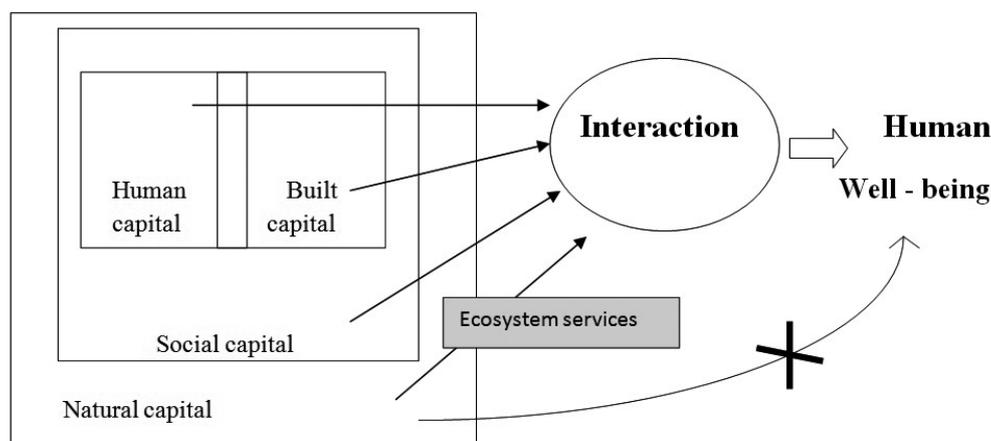
that ensure human well-being such as shelter, clothing or food. In the case of achieving material minimum, human well-being is very often perceived empirically. These nonmaterial components of human well-being include: good health, security, good social relations, freedom of choice and possibility to make choices (Butler et al., 2005).

On the other hand, cultural services make particular contribution to health, which is illustrated by many examples. For instance, people breeding animals in rural areas are emotionally attached to them (Zinsstag and Weiss, 2001). Contact with nature, animals for people after heart attacks speeds up the recovery process (Friedmann and Thomas, 1995). When deciding to purchase an apartment, people take their decisions based on the presence of a park, green area in its vicinity, which only confirms a high supply and demand for such services.

Ecosystem services may arise if ecological structures (e.g. tree) or their functions (e.g. air-purification) directly or indirectly contribute to fulfilling people's needs and desires. Such

services (e.g. providing clean potable water) generate benefits (e.g. better human health), which in turn enhance a general well-being (Daniel et al., 2012).

So that we may speak about a direct effect of the environment on human well-being, it is worth pointing to the complexity of this phenomenon (Fig. 2.)



**Figure 2.** Relationship between individual elements, affecting human well-being (source: Constanza et al., 2014)

The above diagram illustrates links between built capital, social capital, human capital and natural capital, which are necessary in the process of building human well-being. Built capital and human capital (economy) are present in the society, which is in turn imbedded in the rest of nature. Ecosystem services are a relevant contribution of natural capital to human

well-being however they do not affect it directly. Constanza also highlights the fact that natural capital alone does not affect well-being directly. Therefore, it is necessary to adapt a broad, transdisciplinary perspective in determining the addressees of ecosystem services (Constanza et al., 2014).

## 5. Cultural ecosystem services in cities

The importance of nature in cities has been recognized since the time of antiquity, for instance in Byzantium (Barthel et al., 2010). In the following periods, gardens were arranged ensuring comfortable rest in natural surroundings, while making use of the esthetic function of vegetation.

However only since the 1990s an increasing number of papers on urban green in the context of ecosystem services has appeared (Bolund and Hunhammar, 1999). The so-called “green areas” and “blue areas” have been distinguished among other things and attempts have been made to characterize their importance in urban areas (e.g. Kates and Wilbanks, 2003).

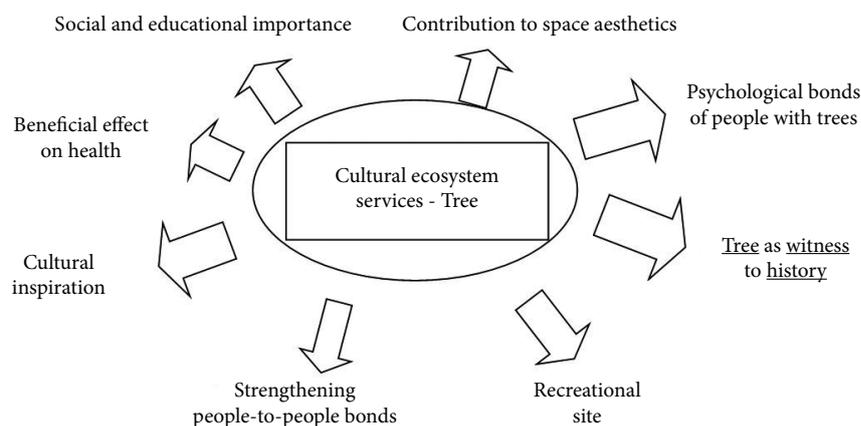
Green habitats include parks, urban forests, cemeteries, free land, gardens and squares, campuses or landfills, while blue areas contain streams, lakes, ponds or storm water reservoirs (Elmqvist et al., 2015). Contemporary research into parks and urban forests users

verify beliefs about benefits relating to stress reduction and mental health (Hartig, 1991). In his research findings, Godben (1992) showed significant relationship between park users and the perceived well-being among people, i.e.: those who used parks quite often were more likely to report “bliss” than those who did not use them.

There were also other studies (e.g. Payne et al., 2005), which proved that green areas have a beneficial effect on urban residents health, enhancing their physical activity and ability to relax faster. In addition, green areas play an important role in terms of maintaining and building social bonds (Kuo et al., 1998). Apart from many environmental and ecological services, urban nature provides an important psychological benefit to the society. It is believed that improved health and well-being of individuals lead to sustainable community development. Based on the findings from three studies

in three cities (Amsterdam (the Netherlands), Paris (France) and Sewilla (Spain), Chiesura (2004) identified several reasons for visiting city parks, with the most common being a desire to relax. This, of course, seems justifiable as parks provide fresh air, ensure mental and physical rest and the experience of nature. A quite large

number of respondents also declared a need „To escape from the city”. Parks are considered some sort of oasis, a hideaway from traffic noise, hustle or crowds (Chiesura, 2004). Given their specificity, the importance of urban trees have been purposefully highlighted and illustrated in Fig. 3 (Kronenberg, 2012).



**Figure 3.** The importance of trees in urban areas, ecosystem services in cities (source: Kronenberg, 2012)

The services outlined in the above figure, may be provided by individual trees as well as by a community of trees, for instance parks. The benefits urban trees provide, outlined therein, show how important they are, taking into consideration, for example utilitarian reasons. Apart from obvious reasons such as recreational, social and educational reasons emerge, which shall be understood in terms of educational and didactic roles of parks.

## 6. Summary

The areas of urban green, in their broadest sense, perform various functions, including social and cultural ones, while the concept of ecosystem services is naturally linked to meeting social needs expressed in terms of cultural services. Therefore urban environment plays an important role in satisfying non-material human needs. Many authors have attempted to investigate and describe the benefits city residents derive from the natural environment. Given all service categories, cultural services are of great value, which in some way affect the perception of urban landscape, recreational

Equally important are blue areas in urban space. Water resources are considered the basis for urban functioning and development. Unfortunately, intensive urbanization processes contribute to water and water-dependent ecosystems degradation. Obviously, they entail many, often underestimated benefits. The river valley ecosystems provide regulating services, consisting in a natural flood-protection control and self-cleaning of waterways.

values, as well as the natural and anthropogenic ones. People visit green areas because they want to relax, escape from the hustle and bustle of the city life and the routine of day-to-day life, and they also want to experience the tranquility and beauty of nature. Public parks are in some way an “oasis” in an urban area, where people can engage in social interactions in a safe and peaceful environment. As a public space, city-center green areas, certainly foster the formation of the essence of the city life and provide a space for interaction and integration. Access to green and blue space in cities is beneficial in

terms of longevity, shorter recovery time after medical treatment, stress reduction, of which all translate to improved well-being. Cultural services provided by urban green ecosystems, including recreation and relaxation, count among most important ecosystem services in cities. All ecosystems then ensure esthetic and cultural values in cities and structure the land-

scape. Trees play an extremely important role in urban green areas, constituting one of the most important components of urban landscape. Undoubtedly, they have an invaluable influence on physical and mental health of people, they affect perception of environmental beauty and they very often co-create their cultural identity.

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