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- 1 This thematic issue is based on the research program SERVEUR (Ecosystem Services of Urban Greenspace 2013-2016). It is funded by the Center Loire Valley Region in France and estimates the services rendered by ecosystems. This notion is recent. However, it has long been recognized that nature provides many benefits to human groups. Although little research has been carried out until the end of the 20th century, scientific publications have multiplied since the 1990s. But it was the Millennium Ecosystem Assessment (MEA) that popularized the concept. The definition of ecosystem services proposed by the MEA is very simple: it is the benefits that human groups derive from ecosystems (MEA, 2005). The MEA also distinguishes several categories of uses, that we will explain thereafter. The definition was inspired by those proposed in 1997 by two groups of researchers: Daily *et al* (1997) emphasize that ecosystem services are "the conditions and processes by which natural ecosystems and the species that compose them sustain human life and respond to his needs" and Costanza *et al.* (1997) present "ecosystem goods (eg. food) and ecosystem services (eg. waste assimilation)" as "the benefits that men derive directly or indirectly from ecosystem functions". The definition of the MEA takes up Daily's idea by using the term "services" to refer to the tangible and intangible benefits that men derive from ecosystems and the opinion of Costanza by including both natural ecosystems and those modified by humans as sources of ecosystem services. Its benefits are to be simple compared to the other two and to allow a flexible use of the notion.
- 2 The expert assessment carried out within the framework of the MEA allowed highlighting the values of biodiversity for the life of human beings, and hence the costs of its loss, either observed or projected. The benefit of the concept of ecosystem service is now well recognized for its properties of highlighting the dimensions of the "value" of biodiversity related to human beings. It therefore focuses on aspects of ecosystems that have a direct

relationship to well-being, that is to say that they can be used or appreciated in one way or another by people (Staub C., Ott W. *et al.*, 2011).

- 3 Four main types of services are distinguished by the MEA: supply services (agricultural products, wood, drinking water, fiber and fuel, fish, etc.), regulation services (regulation of climate, floods, etc.), cultural services (aesthetic, religious, recreational and educational) and support services, which form the basis of the other 3 types of service (major geochemical cycles, soil formation and primary production) . In general, ecosystems provide many goods or products.
- 4 Comprehensive assessment of ecosystem services is impossible; it is rarely performed and reveals very complex. Therefore, the SERVEUR project proposes to carry out an in-depth study on the cultural services of urban green spaces. These spaces play an essential role in social and cultural life: places of relaxation and recreation, well-being and care, where one can escape, meet or have a rest, sources of inspiration and beauty, marker of personal or collective identity, memory of the territory and traditions... Yet they are less documented in the bibliography because they include less concrete and indirect services (Maresca *et al.*, 2011) and are certainly the most complex to grasp. Moreover, these are services that can hardly quantify or monetize.
- 5 IUCN, in its panorama of ecosystem services provided by urban ecosystems (IUCN, 2013), proposes the classification into six categories: spiritual, pedagogical, recreational, scientific, aesthetic and the health service. These categories are of course not separated and some services may be applied to different situations depending on specificities related to land or individuals. Green spaces thus encompass multiple functions within human society. By their material and immaterial properties, they contribute to quality of life and culture, which are non-market values but are real and decisive in the choice of life and societies. All of these non-market cultural services are essential to human communities. The perception of the landscape is not only very important for the residents of these spaces but also for those more distant that come more or less regularly. Individuals are most sensitive to their environment than to the characteristics of green spaces: presence of trees and animals, shade, views, silence with sounds of nature...
- 6 When the ability of an ecosystem or green space to provide goods and services is established, it is now considered important to determine its "value". The latter is classified into three basic types: ecological, socio-cultural and economic.
 - The importance of ecological value is now well recognized. At various scales, ecosystems and the species they inhabit play an essential role in preserving life-sustaining processes. The dimensions of this ecological value are measured by indicators such as specific diversity, rarity, health and quality of the green space, exceeding thresholds, fragmentation, resilience...
 - The importance of the socio-cultural value is certainly difficult to understand but it is obvious that the various urban green spaces (public parks, walks, squares, alignment of plants, gardens and banks of streams...) offer important amenities (often supplemented or reinforced by nature cultivated in private and family gardens and also now on balconies, walls and terraces). They are integrated for aesthetic reasons (national competition of flowered cities for example) or to provide the inhabitants with a supplement of well-being or recreational possibilities. Besides the uses of amenities or therapeutics mentioned above, the international literature indicates other values: inheritance, existential or identity. How can we capture these values: through economic evaluation methods (see below)? The latter must integrate the socio-cultural stature, in particular the existence value: for example,

what would cost the loss of one or more species for the functioning of the organism, what would generate this sentimental loss on Ecosystem and individuals? Therefore, SERVER suggests abandoning the illusion of mixing incommensurable things because wealth is not reduced to monetary value and not everything can monetize. New qualitative indicators (social and ecological) must be developed alongside those of a monetary nature. On the other hand, we must reconsider the wealth around the quality of goods and services produced and the non-market character of some.

- The importance of economic value has developed strongly around the notion of ecosystem service. Environmental assessment, from an economic point of view, is to give a monetary value to an improvement / degradation of the quality of the environment. This assessment is necessary as the benefits of environmental policies are often very difficult to calculate because most of them are not taken into account in market goods and services (see above). The costs to protect the environment are, at least in principle, easier to identify once the cost of regulations associated with standards, taxes or other public measures are known. They may be, for example direct interventions of the State services on the public spaces and their installations.
- 7 The difficulties in performing a cost-benefit analysis are essentially based on the width of the spectrum of data required and the height of that spectrum in terms of quality or reliability of the available information. In the case of green spaces, for example, a non-exhaustive list would range from the present average value of biodiversity in a given area, to the value of existing resources for tourism, and the loss of value due to pollution of all kinds. Fixed and variable costs for the development of these spaces should also be added. The question of measuring benefits is therefore crucial in a normative approach to selecting public policies that are socially efficient, that is to say those that maximize the net benefit for all members of society.
 - 8 The purpose of these approaches is to protect ecosystems from a conservationist perspective. These economic approaches in the field of the environment can provide additional arguments for the restoration of more "natural" environments in the urban space. In fact, SERVEUR's research shows that ecological and functional restoration is not contradictory to the practice of leisure activities. On the contrary, the increase in the diversity of green spaces makes it possible to vary activities, sports and non-sporting practices. Through the creation, rehabilitation and restoration of "natural" environments, an added value can be brought to the landscape. Indeed, it is valued by creating access points on foot or by bike, hiking trails or tours allowing visitors to discover the natural and historical heritage of the region.
 - 9 The SERVEUR research program ended with an international symposium in May 2016 in Tours (France) entitled "Ecosystem services: their contributions and relevance in urban environment". In this thematic issue, we propose ten contributions that shed new light on cultural ecosystem services and re-examine ecosystem services on a broader scale.
 - 10 Mehdi L., Weber C., Di Pietro F. and Wissal S. on the one hand and Blanchart A., Sere G., Cherel J., Gilles Warot G., Stas M., Consales J-N. And Schwartz C. on the other hand propose a synthesis of the scientific literature to highlight the numerous ecosystem uses in urban areas and the growing interest of these questions in scientific research. The first text deals with the theme of plants in cities while the second deals with urban soils
 - 11 Vannier C., Crouzat E., C. Byczek, Lasseur R., Shoemaker T., Longaretti PY. Lavorel S. and Fabien Roussel F. question methods for identifying and mapping ecosystem services. They propose the mobilization of databases, both from existing public information and from

the processing of multiresolution and multitemporal satellite images. The information is then spatialized based on both direct indicators (Biophysical parameters) and indirect ones (land use).

- 12 Bally F.; Laforest V., Grazilhon S. and Piatyszek E.; Brunet L.; Brown M., Vaseux L., Martouzet D. and Di Pietro F.; Brun M., Bonthoux S., Greulich S. and Di Pietro F. propose examples that illustrate the mobilization of the SEC concept in different contexts. These texts show that cultural services are meaningful only if they are not detached from the other categories of ecosystem services. We are here in a systemic approach that further complicates the evaluation of ecosystem services.
- 13 Finally, Maillefert M. and Petit O.; Wissal S. and Weber C. propose an interdisciplinary approach aiming at a mutual enrichment of the disciplinary approaches of the SES. While Maillefert *et al* mobilize the notion of territory through territorialized ecosystem services hybridizing geographical and ecological approaches, Wissal S. *et al* offer a transversal approach by the prism of the evaluation.
- 14 Enjoy !!

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