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GREENBELTS: SOME EUROPEAN EXPERIENCES

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We are witnessing the way in which the disorderly expansion of cities and current urban planning following new models of monofunctional urbanism generate a series of negative impacts on the quality of landscape and territory. These negative impacts are especially visible in peri-urban areas due to the acceleration of suburbanization processes. The progressive consumption of land is a matter of some concern because of the construction of new housing and an increasing number of infrastructures which also contribute to further fragmentation of natural habitats with consequent negative impact on fauna and flora. As a result, a marked reduction in the biodiversity of city edge areas, and a noticeable decrease of accessible leisure zones for the enjoyment of locals, as well as of quality farmland are in evidence. In response, some voices are being raised demanding better conservation of these peri-urban areas and the promotion of appropriate planning tailored to their physical characteristics and fragility.

A compact city generates a better use of resources, allows a pedestrian-based mobility model, promotes greater social interaction and a more diverse society, and provides better access to public facilities and services (Commission of the European Communities, 1990; Thomas and Cousins, 1996; Rueda, 2002). Furthermore, aspects such as the size, shape and isolation of natural or semi-natural areas must be taken into account to determine impacts on ecological processes and species diversity, since they are obviously closely linked to the maintenance of a compact urban form as a pattern for a more sustainable city (Burton, 2000; Blais, 2010).

Greenbelts provide an urban planning instrument with a long tradition in fighting against urban sprawl (Siedentop et al., 2016). They have been used to generate multiple social and environmental benefits, including the protection of green areas and natural areas, preservation of agricultural land, creation of recreation and leisure for urban populations, biodiversity and

landscape conservation, and the preservation of cultural values. New functions have recently been incorporated such as the fight against climate change, the reduction of environmental risks (fires and floods, mainly), and educational and environmental awareness (Yokohari et al., 2000; Yang Jinxing, 2007; Brown et al., 2004; Kahn and Abbasi, 2000; Mortberg and Wallentinus, 2000).

In this article, we seek to determine how this concept is being applied in European urban planning. To this end, we analyze various European actions that apply this type of instrument, in order to identify the relevant factors involved in initiating such urban practices. In particular, five Greenbelt examples launched in Europe (London, Copenhagen, Cologne, Frankfurt and Brussels) will be analyzed, mainly concerning aspects such as legal structure, mechanisms and levels of protection, the administrations engaged in management, the characteristic features of the area (natural and cultural values, the connection with urban centers, size and dimension, etc.), the pressures to which they are subject, future challenges, etc. While the study cases cover different time periods and scales and reflect very different approaches at the time of conception, we consider that the lessons learned from these examples can provide a useful tool for landscape planning and the development of future Greenbelts or green infrastructure. In fact, although the scope, planning methodology, shape and administrative context of each case analyzed are different, they all share common characteristics, such as the search for better preservation of green spaces and greater connectivity of urban areas with the natural and rural environment.

The methodology focuses on the study of best practices through an initial comparative analysis of different international Green Infrastructure performances. This methodology proves to be particularly suitable for the study of urban landscapes and their sustainable management, since good practices are useful tools in terms of learning, and when proposing the replication of successful experiences in other contexts. Consequently, we proceeded as follows:

- First, we spent considerable time on an initial review of the literature regarding the Greenbelt concept, analyzing both scientific articles published in journals of international prestige, and documentation published by the entities promoting different Greenbelt initiatives (Local Authorities, European Environment Agency (EEA), Greenbelt Foundation, etc.). In addition, a search and synthesis of key governmental documents relating to their management and planning were undertaken. This literature review allowed us to build the historical background and the definition and functionality of the concept.
- We then collected a wide range of European Greenbelt study cases through the selection and systematic study of innovative experiences, while at the same time a critical analysis of the selected case studies was conducted to pinpoint the key aspects required for these practices to be successful. We focus on aspects involving the promoting body or bodies, the actions undertaken, and the management and planning system, amongst others.
- Finally, we aim to elucidate the key elements that allow the measurement of progress when devising a package of recommendations to be considered in the planning of such instruments. 30

From a review of the literature (Freestone, 2002; Bengtson and Youn, 2006; Yokohari et al., 2000; Yang Jinxing, 2007), it can be drawn that Greenbelts emerged from the proposals made by Ebenezer Howard in his Garden City Plan (Howard, 1898) in which Howard proposed to achieve the decongestion of large cities through the establishment of rural-urban cells surrounded by Greenbelts. The benefits of both rural and urban areas could thereby be brought together whilst avoiding the negative aspects of both areas. These Greenbelts would preserve undeveloped areas around the urban centers and help to control the growth of the city by imposing physical limits on it (Dawkins and Nelson, 2002). From that time onward, numerous examples of Greenbelt or peri-urban green infrastructure have been launched (the Greenbelt of Moscow, The Copenhagen Finger Plan, the Greenbelt of Ottawa, the Green Heart of the Netherlands, etc.), some of them with greater success than the others, but all of them supported by the same generating principles: mitigation of the pressures of urban growth and associated infrastructure, provision of green and leisure areas within easy reach of most citizens, promotion of civic awareness, recovery of degraded or fragile areas, and conservation of biodiversity.

However, we must take into account that Greenbelts are not static instruments but have adapted and evolved leading to the development of very widespread practices today, such as urban green infrastructures (Ahern, 2007; Benedict and McMahon, 2002, 2006; European Commission, 2009). Although the initial function of the latter was to guarantee the existence of spaces devoted to agricultural activities close to urban areas (Akimowicz et al., 2016), and to put a brake on urban sprawl while preserving rural areas (Yang and Jinxing, 2007), today there has been an expansion in their functions, leading to an increase in their overall significance' (Bengston and Youn, 2006; Amati and Yokohari, 2006). In this regard, some of the objectives to be met with this type of green infrastructure are the provision of food security, protection of ecological integrity in the whole area, the conservation of biodiversity, preservation of local water quality and the designing of natural spaces for recreational activities. In addition, they provide ecosystem services which can also help to improve the physical and mental health of citizens (Tzoulas et al., 2007). Today, Greenbelt continues to constitute a relevant planning tool (Amati, 2008), although it has also been the object of some criticism, because it can set off a number of negative effects (causing new urban development beyond the Greenbelt, generating higher costs in transport and in the provision of public services, increases in housing prices, and the freezing of the real estate or commercial market due to increasing installation costs).

In this context, some of the experiences analysed have been in place for a long time and the majority were initially conceived with the objective of preserving natural landscapes and establishing a clear separation between urban and rural areas. However, their functions have become more relevant, as recreational use and ecological functions take on greater importance. As we have mentioned, there are a number of recurring factors in the different experiences of Greenbelts: their ability to evolve to meet the current needs of society, the continuous pressure of urban growth and related infrastructure, the importance of active support by landowners, the relevance of the existence of legal planning and management instruments, their potential in the restoration and improvement of natural spaces, the need for consistency to be kept with other policies such as water management or mobility policies, and the crucial role of civic engagement.

This commitment can sometimes be noticed in relation to funding where, although financial funds mainly come from local governments, in recent years private donations or those obtained from companies have risen, especially where the provision of infrastructure and equipment is concerned. Indeed, budget constraint is one of the main challenges to be faced by these areas, and this often leads to maintenance problems and degradation, which have increased in many cases because of negative effects caused by mismanagement of environmental use or by anti-social behaviours. In this sense, another fundamental conservational issue is the way in which these areas are managed and used, as intensive use may conflict with biodiversity conservation and agricultural uses. Thus, although in most cases initiatives to encourage accessibility are being developed, in others the possibility of restricting access or limiting Greenbelt use in certain areas is having to be taken into consideration.

Where the real functionality of Greenbelts is concerned, regardless of the original objectives that fired such initiatives, a great variety of case types can be observed in the examples analyzed. The London Greenbelt, which stands as the earliest case of legislative planning in this regard, is an example where interventionism is generally avoided, favoring the physical planning of an instrument directed at restraint. The case of Copenhagen is somewhat similar, in that the approach was mainly adopted to channel the growth of the city, although extensive conservation areas covered by the Natura 2000 network fall within the overall plan. In contrast, in Brussels, Frankfurt and Cologne, objectives such as the promotion of ecological and biodiversity conservation, or the achievement of a greater coherence in the urban green system through connection to the regional system are pursued. All these cases, however, share the social goal of establishing recreational areas for urban dwellers, which may vary in their proximity to urban conglomerations and involve environments subject to different degrees of intervention, ranging from natural forests to city parks.

Conversely, the land is not always publicly owned, so cooperation and good relations between the Administration and private landowners, who are usually small farmers, is essential. Additionally, one of the functions of these spaces is to protect agricultural land uses, so programs that particularly promote local agriculture should be developed; this might include the creation of markets for local products, subsidies to transform their traditional activity into organic farming, and the setting aside of spaces as public gardens oriented toward creating employment so as to socially integrate specific disadvantaged groups, perhaps, or simply to encourage productive leisure activity of such a nature.

In terms of the shape they adopt, some Greenbelts are configured following the traditional approach, functioning as a border between the central city and suburban communities. In a sense, these are abstract conceptions reflected over the whole territory that do not always fully match the landscape parameters (Yang Jinxing, 2007). They frequently give the impression that, as structures, they are turning their backs on nearby rural villages. But when this occurs, flows and interrelationships between urban and rural areas have not been considered, ignoring the fact that Greenbelts could play an important role in structuring urban regions when they act as connectors of different spatial units (Kühn, 2003). The future of Greenbelts will probably be linked to their evolution towards an integrated green infrastructure through the development and protection of a multifunctional network of green spaces coupled with proper management of the hydrographic network in urban areas (Schrijnen, 2000). This would, to a large extent, make it possible to improve biodiversity conservation, connectivity,

and the ecological resilience of natural areas, and to achieve a greater functionality of the ecosystem in the provision of goods and services (EEA, 2011; Aguado et al., 2013). We are talking about introducing biodiversity in Brussels, for instance, using instruments such as "green walls", "green roofs", private gardens, etc., seeking to recover whatever spaces are capable of containing biodiversity.

In conclusion, the review of the different cases suggests that planners of such initiatives should: (1) determine their form, role, and conceptual organization with a strong emphasis on the connectivity and protection of natural systems and cultural qualities; (2) apply the principles of sustainability in order to preserve biodiversity, adequate workability of the system, and productivity, the latter being adapted to appropriate human usage levels; (3) develop efficient and affordable strategies of management and implementation; and (4) gather public support by informing and engaging local citizens (Taylor et al., 1995). In this regard, we believe that citizens can play a key role in the success of these initiatives. Therefore, one of the factors that must be underlined is the need for a strong degree of social support as an essential element for long term success in order to protect these projects from real estate development pressures. To encourage this support, fluid and constant communication regarding the benefits flowing from Greenbelt is necessary.

Another key feature is permeability for different land uses. A Greenbelt should not act as an impassable frontier and should not critically limit the need for future developments. One of the criticisms often leveled at this type of planning is that Greenbelts can contribute to rising housing prices. Accordingly, the design should be sufficiently flexible and realistic, and take expected population growth into account to allow for the adequate supply of housing. But, at the same time, it is important to keep urbanization to a minimum, reducing infrastructures and artificial barriers.

It is hard to predict the role that Greenbelts will assume in the future. But it is certainly true that, whilst the first Greenbelt prototypes were conceived in order to protect landscapes by applying environmental features which might at the time have gone unnoticed, they are highly regarded today. Similarly, the more recently established Greenbelts are likely to acquire increasing importance for local communities in view of the global changes that are taking place, such as the impacts generated by climate change, water shortage, or the increasing cost of raw materials. One big challenge will be to encourage the transition to a green infrastructure network. In this regard, inner city brownfields or abandoned areas can play a major role. As far as possible, the legal steps necessary to transform many of these inner-city spaces into areas of opportunity for use as quality public spaces should be discussed.

Finally, we must highlight the fact that, in Europe, some functions are not being properly addressed, such as the possibility of promoting sustainable agriculture within close reach of urban areas. Local Food movements, for instance, are not gaining momentum in Europe as much as they are in the United States or Canada. Another challenge that governments will have to face is management of the usage of these spaces; leisure use is currently being seen as a big priority, but this comes into serious conflict with the conservation of some species. Then again, if the question of accessibility is not adequately managed, a risk of leisure gentrification can appear due to the fact that these spaces are often located far from the urban core, and not all citizens are empowered to access them. So a necessary balance between public access, and the biological conservation and preservation of these areas, must be achieved.