URBAN FOREST – KEY ELEMENT IN URBAN LANDSCAPE PLANNING

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Abstract:
The urban landscape is the result of socio-economic development and urbanization patterns which continue to have a significant impact at different scales. Minimizing the negative impacts of urbanization remains an important objective in order to achieve a sustainable development. The need of urban green areas is increasing due to the fact that many open spaces become occupied with buildings and infrastructure. Urban forests can play a crucial role in improving the quality of urban life. This study aims to assess the spatial patterns of urban forests and their relation with the urban planning process.

Key words: urban forests, urban landscape, urban planning
JEL Classification: Q01, Q23, Q26

Introduction

Urban forests are broadly defined as natural and planted tree resources in urban areas (Ordonez & Duinker, 2015; Konijnendijk et al., 2006, Randrup et al., 2005). These elements of the green infrastructure (Brady et al., 2001) are improving the urban environments making cities better places to live and work. Many consider the urban forest to be an ecosystem which not only includes vegetation but also water, soils, urban infrastructures, transportation systems allowing people to move (Knuth, 2005).

Defining a city's urban forest is not simple due to the fact that each urban area has its own specificity which involves natural environment characteristics, but also historical and cultural aspects. A strict definition of the concept has not yet been agreed, the urban forests considered as natural resources comprising the land in areas of intense human activities

which are occupied by trees (Knuth, 2005). Although initially the forest was regarded as the primarily source of wood, today the main function of urban forests is the recreational function for the urban community. Starting from 19 century, besides the primary recreational purpose, urban forests have other functions such as biodiversity conservation, water protection, increasing the attractiveness for housing and economic development. The concept of urban forest is regarded differently across continents, the North America perspective being focused on trees in built areas while in some European countries the woodlands composed the urban forests (Konijnendijk et al., 2006). Urban forests are part of the urban landscape and the urban ecosystem providing a wide range of benefits (Helms 2002, Tyrvainen, 1999). These benefits can be grouped in five categories: social, esthetics, climatic, ecological and economic (Tyrvainen, 1999). The social benefits are associated with the recreation opportunities created by the existence of these natural areas in cities. The quality improvement of the urban environment is associated with cultural and historical values which increase the importance of the forest in the life of citizens. The attractiveness of urban forests comprise the possibilities of exercise physical activities such as walking, cycling, jogging, picnicking or picking mushrooms and therefore providing health benefits. The esthetics benefits are linked with the use of vegetation in urban planning in order to define the open space. People preferences differ based on the geographical region in question studies have shown that higher educated residents prefer a more ecologically-oriented management of the urban forests.

The climatic benefits involve the improvement of air quality by removing air pollutants. The urban forests play a major role in the urban climate being a temperature reduction element, which helps diminishing the negative effects of the urban heat island or can offer shelter from cold winds. The vegetation and fauna of urban forests represents great interest for the biodiversity conservation in urban areas (Nowak, 2011). They can act as a stepping stones or core habitat for species dispersal allowing functional flows and movements in the landscape. (Forman, 1995).

The economic benefits of urban forests can be classified as use values and non-use values. The use values can be consumptive and include the marked price products such as timber, berries, and mushrooms. Although, timber is one of the most important marked price products in rural areas, urban forests are not exploited for their wood, the main values having no price marked. These values are a non-consumptive use type and refer to the recreational opportunities, pleasant landscape and reduction of costs through cooling function in the urban climate. In the urban landscape urban, forests can be an economic factor which influences the

property prices, having an important role for the nearby recreation purposes (Kienast et al., 2012). Urban forests have a great influence on the land market prices, their proximity being very attractive for residential development or business parks projects. There are different methods for estimating the amenity value of urban forests in monetary terms (Tyrvainen, 1999) for example: the hedonic pricing, contingent valuation, tree pricing etc.

This paper aims to assess the spatial pattern of urban forest and their relation to the urban planning process. In order to achieve this goal two objectives were set: (a) a review of the legal context of forests in urban areas and (b) a case study of Braşov city to exemplify the spatial pattern of urban forests in relation to urban development.

Data and methods

The data used comprises the 2010 master plan of Braşov (City of Braşov, 2010) and aerial images from 2005 and 2008 (ANCPI, 2015). The analysis is based on mapping the spatial configuration of the urban forest and the built up areas. Urban forests and buildings were digitized using GIS software in order to create land use maps. Information regarding the forests functions was extracted from the master plan. Using spatial statistics and a buffer, the spatial configuration of urban forests is quantified in relation to the development of new buildings.

The study area is Braşov city, an important urban pole in the central eastern part of Romania. The administrative territory of Braşov is situated in the southern part of the Braşov depression with an average elevation of 625m. The topography is smooth in the center and north part of the city, which allowed the development of the urban area and high elevated in the south part where one can find hilly regions covered by forests with coniferous species. Being at a crossroads between the north, south, east and west of the country, Braşov is situated on a major development axe Bucureşti – Ploieşti- Braşov –Iaşi. The atractiveness of the urban areas is determined by the variety of natural environment, the developed transport network and the workforce.

Results and discussions

❖ Urban forests in Romania – legislation aspects

The Romanian urban system had to adapt to the shifting socio-economic and historical conditions that followed the change from a communist regime to a capitalized economy. If previous 1989, the expansion of urban areas was realized in a compact way, afterwards the cities have been developed in an unorganized manner leading to the

appearance of urban sprawl phenomenon (Suditu, 2010). After the communist era, the urban development in Romania experienced the multiplication of buildings with different destinations (residential, industrial or services) which led to an extent of the building perimeters and the fragmentation of the urban landscape (Suditu, 2012).

The uncontrolled urban growth has negative impacts on the environmental quality. Mostly, this process can be observed in the spatial pattern of the built up areas which are expanding in the detriment of agricultural land, forests and areas with a rural character (Iojă et al. 2013, Niță 2011). In this context, the natural and semi-natural areas in cities must be protected in order to provide benefits and sustain the economic development of the city.

The planning tools used in urban areas are provided by the Law no. 350/2001 regarding territorial planning and urbanism. The main tool is the master plan of the city which establishes the limit of the built area. By 2011, the limit of built area increased by promoting urban zone plans which permitted one to introduce a land located in "no built zone" in the built area (Suditu, 2012).

Due to the national legislation aspects, the first one has to regard differently the forests resources in an urban administrative area. The urban forests can be considered the forest resources that are located inside the limit of the built area. The management of these areas is made directly by the local administration under the incidence of the Law of Urban Green Spaces no. 24/2007. This law states the types of urban green spaces in a city. The term of urban forest is not found inside the text law but the recreational forests are defined to be those that present the framework for good development of recreational activities. The master plan of a city can give different functions to forested areas, for example: protection for water bodies, recreational forests etc.

Outside the built area, the forest resources are administrated by Romsilva National Forest Agency under the Forestry Code Law 46/2008. There are two main types of forests that are described in the Forestry Code: ones with specialized functions to comprise the protection of water bodies, recreational purposes and protected areas, and the others for production function – timber exploitation. It is prohibited to enclose forests in the built area of cities.

❖ Case study – Brașov city

The land use map (Fig. 1) shows that the urban forests are concentrated in the south part of the city along the limit of the built up area. There are several functions specified in the master plan which

regards the urban forests: recreational function, protection function and conservation function (Tab. 1).

Between 2005 and 2008, the most dynamic area of urban expansion was the north of the city, but through the buffer analysis we identified that a percentage of 25.45 % of the new buildings was developed at a maximum 500 m from the urban forests. The south-eastern part of the city, the Noua District presents a high rate of urban development in terms of built space.

Urban forests	
Function Type	**Surface (ha)**
Recreational	261.08
Protection	35.68
Conservation	363.95
Forests and plantations	1821.15

Table 1. Urban forests – functions and surfaces

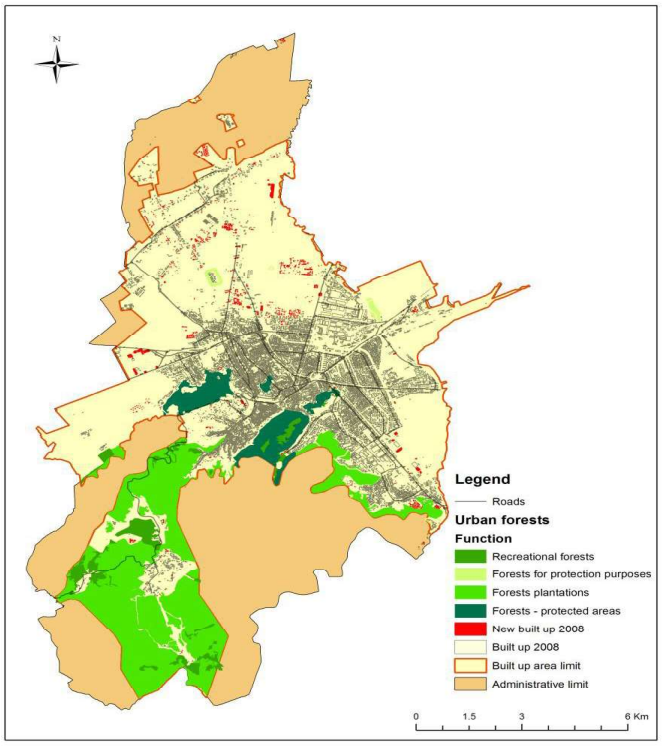

Figure 1. Urban forests and urban expansion - Brașov

Conclusions

Urban forests are becoming more important for their benefits, being a factor for the urban quality of life. In Brasov, urban expansion has reached its development in the northern part of the city, as opposed to the agricultural land use. But there is also an expansion in the proximity of forests, even if it is not at the same rate.

The urban forest management does not have an integrative character being spatially limited by the boundary of built area. While the urban areas are becoming more complicated in terms of land uses, there is a need of reevaluation of natural resources and recreation spaces in and around cities. A sustainable development scenario considers urban forests as part of the urban landscape and therefore essential for the social and economic evolution in the short and long term.

Adopting a smart growth attitude will place the growing in the right location where there is already the necessary infrastructure, thus conserving the natural and open spaces like urban forests.

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