

# GREENING URBAN SPACES IN ROMANIA

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## ABSTRACT

Reintegration of green areas in Romania from urban areas strongly exacerbates ecological risks at urban level and also has a negative impact on population health and quality of life. The more we look around, we see that mankind is increasingly trying to create new green spaces especially in the urban area. Compared to other European countries, Romania has a deficit in terms of the net green area per capita situation, so many cities do not have the minimum required. In the article presented, we will consider several ways to reduce or even eliminate this deficit in Romania. Looking around, more and more people are interested in a healthier and cleaner lifestyle, and the fact that the lack of a green or ecological space brings many concerns for our country, makes fundamental measures to be taken into account and applied in a more coherent way. So, in the years to come, we will be able to admire more green spaces that will benefit everywhere.

**Keywords:** urban space, Romania, green area.

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## 1. Introduction

Not long ago, greening is a very important topic for most people, especially for those in the urban area. For a country like ours, Romania, it seems shocking that in every city there are urban greening spaces. From the point of view, urban green space is a real moderator to the whole impact of human activity on the environment. Through a complex process of photosynthesis, plants consume carbon dioxide and eliminate oxygen, building the planet's main source of life. Experienced studies have shown that one hectare of forest produces an average of about 10 tonnes per year and consumes 14 tonnes of carbon dioxide. According to the above, vegetation plays an important role in modernizing the urban climate. In the cities of Romania concrete or paved constructions form a specific urban climate with a restriction of the circulation of the air mass and elevated temperatures which leads to the production of certain special effects. Climate studies have shown that the average air temperature for summer days is about 3.5 degrees lower compared to areas where there are no green spaces (cities) and 13 degrees lower than the temperature of the concrete or asphalt. Among other benefits of vegetation is the attenuation of noise pollution, because green spaces that are compact form a "wall" for different noises and greatly

contribute to their reduction during the vegetation period. Looking at social benefits, green spaces contribute to the growth of elements and create new opportunities for different people as they interact with the whole community. By setting up green springs, certain cultural and social events can also be created, such as local festivals, various theatrical activities and other social economic manifestations. If a green space is well maintained, it helps to promote urban health because it promotes an active and healthy lifestyle by practicing various physical exercises, sports, cycling, etc (Popovici, Balteanu and Kucsicsa, 2013).

## 2. The green space. Concept and basic notions

These spaces provide people in the city with a place to relax and relieve stress in central areas and concrete buildings, as they respond to recreational needs after many hours of work in the office or other activities that have required a lot. For those who do not have time or a less-satisfactory financial situation, the only source of recreation is the parks arranged by the territorial administrations. Most of the time, green spaces become playgrounds for children, thus helping their mental and social development. These spaces provide people in the city with a place to relax and relieve stress in central areas and concrete buildings, as they respond to recreational needs after many hours of work in the office or other activities that have required a lot. For those who do not have time or a less-satisfactory financial situation, the only source of recreation is the parks arranged by the territorial administrations (Radu, Conda and Biris, 2011). Most of the time, green spaces become playgrounds for children, thus helping their mental and social development. Also, from an aesthetic point of view, urban space is of great importance because it reduces the impression of rigidity of any type of built environment. The economic benefits of green spaces result in a favorable environment and image in correlation with urban centers, which is why the activity for investments and new job offers increases. At present, researchers use several definitions for "Green Space" or "Greening", depending on how they are managed or how they perceive a community and location. In Romania, the concept of green space or greening means creating a semi-natural system consisting of a vegetation of the wood type (shrubs, herbaceous flowers). In the following we want to list the most important categories of green spaces, and here we have (Wolch, Byrne and Newell, 2011):

- Specialized green spaces for public use;
- Outdoor museums, botanical gardens, recreation areas, zoos;
- Recreational facilities and complex sports facilities;
- Green areas for protecting rivers and lakes;
- Greenhouses and nurseries;
- Recreational grounds;
- Terrain for practicing performance sports.

As mentioned above, even if there is no clear definition of what green space means, there is no room for interpretation when it comes to popularizing it. We considered it efficient to present a classification of more benefits that green spaces meet in urban areas: economic, social and environmental benefits. From an ecological point of view, green space contributes to (Haq, 2011):

- A natural cleaning of the entire atmosphere by keeping the dust;
- A steady consumption of carbon dioxide in the photosynthesis process;
- Noise reduction;
- A moderation of the urban climate;
- Perpetuating and preserving indigenous natural vegetation.

Among the many social benefits offered by the existence of green spaces in the urban environment we mention (Popovici, Balteanu and Kucsicsa, 2013):

- A change in social inclusion by facilitating social contact between people of several ages, but also by participating in different cultural and social events
- Promote urban health by adopting an active and healthy lifestyle
- The human need for leisure and recreation
- Aridity and diminishing the impression of rigidity of any environment that is built by the aesthetic function that green spaces meet.

### 3. The role and efficiency of the green economy

Regarding economic life in urban areas, green spaces bring some important benefits such as: creating a favorable image of urban centers with good results increasing a favorable image with results in defining investment activity, increasing the value of urban areas, modifying housing when it is properly maintained or even the development of tourism. Over the past twenty years, researchers have shown a growing interest in determining to what extent ecological infrastructure leads to economic well-being or whether some benefits can be quantified, generating economic value in cities. A large number of researchers and experts have concluded that these seven elements that fall within the green space and the urban environment can be measured and also the calculation of those direct incomes for the state budget or the realized savings: changing and increasing property value close to green spaces, health promotion, tourism development, air pollution and some benefits of

direct use of leisure facilities. In order to better understand how these benefits can cause income or savings, we will provide more details about each one. Nowadays, to measure the effect that green spaces have on the various adjacent properties gets a common practice. More studies have shown that the value of land and dwellings adjacent to green spaces may increase by up to 21%. In a concrete example, we all recognize that people who want to buy a new home are willing to pay more than the closure of a park, a school, or another unit in that sphere. So green urban infrastructure helps to multiply real estate revenue. In practice, it is believed that the image of an area can be improved as a result of high property prices. Cities that create green spaces attract more visitors, which may result in new jobs being created. Economists call property value and "hedonic value" and it is admitted that it can be influenced by several features. The main feature is accessibility that represents the distance from the green or a certain percentage of green areas given in a given perimeter (Bran, 2000). In Romania, in order to determine how green spaces lead to higher revenues for the state budget, the researchers have combined the value of properties with other green areas such as parks and have applied some average value benefits resulting in the value of the property influenced by the proximity of Park. If you know the annual property tax rate, you can calculate the value of the tax charged for the adjacent properties in the area of interest. Without support, the rate of property value increase becomes difficult to measure earnings for green spaces. In order to continue with the fact that ecological infrastructure plays a very important role in tourism, it is at the same time a great opportunity to add gross value to a certain region of the country, we will enumerate the main factors that influence the process:

- Contribute to supporting urban tourism;
- Called cities as more attractive;
- Generates economic activity in various sectors such as public services, agriculture, forestry, art and cultural events;
- Keeps the attractive landscapes and strengthens visitors' attractions.

For example, in order to be able to calculate the contribution of the parks to stimulate tourism and consequently the revenues for the state budget, it is necessary to estimate the number of tourists passing through the park and what are the expenses incurred during the visit or those who visit I just pass occasionally. For all these calculations, polls are often used for people visiting the park. When it comes to population health through greening, health benefits are quantified in economic terms and refers to the savings made in the health budget due to the reduction in the cost of certain saricines. In general, medical expenses have a lower cost for people who are more physically active than those at a sedentary stage.

#### 4. Implementing the green economy in urbanization and its effects

Activities such as cycling or walking, picnicking, playing a match in a sports team, visiting a botanical garden, and many more are included in the category resulting from the direct use of green areas, where for many times people would not pay a sum of money. Even so, economists have a duty to calculate the value of such an activity and have to consider the cost of such activities in a private work area. So, the notion of "willingness to pay" is born, so through the free opportunities that people take advantage of or are at a low cost, people often make significant savings. Very often, the opinions are shared because there are savings that are not made directly by comparing them with tourism ventures or taxes, and they are indirectly included in society. While they have to pay for any activity in an area with green space to enjoy recreation and rest, city residents would give up these favorite activities and lead to dissatisfaction. In order to determine the correct economic value of using green spaces for more activities, we need to separate them into three categories as follows (Bran, Simon and Ioan, 1999):

- General activities such as the use of playgrounds, the development of trails, walking animals;
- Various sporting activities such as swimming,
- cycling, soccer, skating;
- Concerts, cultural events, special facilities.

After we have obtained this classification, the next step is to estimate the number of people visiting the recreation area during one year or the park and to assess the activities strictly related to the facilities provided. Most meetings are formed for general activities, and each visit is attributed to a medium-sized value and provides certain categories of activities and greater economic value of green spaces for this use. The human need to achieve as much as possible and to integrate into society and to know more people in the area they live in is representative of a person who wants to live in an environment or green area. Through socialization, we convey some basic and fundamental rules of social life, prohibitions, rules, habits, mentalities, etc., from basic skills to sophisticated and complex ones involved in scientific research or creative action. If we take into account that the above listed actions used for the direct use of green spaces lead to social cohesion, the situation of measuring the economic value that actually describes the relationship established in a certain community following the human interaction of this activity. This idea started out for the first time from people who want to be a modern social unit. Social capital is used by the World Bank as an idea of useful organization. Everyone is aware that social cohesion is very important for a society to prosper especially from an economic point of view and that development must be sustainable. Social capital should not only be understood as a sum of the institutions that create a particular society, but it is a body that together brings prosperity. In order to determine the correct economic value of social cohesion, it is important to admit the extent to which people spend both money and time to plan and maintain a green urban infrastructure. For this model, the researchers decide to

consider the work of several volunteer-based environmental organizations that collect garbage from green spaces, then plan to plant trees and flowers either to organize in-house meetings to inform citizens on these issues. For each above organization, it is necessary to calculate the number of hours of voluntary work and which is in itself the value attributed to a volunteer hour. Let's assume that the value of a volunteer work time is \$ 11, in which case the number of hours worked has been added to contributions in the form of donations or certain sponsorships, so that the economic value of cohesion stimulated and influenced by the existence of these green areas. To fight against climate change, Romania has significant assets like these green spaces. The most common are greenhouse gases that are removed from the atmosphere, with the author of these areas as well as carbon dioxide (Haq, 2011). Trees remove this type of gas and keep generations in line. Forests represent about 61% of the carbon that exists in soil and vegetation according to the latest reports. Tree leaves absorb the amount of pollutants and act as a natural filter to stabilize dust. They are the "green lungs" of the cities because they absorb all the noxes, gas emissions, dust and oxygen to eliminate a healthier life. Unsee studies by researchers show that the dust level in a particular park was 60% lower than outside the park. In order to find out how green areas reduce certain air and soil pollution costs, we need to know the area of interest in the following two respects: what are the tons of pollutants removed by green and what are the money saved for each tune that was also removed for which category of pollutant. In most cases, pollutants that are most closely monitored are: sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), carbon monoxide (CO), suspended particulate matter (PM<sub>10</sub>). In Romania, the National Air Quality Monitoring Network has over 100 stations across the country and monitors air quality. Money that saves on tonnage is the so-called "value of externality." The solution works on the principle of costs that are postponed. Here many scientists use certain computers that measure the penetration of the pollutant over a certain area and over a period of time being correlated with the hourly concentration of pollution from the Environmental Protection Agency and some data to look at the functions of different types of trees and seasonal variations of the leaves. The total amount of pollutant elimination is obtained by multiplying the amount of pollutant that has been removed with the money that was saved for each tonne that was removed (Radu, Conda and Biris, 2011).

#### 5. Reducing costs and increasing productivity on the broad consumer market on green spaces

The most important aspects that are closely related to the influence of vegetation on how to reduce the management costs for urban waters are (Bran, Simon and Ioan, 1999):

- There is a vegetation area that keeps a large amount of rainwater and most of the water does not reach the ground, the reason being its evaporation;

- If rainwater is captured, leakage is automatically slowed down;
- Vegetation has the role of cleaning water and acts as a filter for intercepting and recycling nutrients;
- Reduces the risk of flooding;
- Allows a more fluid drain.

In order to identify the best value for savings in rainwater management in urban areas where green spaces have been created, it is very important and necessary to have all the land cover data (which is the surface of the open grassland, the water surface, and the area also there should be an estimate of annual leakages, the amount of rain on waterproof surfaces, and annual water treatment costs, as it is very important to have a clear analysis of the composition and of course what is the cost per cubic meter. A model that helps us calculate savings from leakage reduction should include the following important points (Wolch, Byrne and Newell, 2011):

- What is the average annual rainfall of a city?
- what is the amount of actual leakage in parks and gardens;
- what happened if there were no parks and that
- quantity of water did not have a permeability like the rest of the city.

If we make a difference between the two, we will get the leakage reduction due to the perennality of the park and get the total economy. The greening of urban spaces in Romania takes the capital of Bucharest, which until long was considered a city of gardens, and today faces a whole class of urban problems that lead to a worsening of the quality of life of its inhabitants. A major situation faced by the city is the lack of green space, and this crisis began in 1990 when many buildings reduced the green areas of the city. Research has shown that over the past twenty years, more than 1.6 million trees and twenty million square meters of green space have disappeared. Most estimates show that the total green space cut rate was 260 hectares in a year, and so it can be explained that the green space in Bucharest is just a stretch of the existing before surface. 389/5000 The best-placed sector is the first sector that occupies about 11 square meters, in sector 6 there is only 0.6 square meters with the green area twenty times less than it was normal. In the capital there are on average more than 40 parks, some of which have historical value or have a wonderful scenery, also giving them an identity for this great city.

The main functions of green spaces in urban areas according to several studies carried out over time at the level of Romania contribute to:

- meeting the needs of relaxation or recreation of the people, aesthetic, cognitive;
- contributes to diminishing or sometimes even relieving the stress of urban life;
- green spaces help ecologically and socially urban systems, help to embellish the city, can even get a tourist point;
- it offers the possibility of meditation and supports the rest of the people;

- as green spaces are more diversified by types of species or landscapes, their psychological value is higher;
- It has the role of regulating precipitation and reduces the danger of landslides;
- reduce the city's temperature with plants that create an evapotranspiration process;
- a beneficial impact on the climate (Popovici, Balteanu and Kucsicsa, 2013).

## 6. Parks in Bucharest. History of evolution and benefits

Below we will find some parks in Bucharest and we chose this city because it is the capital of Romania and has some green spaces that can be proud even at European level. The first on our list is Cismigiu Park. Cismigiu Park is the most beautiful and old "green" exhibition, with an area of approximately 33.5 acres. It is located right in the center of the city and resembles the structure of Anglican parks. It has a central lake, surrounded by large and welcoming alleys, and the banks are sheltered under the trees for decades or even hundreds of years, various sculptures, monuments, floral arrangements. There are two rivers and two bridges that run over the lake. If we are admirers of art, in this park we have the possibility to observe some sculpted busts, which is why these parks are among the most loving places where you can walk and have fun admiring the created creations. If we look at the whole and we relate to the technical and urban equipment, this park was extended during its development and it was offered a modernization regarding the ambient and general lighting system, which are located outside the public traffic being approved by projects legally. At the same time, it has undergone many interventions for the original reconditioning of the park by using composition and similar species. The park is classified as a historical monument and is listed on the list of historical monuments in 2004 through a series of monuments found in this park (Radu, Conda and Biris, 2011).

The Herastru Park, which is located in the North area of the capital and has an area of approximately 272 hectares, representing a park complex around Lake Herastru, it also bears the title of the most green urban area that is used for relaxation and physical education or sports. With such a surface, it helps to absorb the noise or the various disturbing factors. The most important components that can be highlighted in this park are: Kiseleff Park Village Museum and even Bordei Park. The Herastru Park is divided into two as follows: The Old Herastru and here we find statues, monuments, pavilions and the relaxation area (the banks for the banks) and the second part of the park is Herastru de Nord or New Herastru as the most extravagant where we meet the people who are interested in making more movement, fun or terraces located on the edge of the lake that offers a memorable view. The lake in the center of the park is part of the chain of lakes in the Colentina river and is very much used for nautical activities, and is also equipped with bikes, hydro-bicycles and small ships. Herastru Park is a tourist point of the capital for the numerous tourist attractions inside it, and the most important are:

- Expoflora representing the area around 36-37 acres;
- The Japanese Garden, which at its location
- also helped the Japanese embassy in Romania;
- Rose Island that includes two directions to the
- Village Museum and the latter;
- Caryatid Alley by Constantin Barasch.

The Tineretului Park, located in the southern part of the capital, with a capacity of about 197 acres, has a very large green space. In this park there is also the famous Polyvalent Hall that helps host some sporting events and cultural activities. Also, here we find a huge paved platform that is decorated with statutory groups and is useful for organizing outdoor school activities. Close to the residential, we find quite large playgrounds, relaxation areas or even a pier for hydro-bicycles and boats. The surface of the existing lake has a capacity of approximately 39.6 hectares and it is naturally supplied with surface water. Here are three islands and two of these islands are connected by two small bridges, they are framed in the shoreline configuration and are wonderful visual landmarks. If we consider how the surface relief is shaped and the differences between the soil surface can reach even at 16-17 meters at some points, and from these you can see the lake better and represent an excellent position for admiring the panorama. In addition to the existing lake, in this park we can meet a lot of other interesting things like: steam train, riding tracks, jogging track with a length of about 7 Kilometers, football fields, tennis courts, and in winter there are even an artificially crafted skateboard. Other interesting emblems that can be seen here are the circular rosary, which is about 200 meters in diameter, with paved internal paths leading to a special view. Drawing a conclusion can be said and it is demonstrated that the Herastrau Park is the largest of the Bucuresti, followed by the Tineretului Park and then by the Carol Park. Even so, these three parks along with the other green spaces cannot be in line with EU green space development standards. One cannot discuss the excessive fragmentation of the parks in Bucharest, but there are some exceptions such as the Titan Park or other parks belonging to a smaller category. This is because the parks are very small and only in some neighborhoods. Bucharest's parks are separated from one another and there is no way of communicating or linking them. All large parks are completely isolated, except Herastrau that covers the entire lake surface and has a certain continuity structure that can be said. The green areas in Bucharest every day are affected and undergo changes due to human activities. As in most urban areas and parks in the capital there are environmental samples such as: air pollution with suspended dust, air pollution with various toxic agents (carbon monoxide, sulfur

dioxide, hydrocarbons, nitrogen dioxide, and examples can continue; it is necessary to take some measures that have the focus on the extension of the green areas and the protection of the already created green space. The water and the lake can also become important points for creating a new oasis of vegetation (Popovici, Balteanu and Kucsicsa, 2013).

## 7. Conclusion

Concluding the above, it can be seen that green spaces offer residents in large urban agglomerations where there is a life-threatening and often unhealthy environment, a favorable source of relaxation and health that sustains biodiversity conservation and the protection of the natural environment.

Worldwide or in developed or developing countries, the concern of people and authorities to have a cleaner environment is growing.

Being known that over 50% of the world's population lives in an urban area and this has put a fairly large ecological footprint, city management and organization need to be very well thought out and planned to have an interest in maintaining socio-economic development and nature.

All studies in Romania, but not only globally, show that the most important way both for the creation of an environmental framework and for the protection of the environment is the continuous development of a green space.

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