



Developing a model for evaluating the potential of urban green infrastructures for sustainable planning

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Scientific report – Phase 1

2015



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Introduction

In 2015, the project *Developing a model for evaluating the potential of urban green infrastructures for sustainable planning* presented a single phase with its main objective to establish the conceptual framework for the analysis of urban green infrastructures and urban planning.

The objective was fully accomplished by:

-Defining the conceptual framework of *green infrastructures* (establishing criteria for the classification of urban green infrastructure, and also, analysing policies, programs and funding sources for this) that was completed through the development of an *Internal Report on the conceptual framework of green infrastructures*.

-Defining the conceptual framework of *urban planning* (identifying the stakeholders and main processes that are applied in urban planning and also the indicators expressing the structures and processes that influence the urban planning) that was completed through the development of an *Internal Report on the conceptual framework of urban planning*.

- The establishment of the *defining case studies* for Romania started using existing data and through the ability to obtain new data, but also taking into account the selection of cities that have to reflect the defining typologies of the existing local conditions allowing to determine in optimal conditions the integration of urban green infrastructures in the urban planning process of Romania's cities.

The report presents the major results obtained in the project during this short time corresponding to the first phase – 2015.

Scientific report's team:

University lecturer Mihai Răzvan Niță - Project Director

University assistant Diana Andreea Onose – Postdoctoral researcher

University assistant Athanasios Alexandru Gavriliadis – Postdoctoral researcher

PhD. Irina Iulia Năstase – PhD student

1. Overview on the conceptual framework of green infrastructures

Urban green infrastructures (UGI) are a multiperspective concept (Newell et al., 2013) broadly expressing networks connected by multifunctional spaces that support social and ecological processes (Iojă et al., 2014). Green infrastructures have fundamental characteristics such as *connectivity* and *multifunctionality* covering a wide range of specific elements (Cameron et al., 2012).

1.1. Establishing criteria for the classification of UGI

This objective was accomplished through the identification of the main definitions regarding urban green infrastructures, underlying the existing criteria for their classification and identifying the main typologies of urban green infrastructures.

Green infrastructures do not universally possess an accepted definition, as there are differences in the approach of the concepts of conservation and planning. Nevertheless, the majority of definitions underline elements such as *connectivity*, *multifunctionality* and *conservation* (EEA, 2011). Green infrastructures are defined by a series of characteristics that allow their evaluation: *critical mass* (minimal dimension of an element that can be considered as green infrastructure), *benefits* provided to the population, *multifunctionality* (the variety of their functions for society and nature also), the replacement of a traditional infrastructure and the degree of anthropic involvement in their maintenance (IEEP, 201b).

The criteria used for the classification can vary ranging from the ecosystem services considered, the type of green infrastructure used, the main environmental component, the scale applied to the elements of infrastructure, the benefits provided, the type of costs. Besides the *green techniques* and the environmental element considered, the green infrastructures can relate to *water* (swales, constructed wetlands, rain gardens, permeable paving, water collection systems), *air* (green walls), *soil* (phytoremediation), *biodiversity* (urban forests, tree boxes) or *complex* (green roofs, urban gardens, green streets).

The European Union DG Environment classification specifies the typologies of green infrastructures (DG Environment, 2012) (zones with high values of biodiversity – situated in protected areas networks, functional ecosystems with high values situated outside protected areas, landscape elements, restored habitats, artificial components, multifunctional zones, urban elements). In addition to this, another typology is specified in functional classification



of green infrastructures (recreational active and pasive spaces, resources of habitat and environment, farms and agricultural land, historical and cultural resources).

1.2. Evaluation of policies, programs and funding sources for UGI

The European Strategy for Biodiversity 2020 states the development of green infrastructures (2nd objective – a better protection of ecosystems and their services, a wide usage of green infrastructures). United Nations and World Health Organization promote actions to improve environmental quality in urban areas, one of the measure proposed refers to the distribution of green spaces. In **Romania**, the National Strategy for Sustainable Development and the National Strategy for the Conservation of Biodiversity propose the development of new green infrastructures.

The most common objectives presented in the European projects are (Naumann et al., 2011): biodiversity conservation, population's health and well-being, land sustainable management, water management, prevention and adaptation to climate change. A number of domains of European Community policies contain elements that can be related to the development of green infrastructures (IEEP, 2011a): in forestry domain, the member states are encouraged to access EAFRD funds for measures of afforestation, reforestation; for biodiversity and nature conservation there is the possibility to run demonstration projects based on green infrastructures through the LIFE+ program, but there are also projects encouraging the connectivity of the Natura 2000 sites. The water protection is promoted through EAFRD projects and cohesion funds for developing green infrastructures treating and purifying waters and also leading to a watershed management according to the provisions of the Water Framework Directive. ERDF programs promote projects based on ecological restoration (DG Environment, 2012). At a European level, the principles of green infrastructures are integrated into the research programs. An example is the Horizon 2020 Program which considers the green infrastructures as a priority in research due to the necessary transformation to an efficient usage of resources and to a green economy (IEEP, 2011a).

2. Overview on the conceptual framework of urban planning

Sustainable urban planning consists in addressing urban areas in an integrated manner, taking into account the local specificities (Norton et al., 2015), integrating the vision of decision makers (Vandermeulen et al., 2011), taking into account the arguments of the local stakeholders (Faehnle et al., 2014) in order to select the best solution for development (Govindarajulu, 2014). The integration of all these aspects requires a sustainable, interdisciplinary and participatory urban planning that oftenly uses the green infrastructures (DG Environment, 2012) as a useful tool to achieve sustainable goals of the settlements (Church, 2015).

2.1. Identifying stakeholders and processes in urban planning

The report presents the main legislative acts based on the urban green infrastructures that are being managed and planned, in two categories: one that targets the urban planning in a general way and the other one that is focused on the green spaces viewed as main elements of urban green infrastructure. The differences between legislation aspects at the national and european level are highlighted on the two categories.

The existence of urban green infrastructures cannot be possible without regulations imposed by the authorities as space is a precious resource in the urban environments. The interests of developers, cumulated with urban expansion and the growth of urban population makes the green spaces more vulnerable. The report presents the main *institutional actors* from all the management structures who influence the way of planning and management for urban green infrastructures in Romania.

Besides institutional actors there are several other actors and potential actors who can influence the decisions made on various levels of management. These actors are *representatives of the civil society and other potential actors*. If there is an information exchange between all the actors in the case of institutional actors, here each entity will operate separately. In the case of big projects or especially in the case where the urban green infrastructures network is affected by the interests of a third party, the non- institutional actors will often unite to increase the pressure on the institutional actors and to impose their visions.

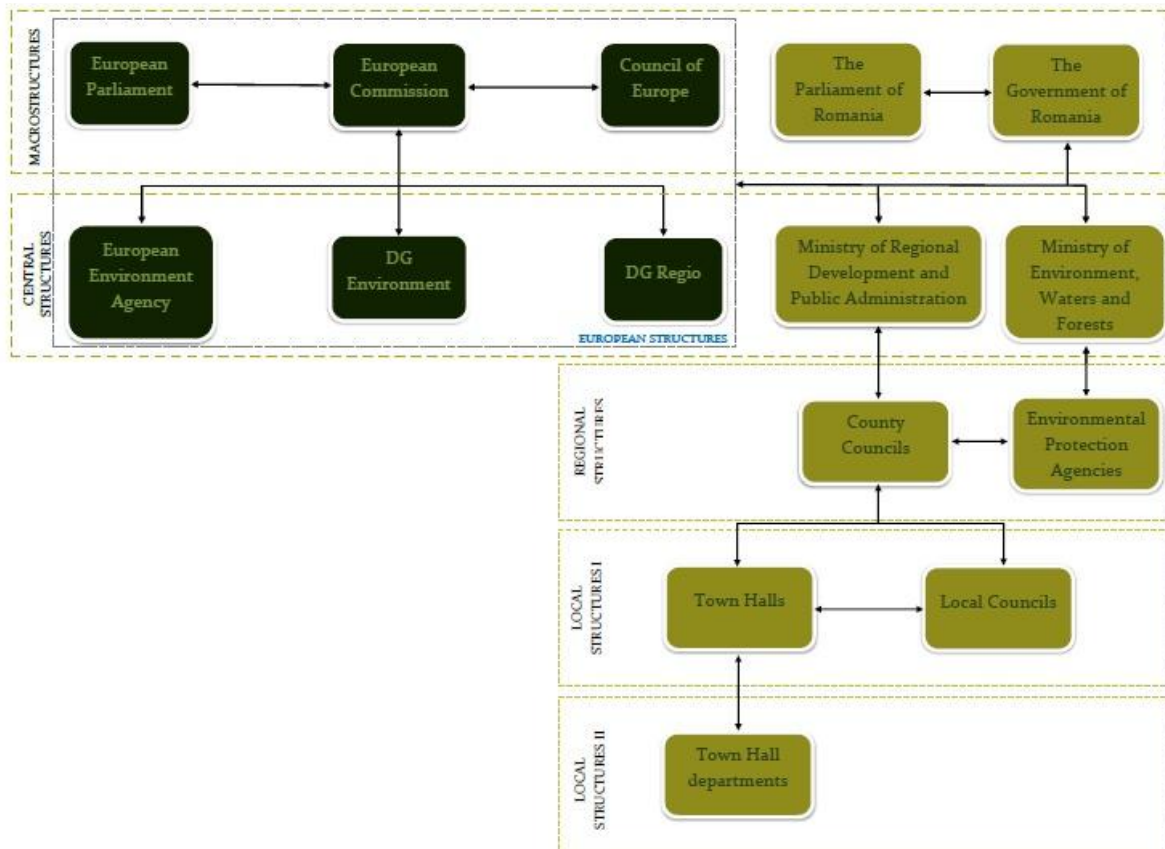


Figure 1 – Main institutional actors in the planning and management of urban green infrastructures in Romania

2.2. Identifying indicators expressing the structures and processes that influence urban planning

The report highlights that the actual legislative structure together with documents, reports and official studies that support it, is being properly targeted and founded. However, at the level of microstructures (local authorities, departments in town halls, environmental protection agencies etc.) reaching the objectives concerning the urban green infrastructures network that are imposed at a higher level, it is often difficult due to the bureaucratic processes and the orientation towards other activity sectors, that are considered to have priority in the development of urban areas and improvement of the life quality.

The report presents the indicators that characterised the structure and processes influencing urban planning. There is a clear distinction made between the **indicators**: descriptive indicators, performance indicators, efficiency indicators and the actual policy of indicators.

3. Establishing the defining case studies for Romania

In order to study the next cases, a major component is the proper selection of cities that can be established for Romania. The method used to select the case studies is randomized stratification, aiming to be at least one city for each rank (specified in Law 575/2001, this will be the level based on which the layering is made). The selection of cities has been taken into account with specific characteristics , such as the number of inhabitants, economic specifics, natural environmental conditions, in order to direct the case studies to a variety of options (Figure 2).

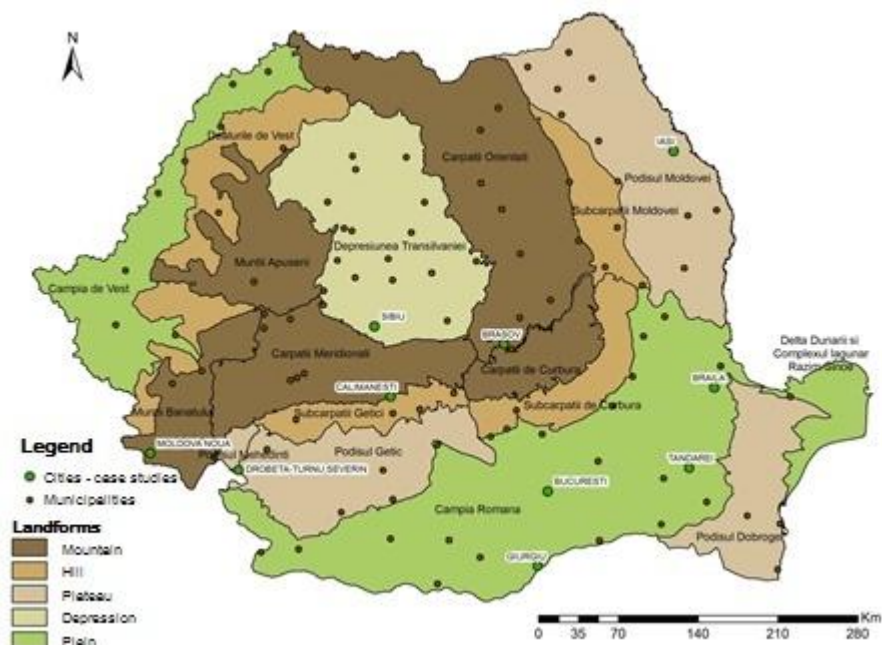


Figure 2 – Defining case studies for urban green infrastructures asesment in Romania

The necessary data for the project case studies, for all ten cities selected as case studies, are: structural aspects (morphology, morphometry, flora and fauna composition, connectivity); environmental quality; ecological services of the green infrastructures (microclimate improvement, air quality improvement, changing the radiative balance, carbon and water regulation); social functions (specific green infrastructure usage to increase the housing quality by providing the social services); effectiveness of the actual management of green infrastructures.



4. Main results

Published articles

Niță M.R., Bălaș V.G. et al. (2015), Mapping the differences in online public information by local administrative units in Romania, [Forum geografic - Geographical studies and environment protection research](#), ISSN 1583-1523, Volume XIV, Issue 2 (in press), BDI

Participation with papers in international scientific meetings

Gavrilidis A.A., Ciocănea C.M., Niță M.R., Onose D.A., Năstase I.I. (2015), Urban Landscape Quality Index – planning tool for evaluating urban landscapes and improving the quality of life, [International Conference Environment at a Crossroads: SMART approaches for a sustainable future](#), Bucharest, 12-15 November, 2015

Onose D.A., Pătru-Stupariu I., Niță M.R., Gavrilidis A.A., Năstase I.I. (2015), Quantifying the role of accessibility in the attractiveness of urban parks. Case study Bucharest, [International Conference Environment at a Crossroads: SMART approaches for a sustainable future, Bucharest](#), 12-15 November, 2015

The results of both papers were published in [Proceedings of the International Conference Environment at a Crossroads: SMART approaches for a sustainable future](#), available on CD and online, ISBN 978-973-0-20300-4.

Internship for information – documentation activities

During 23-29 november 2015, one member of the research team – **Athanasios Al. Gavrilidis** went for an internship of information-documentation activities at the University of Salzburg (Austria), where he accessed the university's library, had meetings with Mr. J. Breuste, head of the Urban and Landscape Ecology department, president of SURE (Society of Urban Ecology) and he also visualized examples of good practices in the development of urban green infrastructure.

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