

# GREEN INFRASTRUCTURE AS A TOOL OF RURAL DEVELOPMENT

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## **Abstract**

*The aim of this paper is to highlight the importance of the green infrastructure (GI) in rural development. GI's multifunctionality could contribute to the achievement of a number of policy aims of rural development. The green infrastructure integrated in rural development programs can strengthen the spatial character of rural development and synergies can be originated by the development of appropriate wildlife and human living conditions and more harmonized urban-rural relations.*

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## **1 Introduction**

The urbanization as a global trend is accompanied by the slow demise of rural communities. Generally, the urban-rural relation has deteriorated; therefore many plans and programs were prepared in connection with rural development to improve this relationship. The Hungarian National Rural Development Strategy [1] highlighted the considerable immigration of rural population due to the lack of local jobs and inappropriate living conditions. The National Rural Development Program 2014-2020 [2] also deals with improvement of the formerly close urban-rural relationship regarding not only the production and consumption but the social and cultural connections as well. The Program highlights the fact that the natural and semi natural ecosystems and their services become more and more valuable and attractive from the point of view of societal wellbeing, tourism and urban inhabitants. According to Csatári [6] the dissolution of the harmonious urban-rural relationship is one of the results of the growing infrastructural gap between urban and rural areas.

The rural development policy is searching solutions to avoid harmful effects of these processes and to find the tools for improving accessibility and urban-rural linkages. Green infrastructure development is an effective tool for all these conflicts.

### **1.1 Terms**

According to Benedict and McMahon green infrastructure is “an interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife. Used in this context, green infrastructure is the ecological framework for environmental, social, and economic health – in short, our natural life-support system.” [3]

As the infrastructure in general [4]; so the green infrastructure is an essential condition for societal wellbeing and through the ecosystem services contributes to economic development.

### **1.2 Relations of green infrastructure and rural development**

The development of the elements of green infrastructure as the characteristic values of rural regions is one of the most important objectives of rural development. *Table 1.* highlights the wide varieties of GI features.

*Table 1. Features of the Green infrastructure (Adapted from [3])*

<i>Natural ecosystems</i>	<i>Other green spaces</i>
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<ul style="list-style-type: none"> <li>- Forests</li> <li>- Lakes, water courses, flood plains</li> <li>- Ecologic core areas, ecologic corridors, migration routes,</li> <li>- Other natural habitats and protected natural areas</li> </ul>	<ul style="list-style-type: none"> <li>- Private and public gardens, parks, alleys, artificial lakes</li> <li>- urban green corridors and networks and green belts</li> <li>- greenways, hiking trails</li> <li>- high natural value agricultural areas (e.g. horticulture)</li> <li>- restored areas</li> <li>- certaincultural heritage areas</li> <li>- protection areas of underground waters</li> </ul>
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Hungary's Rural Development Program (RDP) puts emphasis on protection of natural ecosystems and their agricultural and tourist use [2]. One of the main objective of the RDP is to preserve the rural population by enhancing life quality and local identity. The landscape conditions influence tourist destinations but even residential location choices, so GI as a characteristic feature of the landscape has an important role.

*Table 2.* compares the functions of GI and the relevant tasks of rural development.

*Table 2. Functions of the Green infrastructure and objectives of rural development from the National Rural Development Program (Adapted from: [3], [5])*

<i>Functions of GI</i>	<i>Tasks of Rural development (RDP)</i>
<ul style="list-style-type: none"> <li>- Protecting ecosystems state and biodiversity</li> <li>- Supporting diversity of landscapes, enhancing its development</li> <li>- Improving biological activity</li> <li>- Improving ecosystem functioning and promoting ecosystem services</li> <li>- Supporting the development of a green economy and sustainable land and water management</li> <li>- Promoting societal wellbeing and health</li> <li>- Enhancing human-nature relations</li> <li>- Improving aesthetic value of landscape</li> <li>- Improving spatial connections</li> <li>- Enhancing urban-rural relationship</li> </ul>	<ul style="list-style-type: none"> <li>- Protection and sustainable use of natural resources</li> <li>- Improvement of rural environmental quality</li> <li>- Sustainable agricultural production structure and policy</li> <li>- Enhancing added value, food security, strengthening local markets</li> <li>- Development of local economy</li> <li>- Rural social and physical infrastructure, health development, sustainable rural settlements, communities</li> <li>- Development programs for small villages and farmsteads</li> <li>- Complex, specific regional development programs</li> </ul>

GI's multifunctionality could contribute to the achievement of a number of policy aims of rural development. The question is how we can integrate green infrastructure planning into the frames of rural development. Since 1990 rural development programs have been elaborated in the frames of PHARE, SAPARD and later CAP in Hungary. Rural development documents are formed by the needs and requirements of the Hungarian rural regions and the prerequisites of the rural development policy of the EU mostly financing the programs. Local planning is the task of the Local Action Groups. The quality of local plans varies region by region, and rural planning overlap with the regional planning system.

### 1.3 Thesis

Green infrastructure should be considered as a kind of required infrastructure supplying highly valuable ecosystem services. The development and networking of green infrastructure elements in rural territories provide ecosystem services for the cities. These services connecting green infrastructure and urban green network enhance urban environmental quality. The appropriate environmental conditions can generate a considerable improvement of social wellbeing [3].

This approach means a really important change in the subordinate position of rural areas in comparison of cities. Rural regions could break out from the current negative spiral of worthlessness, decay and backwardness. In this sense the development of the green infrastructure can become an effective tool in rural development.

## 2 Method

We carried out a multi-level research: on national level we analysed the strategic documents of rural development and on micro-regional level the development programs of some Local Action Groups furthermore we examined local projects related to village and green infrastructure development. We analysed the national and local rural development programs (on four model areas) focusing on landscape issues, landscape ecologic aspects and urban-rural partnership. [1, 2, 11-18]

We looked for Hungarian and foreign examples for the connection of green infrastructure and urban green space network. The Nivegy-valley is part of one of the four model areas where we carried out research projects and university workshops with field survey and in depth research. Nivegy-valley is a rural region on the peripheries of the popular tourist resort of Balaton consisting of small villages with severe depopulation tendencies. Our project focused on landscape and tourism development with the main goal of enhancing the population retention capacity.

Close to this is situated the small city of Veszprém, the county seat where the rehabilitation of creek Séd [7] offered interesting experiments. The creek had a crucial role in the development of the city as it connects the urban area with the surrounding mountains, ensures fresh air in the settlement and functions as a green corridor in urban environment. We got familiar with the project through literature, field survey, and meeting the planners. Veszprém offers a great example for the advantages of a well-functioning green corridor. Before the restoration works the creek was an almost artificial watercourse in run down condition with an exception of the section under nature protection because of its natural riparian vegetation. The main function of the creek had been the run off of drain water and cleaned sewage water. There are some restaurants and cafes in the vicinity and also the city zoo is nearby. The valley hides medieval ruins, and it has been a popular recreational area of city dwellers. The objectives of the restoration project were:

- complex renewal of the open space network according to ecologic and aesthetic aspects,
- appropriate for paediatric, cycling and disabled use as well,
- improvement of the accessibility of the valley,
- creation of visual and physical connection with other city parts (e.g. from the castle was important to get a picturesque view),
- improvement of the riparian vegetation fitting the ecologic conditions,
- to offer varied family programs by elaboration of indoor and outdoor event locations, playgrounds and presenting the archaeological sites,
- ecologic restoration of the creek valley.

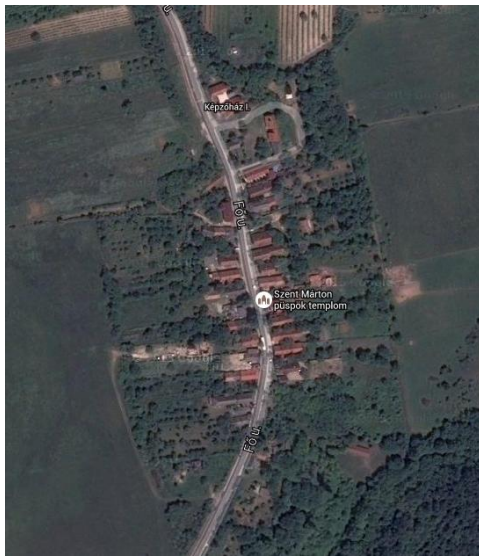
The project proves that the urban green network can be connected to green infrastructure ensuring the connectivity with rural areas creating a great value for urban citizens. [7]

Green infrastructure planning is becoming a common tool in Europe. Usually GI is used in urban environment but in England it is applied in rural regions as well [10].

### 3 Results

The settlements of Nivegy-valley are small villages consisting of a few streets. The villages are surrounded by rich natural environment. The small rural settlements do not destroy the natural ecosystems so GI is preserved better than in the cities (*Figure 1.*). *Figure 2.* shows the favourable situation of city Veszprém although it has also parts disconnected from the urban green network and the surrounding natural ecosystems. So it was crucial to restore the ecologic value of Séd creek valley and develop the green network of the city.

Cities have a great need for services of green infrastructure offered by rural regions. Comparing the situation of Veszprém and Óbudavár from Nivegy-valley it is clear that while rural settlements possess abundant green infrastructure, the cities have a great deficiency in this field. In case of general infrastructure this is just the opposite.



*Figure 1. Óbudavár. The houses directly connect to the GI in the one street village (google map)*



*Figure 2. Veszprém. Several parts of the city can be connected to GI just through development and ecologic restoration projects (google map)*

Comparing the objectives of Hungary's RDP (*Table 2.*) and the expected result of the restoration project of the Séd creek we can state that green infrastructure development can contribute to the realization of the following objectives

- a considerable improvement of natural resources by the rehabilitation of the creek valley,
- ensuring the sustainable use of the area by the planned activities,
- the improvement of quality of urban environment due to the cautious planning,
- strengthening regional identity by preserving the historic relics as well.

Analysing the national and regional rural development programs we found that landscape and ecologic aspects or urban-rural partnership appear on the level of objectives however these considerations do not play any role. The mentioned aspects show up just in the following financed programs:

- development of playgrounds, renewal of public spaces, elaboration of study trails,
- landscape management, ecologic production, production of local varieties.

However, these are acceptable as partial development of green infrastructure features but not enough from the point of view of green networks. Green infrastructure as a development or as a possible connection tool between urban and rural areas was completely missing from these strategies.

## 4 Discussion

Green infrastructure development in rural regions contributes to the improvement of urban life quality as well. We have to put greater emphasis on GI planning, continuity of the network, integration of urban areas during development of urban and rural regions.

GI has a special complementary character next to the general infrastructure. The role of GI in social well-being is just as important as infrastructure. Cities should devote resources for GI development in rural regions because they enjoy its benefits as well.

GI development in Veszprém has enhanced the quality of urban and peri-urban green network creating connection with GI in rural areas. The restored green spaces became popular recreational area for locals and tourists as well. The recently established cycling paths along GI corridors in Óbudavár are attractive for city dwellers enhancing urban-rural relationship. GI development offers opportunities to diversify tourism services. The upgraded green space network could be a manifestation of landscape cohesion and regional identity. Regional identity supposed to be the territorial base of rural development planning.

Planning the financial program of RDP these aspects should be taken into consideration still in the current programming period.

## 5 Conclusion

Partnership is necessary between the cities and the surrounding villages in order to realize green infrastructure development. Green infrastructure development highlights the interdependency of cities and rural regions as it is stated in the European Charter of Rural Areas [19] as well.

It would be important to strengthen the spatial character of planning in rural development, meanwhile we should improve responsibility for rural regions in spatial planning. We have to find the methods of integration of GI in spatial and rural plans.

Further research projects shall highlight and analyse the importance, complementary characteristics, social and economic advantages of green infrastructure.

We have to adopt the practice and experiments of countries where green infrastructure planning is a common tool of spatial planning.

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