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# Strategic and Spatial Regulation Tools for Harmonizing Land Use Interests in the Carpathians – Experience from Slovakia

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## 1. Abstract

Carpathian ecoregion is one of the last strongholds of biodiversity in Europe. The area spreads across several European countries and contains thriving populations of large carnivores and other species, while staying some of the least-fragmented areas in Europe. At the same time, it is under growing pressure to develop its infrastructure endangering this natural uniqueness. In this paper the pressures to develop the area are described in the light of the existing planning policies in Slovakia. We focus on one of the TransGREEN and ConnectGREEN project cross-border pilot areas located between Czech Republic and Slovakia ‘Beskydy-Kysuce’ where we discuss the pressures to develop the infrastructure and the measures to retain the fragmentation as low as possible.

The paper discusses Slovak planning policies on national, regional and local levels. In its second part the focus is on examples of development in this pilot area demonstrating the growing pressure for more infrastructure being built improving the transport connection between Slovakia and Czech Republic. The measures to ease the conflicts between the interests of nature protection and green infrastructure, and the interests of developing the grey infrastructure in this area are presented. Lastly, we review the planning policies and tools in the Slovak national spatial planning system aimed at regulating the development considering all interests in the territory and managing this growth while keeping it in the lines of sustainable development, biodiversity protection and enhancing resilience of this area. The aim is to demonstrate in this pilot area the approach of Slovak planning policies and tools in the Slovak national spatial planning system leading to find the way how to anchor the regulation or adaptive measures so as to create a unified strategic framework for the Carpathian region with a set of recommendations to regulate a massive development in this unique area to avoid the conflicts between green and grey infrastructure.

## 2. Introduction

The Carpathian Mountains play a key role in maintaining the biodiversity richness in whole Europe. They remain some of the last stronghold of natural areas creating habitat for many species,

including endangered species. Their protection is in the interest of all European countries and it need to become some of the most important international and national policy priorities. Frequently, some of the key deficiencies in the nature protection is lack of awareness about the existing possibilities and tools on how to make the nature protection legally binding and how to enforce the plans.

At the same time, the whole mountain range is under growing pressure to develop and built infrastructure to interconnect regions and cities. There is no doubt that developing connections across Carpathians is important for the development of the region and for their balanced growth, the emphasis must remain on allowing this development having the nature and its interests in mind. However, stakeholders whose agenda is to protect Carpathians are often not aware about how to use the existing formal and informal planning tools.

The following paper is describing the international and Slovak national planning policies on all levels, related to biodiversity, spatial planning and transportation. Spatial planning provides the only framework that has a power to translate the nature protection ideas and measures to the legislature as the spatial (master) plans in Carpathian countries serve as local laws and the measures presented in them are legally binding. Therefore, spatial planning serves a special role in biodiversity protection as a place where the interests of development needs and nature protection are confronted and are negotiated with legal power. This paper is aimed at listing the key legal acts and spatial planning tools in Slovakia that provide this protection and allow nature protection to be enforced. Later on, it is focusing on demonstration of measures taken in the case study area of Beskydy-Kysuce (Slovak-Czech cross border area) to maintain the biodiversity and foster the ecological connectivity in the area as an example of how the measures developed by nature protection representatives can be translated into spatial plans and become legally binding and enforced by authorities.

### **3. Key national legislation in Slovakia in relation to biodiversity and spatial planning**

This section is dedicated to showcase the complexity of spatial planning and nature protection legislature in Slovakia that is consisting of several legal acts that are changing frequently. The current system where the very complex planning framework is splintered into so many legal acts is confusing for planners and nature conservationists and helps the proponents of development to push their projects. Increasing awareness of the system and how it works is one of the ways how to empower stakeholders to negotiate their positions and increase the protection of Carpathian landscape.

National biodiversity related law (adapted from (Immerova et al, 2019)):

- Act No. 543/2002 Coll. on Nature and Landscape Protection of June 25, 2002 as amended by later regulations, regulating competencies of state administration bodies and municipalities, and rights and obligations of legal persons and natural persons in nature and landscape protection.
- Decree of the Ministry of the Environment of the SR No. 24/2003 Coll. implementing the Nature Conservation Act.

- Act No. 24/2006 Coll. on Environmental Impact Assessment
- National Biodiversity Strategy of the Slovak Republic until 2020 approved by the Decree of the Slovak Government No. 12/2014 of January 8, 2014 with the objective to stop the loss of biodiversity and degradation of the ecosystems and their services in Slovakia until 2020, to safeguard the restoration of biodiversity and ecosystems, and to increase the contribution towards stopping the loss of biodiversity in the world.
- Action Plan for the implementation of the Updated National Biodiversity Strategy until 2020 approved by the Decree of the Slovak Government No. 442/2014 of September 10, 2014. Strategy, Principles and Priorities of the State Environmental Policy approved by the Decree of the Slovak Government No. 619/1993 of September 7, 1993. And Decree of National Council of the Slovak Republic No. 339/1993.

#### National spatial-planning related law

- Act No. 50/76 Coll. Law on Territorial Planning and Building Code – The law defines principles, procedures, documentation and other issues dealing with land use.
- Act No. 539/2008 on the Promotion of Regional Development – this law provides a framework for spatial development focused on social and economic development and its planning.
- Act No. 369/90 Coll. on Municipalities – The law only defines responsibilities for planning and land and environment management, but not for sustainable land-use.
- Act No. 221/96 Coll. on Territorial and Administrative Division of the SR and Act No. 222/96 Coll. On Organisation of Local Self Government – Division of responsibilities for land-use and environment, including the regeneration processes.
- Act No. 330/91 Coll. on Land Consolidation, Settlement of Land Ownership, Land Registries, Farmland and Land Communities. The law defines the land consolidation procedure, that is rational space ordering of plot ownership in a certain zone and with it connected other immovable agriculture and forestry ownership ordering.
- Act No. 220/04 Coll. on Protection and Use of Agricultural Land and Directive of the Ministry of Agriculture of the SR to the implementation of the Decrees No. 12/09 on Forest Land Protection in the Territorial Planning – its amendment by the Act No. 219/2008 Coll. – The law introduced a fee for transformation of the most valuable soils to non-agricultural land. The directive defines the procedure and precondition for changes in the forest land use.

#### **4. Characteristics of Carpathians / Impacts of regional development on the Carpathians**

The Carpathians stretch over Central and Eastern Europe in a 1,500-kilometer arc. They run across the territory of eight nations (from west to east and south-east) and cover an area of around 209,000 km<sup>2</sup>: Austria, the Czech Republic, Slovakia, Poland, Hungary, Ukraine, Romania, and Serbia. The Carpathians are not a continuous chain of mountains, but rather a collection of orographically and geologically diverse groups with a wide range of structural features (Hlavac et al, 2019).

Carpathians comprise of two large eco-regions, the Carpathian Mountains and the Pannonian Plains (Munteanu et al, 2014), covering the area of several European countries (Czech Republic, Slovakia, Poland, Hungary, Ukraine, Serbia and Romania). The region is deemed as one of the largest temperate forests in Europe (Knorn et al, 2009) with farmland of high value for nature conservation (Paracchini et al, 2008)) and soil fertility (Schiller et al, 2010). The geographical variation of the

region goes back to the younger Tertiary, when the first orogeny took place approximately 15 million years ago, on the base layers made of sandstones and slates, at some places also granite, limestone and dolomite. The current profile of the mountains was then finalized during the Quaternary period by shifting of glaciers in the interludes between the glacial periods. The landscape was shaped by volcanic activity as well; its remnants can be found in the Southern Carpathians, in southern parts of Slovakia and Hungary (Hlavac et al, 2019).

The Carpathian region has a long history of land use where long periods of agricultural and forest land use were influenced by political, economic and demographic changes (Verburg et al, 2009). The region experienced forest transition during the period between the world wars and the forest expansion trend persisted after the collapse of socialism after 1989 in majority of countries (Munteanu et al, 2014). The highest rate of decrease in forest cover took place during the era of Austro-Hungarian monarchy (initiated by German settlers kindling industrial revolution of the 19th century), while it increased during the majority of the past 250 years including the most recent period of transition and EU accession (Munteanu et al, 2014). The change in agriculture land cover was proportionate to the forest cover i.e. where forest increased, the agriculture land decreased, with exception of the period of Austro-Hungarian monarchy when the agriculture land increased and forest land cover remained stable suggesting expanding agriculture into other land covers (Munteanu et al, 2014). The period from 1990s onwards was in many areas characteristic by land abandonment and forestation as a result of factors such as the lack of agricultural subsidies, decreased profitability (Muller et al, 2013) bankruptcy of large agricultural companies (Petrovic & Hresko, 2010), high migration to western Europe decreasing rate of employment in agriculture (Munteanu et al, 2014) or reducing pressure on land and allowing forest succession to take place (Kozak, 2003). The collapse of socialist regime and planned economy also resulted in difficulties with maintenance of biodiversity and cultural landscape values as they are no longer automatically provided as a product of traditional land use resulting from economic remoteness (Von Haaren, 2002).

Approximately 18 percent (or 36,000 km<sup>2</sup>) of the Carpathian Mountains are protected by law, with more than half of this area falling into the IUCN Protected Area Management Category System. Individual nations have different types of designated protected areas and related conditions of protection, with discrepancies owing primarily to the current status of EU membership (Hlavac et al, 2019).

One of the most pressing transportation issues in the Carpathians is the long-term unfavorable development of a modal split, with increased road transportation and individual automobile transportation. The Danube-Carpathian region's underdeveloped transportation network is not geared to accommodate all of the region's growing mobility needs. Multimodality improvement, greater interconnections among modes, and modernization and development of infrastructure networks are among the mobility concerns at hand. The opportunities in this regard are based on the ability to improve the TEN-T Core Network Corridors that transverse the region (Maffi et al, 2017).

## **5. Urban planning tools in Slovakia projected to management of development in the Carpathians**

This section describes and analyses the tools available within the Slovak legal system that can be used to mediate the interests of nature protection into the legal system. Slovakia's legal system bears many similarities to other Carpathian countries' planning systems and many of the presented tools occur on other countries as well. One of the key limits of nature protection in Carpathian

countries is the fact that although these tools are available, they are not used because authorities are not aware of them and/or how to use them. We therefore present them in this section and in the section 6 we demonstrate on an example how they can be used in specific case.

We consider preventing the Carpathians, especially Carpathian corridor as a big challenge for spatial planning. It is important to reflect Carpathian region as a unique area in the relevant strategic development documents and subsequently in the landscape planning documentation and thus ensure the harmonisation of its function with the other functions in the territory. The preservation and creation of sustainable landscape structures will enable not only the continuous interconnection of several ecosystems, but also the sustainable development of municipalities and improving the quality of life for its inhabitants. The implementation of support measures to overcome the barriers to wildlife migration have meaning only if the functionality of this unique area as a whole is ensured by functional regulation in the Master plans. From our point of view, it is recommended to implement a Zonal Master plan for Carpathians, in which will be regulation e.g., regulation of built-up area, regulation of traffic calming, regulation of building new recreational zones or residential zones etc. In order for animals to follow their migratory routes, they must find suitable landscape structures for them. For example, intensively used agricultural land offers few shelter options, fenced areas are insurmountable barriers and a lot more issues in the area (Finka et al, 2011).

Pursuant to Act no. 50/1976 Coll. as amended, the task of spatial planning in Slovak republic is to systematically and comprehensively address the spatial arrangement and functional use of the territory, determine its principles, propose material and temporal coordination of activities affecting the environment, ecological stability, cultural and historical values, spatial development and landscape creation in accordance to sustainable development principles. The main spatial planning tools are spatial planning base documents, spatial planning documentation and spatial decision.

1. **Spatial planning base documents** – serve primarily as tools for solving partial problems in the territory, as a deepening or verification of the solution proposed by the spatial planning documentation, as well as a basis for spatial decision-making in the territory and also for permanent monitoring of the changes in the area. They consist of, as follows:

- a) Urban study
- b) Territorial general
- c) Territorial prognosis
- d) System of territorial technical documents
- e) Other documents e.g., Strategies of sustainable development, Strategies of the state environmental policy, Environmental action programs and sectoral concepts, Territorial system of ecological stability, etc.

2. **Spatial planning documentation** – this part includes a list of tools comprehensively addressing the spatial arrangement and functional use of the territory, harmonizes the interests and activities affecting spatial development, the environment and ecological stability, and establishes the regulations of spatial arrangement and functional use of the territory. It is prepared on national, regional, municipal and zonal level. These formal tools, after being formally accepted by authorities, serve as a locally binding laws that need to be enforced by authorities as a way to guide the development of the area.

Other binding documents related to the law (overall binding or binding for public sector) includes Regional Program of Social and Economic Development, National Regional Development Strategy, Program of Social and Economic Development of a Group of Municipalities, and Program of Social and Economic Development of a Municipality.

Other relevant legal adjustments and planning tools in Slovak Republic:

- Protected area – Protected area means an area in which the performance of certain activities is prohibited or restricted by reason of the protection of the interests of society on the basis of a generally binding legal regulation of the competent administrative body, or by a decision of the government.
- Landscape-ecological plan at the regional and municipal level – Landscape ecological plan is a document elaborated as part of the procurement of land-use plans at regional and municipal level with the focus on landscape ecologic analyses, assessment and optimisation of functional use of landscape elements in harmony with landscape ecological potentials and limits for the development.
- Forest land fund and its protection – The forest land fund consists of land overgrown with forest trees that serve to fulfil the function of forests and land that serves forest management, land above the upper limit of forest vegetation in high mountain areas, with the exception of built-up land and their access roads.
- National Nature Preserve – Nature reserve, usually representing a supra-regional biocentre as part of the most important natural heritage of the state.
- National Park – A large area, usually with an area of over 1000 ha, mostly with ecosystems not substantially altered by human activity, or in a unique and natural landscape structure, forming supra-regional biocentres and the most important natural heritage, in which nature protection is superior to other activities.
- Protection zone – Protection zones are areas declared by a zoning decision in which certain activities are prohibited or restricted for reasons of protection of society's interests, especially in terms of air protection, nature protection areas of interest, mineral deposits and mining structures, operations of industrial and agricultural enterprises, transport structures and engineering networks, watercourses and sources of surface and groundwater intended for drinking water supply, etc.
- Specially protected nature area – Declared area scientifically, whether aesthetically very important or unique, which has established conditions of protection.
- Nature reserve – A smaller area, usually with an area of up to 1000 ha, which represents the original, or slightly modified by ecological activity ecosystems and biocentres, can be declared by the regional authority as a generally binding decree as a nature reserve.
- Territorial protection – According to the law, territorial protection is a special protection of nature and landscape in a defined area in the second to fifth level of protection. The range of restrictions increases with increasing degree of protection.

## 6. Beskydy-Kysuce case study

Beskydy and Kysuce are two regions in the Czech Republic that are located on the northern side of the Czech-Slovak state border. This region is located in the northwest corner of the Carpathian Mountain range arch, which spans seven nations. This region's uniqueness rests in its biodiversity, which is still well-preserved and thus capable of supporting the region's existence as a whole. The

presence of charismatic animal species such as the brown bear, grey wolf, and Eurasian lynx (all huge carnivores) lends this location a special significance.

However, there are other items of interest associated to the region's rapid development that have a negative impact on the biodiversity of the area. Housing and transportation infrastructure development is progressing, slicing the land into even smaller bits. Large predators' high requirement for space (long distance dispersal, especially of young animals), food, and reproduction cannot be met by these little "islands." The population balance of their species has a direct impact on the population balance of other species. Furthermore, isolated populations are frequently doomed to extinction.

In order to preserve the treasures of this region in a fast developing and competitive world, the TransGREEN Project supported elaboration and publishing of the Catalogue of measures (Immerova et al, 2019) as a respond to the above-mentioned pressures and threats to foster sustainable development of the area. Below we provide a list of the most frequently used measures proposed to improve the ecological status and ecological connectivity of the area. The Catalogue of measures lists these measures in more detail with concrete locations where these are planned. The measures are proposed in accordance with the national and international legislation described in the earlier parts of this paper. Examples of measures proposed for the Beskydy-Kysuce area (Slovakia-Czech Republic) (Immerova et al, 2019):

- Construction of a green bridge, the surface of the green bridge and its surrounding should be covered in vegetation (native species) leading animals to the bridge and across to the other side, properly placed fences should support the movement of animals on to the bridge
- Maintaining the existing stripe of vegetation and possibly adding further vegetation which would lead the animals across the pastures
- Up until the bridge is built, it is recommended to place warning signs (Beware of wildlife crossing, Slow down) to alert the drivers and decrease the speed of the vehicles
- Maintaining the corridor free (unbuilt) and placing a construction ban in the area into the spatial plan of the respective municipality
- Placing a construction ban in the area
- Planting the neighbouring fields with individual trees and groups of shrubs, which would divide large open areas and serve as hiding for animals while crossing to the forest
- Thinning the forest cover in places where forest borders the road in order to safeguard better visibility for drivers as well as for animals
- Managing the area under viaducts and their surroundings so that it resembles natural conditions of the area (quality soil, grass, bushes) and restricting hunting activities in its wider area. Checking the permeability of the underpass regularly
- Not supporting any further development of nearby human-made areas
- Avoiding building of support walls which are more than 1 m high
- Maintaining the vegetation cover of the corridor as a feature contributing to the functionality of the corridor
- Improving the chances of successful crossing of the water reservoir for wildlife by building of peninsulas with suitable vegetation, which would lead the wildlife to the narrowest spot of crossing
- Avoiding planting the nearby fields with the crops attractive to large mammals (e.g. corn) in order to avoid a decrease in high, although seasonal concentration of animals
- Stopping further fencing of the areas nearby



## 7. Conclusion

The objective of the paper was to demonstrate the legislature and planning tools aimed at improving the biodiversity and ecological connectivity in Carpathians as some of the last strongholds of biodiversity in Europe. On case study of Beskydy-Kysuce area these tools and measures were demonstrated how they can be proposed and implemented in practice, utilizing the knowledge from previous international research projects. The EU funded projects as TRANSGREEN and ConnectGREEN are striving to promote the topic of biodiversity protection and putting the agenda of maintaining ecological connectivity on the table of policymakers on the European and national level. Although the current legal systems in majority of Carpathian countries provide solid base for planning and enforcement of nature protection measures, oftentimes stakeholders are not aware of these tools and cannot efficiently use them. Therefore, in this paper we made a list of available tools in Slovak planning system and demonstrated their use in practice. The collaboration of spatial planners, nature conservationists and engineers is the only way to come up with solutions which are satisfying the needs of the society and the nature in balanced and harmonious way. The case study was used as one of the pilot areas of the TransGREEN project and served to demonstrate how such balanced development can take place and, in the end, to render the final solution as more valuable than when it is following strictly human-centric approach. It serves as the best practice example of how the balanced development shall look like and hopefully further development in the Carpathians will follow the same path.

## 8. Acknowledgement

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