Interreg
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Danube Transnational Programme
SaveGREEN

Output T2.3 Preparatory Actions for implementing CSOP

Landscape protection and development in the area of the planned M2 motorway in Hungary

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Table of contents

1. Introduction

Within the frames of the SaveGreen project, an important objective was to elaborate a Cross-Sectoral Operational Program for the pilot areas. The goal of the "CSOP" was to identify major threats/pressure to connectivity and general objectives to address them, as well as relevant sectors and main stakeholders/actors focusing on the pilot site.

Our goal was to carry on a complex, landscape level analysis of the study area. First, we studied the landscape conditions, then elaborated a general cross-sectoral analysis and exploration of land-use conflicts.

We consulted the local stakeholders and experts of the relevant sectors several times, and presented them our results. We integrated the analysis into the Master landscape Architecture education which helped to widen and deepen the focus of assessment and also served as dissemination of the topic of conflicts between ecological connectivity and infrastructure.

2. Pilot site

The Hungarian pilot site is a border region of the planned M2 motorway in North-Hungary. The aim of the planned M2 motorway is to increase border crossing opportunities in the Hont-Parassapuszta border area and to divert transit/cross-border traffic to the outskirts of the area settlements. Successful completion of the new motorway project will bring positive changes within cross-border cooperation (e.g. connecting the Nitra region with the Budapest agglomeration), support further development of the border regions and their economic potential and improve the quality of environment in the area between Vác and the border.

The heavy transit traffic causes environmental problems in the settlements that are already becoming unbearable. In order to ease these negative effects a motorway is planned in the area: M2. The most dominant feature of the hydrography of the area is the Ipoly River, and the most important streams in the area are Csitár-stream, Hévíz-stream, Vargatói-stream, Fekete-stream, Derék-stream, Haraszti-ditch, Nagyoroszi-stream and Bernecei-stream. Of these, the Csitár stream, the Hévíz stream, the Fekete stream and the Derék stream and its tributaries flow directly into the Ipoly. Some of the watercourses originate from springs on the Börzsöny side in the Hont area and flow northwards into the Ipoly River, while others originate in the Nagyoroszi area and flow northwards towards Drégelypalánk and eastwards and north-eastwards towards Patak and Ipolyvece.

Figure 1. The pilot area is a highly varied landscape from monotonous forested mountain landscape to cultivated land and floodplain of river Ipoly

3. Methods

The landscape study, the analysis of the landscape features and the design were carried out based on field trips and using a wide scale geographic database.

3.1. Field trips

We had several field trips, first just for the tutors, teachers but afterwards, as we integrated the pilot area into the landscape architecture Master education, we carried out 2 whole day filed trip with students, furthermore one week on site workshop.

Field trip dates:

2021. January

2021. February

2021 April

Figures 2. & 3. Late winter field trip for tutors, 4. February 2021

Figures 4. & 5. Summer field trip for students, 4. of June 2021

3.2. Desk study

The first step of the research was a desk study. The databases were drawn from several sources covering several thematic areas. Among the land use databases, the time-series Corine Land Cover (CLC) layers showing land use change have proved to be particularly useful for landscape-scale analyses. For the analysis of the natural conditions, the agro-ecopotential map and genetic soil maps were used to describe the soil conditions. For the description of the nature conservation situation the Nature Information System on nationally protected areas were used. Digital maps of the 1st, 2nd and 3rd military surveys (Military Surveys made for the Kingdom of Hungary and for the Habsburg Empire (1782–1785, 1841–1859, 1869–1887), the Military Survey of Hungary from 1941, and the so-called Topographic Maps made between 1980–1990 and Google Satellite image in 2019) were used for landscape history research.

The analysis of landscape heritage was based on historical and GIS databases, as well as on surveys and data collection from the study area.

We analysed the state and the change of green infrastructure. We assessed the increasing anthropogenic influence of the study area by elaborating a hemeroby map furthermore the level of landscape fragmentation. We highlighted the conflicts related to green infrastructure.

The main part of the research was to define and collect the natural and cultural heritage elements of the study area. Our research based on desktop study and on field survey. The analysis of touristic features based on landscape heritage was made using the Godsave A4 model.

Landscape characterization was an important step of the assessment, which includes a brief description and delineation of the planning area and exploration of the larger-scale landscape context. It is based on a study of natural features, including climate, topography and geomorphology, combined with an examination of exposure, slope categories and water regime. These factors influence the potential for agriculture and afforestation. The local climate and topography determine the vegetation. It is also important to mention the geological, geomorphological and soil conditions, which also influence the landscape vegetation and cultivation effectiveness. A particular focus is on the landscape structure and the different land uses (forestry, agriculture, arable land). The condition of green infrastructure elements, transport and accessibility are also examined.

The core of the study become the Logframe that contains objectives and actions to ease and mitigate the negative effects caused by the existing and planned infrastructure.

We highlighted the critical sections, which mostly are where the watercourses cross the planned M2 motorway and finally we elaborated proposals to mitigate the negative effects and generally to improve landscape potential.

The first consultation with experts was made online, because of the Covid situation

'Inaugural meeting of the Hungarian cross-sectoral working group' event, organized by the SaveGREEN project, 15th October 2020, online

1st session (moderator: Viktória Selmeczy, CEEweb)
10.00 - 10.15 Welcome and introduction of the SaveGREEN project and Cross-Sectoral Operational Plans = CSOP (Viktória Selmeczy, CEEweb)
10.15 – 10.30 Presentation on the challenges and the future of the Hungarian cross-sectoral cooperations (András Weiperth, Szent Istvan University)
10.30 – 10.45 Presentation on the thematic pillars of the SaveGREEN project (Szent Istvan University)
10.45 – 11.00 Presentation on policy outputs of the SaveGREEN project (Gabriella Mária Nagy PhD, CEEweb)

2nd session (moderator: Szent Istvan University)
11.00 – 11.15 Introduction of Stakeholder Analysis and multi-level communication with the stakeholders (András Weiperth, Szent Istvan University)
11.15 – 12.00 Open discussion with the ASPs on the topic of:
- Stakeholder Analysis
- multi-level communication with the stakeholders
- expectations from the SaveGreen project
- involement of further projects for joint cooperation

4. Results

We elaborated a detailed **landscape assessment** within the frames of the CSOP. The planned M2 motorway will lead through a diverse, transition landscape of the Nógrád basin and on the peripheries of the Börzsöny Mountain and the crosses of the Ipoly valley, the landscape is crossed by several watercourses representing the most important ecological corridors connecting the core areas.

Land use conflicts include erosion, deflation, inland water, and fragmentation. These mainly natural processes can be exacerbated by human activity, which can occur due to inappropriate land uses in areas at risk.

The vulnerability of the area to anthropogenic impacts was assessed, considering areas under protection, areas sensitive to erosion and deflation and surface water protection areas.

The situation of the ecological network within the area has been examined and assessed: the barriers and lack of connections have been examined and assessed in order to propose landscape rehabilitation measures for restoration. Each land use conflict was assessed according to its significance.

The problems of the green infrastructure elements were divided into 6 groups depending on what the conflict is mainly related to, so that the groups were as follows: conflicts related to forests, fields, water, farm and tree lines.

One of the core parts of the CSOP is the **Logframe** which gives an overview of the major conflicts and objectives related to the barrier effect of the new and existing infrastructure lines, including the changes in land management. The Logframe provides the country specific suggestions for the mitigation of negative effects. The most important measures concern the **new infrastructure lines,** among others:

- During route selection, ecological aspects should be considered, but this is often decided before ecologists/biologists have examined a trail in detail
- Avoid sensitive areas
- Gather data on relevant species using camera traps, tracking and telemetry. For watercourses, continuous sampling is required.
- SEA and EIA legislation should be complemented by provisions for specific roads; for example, the direct and indirect impact area of different roads.
- Specific, well-measured indicators such as the fragmentation analysis (e.g. minimum net size) or biological activation value calculations should be incorporated into the SEA process and spatial planning.
- A minimum percentage of the entry-level costs of a given project should be stipulated in legislation that must be spent on the ecological protection facilities (like under- and overpasses, fences) of the road, including the

provision of area required for planting and implementing these facilities. In addition, a minimum size of an area intended for planting also requires further specification within the legislation, because planting can influence the effectiveness of ecoducts, among others. (The exact size should depend on the road category.)

- Set up a systematic monitoring plan of new linear infrastructure (before baseline, during the construction and after the construction is finished).
- The term of 'ecological corridor' or 'ecological connectivity' should be nominated in Gov. Decree 314/2005 (XII.25.), requiring that the impact of the railway/road project to ecological corridors should be evaluated in EIAs.
- Review of national and international practice and adaptation to domestic conditions.
- Advocacy for development of a new small infrastructure project to create a defragmentation facility (overpass).

Most important general objectives **for the existing infrastructure lines,** among others:

- Safeguard the permeability of existing transport infrastructure (including the enhancement of permeability of existing features, when possible)
- Safeguard the transversal permeability of riverbanks (including the enhancement of permeability of existing features, when possible)
- Safeguard the longitudinal permeability of rivers (including the enhancement of permeability of existing features, when possible)

In the **Descriptive part** we gave a focused assessment on watercourses, which serve as ecological corridors and the planned motorway is going across them. In the following we highlighted the critical sections. The most important critical sections of the planned M2 are the crossing zones of the above mentioned watercourses. Later we gave recommendations for mitigating the barrier effect of the planned motorway, and on a higher scale we formed proposals to improve the landscape connectivity and general ecological conditions.

At several workshops we presented our results for local stakeholders and professionals.

3-14 May 2021. workshop with students

Figures 6. & 7. Presentation of the first results to local stakeholders in Drégelypalánk, 4. of June 2021.

18-20 May 2022 International Workshop in the Hungarian-Slovakian pilot area

Figure 8. Group photo on the HU-SK international workshop © Aleksandra Khirv, CEEweb

21. May 2021.

Consultation with local stakeholders and experts

10.00 - 10.15 Presentation of the participants and the SaveGREEN project (Dr. Gabriella Mária Nagy and Viktória Selmeczy, CEEweb)
10.15 - 10.25 Presentation of the habitat suitability model for Hungarian green infrastructure project (Dr László Kollányi, MATE)
10.25 - 10.35 Presentation of the habitat model of the ConnectGREEN (pre-project) project and the and the mapped critical areas in Nógrád County and the proposals to address the problems, (Dr. Gabriella Mária Nagy, CEEweb)
10.35 - 10.45 "QGIS Field" supporting the field survey in the SaveGreen project application (video and field narration)
10.45 - 11.00 Presentation of the field surveys of the MATE Faculty of Landscape Architecture and Urban Planning, Results of student assignments (MATE)
11.00 - 11.10 Preparatory work for national and international financial support for green infrastructure (Dr. Gabriella Mária Nagy, CEEweb)
11.10 - 12.00 Networking, brainstorming, identification of further relevant participants
13.00-16.00 Field visit

Figure 9. & 10. Road No. 2 crossing of the Hévíz-stream with an inappropriately sized culvert

A particular ecological conflict is “the amphibian guidance (wall) system” near Hont, which has faults in its construction and maintenance. As mentioned before, the Borzsöny Mountains and the Ipoly River represent important core areas for a wide range of wildlife but especially amphibians. In spring, the Honti frogs emerge from their frost-free winter hiding places in Börzsöny and head for their breeding grounds in the Ipoly River floodplain. The Hont is home to thousands of frogs, the largest part of the Börzsöny brown toad population, with 10 of Hungary's 12 frog species found in the area. Unfortunately, the road No. 2. crosses the core areas causing serious ecological damage.

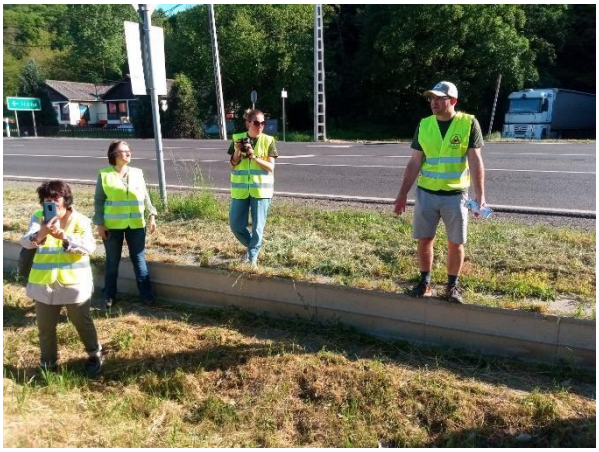

Figure 11. During SaveGREEN Transnational Experience Exchange Workshop we visited "the amphibian guidance (wall) system"

We used for the elaboration of the CSOP the results of:

Nóra Hubayné Horváth, Zsolt Szilvácsku, Edina Dancsokné Fóris, László Kollányi, Krisztina Filepné Kovács, Ildikó Módosné Bugyi, Dalma Varga and Ágnes Sallay (eds.), A tervezett M2 autópálya határmenti térségének tájvédelmi és tájfejlesztési tanulmányterve, made on student workshop, Hungarian University of Agriculture and Life Sciences, Institute of Landscape Architecture and Urbanism and Garden Art, Budapest, 2021.

Zsombor Bányai (2021): Ökológiai folyosók értékelési módszertanának kidolgozása és alkalmazása az M2-es autópálya tervezett szakaszán / Elaboration and application of assessment method for ecological corridors in the region of the planned M2 motorway, Supervisors: László Kollányi, András Weipert; MATE, Hungarian University of Agriculture and Life Sciences

VIBROCOMP – BOKÚT-TERV KONZORCIUM (2015): M2 GYORSFORGALMI ÚT, VÁC-ORSZÁGHATÁR KÖZÖTTI SZAKASZ NATURA 2000 HATÁSBECSLÉS; Ipoly völgye SPA (HUDI10008), Ipoly-völgy SCI (HUDI20026) Projekt szám: A002.02; Megbízó: NIF Nemzeti Infrastruktúra Fejlesztő zártkörűen működő Részvénytársaság