



HARMON

Harmonization of Green and Grey
Infrastructure in Danube Region

A Strategic Approach

for Harmonization of Green and Grey Infrastructure

in four Danube Region countries

(Austria, Bulgaria, Czech Republic and Romania)

Project co-funded by European Union funds (ERDF)

A stream of cooperation

ORIGINAL PARAMETERS TO ASSESS THE HARMONIZATION OF GREEN AND GREY INFRASTRUCTURE

Operationalization of the harmonization status is difficult without a series of pre-defined parameters, which would foster a more homogenous interpretation of the terminology related to the harmonization of green and grey infrastructure.

In the context of the HARMON project, which aims to compare situation in Austria, Bulgaria, Czech Republic and Romania in order to identify common needs and existing good-practices for potential transfers across countries, the need for a structured logical framework of assessing harmonization status has become apparent.

Comparing the state of play in different countries in order to identify common needs and existing good-practices for potential transfers required a common structured logical framework which could be used as a strategic action plan for harmonization.

The development of parameters for assessing harmonization status is the main original contribution of the HARMON project. The parameters have showcased the needs/challenges for harmonization and have facilitated the interaction with stakeholders/target groups of project countries for data collection. Data was collected and collated using existing information available through similar initiatives like GreenWeb¹, from DTP projects or studies (TRANSGREEN, ConnectGREEN and Ecological Connectivity in the Danube Region ²) or from partners' expert opinion and based on past interaction with various interested groups.

The parameters are reflecting a pyramidal approach, from strategic level to implementation, including cross-sectoral education and communication and have been structured in four categories/levels:

- A. Policy and strategies;**
- B. Planning and environmental impact assessment;**
- C. Implementation and management;**
- D. Education, awareness, consultation and communication.**

¹ www.green-web.eu

² Huber, M., Jungmeier, M., Glatz-Jorde, S. Höfferle, P., Berger, V. (2018): *Ecological Connectivity in the Danube Region. Final Report.* Study commissioned by Bayrisches Staatsministerium für Umwelt und Verbraucherschutz. E.C.O. Institut für Ökologie, Klagenfurt, 75 p.

2.1. Policy and strategic level ('A' parameters)

General context. Grey (linear transport) infrastructure is one of the key elements to support socio-economic development, with a high (geo-) strategic and political significance. Therefore its importance is easily recognized on all social levels. Policies/ strategic plans to develop grey infrastructure have been in place at European, regional and local levels, for many years now.

Green infrastructure, on the other hand, is a relatively new concept, more complex and therefore more prone to different interpretations. Although it is considered as one of the key instruments to address specific societal needs by EU strategy³ and adequate to address climate change effects, the implementation of Green infrastructure strategy seems impacted primarily by the lack of coherent and uniform operationalization of the concept.

As the premises of harmonization are highly depending on both the formal recognition of the concept and on operationalization of its objectives, we explored if the Green Infrastructure concept is integrated into national policies / legislation, and if concrete national objectives have been proposed / action plans have been adopted, using the following parameters:

Parameter A.1. Integration of the EU Strategy on Green Infrastructure in national legislation.

We queried if and on what level of policy/legislation a country has adopted the EU Strategy on Green Infrastructure, and if there is any concrete action plan with quantitative objectives at national / regional or local scale.

Parameter A.2. Clear and comprehensive definition of Green Infrastructure.

First, we queried if within national strategies/legislation or in official documents there is a clear and comprehensive "official" definition of Green Infrastructure which can be linked with specific management / jurisdiction, or if Green Infrastructure is defined just in generic terms which needs to be further operationalized as at present it could be interpreted in different ways.

Second, we queried if components of Green Infrastructure are referenced to in concrete administrative terms (as protected status, land-use, land-types, habitat of specific statute etc.).

Parameter A.3. Specific Action Plans for Green Infrastructure.

We queried if at national, regional or local level, there are any action plans to implement Green Infrastructure strategy / concept, with concrete objectives.

Parameter A.4. Integration of Green Infrastructure themes (connectivity/corridors, permeability, fragmentation, ecosystem services, climate change adaptation etc.) in biodiversity, transport and other sectoral strategies.

We queried if Green Infrastructure themes as connectivity, permeability, fragmentation, ecosystem services, climate change adaptation etc. are integrated into sectoral strategies / legislation (Biodiversity / Environment; Transports; Strategic development; Forestry; Agriculture; Water management; Game management; Development; Tourism etc.).

³ EU Strategy on Green Infrastructure

Parameter A.5. Sectoral strategies and policies are subject to SEA procedure.

Strategic Environmental assessment (SEA) is a process having the ultimate objective of providing decision-makers with an indication of the likely consequences of their actions. It is applied internationally as a preventive environmental management tool to ensure that proposed actions are economically viable, socially equitable, and environmentally sustainable.^[4]

We queried if sectoral strategies and policies have been (formally) subject to SEA procedure and then if SEA procedure has adequately assessed the impacts on connectivity.

Parameter A.5.1. SEA procedure for strategies and policies includes *formal* assessments of impacts on connectivity.

Parameter A.5.2. SEA procedure for transport (and other) strategies and policies includes adequate assessments of impacts on connectivity.

⁴ [Environmental Impact Assessment as a Tool for Sustainable Development](https://iau.academia.edu/DrKavehOstadAliAskari), Dr. Kaveh Ostad-Ali-Askari, <https://iau.academia.edu/DrKavehOstadAliAskari>

2.2. Planning and environmental impact assessment level ('B' parameters)

General context. The planning phase of any infrastructure project offers the best opportunity to understand the potential conflict points, the needs for harmonization and to find the best set of solutions. The first obvious step would be to have access to relevant data, that could be as basic as overlaid maps of both Grey and Green infrastructure.

As Green Infrastructure is more complicated to represent, we explored the level of local expertise in mapping it. Availability, accuracy and functionality of data-base platforms are critical elements for informed decision. Even if Environment Impact Assessment (EIA) and Appropriate Assessment (AA) procedures have not explicitly consider connectivity as a topic, both procedures are critical instruments to assure implementation of projects that likely to have significant effects on environment.

According to the Habitats Directives, Member States shall assure the coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are essential for the migration, dispersal and genetic exchange of wild species. **In order to assure the assessment of connectivity in both procedures there is a need to develop national guidelines.**

We focused on transport infrastructure projects, but we also assessed other sectorial projects as, as we discussed, although harmonization with Grey infrastructure is critical, the functionality of the Green Infrastructure is dependent on other sectors with influences at landscape level. We queried availability of support-data, methodologies and coherent expertise to address harmonization on avoid-mitigate-compensate approach, based on following parameters:

Parameter B.1. Expertize in mapping Green Infrastructure.

We queried existing experience in mapping Green Infrastructure in each country, broad methodologies being used and if mapping led to practical outcome in Green Infrastructure implementation.

Parameter B.2. Comprehensive, clear, unitary / official methodology for identification of Green Infrastructure.

We queried if past experience led to a comprehensive, clear, unitary / official methodology to identify and map Green Infrastructure.

Parameter B.3. Coherent and functional data-base including relevant maps

We queried availability of Green Infrastructure maps and sectoral plans/projects maps in a functional format (i.e. GIS shape file) and the availability of relevant support-data in a coherent functional data-base/platform.

Parameter B.3.1. Clear representation of Green Infrastructure: official maps are available in useful formats (i.e. GIS shape file).

Parameter B.3.2. Clear representation of Grey Infrastructure projects (including planned one): official maps are available in useful formats (i.e. GIS shape file).

Parameter B.3.3. Clear representation sectoral projects (water management, agriculture, forestry, development, extractive, tourism, other infrastructure, cadaster): official maps are available in useful formats (i.e. GIS shape file).

Parameter B.3.4. Other relevant data are available on functional formats: (umbrella) species distributions, species action plans, species / habitats range models linked with climate change, road-kill & accidents data, ecosystem services etc.

Parameter B.4. Dedicated platform for data-base / maps / information sharing.

We queried existence of data sharing platforms, their status (project-based initiatives or official ones), the extent and quality of data, functionality of platforms for practitioners.

Parameter B.4.1. Official status of platforms and data.

Parameter B.4.2. Platform usability and functionality.

Parameter B.5. Impact assessment procedures are taking into account connectivity.

We queried if formal assessment of impacts on connectivity are being conducted, the quality and outputs of the EIA or AA assessments.

Parameter B.5.1. Specific themes (connectivity/fragmentation) are **formal** indicators to evaluate the impact of transport infrastructure and other sectorial projects within EIA, AA procedures.

Parameter B.5.2. Specific themes (connectivity/fragmentation) are being **adequately evaluated** in terms of their impact of sectoral projects within EIA, AA procedures.

2.3. Implementation and management level ('C' parameters)

General context. Harmonization solutions should be established / designed during the planning and assessment process stages, but their efficient implementation and monitoring are highly dependent on land jurisdiction, adequate management measures and funds available for responsible organizations. As discussed, Green Infrastructure is a complex, dynamic and sensitive system, therefore it is important to conduct pro-active studies and to be able to exchange all the know-how available in order to fundament, adjust and improve specific management decisions / measures based on scientific-proofed or best-available data.

We queried the legal status of Green Infrastructure elements, the coherence of management objectives and their fundament on species ecology or on ecosystem approach, concrete management measures availability and their financial support, as well as the capacity to integrate scientific research results and know-how exchange into a mechanism of constant learning and improvement, based on following parameters:

Parameter C.1. Legal statute of Green Infrastructure: administrative statute

We queried if Green Infrastructure is included in official land-use plans / cadaster and if there are specific requirements / restrictions linked to them.

Parameter C.2. Coherent and clear management objectives for green infrastructure components

We queried if ecological requirements of (target/umbrella) species has been used to develop clear management objectives for Green Infrastructure components and if there is any connection with species action plans, Natura 2000 management plans, climate change scenarios, ecosystem services or other socio-cultural requirements.

Parameter C.2.1. Ecological requirements related to connectivity are available for (all) relevant (umbrella) species: coherent and consistent operationalization of ecological requirements of relevant (umbrella) species

Parameter C.2.3. Management objectives for Green Infrastructure components incorporate adaptation to climate change, ecosystem services, and other socio-cultural aspects

Parameter C.3. A clear set of management measures and monitoring procedures linked to management objectives

We queried if there is a clear and coherent set of management measures and monitoring procedures associated with management objectives of all Green Infrastructure elements.

Parameter C.4. Implementation of conservation / management measures are financially supported in a coherent and consistent manner

We queried if there is potential and functional efficient funding for management and monitoring.

Parameter C.4.1. Direct financial support for implementation of conservation / management measures

Parameter C.4.2. Direct financial support for coherent and consistent monitoring

Parameter C.4.3. Indirect funding for beneficial management measures

Parameter C.5. Research support, experience exchange and learning mechanism

We queried if there are significant research support and functional formal and informal mechanisms to facilitate the experience exchange and to implement lessons learned for constantly improving the harmonization outputs.

Parameter C.5.1. (Pro-active) scientific research / data-collection initiatives, funding, projects implemented

Parameter C.5.2. Experience exchange mechanisms as cross-sectoral networks / forums to facilitate know-how exchange and cooperation in Green and Grey Infrastructure harmonization

Parameter C.5.3. Evidence of lesson learning / adaptation of official procedures based on experience exchange

2.4. Education, awareness, consultation and communication level ('D' parameters)

General context. A fundamental pre-condition for a successful harmonization is that the knowledge base at all levels / stakeholders / interested groups is adequate enough to support proper decisions, to implement correct solutions, to improve constantly the approach/the process/ collaborations and to maintain efficient communication between stakeholders and with the general public.

What we queried was if the inter-disciplinary education exists, if the mandatory consultation process for new transport infrastructure is being implemented adequately or if it is mostly formal, and if harmonization needs are communicated correctly and efficiently, based on following parameters:

Parameter D.1. Specific university / post-university inter-disciplinary (transport/engineering and biology/ecology) education exists

We queried if concrete Green and Grey Infrastructure harmonization related topics exist in transport- and environment-focused university curricula, and if there is any dedicated inter-disciplinary curricula focusing on transport ecology.

Parameter D.1.1. Ecological connectivity related topics are part of existing transport- and environment related university curricula

Parameter D.1.2. Ecological connectivity related / transport ecology is specifically targeted by inter-disciplinary curricula

Parameter D.2. Adequate consultations are being conducted as part of the transport project assessment

We queried if responsible authorities are making sure that all stakeholders / interested groups are aware and understand the implications of different options evaluated for transport projects (from all perspectives – economic, social, cultural, well-being, environment etc.) and that the feedback is collected and taken into account.

Parameter D.3. Non-conflictual/supportive, credible and efficient (informed, adequate, complete and consistent) communication from stakeholders

We queried the scope (if stakeholders perceive harmonization as a sectoral goal or as a imposed topic) and the premises (credibility and efficiency) for achieving results through communication.

Parameter D.3.1. Non-conflictual messages for the general public

Parameter D.3.2. Availability of adequate informative support-materials, relevant for all stakeholders (from policy to sectoral levels and for the general public)

Parameter D.3.3. Trained personnel in communication / facilitation (aware of technical aspects) available within relevant agencies / organizations / projects / networks

Parameter D.3.4. Key promoters exist within political system, relevant agencies / organizations, press, public figures.

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¹Zarand Association, (Leader Partner), Romania, www.zarand.org

²Environment Agency Austria, (Project Partner), Austria,
<http://www.umweltbundesamt.at>

³Friends of the Earth, Olomouc branch, (Project Partner), Check Republic,
www.olomouc.hnutiduha.cz

⁴Black Sea NGO Network, (Project Partner), Bulgaria, www.bsnn.org

⁵Egnatia Odos S.A. EL, (Associated Partner), Hellas, www.egnatia.gr

⁶Austrian Ministry for Transport, Innovation and Technology, (Associated Partner), Austria, www.bmvit.at

⁷The National Environmental Protection Agency, (Associated Partner), Romania,
www.anpm.ro

⁸IENE-Infrastructure and Ecology Network Europe, (Associated Partner), France,
www.iene.info

1

Zarand Association (AZ) is a key organization in promoting the importance of landscape connectivity, harmonization of grey and green infrastructure in Romania. AZ members were the first to pioneer the need to safeguard the last viable ecological corridor between the Western and Southern Carpathians as an example of good practice for Romania. Due to the efforts of AZ, a Statement of Intent has been signed in 2010 by a number of Romanian and International relevant authorities and organizations expressing their support to maintain the functionality of the corridor. AZ experts were responsible for a study commissioned by the Ministry of Environment aiming to identify new Natura 2000 sites that would ensure coherence of the network – as a result, in 2011, the first 17 Natura 2000 sites were designated in Romania with the main aim of ensuring connectivity at regional level. AZ was the lead organization to address the issues of Lugoj-Deva motorway by involving national stakeholders, national and international experts and EC in finding alternative solutions to the original project which would have been a barrier in wildlife movement. As a result, the Lugoj-Deva Motorway is the first infrastructure project in Romania to incorporate mitigation measures and a best practice example for the region. AZ was partner/contractor in a number of multi-partners / international projects related to connectivity and land management: LIFE Connect Carpathians project (aimed to develop regional action plans for bear and wolf addressing connectivity as a particular issue), COREHABS, TRANSGREEN. AZ experts participated in the development of national guidelines for avoiding fragmentation by the transport sector. Since 2013 AZ has been a custodian of a Natura 2000 site within an ecological corridor and it has been implementing projects and activities related to conservation, sustainable development, capacity building and education.

2

Umweltbundesamt, the Environment Agency Austria (EAA), provides advisory services across a wide range of areas, mainly in the fields of climate change mitigation and adaptation, energy efficiency and renewable energy, air quality, water quality and resources, biodiversity, genetically modified organisms, nature protection, waste and resource management, chemicals, environmental legal advice, as well as data management, including monitoring and reporting. Through co-operation in numerous European and international working groups and committees, EEA is in touch with the latest regulatory, scientific and political developments and ensures a mutual exchange of knowledge. Public authorities, policy makers and private businesses benefit from innovative solutions and EEA international network. The EEA pursues an interdisciplinary approach to the design and development of perspectives for the environment and society. Preventive environmental protection, in the sense of sustainable development, is at the center of its activities. With more than 30 years of experience the EEA is a top provider of environmental consultancy services, EAA range of services includes performing evaluations, setting standards and developing methods and recommendations and it provides the basics for decision-making as well as sustainable solutions. Based on broad expertise, the EEA also offers sustainable solutions and services in many areas including the development of environmentally sustainable transportation, infrastructures focusing on the development of monitoring concepts for wildlife corridors and green bridges and support for the development of mapping strategies for wildlife corridors.

3

Friends of the Earth Czech Republic (FoE CZ) has been dealing with issues connected to conflict between grey and green infrastructure in the West Carpathians for the last 12 years (i.e. mostly conflict mitigation between new roads and protected areas and species). The organization is focusing on monitoring and conservation of large carnivores in the whole Czech Republic and Western Slovakia, involvement of local people in monitoring, education activities and active participation in decision making processes where transport and development projects are concerned. Large carnivores are especially sensitive to habitat fragmentation caused by transport infrastructure because of their large home ranges. Road and rail networks with low impact on large carnivore populations' movement will thus be beneficial for many other large and small terrestrial animals. FoE CZ with the cooperation of experts from universities also deals with habitat modeling and corridor design. FoE CZ's experience from the West Carpathians could promote sustainable solutions in other areas in Southern and Eastern Europe. The organization was a partner in TRANSGREEN project dealing with similar issues.

4

Black Sea NGO Network (BSNN) registered in 1999 in Varna, Bulgaria is an independent, non-political, non-profit public benefit association of NGOs working on environment and sustainable development issues. BSNN has members in the six littoral countries and has associates in the wider region, the Danube states and Europe. It has implemented many cross-border and international projects. It cooperates with regional networks like the Danube Environmental Forum, Seas at Risk, Coalition Clean Baltic, MIO – ECSDE etc. BSNN has a permanent office with adequate equipment, staff, pool of experts and volunteers. BSNN activities are focused primarily on environmental and sustainability issues but also include wider society development issues. BSNN areas of competence include regional and EU environmental policies, Black Sea and Danube Region issues, international waters management, biodiversity protection, sustainable development, integrated coastal zone management, climate change, environmental governance, environmental education, youth involvement, civil society development, stakeholder involvement, awareness raising, networking, advocacy and lobbying. BSNN has a long record of cross-border cooperation with regional partners in capacity building and environmental management projects, expert involvement and cooperation with scientific and educational establishments, involving decision makers and authorities on local, national and regional level, education, awareness raising activities, environmental protection and campaigning. BSNN in its daily activities manages and implements projects on national and cross-border level, organizes training, publicity and media events, meetings, workshops, conferences, expert work, publications, networking. BSNN has implemented various cross-border projects financed by EU and other international donors: 6 and 7 FP of EU, JOP 'Black Sea Basin' 2007-2013, FM of EEA/Norway Grants for NGOs, European Fisheries Fund, Interreg, GEF-UNDP.

5

Established in 1994, **Egnatia Odos SA (EO SA)** is a dynamic, innovative and reputable organization, responsible for the design, construction, operation and maintenance of one of the most complex and ambitious infrastructure projects in Greece, which consists of the Egnatia Motorway and its vertical axes. EO SA is a legal entity governed by private law in the form of a "Société Anonyme", with the Greek State being the sole shareholder. It has also been the project manager for programmes concerning the monitoring of the status of big mammals along the motorway, of a total cost of more than €1m. EO SA has 220 highly qualified professionals and an Environment Department with long experience in environmental projects. EO SA will give benefit to the project in applying the best environmental practices along its road network concerning interaction with the "green zones". Also having Egnatia Motorway as a unique case study, Egnatia Odos SA can transfer its unique experience on planning, design, construction and operation of large scale infrastructure projects in Southeastern Europe.

6

The Austrian Ministry of Transport, Innovation and Technology has started in the 80s to deal with the conflict of linear transportation infrastructure and wildlife. Since then it has gained a lot of experience, developed best practices, a state of the art and guidelines and directives on how to protect both, drivers and wildlife, in the best and most effective way. The guidelines determines the planning process of new roads and railways, the necessary amount and location of crossing structures, fencing, as well as other possible measures to avoid wildlife vehicle collisions. A directive is part of the defragmentation strategy and obliges the motorway company to construct crossing structures at crucial points along the existing motorways. The Austrian Ministry of Transport, Innovation and Technology has long experience in establishing environmentally sustainable transportation and thereby can provide appropriate support on a strategic level, transfer of experience and best practices, contribution on defining and filling in the gaps that still exist to improve the efforts that need to be undertaken.

7

The National Agency for Environmental Protection, Romania (NEPA) is the specialized institution of the central public administration, subordinated to the Ministry of Environment with competences in the implementation of environmental protection policies and legislation. NEPA was established in 2004, having under its responsibility 42 county environmental agencies. NEPA is responsible of providing technical support for the substantiation of normative acts, sectorial environmental strategies and policies harmonized with the European acquis and based on the concept of sustainable development; implementation of legislation in the field of environmental protection; coordinating the implementation of environmental strategies and policies at national, regional and local level; representation in the

field of environmental protection in internal and external relations, according to the mandate granted by the Ministry of Environment; authorizing activities with potential impact on the environment and ensuring compliance with legal provisions; ensuring the functioning of national reference laboratories for air, waste, noise and vibration, as well as, radioactivity; coordinating the implementation of sectorial action plans and the national action plan for environmental protection. NEPA will play a crucial role in both the harmonization of Green and Grey infrastructures in Romania and in planning concrete actions, being the national responsible authority to approve each new development. As a responsible government authority which implements policies and legislation in the field of environmental protection, NEPA can offer the appropriate support at strategic and legislative level.

8

IENE- Infrastructure and Ecology Network Europe is a network of experts working with various aspects of transportation, infrastructure and ecology. The network was initiated in 1996 to provide an independent, international and interdisciplinary arena for the exchange and development of expert knowledge – and with the aim to promote a safe and ecologically sustainable pan-European transport infrastructure. IENE arranges international conferences, workshops and symposia, initiates collaboration projects and helps answering questions that require a joint international expertise. The last 10 years IENE became globally recognized as an international Arena for exchange of knowledge and experience among all interested in transport and ecology, from researchers to practitioners. Basic results of the 20 years of activity are: 6 biannual international conferences with totally 1.428 participants, 199 countries' representations, 594 lectures and 256 poster presentations, 17 international workshops with totally 1.152 participants, 167 countries' representations, 138 lectures and 40 poster presentations. By the end of 2016, the overall IENE arena has as active circa 400 members not only from Europe but all over the world, representing 51 countries. Through the IENE international conferences and their declarations, workshops, seminars, projects and the website the network has developed as an irreplaceable cog in the development of a sustainable transport system. IENE can transfer experience and knowhow from the global/international level to the regional European level, being the author of COST 341- *Habitat Fragmentation due to Transportation Infrastructure, WILDLIFE AND TRAFFIC: A European Handbook for Identifying Conflicts and Designing Solutions.*