

What is Green Infrastructure?

Green Infrastructure “is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, GI is present in rural and urban settings.” Linked together, these strategically planned networks of green elements are able to provide multiple benefits in the form of supporting a green economy, improving quality of life, protecting biodiversity and enhancing the ability of ecosystems to deliver services such as disaster risk reduction, water purification, air quality, space for recreation and climate change mitigation and adaptation.

The European Green Infrastructure Strategy

The Green Infrastructure Strategy proposed by the European Commission, promotes the development of Green Infrastructure across the EU delivering economic, social and ecological benefits and contributing to sustainable growth. It guides the implementation of Green Infrastructure at EU, regional, national and local levels. A main feature of the Green Infrastructure Strategy is its integration into relevant policies through: ecosystem-based adaptation into climate change policies; nature-based solutions into research and innovation policies; natural water retention measures into water policies; and through its focus on delivering multiple ecosystem services and their underlying factor - a rich biodiversity - into nature policies. The Natura 2000 network in particular plays a major role in protecting many of the core areas with healthy ecosystems.

The Green Infrastructure approach features also in regional and cohesion policies, disaster prevention and the greening of the Common Agriculture Policy.

As Green Infrastructure can make a significant contribution to many sectors and EU policy objectives, Green Infrastructure is being integrated into many funding streams including Structural Funds (the European Regional Development Fund (ERDF); European Social Fund (ESF)), the Cohesion Fund (CF), the European Maritime and Fisheries Fund (EMFF), the European Agricultural Fund for Rural Development (EAFRD), LIFE+ and Horizon 2020 project funds and the Natural Capital Financing Facility (NCFF) of the European Investment Bank (EIB).

Costs & benefits of Green Infrastructure

Green Infrastructure can often provide more benefits at less cost than single-purpose grey infrastructure. A growing body of research and experience demonstrates Green Infrastructure’s high potential due to its multi-functionality, i.e., its ability to perform several functions and to provide several benefits in the same spatial area. These functions can be social (providing healthy environment or green space for leisure and sports), environmental (conserving biodiversity or adapting to climate change and related water issues), and economic (supplying jobs, raising property prices and reducing damage recovery costs). These benefits will however only be fully delivered if Green Infrastructure elements are functional: they need to be big enough, at the right place and well connected. At the same time, these multiple benefits need to be weighed against the costs of establishing and maintaining Green Infrastructure, ideally over the expected life cycle.

Green Infrastructure and the European Semester

Green Infrastructure can play a role in the European Semester, for instance through natural flood prevention or job creation. Floods are among the most common and most costly natural disasters in Europe, and flooding events are likely to become more frequent with climate change. Benefiting from nature’s own capacity to absorb large quantities of excess water is cost-effective and can play a major role in sustainable flood risk management. Investing in Green Infrastructure for flood protection typically yields benefits 6-8 times the costs. Investments in Green Infrastructure can help boost new markets in services, such as planning, implementing and monitoring Green Infrastructure.

Green Infrastructure in Slovenia

Since the 1990s, Slovenia has been piloting the establishment of the Pan-European Ecological Network (PEEN), which has been one of the cornerstones of the EU Natura 2000 network in its Slovenian part. The country has more designated Natura 2000 sites than any other EU country, with 37% of its territory being covered. Besides sites designated under the Natura 2000 network, some areas are also designated under the national legislation as protected areas or 'areas of ecological importance'. Thus, Slovenia has been able to ensure considerable connectivity of the areas of highest conservation concern. However, the favourable conservation status is secured for just 29% of the species and 43% of the habitats of Community interest. Areas protected under the national legislation are mainly protected by the state (around 80%); the rest is protected locally. The main barrier to broader

implementation is the underfunding of the Green Infrastructure management, currently carried out mostly with EU funds, e.g., LIFE or INTERREG. The mainstreaming of the Green Infrastructure objectives into sectoral planning is still insufficient, although Green Infrastructure topics (green areas, restoration and preservation of landscapes, etc.) are explicitly highlighted in both the Spatial Development Strategy and the Slovenian Communication on Climate Change.



Policy setting & ongoing implementation

The Natura 2000 Management programme for Slovenia for 2015-2020 was adopted in April 2015. Once implemented, its outcome could be a coherent Natura 2000 network providing many of the core areas with healthy ecosystems by developing functional Green Infrastructure. It comprises concrete and operational measures for the Natura 2000 network on the basis of the approach of the Priority Action Frameworks (PAFs). The preparation of the Programme was funded under the LIFE programme. The intention is to: 1) integrate measures / solutions from the Natura 2000 Management Programme (2014-2020) into operational programmes for obtaining EU funds (agricultural, structural and cohesion, fisheries, LIFE); 2) finalise and update the PAF, as required by Art. 8 of the EU Habitats Directive; 3) analyse the implementation of measures and achieve the objectives from the Natura 2000 Management Programme 2007-2013, and use the results to draw up a new programme; 4) communicate measures for Natura 2000 to different stakeholders and target groups, raise their awareness of Natura 2000 and increase the awareness of the general public of the importance of the network; 5) identify opportunities within Natura 2000 sites for local and / or regional development, jobs and economic growth; 6) adopt legislation harmonised with all competent sectors to properly manage the Natura 2000 sites in the country in 2014-2020; and 7) contribute to the understanding that the Natura 2000 network is also a good opportunity for sustainable development.

Action 5 of the EU Biodiversity Strategy to 2020 calls on Member States to work on the "Mapping and Assessment of Ecosystems and their Services" (MAES). Slovenia has completed the local and regional assessments; currently, no national assessment is foreseen.

Good practices in Slovenia

Sečovlje Salina Nature Park and N2K area – exemplary public-private partnership

Sečovlje salina is a 650 ha area along the estuary of the Dragonja River on the southernmost stretch of the Slovenian coastline. The coastal alluvial plain has developed over centuries by the continuous deposition of sediments in the Dragonja river estuary. Basins for evaporating sea water were created at least 700 years ago; the landscape and ecosystem has remained relatively unchanged since. Several different habitat types, however, have evolved, all of them dependent on the salty environment and the presence of humans to prevent tide and floods. This is the first state-designated protected area to be managed by a private company (Soline; a salt producer). The project is a good example of a multifunctional Green Infrastructure capable of combining salt production, tourism and recreational activities and education whilst at the same time conserving unique habitats for salt-loving vegetation. The project – the result of public-private efforts – improved the conservation status of target bird, reptile and fish species and target habitat types in the Natura 2000 site Sečovlje salina. The specific actions were to ensure control and effectively manage the water regime; enhance the conservation status of numerous species and habitats in the area; and raise public awareness.

Benefits of the project include:

- Improved water regime over a large wetland territory;
- Created opportunities for boosting the local economy (park employees have increased from 15 in 2002 to over 80 to date, due to better preserved nature);
- Enhanced quality of life through increased options for recreation and better environmental security;
- Contribution to climate change mitigation through conservation management of a large wetland (carbon sink); and
- Contribution to sustainable development (e.g., increased system flexibility, Global Climate Change adaptation, sustainable transport).

Ljubljana – case study on green infrastructure planning and governance

Ljubljana is Slovenia's capital and with 280,000 inhabitants the largest city of the country, situated between the Alps and the Karst in the central area of the country. Ljubljana has many watercourses; the rivers Ljubljanica, Sava, Gradaščica, the Mali Graben, the Iška and the Išča all flow through the city. Ljubljana is also one of the wettest capitals in Europe with high yearly precipitation. Throughout the city's history, floods have frequently struck the city. Ljubljana has a few large parks in its centre and four landscape parks around the centre. These parks generally combine recreational functions and high biodiversity levels. The main aims of the city's spatial policy are to maintain the well-structured green network, redevelop brownfields and create new green areas. The green network functions as a Green Infrastructure area since it is multifunctional, providing socio-cultural and ecological benefits as well as flood prevention.

Benefits of the project include:

- Example of Green Infrastructure urban planning with multi-stakeholder participatory approach;
- Restored Ljubljanica and Sava Rivers (and their banks) and enhanced flood risk prevention;
- Linked green spaces with urban restoration;
- Reinforced spatial protection in the region: designation of new PAs, e.g., Ljubljana Marsh Nature Park (IUCN category V); and
- Increased public support and understanding of Green Infrastructure establishment (e.g., restoring the degraded open urban space at Šmartinska cesta).

Conservation and management of freshwater wetlands in Slovenia

The lack of appropriate management in the past 50 years has led to wetland loss and degradation. During this period, many wetland areas were modified and drainage systems were constructed, especially for agricultural land and forests. Between 1973 and 1991, more than 70,000 ha of lowlands were drained. Flood control schemes have also canalised natural meandering streams and restricted naturally fast-flowing waters. Agricultural intensification has been the main anthropogenic factor causing wetland loss and degradation throughout Slovenia. Official figures show a decrease of almost 40% (1,282 ha) in reed beds, marshes and ponds between 1950 and 1992. The goal of the project is to restore the



Velika Planina hill

favourable conservation status of eight targeted freshwater habitats and six wetland habitat SCIs. The project sites – Pohorje, Zelenci, Vrhe, Planik, Gornji kal and Mura-Petišovci – contain different types of wetlands, all of which have suffered from a lack of appropriate management. Healthy freshwater wetlands are good examples of Green Infrastructure which can deliver multiple functions such as flood prevention, water filtration and maintenance of the water table, as well as recreation possibilities, carbon storage, timber and interconnected wildlife refuges.

Benefits of the project include:

- A general increase in biodiversity. Examples are (1) improved habitat of the southernmost populations of black grouse and capercaillie; and (2) revitalised oxbow lakes and related species in the Mura river, including fish such as the mud minnow, amphibians, dragonflies and turtles;
- Mainstream conservation guidelines into sector management plans to ensure active ongoing management of project areas even after their initial funding period is over;
- Establishment of an integrated systematic approach for managing freshwater wetlands in Slovenia that will have a demonstrative value for conserving other wetlands;
- Raised awareness of the importance of wetland species and habitats, the Natura 2000 network and biodiversity among landowners, local communities, visitors and local and national authorities; and
- Multiple benefits of the implemented Green Infrastructure measures (e.g., flood prevention, recreation, water filtration) expected to be higher than the costs of the project.

Challenges and opportunities

- The National Ecological Network in Slovenia is insufficient to secure effective protection of the rich biodiversity for which it is designated, mostly due to the lack of adequate government funding.
- The management of the areas comprising the Ecological Network is largely decentralised; with the lack of effective operational PAF, the coherence and integrity of the Green Infrastructure is unsure.
- The currently low uptake of Green Infrastructure in agriculture land, combined with the low uptake of the existing agri-environment measures is a barrier to effective preservation of the lowland and open area biodiversity.
- There seems to be a lack of understanding of the potential benefits from Green Infrastructure and the enhanced quality of life it could guarantee if adequately managed.
- The preparation of the Natura 2000 Management Programme for Slovenia for 2015–2020 involved partners from all sectors (agriculture, forestry, fish and game management, and water), which creates an optimal setting for enhancing the mainstreaming of the Green Infrastructure concept into sectoral policies.
- Adaptation of the legislation aimed at regulating the decentralised management of Slovenian spatial protection, e.g., by development of management guidelines.
- In cooperation with all involved partners and key stakeholders, the available financial mechanisms (e.g., from the Operational Programme for the Implementation of the EU Cohesion Policy 2014–2020, Rural Development Programme 2014–2020, LIFE, etc.) need to be actively used to achieve the goals of the Natura 2000 network, which is the key part of Green Infrastructure in Slovenia.
- Integration of Green Infrastructure concerns into the tourist sector needs to be encouraged.
- The ecosystem services offered by the national ecological network should be evaluated and promoted among the local public.
- The MAES process in Slovenia is useful for spatially explicit prioritisation and problem identification in relation to Green Infrastructure uptake.



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