

## 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.

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 (NCF) 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 Italy

The concept of Green Infrastructure was first introduced in Italy in December 2013 by the Ministry of the Environment as part of its national conference “La Natura dell’Italia”. The objective of this conference was to kick-start the economy focusing on Italy’s natural capital and protected areas and highlighting the importance of Green Infrastructure in a green economy context for the National Biodiversity Strategy. Currently, the Italian Ministry of the Environment is

responsible for implementing the Green Infrastructure Strategy (COM(2013) 249 final) at the national level, within the broader context of the European Biodiversity Strategy for 2020. Accordingly, the Ministry has commissioned the Italian Botanical Society (SBI), with a working group from La Sapienza University of Rome and the Interuniversity Research Centre “Biodiversity, Plant Sociology and Landscape Ecology” to develop:

- A methodological framework for identifying ecosystem restoration priorities and promoting Green Infrastructure in Italy;
- A restoration project on freshwater ecosystems making use of Green Infrastructure; and
- Two Green Infrastructure pilots for the urban and peri-urban context of the Metropolitan Area of Rome.

The methodological framework has been built on the basic principles of Green Infrastructure, i.e., multifunctionality, multi-scales, identification of priorities, and integration with biodiversity conservation measures and land planning at multiple levels. Moreover, the connection between Green Infrastructure and ecological networks has been explored in order to capitalise on existing knowledge for developing new Green Infrastructure projects. Since 2013, the concept of Green Infrastructure has been used in press articles and studies in many Italian regions which highlight its economic and social benefits. The importance of managing European funds for Green Infrastructure in an effective manner is also stressed in agricultural and urban areas. Increasingly, the ‘ecological network’ (‘reti ecologiche’) expression is being replaced by the broader concept of Green Infrastructure. Generally, the concept of Green Infrastructure as promoted in Italy, is linked to ecosystem services and green economy.



## Policy setting & ongoing implementation

Italy considers Green Infrastructure as a means to strengthen biodiversity conservation, promote and enhance natural capital, in order to develop a greener economy. The implementation should start from protected areas, which are crucial to conserve natural capital, implement sustainable tourism and implement traditional forms of agriculture and industry, since these activities are well suited for developing a green economy.

Action 5 of the EU Biodiversity Strategy to 2020 calls Member States to work on the “Mapping and Assess the state of Ecosystems and their Services” (MAES). Italy started assessing its national ecosystems in 2014 and has recently completed its biophysical evaluation with the production of the map of Italy’s ecosystems. Green Infrastructure is also considered relevant outside protected areas as an instrument for taking natural capital into account into spatial planning and management. It is also a sustainable solution to hydrogeological risks and climate change as it improves natural connections between urban and rural areas and enhances synergies between natural and cultural capital, as underlined by the Charter of Rome on Natural and Cultural Capital.

In 2013, the national “La Natura dell’ Italia” conference proposed several Green Infrastructure objectives. One objective is the implementation of the relevant European directives and harmonisation of policies among regions. As a first step, the discussion underlined the importance of including the topic of Green Infrastructure in the National Biodiversity Strategy and of elaborating specific guidelines for regional and local governments to develop and promote Green Infrastructure. Moreover, the discussion highlighted the necessity of laying out Green Infrastructure guidelines for evaluating environmental impact assessments and strategic environmental assessments.



## Good practices in Italy

### “Corona Verde” (Green Crown) of Turin

“Corona Verde” (Green Crown) is a strategic project implemented in the metropolitan and surrounding (hilly) area of Turin, involving 93 municipalities. It was launched by the Piemonte Region and the “Politecnico di Torino” University. The project aimed to set-up a Green Infrastructure that integrates the “Corona di Delitie” (Crown of Delights), a system of royal residences from the sixteenth and seventeenth century spread out across the city of Turin, with the city’s green belt including metropolitan parks, rivers and rural areas. The project covers an area of 164,883 ha and includes 1,865 ha of special protected areas; EUR 13,147,665 was invested by different parties including the EU. The “Corona Verde” has the objective of providing – in a cost-effective manner – the metropolitan area of Turin with many social, environmental and economic benefits for the city and its population such as protection against soil erosion, reduction of adverse impacts of grey infrastructure projects, enhancement of tourism and, in particular, reduction of pollution since Italian cities are among the most polluted in Europe. The latter is achieved by newly planted trees that filter the air.

### “Piano di azione per l’energia sostenibile” (Green Infrastructure for sustainable energy) in Modena

In 2010, the city of Modena put in place a plan of action for sustainable energy (SEAP). It is part of a bigger initiative of local Italian municipalities called “Patto dei Sindaci” that many mayors signed in 2008. The project’s objective is to requalify its territory according to sustainable development criteria and to pursue energy efficiency goals and a CO2 reduction of 20% by 2020. Urban greening is part of the plan. The primary motive for investing in Modena’s Green Infrastructure is to increase the quantity of biomass for sustainable energy purposes. There



are also other benefits of Green Infrastructure. An increase in Green Infrastructure in agricultural areas, ecological zones and public green will improve landscape quality and scenic beauty; it will also improve the micro climate and make the living environment more comfortable by mitigating the heat island effect and filtering the air. An increase in urban forest of 127.5 ha is planned between 2011 and 2020.

### “Progetto di rete ecologica regionale” (ecological network) across the Lombardia region

The “Lombardia region” project to develop an ecological network (RER) acknowledges the isolation and land fragmentation which represent a high risk for biodiversity and natural habitats. The project focuses on the importance of protecting biodiversity by creating an ecological network which safeguards pieces of land that were not included in the regional protected areas. The objective is to maintain and restore a connection between the flora and fauna where fragmentation occurs. The “Rete Ecologica Regionale” (RER) was approved in 2009 and defines primary



elements which are the areas identified as a priority for biodiversity. The ecological network was designed by using the maps of 73 priority areas for biodiversity, complemented with the other elements constituting the networks such as ecological corridors and road networks. This project also promotes low emission zones in urban and metropolitan regions.

## Challenges and opportunities

- Support the planning of Green Infrastructure in agriculture.
- Develop an ecological classification of agricultural areas.
- Elaborate and provide companies with a toolbox for planning Green Infrastructure and for evaluating its benefits.
- Develop and establish a Green Infrastructure Public Procurement (GI PP) to include in public tenders the use of Green Infrastructure as innovative solutions presenting a real alternative to standard grey infrastructure.
- Develop fiscal incentives for implementing Green Infrastructure.
- Support Green Infrastructure pilot programmes.

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