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**COVER NOTE**

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from: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 8 May 2013

to: Mr Uwe CORSEPIUS, Secretary-General of the Council of the European  
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Green Infrastructure (GI) — Enhancing Europe's Natural Capital

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Delegations will find attached Commission document COM(2013) 249 final.

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**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN  
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL  
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

**Green Infrastructure (GI) — Enhancing Europe's Natural Capital**

{SWD(2013) 155 final}

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN  
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL  
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

**Green Infrastructure (GI) — Enhancing Europe’s Natural Capital**

**1.1. Background**

Human society depends on the benefits provided by nature such as food, materials, clean water, clean air, climate regulation, flood prevention, pollination and recreation<sup>1</sup>. However, many of these benefits, frequently referred to as ecosystem services, are used as if their supply is almost unlimited and treated as free commodities whose true value is not fully appreciated. This can result in public authorities turning to built infrastructure — grey infrastructure — as a substitute for natural solutions to problems such as flood prevention. In Europe we consequently continue to degrade our natural capital, jeopardising our long-term sustainability and undermining our resilience to environmental shocks. As stated in the Resource Efficiency Roadmap<sup>2</sup>, the failure to protect our natural capital and to give a proper value to ecosystem services will need to be addressed as part of the drive towards smart, sustainable and inclusive growth which is the EU’s priority Europe 2020<sup>3</sup>. The roadmap identifies investing in GI as an important step towards protecting natural capital. The EU Biodiversity Strategy to 2020<sup>4</sup> includes a commitment for the Commission to develop a GI strategy<sup>5</sup>. The Resource Efficiency Roadmap states that the Commission will draft a Communication on GI. This document is the Commission’s response to these commitments<sup>6</sup>. It sets out how EU-wide action can add value to the local initiatives currently underway.

**1.2. What is GI?**

GI is a successfully tested tool for providing ecological, economic and social benefits through natural solutions. It helps us to understand the value of the benefits that nature provides to human society and to mobilise investments to sustain and enhance them. It also helps avoid relying on infrastructure that is expensive to build when nature can often provide cheaper, more durable solutions. Many of these create local job opportunities. Green Infrastructure is based on the principle that protecting and enhancing nature and natural processes, and the many benefits human society gets from nature, are consciously integrated into spatial planning and territorial development. Compared to single-purpose, grey infrastructure, GI has many benefits. It is not a constraint on territorial development but promotes natural solutions

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<sup>1</sup> COM(2012) 710 final, Proposal for a Decision of the European Parliament and of the Council on a General Union Environment Action Programme to 2020 ‘Living well, within the limits of our planet’.

<sup>2</sup> COM(2011) 571 final, OJ C 37 of 10.2.2012.

<sup>3</sup> COM(2010) 2020 final, OJ C 88 of 19.3.2011.

<sup>4</sup> COM(2011) 244 final, OJ C 264 of 8.9.2011.

<sup>5</sup> In its conclusions regarding the EU Biodiversity Strategy, the Environment Council (06/11) ‘underscores the importance of Green Infrastructure also as a contribution to further integrating biodiversity considerations into other EU policies; and welcomes the Commission’s commitment to develop a Green Infrastructure Strategy by 2012’. The European Parliament (05/12) ‘urges the Commission to adopt a specific Green Infrastructure Strategy by 2012 at the latest, with biodiversity protection as a primary objective’.

<sup>6</sup> More detailed technical information about Green Infrastructure can be found in a Commission Services Working Document adopted at the same time as this communication SWD(2013) 155 final.

if they are the best option. It can sometimes offer an alternative, or be complementary, to standard grey solutions.

Many definitions of GI have been developed<sup>7</sup>. It is therefore difficult to cover all aspects in one short paragraph. The following working definition will however be used for the purposes of this Communication.

**GI:** 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.

## 2. 2. THE CONTRIBUTION OF GI TO EU POLICIES

### 2.1. Introduction

GI can make a significant contribution to the effective implementation of all policies where some or all of the desired objectives can be achieved in whole or in part through nature-based solutions. There is usually a high return on GI investments and overall reviews of restoration projects typically show cost-benefit ratios in the range of 3 to 75<sup>8</sup>.

### 2.2. Regional Policy

In the Commission's proposals for the Cohesion Fund<sup>9</sup> and the European Regional Development Fund (ERDF)<sup>10</sup>, Green Infrastructure is specifically identified as one of the investment priorities. Green Infrastructure is recognised as contributing to regional policy and sustainable growth in Europe<sup>11</sup> and facilitating smart and sustainable growth through smart specialisation<sup>12</sup>.

**Box 1: Natural and cultural heritage are parts of the EU's territorial capital and identity.** Ecological values, environmental quality and cultural assets are crucial to well-being and economic prospects. Over-exploitation of these natural resources is recognised as a threat to territorial development. Working with nature and in harmony with the local landscape to deliver essential goods and services through GI projects, using a 'place-based' approach, is cost-effective and preserves the physical features and identity of the locality<sup>13</sup>.

GI solutions are particularly important in urban environments in which more than 60% of the EU population lives<sup>14</sup>. GI features in cities deliver health-related benefits such as clean air and

<sup>7</sup> Green Infrastructure and territorial cohesion. European Environment Agency (2011). Technical Report No 18/2011. See also [http://ec.europa.eu/environment/nature/ecosystems/docs/Green\\_Infrastructure.pdf](http://ec.europa.eu/environment/nature/ecosystems/docs/Green_Infrastructure.pdf)

<sup>8</sup> Nellemann, C., Corcoran, E. (eds) 2010. Dead Planet, Living Planet — Biodiversity and ecosystem restoration for sustainable development. A rapid response Assessment. UNEP, GRID-Arendal.

<sup>9</sup> COM(2011) 612 final/2.

<sup>10</sup> COM(2011) 614 final.

<sup>11</sup> COM(2011) 17 final, Regional Policy contributing to sustainable growth in Europe 2020. Commission Staff Working Document, SEC(2011) 92 final.

<sup>12</sup> Connecting smart and sustainable growth through smart specialisation. European Commission, 2012.

<sup>13</sup> Territorial Agenda of the European Union 2020. Towards an inclusive, smart and sustainable Europe of diverse Regions. Informal ministerial meeting of ministers responsible for spatial planning and territorial development. 19 May 2011, Hungary.

<sup>14</sup> Communication from the Commission to the Council and the European Parliament on a Thematic Strategy for the urban environment. COM(2005) 718 final.

better water quality. Healthy ecosystems also reduce the spread of vector-borne diseases. Implementing Green Infrastructure features in urban areas creates a greater sense of community, strengthens the link with voluntary actions undertaken by civil society, and helps combat social exclusion and isolation. They benefit the individual and the community physically, psychologically, emotionally and socio-economically. GI creates opportunities to connect urban and rural areas and provides appealing places to live and work in<sup>15</sup>. Through urban food production and community gardens, which are efficient tools to educate school children and engage the interest of young people in particular, it addresses the disconnect between the production and consumption of food and helps increase its perceived value. Investments in GI have significant potential to strengthen regional and urban development, including by maintaining or creating jobs<sup>16</sup>.

**Box 2: Using land instead of air conditioning — and saving money.** Lower humidity in urban areas due to the absence of vegetation and the increased absorption of energy from the sun caused by dark asphalted or concrete surfaces are the main reasons inner city areas are often many degrees warmer than their surroundings. This phenomenon, known as the urban heat island effect, can have serious consequences, particularly during heat waves, for the health of vulnerable groups of people, such as those who are chronically ill or the elderly. The moist air nature provides for free could be artificially recreated using electricity to evaporate water, but it is estimated that this would cost around EUR 500 000 per hectare. Working with nature and using GI in an urban environment, for example by incorporating biodiversity-rich parks, green spaces and fresh air corridors, can help mitigate the urban heat island effect<sup>17</sup>.

### 2.3. Climate Change and Disaster Risk Management

Ecosystem-based approaches are strategies and measures that harness the adaptive forces of nature. They are among the most widely applicable, economically viable and effective tools to combat the impacts of climate change. When appropriate, such approaches use GI solutions, because they use biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to or mitigate the adverse effects of climate change. The recent EU Strategy on Adaptation to Climate Change<sup>18</sup> therefore aims to explore the need for additional guidance for authorities and decision-makers, civil society, private business and conservation practitioners on ensuring the full mobilisation of ecosystem-based approaches to adaptation. GI initiatives in agriculture and forestry sectors that have a positive effect on carbon stocks and the greenhouse gas balances in the Member States will be taken into account in the framework of LULUCF<sup>19</sup>, thus helping to put EU and UNFCCC climate policies into practice.

**Box 3: GI in relation to climate change mitigation and adaptation.** An example of the many benefits of restoring natural capital is the ecological restoration of floodplain forests. Properly functioning floodplain forests can deliver many benefits, such as filtering water, maintaining the water table and preventing erosion. The forest also mitigates climate change effects by storing CO<sub>2</sub> and providing bio-materials that can act as temporary carbon stores (harvested wood products) or as carbon substitutes, replacing carbon-intensive materials and fuels, as well as acting as a ‘safety valve’ to store water and reduce the risk of flooding in human settlements. Restoring floodplain forests is often cheaper in terms of one-off and maintenance costs than purely technical solutions such as building dams and floodplain reservoirs. Since restoration measures for the floodplain forest also re-connect the river with the adjoining floodplain, they ensure connectivity for species of European importance such as the otter and rare fish and bird species.

<sup>15</sup> Reports, studies and review documents supported by the European Commission — <http://ec.europa.eu/environment/nature/ecosystems/studies.htm>.

<sup>16</sup> See case examples of GI creating jobs in Table 2 of Commission Services Working Document (SWD(2013) 155 final).

<sup>17</sup> SWD(2012) 101 final/2, p. 13.

<sup>18</sup> COM(2013) 216 final, EU Strategy on Adaptation to Climate Change.

<sup>19</sup> Land Use, Land Use Change and Forestry.

GI will also be a necessary adjunct to reducing the carbon footprint of transport and energy provision, mitigating the negative effects of land uptake and fragmentation and boosting opportunities to better integrate land use, ecosystem and biodiversity concerns into policy and planning. GI solutions can contribute significantly to the development of Green Transport Corridors, using the potential of healthy ecosystems e.g. to sustainably mitigate carbon emissions.

The Directive on the energy performance of buildings<sup>20</sup> will promote the development and use of new materials and new design features in building construction as part of the drive to reduce the significant level of GHG emissions from this sector. GI solutions such as green roofs and walls can help reduce GHG emissions. This is because they require less energy for heating and cooling and deliver many other benefits, such as water retention, air purification and biodiversity enrichment.

GI solutions that boost disaster resilience are also an integral part of EU policy on disaster risk management. Climate change and infrastructure development make disaster-prone areas more vulnerable extreme weather events and natural disasters, such as floods, landslides, avalanches, forest fires, storms and wave surges that cost lives and are the cause of billions of euros of damage and insurance costs each year in the EU. The impacts of such events on human society and the environment can often be reduced using GI solutions such as functional flood plains, riparian woodland, protection forests in mountainous areas, barrier beaches and coastal wetlands that can be made in combination with infrastructure for disaster reduction, such as river protection works. GI can also help reduce vulnerability to risks by supporting local livelihoods and economies. Investments in ecosystem-based disaster risk reduction and GI can thus provide many benefits for innovative risk management approaches, adapting to climate change-related risks, maintaining sustainable livelihoods and fostering green growth<sup>21</sup>. Cities and local authorities are the first to deal with the immediate consequences of such disasters. They therefore play a critical role in implementing prevention measures such as GI.

**Box 4: Building resilience and improving our defences.** With regard to coastal flood defence, the Alkborough Flats managed realignment scheme on the Humber Estuary in England has delivered benefits for coastal flood protection and reduced and deferred expenditure on man-made coastal defences. The scheme is estimated to deliver an annual flood protection benefit of £400 667 (EUR 465 000), delivering total benefits with a present value of £12.2 million (EUR 14 million), as well as other benefits for wildlife and ecosystem services. The scheme cost £10.2 million (EUR 11.8 million) and involved the restoration of tidal habitats on 440 hectares of agricultural land.

## 2.4. Natural Capital

Green Infrastructure can play an important role in protecting, conserving and enhancing the EU's natural capital, as stated in the Commission's recent proposal for an Environmental Action Programme to 2020<sup>22</sup>.

### Land and Soil

<sup>20</sup> OJ L 1, 4.1.2003, p. 65.

<sup>21</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A Community approach to the prevention of natural and man-made disasters, COM(2009) 82 final.

<sup>22</sup> COM(2012) 710 final.

Land and soil are key components of the EU's natural resources and yet each year, more than 1 000 km<sup>2</sup> of territory are subject to land-take for housing, industry, roads or recreation<sup>23</sup>. In many regions soil is irreversibly eroded, or has low organic matter content. Soil contamination is also a serious problem<sup>24</sup>. Systematically including GI considerations in the planning and decision-making process will help reduce the loss of ecosystem services associated with future land take and help improve and restore soil functions.

The management of land devoted to agriculture and forestry has a major impact on the condition of the EU's natural capital. In recognition of this link, the Common Agricultural Policy (CAP) and rural development provide instruments and measures to encourage GI and to enhance areas with a high nature value in the countryside. This applies to large-scale direct support for farmers in the CAP's first pillar, preventing land abandonment and fragmentation, and to smaller-scale measures supported through rural development programmes in the second pillar, including non-productive investments, agro-environmental measures (e.g. farmed landscape conservation measures, maintaining and enhancing hedgerows, buffer strips, terraces, dry walls, sylvo-pastoral measures etc.), payments fostering the coherence of Natura 2000, cooperation on maintaining valuable field boundaries, and conserving and restoring rural heritage features.

The Commission included additional greening aspects in its proposals for reforming the Common Agricultural Policy. They include the requirement that farmers who receive first-pillar payments maintain existing permanent grassland on their holding and that 7% of the arable and permanent crop land be ecological focus areas<sup>25</sup>. If properly implemented, these measures can contribute to GI. Because implementing GI approaches requires an integrated view of ecosystem services, it encourages a balanced approach that emphasises the multifunctional nature of rural areas, including access to sustainable, safe and nutritional food through short food supply chains. Green Infrastructure will therefore foster a more coherent approach to decision-making in relation to integrating ecological and sustainability concerns into spatial planning in the rural and urban landscape.

**Box 5: Action in agricultural areas.** The young farmers association of Seville, Spain managed a pioneering LIFE project to develop a model for more sustainable soil management. The project focused on areas where greater arboreal crop coverage and more intensive production had led to an increase in sedimentation, fertiliser run-off and pesticide pollution. It identified what types of vegetation cover provided the best protection against erosion. The soil's better retention capacity was an additional benefit to the associated improvements in water quality from diminished agrichemical run-off. This also had a positive effect on local landscape quality and biodiversity. On a broader scale, the change in land cover made the agrarian landscape more coherent and resilient, notably to climate change.

The forthcoming new Forestry Strategy will integrate other environmental concerns and address the achievement of the forest sub-target under the Biodiversity Strategy. Measures to significantly reduce forest fragmentation and degradation and restore degraded forests can also help improve the conservation status of species and habitats that depend on or are affected by forestry, and help improve the provision of related ecosystem services. GI can make a constructive contribution in this regard by providing a coherent framework within which natural features and functions are conserved and enhanced in forest areas.

<sup>23</sup> European Environment Agency, State of the Environment Report 2010. <http://www.eea.europa.eu/soer>.

<sup>24</sup> The implementation of the soil thematic strategy and ongoing activities. Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2012) 46 final.

<sup>25</sup> COM(2011) 625 final/2.

## Water

Integrating GI considerations into river basin management can contribute significantly to delivering good water quality, mitigating the effects of hydro-morphological pressures and reducing the impacts of floods and droughts<sup>26</sup>. Green Infrastructure also offers cost-effective options<sup>27</sup> for better implementing the Drinking Water Directive<sup>28</sup> and the Groundwater Directive<sup>29</sup>. Innovative multi-benefit, highly efficient and cost-effective green solutions are also being developed for treating waste water<sup>30</sup>.

**Box 6: Action on water-related agro-environmental measures.** In Sint-Truiden in Belgium, measures were taken to protect the village from soil erosion and mud floods. They included grassed waterways, grassed buffer strips and retention ponds in the catchment area. The total cost of these measures was low (EUR 126/ha/20 years) compared to damage remediation and clean-up costs caused by muddy floods in the study area (EUR 54/ha/year) and all secondary benefits, including better downstream water quality; lower downstream dredging costs; less psychological stress for inhabitants and greater biodiversity. Greater biodiversity and better landscape quality created new agro- and eco-tourism opportunities.

With regard to the marine environment, GI can help put the current strategies on marine spatial planning and integrated coastal zone management<sup>31</sup> into practice, in particular the strategies for sustainably managing coastal zones and making coastal defences more efficient. Further developing blue carbon<sup>32</sup> approaches, beneficial for fish stocks, can also profit from the application of GI principles to promote multiple ecosystem services in the marine environment.

## Nature Conservation

Natura 2000 is an ecological network established under the Habitats<sup>33</sup> and Birds Directives<sup>34</sup>. It comprises more than 26 000 sites spread across all the Member States and occupies 18% of the EU's land territory and around 4% of marine waters within Member States' jurisdiction. It was established mainly to conserve and protect key species and habitats across the EU, but it also delivers many ecosystem services to human society. The value of these services has been estimated at EUR 200-300 billion per annum<sup>35</sup>. The work done over the last 25 years to establish and consolidate the network means that the backbone of the EU's GI is already in place. It is a reservoir of biodiversity that can be drawn upon to repopulate and revitalise degraded environments and catalyse the development of GI. This will also help reduce the fragmentation of the ecosystem, improving the connectivity between sites in the Natura 2000 network and thus achieving the objectives of Article 10 of the Habitats Directive<sup>36</sup>.

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<sup>26</sup> A blueprint to safeguard Europe's water resources. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2012) 673 final.

<sup>27</sup> The Economics of Ecosystems and Biodiversity (TEEB). Examples of Vienna, New York, Philadelphia, Vittel, <http://www.teebweb.org/>.

<sup>28</sup> OJ L 330, 5.12.98, p. 32.

<sup>29</sup> OJ L 372, 27.12.2006, p. 19.

<sup>30</sup> Integrated Constructed Wetlands (ICW), an example of GI, can help achieve EU policy objectives for treating waste water and protecting bathing water.

<sup>31</sup> COM(2013) 133 final.

<sup>32</sup> <http://www.thebluecarbonproject.com/the-problem-2/>.

<sup>33</sup> OJ L 206, 22.7.92, p. 7.

<sup>34</sup> OJ L 103, 25.4.79, p. 1.

<sup>35</sup> [http://ec.europa.eu/environment/nature/natura2000/financing/index\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/financing/index_en.htm).

<sup>36</sup> [http://ec.europa.eu/environment/nature/ecosystems/docs/adaptation\\_fragmentation\\_guidelines.pdf](http://ec.europa.eu/environment/nature/ecosystems/docs/adaptation_fragmentation_guidelines.pdf).



### 3. DEVELOPING AN EU STRATEGY FOR GREEN INFRASTRUCTURE

As shown in the previous sections, GI can make a significant contribution to achieving a number of key EU policy objectives. This section looks at what needs to be done to encourage the development of GI and what should be done at EU level.

#### The EU dimension — issues of scale and policies

The development of GI in the EU is at a crossroads. Over the last 20 years, more and more GI projects have been carried out and there is a wealth of experience demonstrating that the approach is flexible, sound and cost-effective. GI projects are carried out on a local, regional, national or trans-boundary scale. However, to optimise the functioning of GI and maximise its benefits, work on the different scales of GI should be interconnected and interdependent. This means that the benefits are significantly enhanced when a minimum degree of consistency and coherence is achieved across the different scales. If no action is taken at EU level, there will be only a few independent initiatives that do not deliver their full potential to restore natural capital and cut the costs of heavy infrastructure<sup>37</sup>. This is why stakeholders are looking for a clear, long-term commitment from the EU to developing and deploying GI.

#### Integrating GI into the key policy areas

As set out in section 2, GI can make a significant contribution in the areas of regional development, climate change, disaster risk management, agriculture/forestry and the environment. In most cases, the contribution GI can make is already recognised. What is needed now is to ensure that it becomes a standard part of spatial planning and territorial development that is fully integrated into the implementation of these policies. For the full potential of Green Infrastructure to be realised within the timeframe of the next budgetary envelope (2014 to 2020), the modalities for using it must be established as soon as possible to facilitate its integration into projects funded through the appropriate funding mechanisms such as the Common Agricultural Policy, the Cohesion Fund, the European Regional Development Fund, Horizon 2020, the Connecting Europe Facility, the European Maritime and Fisheries Fund and the Financial Instrument for the Environment (LIFE).

#### The need for consistent, reliable data

Consistent, reliable data are essential for effectively deploying GI. Information is needed about the extent and condition of ecosystems, the services they provide and the value of these services<sup>38</sup> so that ecosystem services are correctly valued and then priced if appropriate, to promote GI solutions in spatial planning and decision-making processes in relation to infrastructure. While it is clear that most decisions regarding GI projects will be taken at local,

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<sup>37</sup> <http://ec.europa.eu/environment/nature/ecosystems/studies.htm#design>.

<sup>38</sup> Methodological work on mapping and assessing ecosystems and their services is done through action 5 of the Biodiversity Strategy. Such information must however be adapted to GI considerations (see examples on [http://ec.europa.eu/environment/nature/ecosystems/index\\_en.htm](http://ec.europa.eu/environment/nature/ecosystems/index_en.htm)). In the context of climate change policy, the EU recently passed legislation harmonising greenhouse gas accounting in the LULUCF sector and setting out a roadmap for improving and extending Member States' accounting systems. This will ensure that consistent, EU-wide data on the greenhouse gas performance of (managed) ecosystems is available: Decision of the European Parliament and of the Council on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities.

national and regional levels, a minimum level of consistency should be encouraged in relation to the data used to inform these decisions, particularly for projects supported by EU funds.

Although there is currently a lot of data, in most cases they have not been generated or assessed in a consistent or coordinated way. Within the context of the EU Biodiversity Strategy, together with the European Environment Agency, other research bodies and agencies, the Member States and stakeholders, the Commission is working to ensure the most effective use of data from current and planned actions. This work will continue in the future but it should ideally be reinforced and the scientific community's input should be strengthened. The EU has a significant role to play in this process, in particular by providing financial support for programmes that tackle this knowledge gap, such as Horizon 2020 and the European Structural and Investment Funds.

### Improving the knowledge base and encouraging innovation

Our understanding of the technical issues associated with deploying Green Infrastructure has developed considerably in recent years. Nevertheless, more research is needed to improve our understanding of the links between biodiversity (species/habitats) and the condition of the ecosystem (vitality, resilience and productivity) and between the condition of the ecosystem and its capacity to deliver ecosystem services. Further insights into the valuation of ecosystem services, in particular the social, health and security/resilience benefits of GI solutions, would also be extremely useful for underpinning the future development of GI. Investments in applied research to test and apply innovative GI solutions should also be encouraged.

The potential of GI to deliver cost-effective solutions will be further increased by developing appropriate technology and processes, particularly in relation to transport, energy, agriculture, the design and functioning of our cities and boosting the bio-economy<sup>39</sup>. In cities 'intelligent', resource-efficient buildings, incorporating green features such as green roofs and walls and made with new materials, can deliver environmental, social and health benefits<sup>40</sup>. Alongside technology, people working with GI need to acquire adequate skills and competences enabling them to move to an innovative approach. Addressing skills shortages through retraining and further educating skilled personnel is essential for ensuring that there is an adequately trained workforce in the medium term.

At EU level, Horizon 2020 and the European Regional Development Fund are potential sources of support for research on and innovation in GI.

### Providing financial support for GI projects

Integrating GI into policy implementation in key sectors would ensure the support of the associated funding mechanisms for encouraging GI deployment across the EU. The private sector also has a role to play in investing in GI. However, GI projects are complex and inevitably risky, in particular in the early stages of development. The EU must reduce risk through financial instruments (such as risk-sharing practices) and multi-partner deals involving public and private funds. Potential investors (municipality, region, private developers) also need technical assistance to develop GI projects<sup>41</sup>. The Commission and the

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<sup>39</sup> COM(2012) 60 final.

<sup>40</sup> Connecting smart and sustainable growth through smart specialisation. European Commission, 2012.

<sup>41</sup> [http://ec.europa.eu/environment/enveco/biodiversity/pdf/BD\\_Finance\\_summary-300312.pdf](http://ec.europa.eu/environment/enveco/biodiversity/pdf/BD_Finance_summary-300312.pdf).

EIB are looking at a number of options to establish a financing facility to support biodiversity-related investments, including GI projects.

#### EU-level GI projects

Many geographical features such as mountain ranges (the Alps, the Pyrenees, the Carpathians), river basins (the Rhine, the Danube) and forests (the Fennoscandinavian Forests) go beyond national boundaries and are part of the EU's shared natural and cultural heritage and identity. They require coordinated, joined-up actions and a pan-European vision. To date, large-scale infrastructure initiatives have been devoted to transport, energy and ICT<sup>42</sup>. Developing an equivalent instrument, the trans-European priority axes for GI in Europe, TEN-G (based on trans-European networks in grey infrastructure sectors), would have significant benefits for securing the resilience and vitality of some of Europe's most iconic ecosystems, with consequential social and economic benefits. Such initiatives would also act as flagship initiatives that could serve as examples at national, regional and local levels and boost the importance of the development of trans-European GI in policy, planning and financing decisions. Member States and regions are encouraged to seize the opportunities for developing GI in a cross-border/transnational context through the macro-regional strategies supported by the ERDF<sup>43</sup> and through European territorial cooperation programs<sup>44</sup>.

**Box 7: EU-level GI projects.** The European Green Belt initiative is an ecological network running from the Barents Sea to the Black Sea. Its aim is to better harmonise human activities with the natural environment and increase opportunities for the socio-economic development of local communities. It connects national parks, nature parks, biosphere reserves, trans-boundary protected areas and non-protected areas along or across borders. It supports regional development initiatives based on nature conservation. It takes one of the most divisive barriers in human history (the iron curtain) and transforms it into a symbol for reconciliation and cross-border cooperation by conserving and protecting some of Europe's most impressive and fragile landscapes.

#### **4. THE EU STRATEGY FOR PROMOTING GREEN INFRASTRUCTURE**

The Commission is committed to developing an EU GI Strategy that helps to conserve and enhance our natural capital and to achieve the Europe 2020 objectives. Based on the considerations set out above about the potential benefits of GI and the role the EU can play in its development, it thinks that the strategy should take the form of an enabling framework providing a combination of policy signals and technical or scientific actions. At this stage, it thinks that the strategy can be implemented within the context of existing legislation, policy instruments and funding mechanisms. It would contain the elements set out below.

#### Promoting GI in the main policy areas

Regional or cohesion, climate change and environmental policies, disaster risk management, health and consumer policies and the Common Agricultural Policy, including their associated funding mechanisms, will be the main policy areas through which Green Infrastructure will be promoted. By the end of 2013, the Commission will develop technical guidance setting out how Green Infrastructure will be integrated into the implementation of these policies from 2014 to 2020. Within the context of these main policy areas, it will take steps to increase

<sup>42</sup> COM(2011) 676 final, COM(2011) 665 final.

<sup>43</sup> Baltic Sea Strategy and Danube Strategy.

<sup>44</sup> [http://ec.europa.eu/regional\\_policy/cooperate/cooperation/index\\_en.cfm](http://ec.europa.eu/regional_policy/cooperate/cooperation/index_en.cfm).

awareness of GI among key stakeholder groups and to promote best practice, including developing a dedicated IT platform for exchanging information.

It will also consider how GI-related innovation can be financed through a number of other EU instruments such as the Connecting Europe Facility. In the TEN-T policy, for example, Green Infrastructure as an integral part of projects may be promoted within the framework of the proposed corridor approach.

#### Improving information, strengthening the knowledge base and promoting innovation

In addition to continuing the mapping and assessment work in the context of the EU Biodiversity Strategy, by 2015 the Commission will review the extent and quality of the technical and spatial data available for decision-makers in relation to GI deployment. The review will also look at how the current arrangements governing the generation, analysis and dissemination of this information could be improved, in particular through better use of information-sharing facilities.

By 2013, the Commission will assess the need and the opportunities in the context of Horizon 2020 to methodologically support the ongoing mapping and assessment work, improve the knowledge base and develop and encourage innovative technologies and approaches to facilitating the development of GI. It will also assess the contribution technical standards, particularly in relation to physical building blocks and procedures, could make to ‘growing the market’ for GI-friendly products.

### Improving access to finance

The Commission will continue to explore the opportunities for setting up innovative financing mechanisms to support GI. Together with the EIB, it undertakes to set up an EU financing facility by 2014 to support people seeking to develop GI projects.

### EU-level GI projects

By the end of 2015, the Commission will carry out a study to assess the opportunities for developing an EU TEN-G initiative. It will include an assessment of the costs and the economic, social and environmental benefits of such an initiative.

## **5. CONCLUSIONS**

Green Infrastructure can contribute significantly to achieving many of the EU's key policy objectives. The best way for the EU to promote the development of GI is to create an enabling framework to encourage and facilitate GI projects within existing legal, policy and financial instruments. Member States are encouraged to build on these opportunities in order to boost the implementation of GI and exploit its benefits for sustainable development. This document explains the rationale for promoting GI and describes the features of the future EU strategy. By the end of 2017, the Commission will review progress on developing GI and publish a report on the lessons learnt together with recommendations for future action.