SCALES briefs 8
Green Infrastructure(GI) governance: issues to be addressed

2. Summary

Ecosystems are under a great pressure from the intensive human use, habitat fragmentation and climate change. As a result biodiversity is on a decline, and many of the ecosystem services that human society depends on are degraded. Green infrastructure (GI) is a new policy response to these challenges. Systematic GI policies are only emerging, and further research is needed to address the numerous governance challenges.

3. Key words

Green infrastructure, ecosystem services, biodiversity, governance, policy instruments

4. Relevance to legislation

- Birds Directive 79/409/EEC
- Habitats Directive 92/43/EEC
- Water Framework Directive 2000/60/EC
- Marine Strategy Framework Directive 2008/56/EC
- Environmental Impact Assessment Directive 2011/92/EU
- Strategic Environmental Assessment Directive 2001/42/EC
- Common Agricultural Policy (CAP)
- Common Fisheries Policy

5. Relevance to actual environmental problems

Ecosystem degradation, habitat fragmentation, loss of biodiversity and ecosystem services, climate change

6. Description of the problem

**Green Infrastructure:
A new response to old problems**

Figure 1. Green bridge crossing a highway and connecting forests and grassland habitats in Northern Germany. Photo: Björn Schulz

Figure 2. Rivers and forests are important elements of Blue and Green Infrastructure concepts. Photo: André Künzelmann/UFZ

Ecosystems are under a constant stress from development, intensive farming practices, pollution and the like. As a result, biodiversity and associated ecosystem services are declining, with negative impacts on human well-being as well. The failure of existing regulatory frameworks to effectively address the scale-related challenges of biodiversity conservation has been identified as a key policy shortcoming in this regard. (Kettunen et al. 2014) GI is an emerging policy response to address these failures.

The central idea behind the concept is the understanding of natural environment as infrastructure capable of delivering a wide variety of ecological, social and economic benefits (Frischmann 2012). Sometimes GI can be used as a substitute for often expensive gray infrastructure solutions COM (2013) 249. Investing in GI can thus make significant contribution towards number of EU's policy objectives including protecting natural capital, helping species and people adapt to and mitigate climate change, increasing human health and well-being as well as facilitating sustainable growth COM (2013) 249. In order to achieve and maximize these benefits effective tools for the implementation are needed.

Green infrastructure policies at different scales

Only a few systematic frameworks for GI have emerged so far, but a wide range of existing policies and legal instruments already have the potential to support the maintenance and creation of GI at international, trans-boundary, regional, national, and local levels. At international level the Convention on Biological Diversity (CBD), Convention on Migratory Species (CMS), and Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) are amongst the relevant treaties valuable in endorsing the maintenance and creation of GI.

At the EU level GI is an integral part of the biodiversity policy. Target two of the EU Biodiversity Strategy 2020 explicitly mentions the concept of GI and states that "by 2020, ecosystems and their services are maintained and enhanced by establishing GI and restoring at least 15 % of degraded ecosystems" COM (2011) 244. Furthermore, EU GI strategy provides an enabling framework for promoting GI initiatives and policies within the context of existing legislation, policy instruments and funding mechanisms COM (2013) 249. A legal basis for the implementation of GI within EU can be founded in particular in the Birds (79/409/EEC) and Habitats (92/43/EC) Directives. In addition to these nature conservation "backbone" directives, the Water Framework Directive (2000/60/EC) and the Marine Strategy Framework Directive (2008/56/EC) provide a framework for sustaining and enhancing the quality of Europe's "blue infrastructure". At the procedural level the Environmental Impact Assessment Directive (85/337/EEC) and the (Strategic Environmental Assessment Directive 2001/42/EC) provide basis for the integration of GI into sectoral policies. At the member state level, commission promotes the shift towards policy integration to support GI COM (2012) 673. There are already few examples on systematic, integrative GI policies at the member state level. One of the initiatives includes the green and blue infrastructure called Trame verte et bleue (TVB) in France (Barthod & Deshayes 2009). Also, the UK and Sweden, amongst others, have started preparations for systematic GI policy. (see more in Mazza et al. 2011).

Assessing and developing policy instruments for green infrastructure

Green infrastructure is rather a policy regime than a single policy instrument. Natural elements and land-use pressures shaping these elements, which should be addressed by green infrastructure policy, vary greatly in any given area. Hence, only a mix of instruments could adequately serve the goals of green infrastructure policy.

In order to assess and develop suitable mix of policy instruments criteria for the assessment are needed (Borgström and Similä Forthcoming).

We propose that the following criteria can be used to assess the feasibility of existing governance system to support green infrastructure:

- Coverage: Does the current governance system include mechanisms which aim to serve the four functions (1) placement of activities to avoid and mitigate harmful effects on the environment; (2) regulation of activities and projects to avoid and mitigate the harmful effects on ecosystems; (3) protection of places of special importance and (4) restoration of habitats. Do these mechanisms cover all sectors and activities relevant for green infrastructure?
- Capacity to enhance landscape level management and coordination of decision-making: Does the governance system provide strategic planning framework to support individual decision-making processes?
- Flexibility in local decision making and capacity to enhance multiple ecosystem uses: Do the regulation allow taking into account local conditions in a relevant way? Do the laws include adequate mechanisms for accommodating diverging interest?

Figure 3. Illustration of the diversity of green infrastructure elements.

● Robust monitoring and adaptation of decision making: Does the governance system include adequate monitoring system and mechanisms to accommodate decision-making according the monitoring results and new information?

Developing knowledge systems to support decision making

In addition to developing regulatory systems also knowledge systems that provide content for decision-making needs to be revised to make sure that green infrastructure is taken into account in decision-making processes. To support decision making

7. Recommendations

Green infrastructure policy is needed as a response to the continuous loss of biodiversity and degradation of ecosystems and ecosystem services. The current environmental and other sectoral policies and legislation are inadequate, as they fail to integrate the consideration of services that nature provides us for free into all decision-making that affects the use of land and water resources.

There are several options to find ways forward towards more integrative, coordinated governance system for green infrastructure. The situation could be improved through educating planners and making use of new methods developed to provide spatial information on ecosystem services. In addition, strengthening the cooperation and information sharing between authorities would be beneficial. However without changes in legislation, effectiveness of GI policy based on land use planning would remain uncertain as land use planning leaves a lot of discretion to authorities and the link between plans and other instruments such as area conservation mechanisms or permit processes may remain weak. In addition, spatial planning cannot be used to obligate or incentives active management measures, such as restoration, which is one of the core objectives of EU's green infrastructure policy.

affecting green infrastructure planning and measuring tools that cross ecosystem and sectoral boundaries should be developed. The new tools could function as a bridge that combines information from existing (and new) knowledge systems and feeds it to existing decision making system.

Figure 4 indicates the current situation, where decisions are made based on knowledge systems that are segregated to specific habits, ecosystems, geographical areas, and sectors. Figure 5 demonstrates how GI approach could potentially reform the situation.
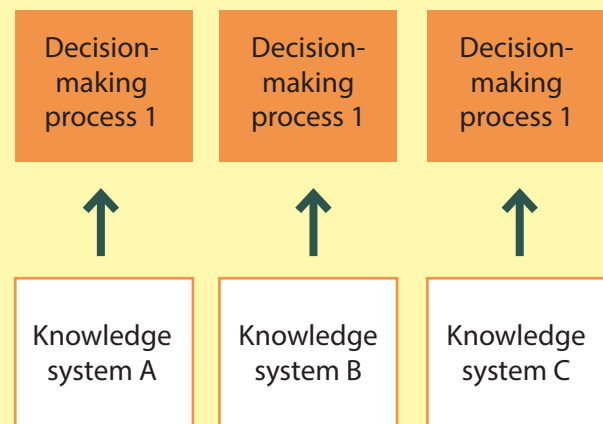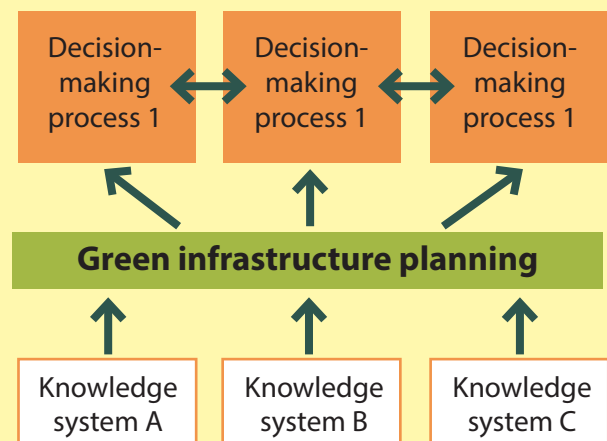

Figure 4. Current governance situation.

Figure 5. Green infrastructure governance.

Thus, we propose, that member states would follow the example of few countries, which have already adopted or plan to adopt a new special planning mechanism for green infrastructure. What is common to those new mechanisms is that they aim to provide means to conceive the big picture spatially, to provide common understanding of the measures needed across-sectors at national and regional level, and to enhance coordination and cooperation between different actors.

8. Authors

Suvi Borgström, Jukka Similä

Contacts: suvi.borgstrom@environment.fi, jukka.simila@environment.fi

9. Publication date

04. 07. 2014

10. Sources

Barthod & Deshayes (2009) Trame verte et bleue, the French green and blue infrastructure, European Commission workshop of Europe 25 – 6 March 2009 Bryssel. Available in http://greeninfrastructureeurope.org/download/8%209%20C%20Barthold%20M%20Deshayes%20The%20French%20Ecological%20Network.pdf

Borgström, Suvi – Similä, Jukka: Assessing Governance Structures for Green Infrastructure (Fortcoming)

Born, C.H. (2012) Green infrastructure and integrated planning: towards broader and integrated conservation strategy? Conference Paper presented in Conference on 20 years of Habitat's directive: European Wildlife's Best hope. Antwerpen 12-13.12.2012.

Camacho, Alejandro E. (2009) Adapting governance to climate change: managing uncertainty through a learning infrastructure. Emory Law Journal vol 59/2009, 4–76.

COM (2013) 249 Communication from the Commission to the European Parliament, Council, the European Economic and Social Committee and the Committee of the Regions. Green Infratsructure (GI) - Enhancing Europe´s Natural Capital.

COM (2012) 673 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A blueprint to safeguard Europe's water Resources.

COM (2011) 612 Proposal for a Regulation of the European Parliament and of the Council on the Cohesion Fund and Repealing Council Regulation (EC) No 1084/2006

COM (2011) 614 Proposal for a Regulation of the European Parliament and of the Council on specific provisions concerning the European Regional Development Fund and the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006

Frischmann, B. (2012) Infrastructure. The Social Value of Shared Recourses. Oxford University Press.

Kettunen M, Apostolopoulou E, Bormpoudakis D, Cent J, Letourneau A, Koivulehto M, Paloniemi R, Grodzińska-Jurczak M, Mathevet R, Scott AV, Borgström S (2014): EU Green Infrastructure: Opportunities & the Need for Addressing Scales. In: Henle K, Settele J, Potts S, Kunin W, Matsinos Y, Similä J, Pantis JD, Grobelnik V, Penev L (Eds) Scaling in ecology and conservation,128-132 pp.

Mazza L. et al. (2011) Green infrastructure implementation and efficiency. Final report for the European Commission, DG Environment on Contract ENV.B.2/SER/2010/0059. Institute for European Environmental Policy, Brussels and London.