





Green4Grey stands for 'green and blue infrastructure for grey periurban landscapes'.

With the Green4Grey LIFE project, we gave a new multifunctional and natural character to the scarce and fragmented undeveloped spaces in an urbanised environment: the so-called "green and blue infrastructure". We transformed the remaining open spaces into natural stepping stones, so that they become the driving force behind the development of an urban natural network. We created a high added value for society by giving the stepping stones various functions, such as water retention, recreation, food production, and green lungs.

The Flemish Land Agency invested together with partners in the design and development of green and blue landscape elements in the Flemish Belt around Brussels and in 'De Wijers', a pond and valley system in the peri-urban area Hasselt-Genk. In six project areas, open space fragments in a greying peri-urban context are transformed into attractive ecological stepping stones with a multifunctional character.

4,4 million euros are invested during the project (2014 - 2019), with a European cofinancing of 1,7 million euro.

More digital info can be found on:

www.green4grey.be/ www.facebook.com/green4grey/

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INTRODUCTION

Why this inspiration guide?

In Flanders we lose every day around 7 hectares of open space to new hard developments, such as housing projects, business parks and infrastructure. With this figure, we are top of the league in the EU. It is expected that the population will increase by one million by 2050. With this there will be no reduction in the pressure on peri-urban open spaces.

Furthermore, Flanders is very fragmented. The 'landscape' is divided into ever smaller fragments of open space, surrounded by other functions. The pressure of grey infrastructure on the remaining open space is very strong in peri-urban areas.

Therefore Flanders can be seen as a perfect laboratory for the development of an innovative approach to implementing the EU 'Green Infrastructure Strategy' in peri-urban regions. Within the Green4Grey LIFE project we developed and showcased the Flemish approach to im-

prove and develop green and blue infrastructure in peri-urban areas. But certainly there are other European peri-urban regions with their own policy instruments and practical experience to promote and deve-

lop peri-urban open spaces.

In this guide we present experiences and approaches from 8 different EU peri-urban regions regarding peri-urban green and blue infrastructure.





Before going into the topic of periurban green and blue infrastructure it is important that the reader understands the peri-urban setting of the Green4Grey project, and of this publication. Therefore we will give a short explanation of peri-urban, a concept that has proved extremely difficult to define but relatively straightforward to characterise.



For <u>more info</u> we refer to the topic papers of the **P**eri-**u**rban **R**egions **Pl**atform **E**urope.

Most prominent characteristics of peri-urban areas with reference to landscape are:

- A high degree of land fragmentation
- Large extent of multi-functional land use
- High rate of changes in land use
- Land use conflicts
- High land prices
- Lack of landscape identity
- Generally highly appreciated

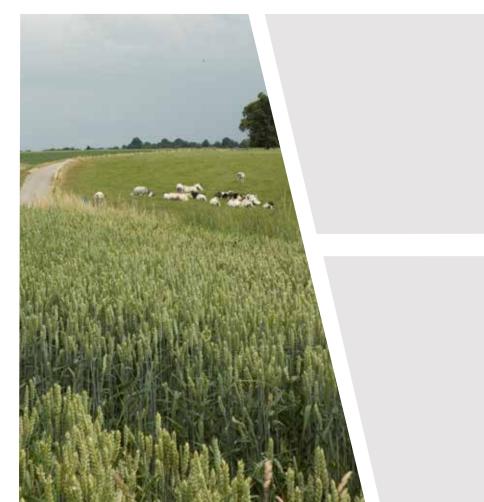
In the Green4Grey project we collaborated with experts from other European peri-urban regions within the meetings of the PURPLE network. In a Green4Grey workshop policy and project approaches to improve peri-urban GI from different European regions were collected and exchanged. The regions and projects differed in scale and approach: from more local to regional, and from policy to implementation.

This inspiration guide is mainly output from this workshop and in co-creation with: Anik Schneiders, John Edwards, Anja Bruell, Simonetta Alberico, Rieke Hansen, Ellen Kelder, Eira Rosberg-Airaksinen en Anke Knapen.

Understanding Green infrastructure

To restore nature and the services they provide, the European Commission wants to offer part of the solution in setting up a strategy for green infrastructure. The term 'greeninfrastructure' can be interpreted in a variety of ways. The European Commission describes green infrastructure as: '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'. From that perspective, green infrastructure is much more than a network of protected natural areas. It supports biodiversity and nature's contributions to people (IPBES 2018). With this broad approach, the Commission wants to colour outside the lines of conventional nature conservation, and wishes to appeal to a wide range of sectors, policy areas and citizens. It encourages member states to develop their own strategy (Michels et al. 2018).

Green infrastructure is not only a debate about "green and blue elements", although opinions can differ whether the whole gradient from green valleys, forests and natural grasslands up to small elements like hedges, pools or orchards belong to green infrastructure. Every application of green infrastructure requires a debate about the goals, quality criteria and the land use that can be reconciled with it (Michels et al. 2018). In the context of an urbanised area more human made or managed elements like gardens and green roofs can be included. Land use change is the major direct driver of the loss of both biodiversity and ecosystem services in Europe. Each element that helps to lower the environmental impact or support the supply of ecosystem services can be included in peri-urban green infrastructure strategies.



The functions of green and blue infrastructure



Nature and biodiversity:

Valleys in a peri-urban context often serve as hotspots for protected fauna and flora, such as the tree frog, the grass snake or rare orchids.



Environmental education:

People building their own living environment, learn more about nature and appreciate it more.



Health and well-being:

Green spots not only provide fresh air but also offer a retreat from urban stress.



Green business sites:

Working in a beautiful green landscape enhances productivity and well-being.



Green living environments:

Attractive green neighborhoods and green elements between residences increase real estate value.



Climate adaptation:

Green climate-proof environments can help to cope with climate change impacts, such as alternating periods of drought and heavy rain.



Green environments for outdoor activities and as meeting places:

Green spots in a peri-urban context can be designed as attractive places to meet people. By connecting these stepping stones, a green network is developed that stimulates cycling, hiking, jogging.....



Sustainable food production:

A tree orchard or pesticide-free community garden provides local and sustainable food



Water quality improvement:

Enhanced water quality is favorable for people, animals and plants



Water retention:

Naturally meandering streams not only stimulate biodiversity, but also act as water buffers offering protection against flooding during heavy rainfall events.

FLANDERS (Belgium)

"Flemish Green infrastructure in fifty shades of green."

Name regio:

Flanders (Belgium)

Surface:

13522 km²

Number of inhabitants:

6,4 million inhabitants, average population density: 474 inhabitants/km



Regional Green Infrastructure strategy

The Research Centre for Nature and Forest (INBO) brought together many parties to discuss the long term GI strategy for Flanders. They facilitated the development of (1) a widely accepted plural definition on GI, (2) developed a set of long term visions on GI based on different values for nature and their services and (3) developed a set of policy recommendations on GI for the Flemish Government.

In the Flemish land use context Green infrastructure can be described as a continuous gradient from green to grey (Schneiders et al., 2016).

In the Flemish analysis of policy options it is stated that GI can be described as fifty shades of green. Each shade is a negotiated solution for a specific location following its own procedure, with its own stakehol-

ders delivering specific targets, using the relevant policy instruments. All the shades contribute to a resilient green network, lowering the environmental impact, restoring nature and its services.

We cannot easily solve complicated socio-ecological problems via a traditional top-down approach in which the government imposes measures from above. These problems demand adaptive governance: a participative approach that allows room for learning processes and adjustments, focusing on awareness and on behavioural and cultural change. Adaptive governance does not strive for immovable rigid definitions, but creates boundary objects that primarily aim to provide a space for negotiating definitions and solutions.

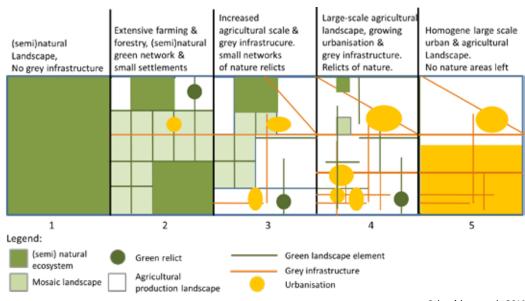
Green infrastructure in Flanders is said to be a boundary object: on the one hand it leaves sufficient room for interpretation by different tar-



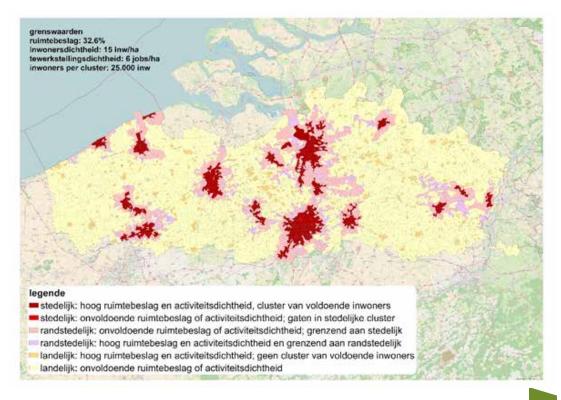
get groups, and on the other hand it is clear and concrete enough for clear communication to occur. The concept of 'green infrastructure' can play a role in the dialogue between actors who want to work together to set up a project or action around biodiversity. The concept must be able to transcend the boundaries between sectors, scale levels and organisations and to evolve flexibly, based on dialogue, interaction in situ, reflection and learning processes. A link to the English summary of the report with recommendations.

Some inspiring Flemish GI projects:

- Restoration project on the river Scheldt
- <u>Zwinproject</u>
- Nature development within the Port of Antwerp



Schneiders et al., 2016



County of Surrey (United Kingdom)

This route is a green corridor for wildlife and people.

Name regio:

Surrey

Surface:

1,663 km²

Number of inhabitants: 12 million estimated in 2018



Regional Green Infrastructure strategy

Surrey was part of the South East Region of England, one of 8 regions with a strategic planning framework, The South East Plan which included a Green Infrastructure policy. With a change of Government in 2010, the regions were abolished together with the strategic plans and there is no strategic framework for green infrastructure planning above the district council level. Surrey comprises 11 district councils who make most planning decisions apart from minerals, waste and county developments such as schools.

The National Planning Policy Framework (NPPF) states that the local planning authorities should set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.

London and several counties and district councils have a GI Strategy.

Current GI strategies and the Policy Background

The NPPF highlights the planning systems role in contributing to the protection and enhancement of the natural environment. It seeks to establish coherent, ecological networks that are more resilient to current and future pressures while recognising the 'wider benefits' eco systems services can have. SCC and Surrey Nature Partnership (SNP) support this ambition and are determined that development should deliver a net benefit to biodiversity.

For Surrey, there is the Surrey Infrastructure Study, see 'Infrastructure Needs and Requirements', Section 4.5 Green Infrastructure, p70-71



In the Surrey Infrastructure Study, the future requirements for green infrastructure to meet expected growth to 2031 are to create:

- 106ha Suitable Alternative Natural Green Space
- 42ha Of new Parkland Surrey
- 21ha Allotments

Examples of some specific projects on GI

Green Arc, a partnership to improve the countryside around London although effort is concentrated in the North East of London around the Olympic site:

A borough council example is <u>Natural Woking</u>, Biodiversity and Green Infrastructure Strategy;

The Colne and Crane Green Infrastructure Strategy covers two river catchments near Heathrow Airport and cover a number of district council and London boroughs.

An example of a walk which has considerable green infrastructure on the fringe of London called <u>the Thames to Downs Link</u>;



Three Countries Park (Belgium, The Netherlands, Germany)

"Water, nature and landscape do not stop at borders."

Name regio:

Euregion Meuse-Rhine Three Countries Park (BE. NL. DE)

Surface:

Euregion Meuse-Rhine (EMR): 11.000 km² - Three Countries Park (3LP): 5.000 km²

Number of inhabitants:

Euregion Meuse-Rhine (EMR): ~ 4 million



Regional Green Infrastructure strategy

The ESPON project LP3LP "Landscape policy for the Three Countries Park" (2012-2014) proposes a "green infrastructure strategy" as the first of four strategies within its policy recommendations for the cross-border area (interregional level).

The LP3LP study serves as a guiding document for the activities of Three Countries Park and many local organisations and action groups in the partner regions across the borders. It has no binding status, but has been accepted as a reference document through the Three Countries Park cooperation agreement and strategic plan. The 3LP strategic plan (2016-2019) defines "landscape and green infrastructure" as a transversal core theme for developing activities and projects (to be continued in the next phase 2020-2023).

<u>Download 3LP strategic plan and view LP3LP book publication.</u>

The main goal of this strategy

- develop a coherent 'ecological network' across the borders, especially to support biodiversity (i.e. migrating species), water quality and retention, and landscape characte
- implement the concept of the "blue-green framework" and its "guiding principles"
- strengthen critical green open spaces against the pressure of increased urbanization, especially at the borders, by giving them an Euregional or even European context.
- thematically link local-regional landscape planning and nature conservation policies & activities with EU policies, investment priorities and funding sources



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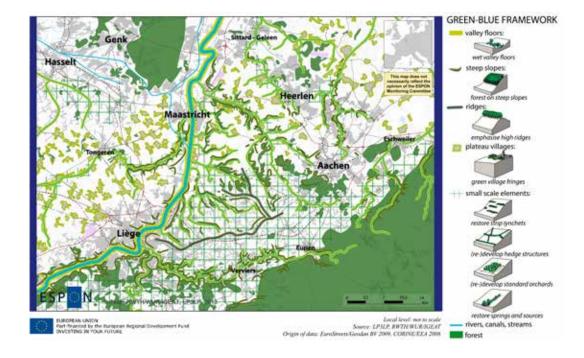
Proposed actions:

- Further development of the "bluegreen framework" into a strategic Green Infrastructure Plan with
- Focus on habitat services in relation to biodiversity targets, regulating services mediated by the water flow, and cultural services in relation to landscape character
- 4 cross-border river basins as test cases for the application of the bluegreen principles to a meso-scale (1:25.000)
- Integration of geographical data across borders and sectors
- Workshops with planning authorities and local communities
- Development of a 3LP green infrastructure project with available European funding sources

Highlights in the approach of the case:

- Cross-border perspective and strategy
- Areas connected by the rivers
- Guiding principles for green infrastructure strongly related to landscape relief and character

Follow-up activities by the Three Countries Park.



Metropolitan City of Turin - MTC (Italy)

"Visual tools are perfect to convince local communities to work together"

Name regio:

Metropolitan City of Turin -MCT (northern Italy, Piedmont Region)

Surface:

6830 km²

Number of inhabitants:

2.3 million



The MCT Green Infrastructure Strategy and its main goals

In Italy, the legislation is very complex and rich, especially in the fields of landscape, cultural and environmental heritage; nevertheless, Italian legislation does not include explicitly the concept of Green Infrastructure (GI). At regional level in 2009 the Piedmont Region "Law on the conservation of natural areas and biodiversity" (n. 19/2009) updated Piedmont's regulations on protected areas and put the stress on the European Natura 2000 Conservation System. The Law also called for the identification, with knowledge deepening at the provincial and local scales, of the Ecological Network including the System of Piedmont Protected areas, SACs, Sites of Community Importance (SCIs) and SPAs, ecological corridors and connections.

The Metropolitan City of Turin aimed at the governance of territorial resources through their protection and enhancement. Trough the PTC2 - the Coordination Territorial Plan, approved in 2011 that is its main provincial planning tool, a first hypothesis of the REP - Provincial Ecological Network -was drawn up as a multifunctional network aimed at maintaining, safeguarding and enhancing biodiversity.

Subsequently, within its Metropolitan Strategic Plan— PSM- (approved in 2018), MCT identified the realisation of the Green Infrastructure Network and the preservation of the ecosystem services value as one of the most important objectives to build a sustainable and resilient metropolitan city.



In implementing the provisions of the PTC2 in the environmental field, the Ecological Network Guidelines were accomplished with the aim of providing municipalities with a technical and procedural guidance for the planning of the Ecological Network at the local level.

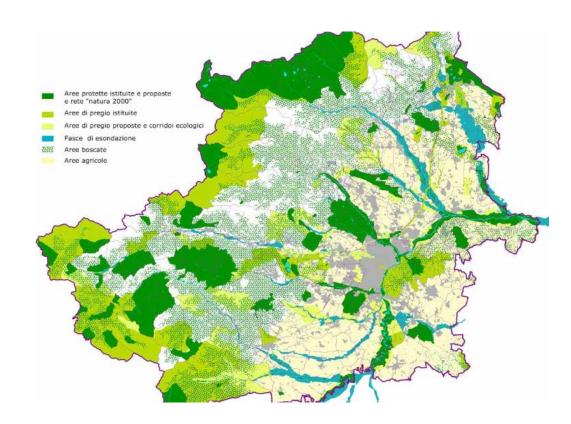
At present MCT is partner of the Ma-GICLandscapes project (co-financed by the Interreg Central Europe Program). The project promotes sustainable land-use by providing land managers, policy makers and communities with tools and knowledge with the aim of elaborating strategies and action plans for enhancing the existing green infrastructure resource in Central Europe.

Visual and interactive tools to increase knowledge and promote a sustainable urban planning

MCT provides an <u>interactive tool</u> to increase the knowledge of the level of land take in its territory:

Thanks to the LIFE SAM4CP project (funded under the LIFE Programme) a web tool was developed to evaluate the environmental benefits - Ecosystem Services - ensured by soil in order to promote a sizeable reduction of soil consumption and an overall saving of the natural resources.





Berlin's Landscape Programme (Germany)

Name regio:

Berlin

Surface:

163,64 km²

Number of inhabitants:

3.6 million (2017)

Strategies for green infrastructure development

Berlin is the capital of Germany and a city-state with 3.6 million inhabitants. 44 % of the city area are covered by green and blue spaces. However, recent population growth leads to high demand for new housing. Aiming at a compact but green city, "City and green growing together" is one of Berlin's eight strategies for urban development (SenStadtUM 2015).

The focus for Berlin's green infrastructure is the citywide green space network formed by two "rings" and two "axes". The inner ring surrounds the densely built-up city centre. The outer ring connects peri-urban landscapes and parks. Three large landscape areas covered by woodlands, lakes and streams in the east and west at the urban fringe are Berlin's core recreational destinations. In the north, the Barnim is a plateau

shaped by the ice age and a historic agricultural landscape. Since the 1990s, this area is being developed as a fourth large recreational area. This process includes a wide variety of activities such as protection of habitats, creation of path networks, grazing with old breeds, or maintenance and restoration of orchards.

Berlin's Landscape Programme (LaPro) is the key strategic planning document for protecting and developing the city's green infrastructure (SenSadtUM 2016). Its four thematic plans include: 1) "Habitat and species protection", 2) "Natural environment", 3) "Recreation and use of green spaces", and 4) "Scenery". Core measures for the four themes are combined in the fifth LaPro plan, the "General Urban Mitigation Plan" (SenSadt 2004) (Gesamtstädtische Ausgleichskonzeption - GAK). The GAK is a tool for completing the city-'s green network and implementing other priority measures. The measu-



res are, for example, new parks, greening of densely built areas in the city centre, closing gaps in the green corridors and improvement of peri-urban landscapes such as the <u>Barnim</u>.

The GAK builds on the German legally binding environmental impact mitigation and compensation regulations. Investors have to pay compensation fees if environmental impact mitigation and compensation is not possible within new urban development areas. Berlin's green space network and the GAK together help to identify critical areas and corridors needed to develop a coherent green infrastructure and to use limited funds strategically. In particular, under conditions of urban growth, Berlin's LaPro provides a long-term perspective for the city's green infrastructure.

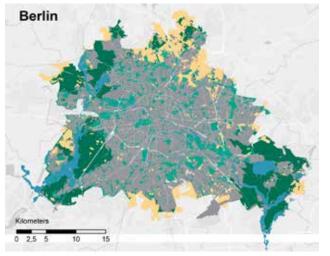
As a city state, Berlin can develop planning strategies for a large territory. Detailed planning and implementation is coordinated with the districts which have local planning sovereignty. In this respect, Berlin is on the one hand comparable to a region with a strong regional planning authority but on the other hand also owns land used for green infrastructure and thus has power in land-use decisions. In peri-urban areas, landscapes are protected and developed together with the adjacent Federal State Brandenburg, for example in the joint protected landscape "Naturpark Barnim".

Examples of some specific projects on GI

The Former Airfield Johannisthal, part of urban development area Berlin Adlershof and part of the out green ring, is a landscape park with a protected nature conservation area in its core. The park combines recreation, nature experience, biodiversity protection and sheep grazing. The conservation area is surrounded

with an elevated circular path. The outer ring consists of activity areas for play, sports or sunbathing fields.

20 Green Walks – 20 routes for walking and biking, in total around 565 km, throughout the city and into the peri-urban landscapes.



Dordrecht (the Netherlands)

"We transform Dordwijkpark into a city park".

Name regio:

Drechtsteden

Surface:

3.403 km²

Number of inhabitants:

3.650.000

Regional Green Infrastructure strategy

Cities are particularly susceptible to the negative impacts of flooding, urban heat islands, poor air qualitv. and other risks associated with more extreme weather conditions. In addition to conventional grey infrastructure, we need blue-green infrastructure (BGI), e.g.: green corridors, permeable paving, bio-swales, rainwater harvesting. BGI can better deal with extreme weather events, foster ecosystem services and increase the liveability of cities in the North Sea Region. BGI's holistic approach has viable environmental, social and economic benefits for city residents.

Blue green strategy of the city of Dordrecht

A green, vibrant city where residents are prepared for a more extreme climate and higher sea levels; that is what Dordrecht is constantly wor-

king on. From the implementation of the Urban Water Plan 2003-2007 it became clear that the policy had to be adapted to the consequences of climate change. The climate challenge is linked to other spatial tasks, such as nature, recreation and the quality of the living environment.

Project: into City Park Interreg NSR V project <u>BEGIN</u> / Transition Dordwijkzone

Objective

The overall objective of BEGIN is to demonstrate at target sites how cities can improve climate resilience with Blue Green Infrastructure involving stakeholders in a value-based decision- making process to overcome its current implementation barriers.





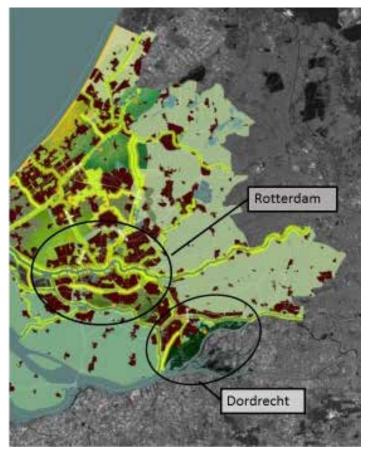
Partnership of 6 NSR countries

The Netherlands: City of Dordrecht; IHE Delft; Erasmus University of Rotterdam, Belgium: City of Antwerp; City of Ghent, Germany: Agency for Roads Bridges and Waters, Hamburg; Hamburg University of Technology, United Kingdom: Construction Industry Research Information Association (CIRIA), City of Bradford Metropolitan District Council, Kent County Council, Aberdeen City Council, Enfield, Royal College of Arts, University of Sheffield, Sweden: City of Gothenburg, Norway: City of Bergen.

Interreg NSR V project BEGIN (BluE Green Infrastructure Through Innovation)

The BEGIN-project aims to help cities in overcoming BGI's implementation barriers through Social Innovation.





City of Lahti (Finland)

"Master planning is a collaboration"

Name regio:

Päijät-Häme

Surface:

518 km² (459 km² land)

Number of inhabitants:

120 000



Green Infrastructure strategy

Lahti green infrastructure program is under construction. However, in Master planning process the green corridors have been identified, as well as important landscape areas like the Ice Age formation of I Salpausselkä, quiet areas as well as carbon sink and storage areas (see map).

The master plan, which encompasses the whole city, sets the framework for the development for land use and traffic. The masterplan outlines how the city functions as a whole and steers local detailed plans. The master planning process in Lahti is a continuous four-year cycle, which means it is reviewed every council term and it can answer relatively fast to new challenges.

Lahti is part of EU Covenant of Mayors for Climate and Energy. June 2019 the city board accepted the Climate adaptation program, which is required, together with Sustainable energy and climate action plan, where 97 actions are identified. Actions include many green infrastructure, biodiversity, citizen's and storm water actions.

Examples of some specific projects on GI

Lahti forerunner in treating storm water in cities. Lahti manages a project which is one of the Government Programme's key projects. Treatment of urban storm water will be improved through the project in the Ranta-Kartano area, in the city centre, by using distributed systems, such as swales, green roofs and infiltration and detention basins. In addition, some of the storm water will be transferred for treatment in a storm water treatment system to be built in the Western Hennala area, which is an old military area under transition. The system will utilise new natural treatment solutions, such as





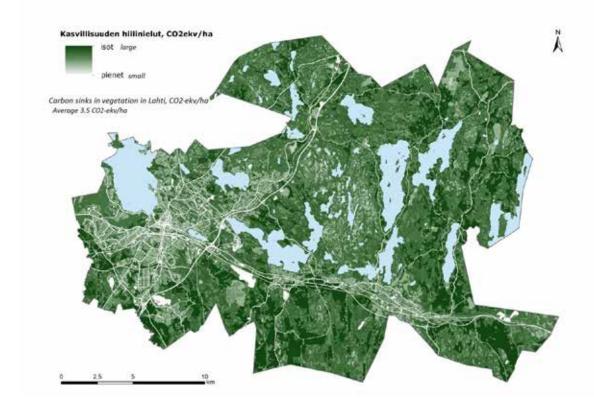
biofiltration. The project in Lahti will reduce significantly to load to Lake Vesijärvi.

The city of Lahti has developed a practice of continuous master planning. Under this model the planning work proceeds in 4-year cycles, with the master plan reviewed during each City Council term. A continuous planning process offers an overall picture of the city's strategic land use, enabling the appropriate timing and targeting of the more detailed city planning and building projects. Process uses many ways of participation and different channels for reaching different groups. The Service network program, the Environmental program and the Sustainable urban mobility plan are combined with master planning process and this is called the Lahti Direction.

<u>Citicap</u> aims to reduce emissions from transport, collect and make available digital data on mobility

and develop new transport services for citizens. The CitiCap project will experiment with a personal carbon trading scheme for mobility as part of the Lahti region's transport policy. It will also produce a platform for mobility mass data, and build a 3 km main cycle route based on smart solutions.

Environmental Grannies and Grandpas go voluntary to basic schools to 'educate' young children by doing environmental and nature education activities. In this way they have the opportunity to transfer their knowledge about this subject to the younger generation. City of Lahti offers to the volunteering seniors education and materials.



De Wijers (Belgium)

"Investments in broad stakeholder involvement pay off in successful implementation of GBI"

Name regio:

De Wijers: peri-urban region in between the cities of Hasselt and Genk (province of Limburg, Flanders, Belgium)

Surface:

26.400 ha

Number of inhabitants:

+/- 200.000



Regional Green Infrastructure strategy

At the regional policy level of Flanders, the highest policy level responsible for the open space, there is no "official" document describing an overarching strategy for Green Infrastructure on the scale of the regio. Green infrastructure strategies are therefore developed and implemented in regional area-specific projects, such as the project of De Wijers.

In 2007, the Flemish Land Agency (VLM) received a mandate from the Minister for the Environment for the coordination of the De Wijers project in the province of Limburg (B). The research carried out by the VLM between 2008 and 2010 was based on an ecosystem-services approach and led to the "Startnota De Wijers" in 2010, highlighting the need for efficient cooperation between all partners in De Wijers. This cooperation model was laid down in the "De

Wijers Declaration", signed in 2010 by local partners, together with the Flemish Minister of the Environment and the Limburg Governor.

Region Flanders as highest policy level involved in this project invest through its instrument of land development.



The main goal of this strategy

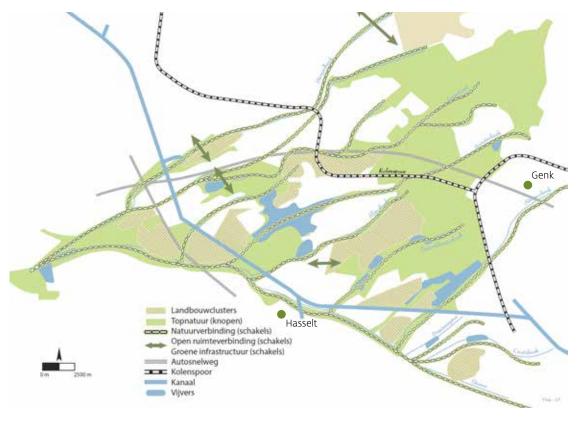
De Wijers's implementation program has the ambition to bring together and tune the initiatives of all the De Wijers partners into long term development plan for this area. By aligning the goals, timing, implementation and financing of all actions, De Wijers is better, faster and more cost-efficiently developed.

To enable this integrated approach, the implementation program includes a spatial development vision for green infrastructure endorsed by all partners and a set of strategic goals and actions to realize this ambition. In 2017, the Flemish Government assigned 5,2 million euros for land development in this projects. This will be used to finance the development of green infrastructure in about 10 smaller project areas.

De Wijers focusses on stakeholder capacity building and engagement

both in the planning phase (a common vision for the area) and in the implementation phase (co-financing, action program). Besides these land development plans, The Flemish government also finances 'quickwins', encouraging local partners to implement the actions of the implementation Program in the short term.

Communication (e.g. <u>www.dewijers.</u> <u>be</u>) plays an important role in the branding of the area and stakeholder involvement.



10 tips for peri-urban Green and Blue Infrastruture

A peer review of the diverse projects, policies and instruments resulted in the following recommendations

Communication

- Inspire people, showing different perspectives for green infrastructure.
- Show that green infrastructure can offer an answer to major societal challenges that policy is facing.
- Use timelines and modelled outcomes with storytelling and visualisations to look into the future.
- Focus on benefits of nature in communication.

Governance issues

- Let EU stimulate cross sectoral management : area based, f.e. LEADER groups.
- Use GI to combine projects from different departments and show win-win.
- Set out very clearly who is responsible, reporting and implementing green infrastructure.

Policy at all levels

- Introduce GI in all planning processes from the start by duty and make it obligatory to explain if GI is not included in their plan.
- Take more time to engage local communities.
- Stimulate private ownership: "Yes in my back yard": make them proud, part of the community.





Backgroundinformation

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