Urban ecosystems

The importance of green infrastructure and nature-based solutions for the development of sustainable cities

A Policy Brief from the Policy Learning Platform on Environment and resource efficiency

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Contents

Introduction

Currently, 74% of Europe's population live in cities and this figure is projected to increase to 83.7% by 2050[1]. This trend will adversely affect the quality of life in cities unless sustainable urbanisation approaches are adopted for creating healthy and prosperous urban ecosystems. When addressing urban eco-systems, the social, environmental and economic aspects of urban environments and their complex interlinkages need to be considered.

This policy brief aims at inspiring local policy makers to **take steps in improving their urban ecosystems**. After a brief overview of the EU strategic legislative and implementation packages emphasising the benefits of sustainable urban development for better quality of life and attractive cities, the socio-economic benefits of adopting nature-based solutions at a city level are explored as they offer multiple strategic opportunities in this regard. Several major challenges affecting urban ecosystems are presented, as well as good practices coming from Interreg Europe projects to face such challenges.

The concept of urban ecosystems

There are several terms used to indicate urban ecosystems. For the purpose of this policy brief we adhere to the definition provided in the 2nd MAES[2] report which states that "Urban ecosystems are areas where most of the human population lives. Urban areas represent mainly human habitats but they usually include significant areas for synanthropic species, which are associated with urban habitats. This class includes urban, industrial, commercial, and transport areas, urban green spaces, mines, dumping and construction sites". The fourth MAES report recognises urban ecosystems as socio-ecological systems where most people live. Urban ecosystems are composed of green infrastructure[3] and built infrastructure[4]. Urban green infrastructure (GI) is a multi-functional network of urban green spaces situated within the boundary of the urban ecosystem. Urban green spaces are the structural components of urban GI[5]. The largest urban ecosystems are currently concentrated primarily on coasts with harbours, along rivers, and at intersections in road networks. Urban ecosystems include physical and biological components that interact with each other. Urban environments offer a wide range of **regulating, provisioning and cultural ecosystem services.** Urban ecosystems are considered in a good condition when the living environment for citizens and urban biodiversity is good (Maes et al., 2016). This means, among others, a good quality of air and water, a sustainable supply of ecosystem services[6] and a high level of diversity of urban species.

[1] https://ec.europa.eu/knowledge4policy/foresight/topic/continuing-urbanisation/developments-and-forecasts-on-continuing-urbanisation_en

[2] Mapping and Assessment of Ecosystem Services

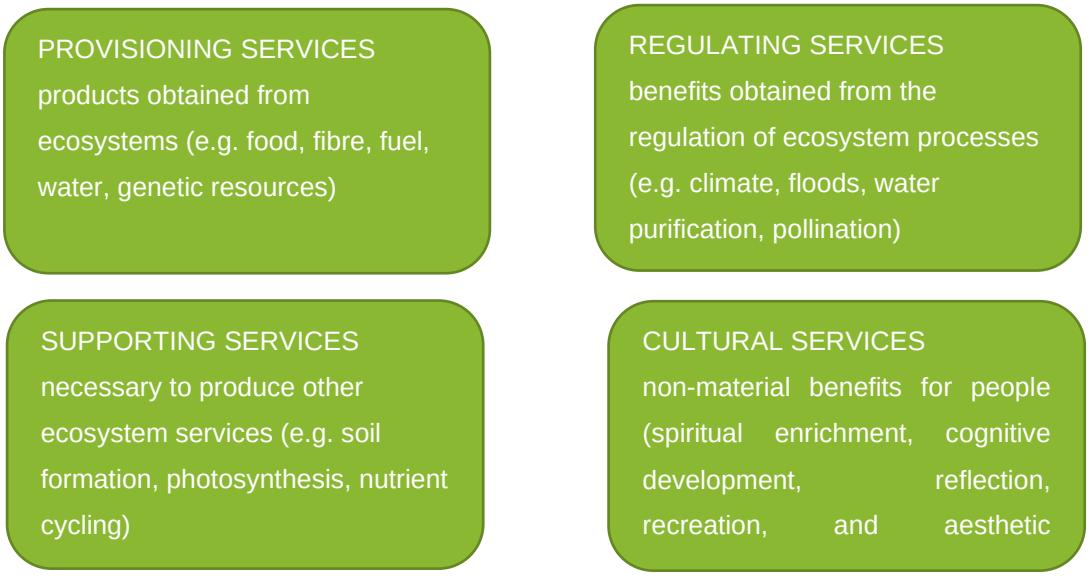
[3] Green infstaructure is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates (urban) green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas.

[4] Built infrastructure includes houses, buildings, roads, bridges, industrial and commercial complexes but also brown fields, dumping or construction sites, 4 MAES report.

[5] https://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/102.pdf

[6] Ecosystem services refer to all the benefits that people obtain from ecosystems (Millennium Ecosystem Assessment, 2005). Further information in platform's policy brief on ecosystem services.

Figure 1: Overview of ecosystem services[7]



The benefits of Green Infrastructure

With the increasing tendency towards urbanisation the importance of **green infrastructure** (GI) in urban areas and peri-urban areas is likely to grow. GI has the potential to provide **environmental benefits** such as moderating the 'urban heat island' effect[8], or reducing energy consumption for cooling in buildings. In this context, **Natural Water Retention Measures** **(NWRM)** are multi-functional measures demonstrating the water-related functions of green infrastructure. They aim to safeguard water resources using natural means and processes and favouring as much as possible the restoration of natural ecosystems or at least of their key functionalities in terms of water management. Greening neighbourhood spaces, adopting nature-based solutions[9] in public spaces such as squares, schools, and hospitals brings **social benefits** as it helps to strengthen social ties.

Economic development in cities is highly dependent on the quality of natural resources. Thinking, planning and acting more innovatively is an opportunity to generate sustainable economic growth and social inclusion. Specifically, nature-based solutions in sustainable urban planning are most often linked to the regeneration of derelict areas, and the improvement of green areas ensuring general well-being of citizens. They can be used to stimulate growth and new jobs by encouraging demonstration projects with replication potential and up-scaling capacity. This approach can be applied to historic districts in cities, as well as derelict industrial sites and run-down urban areas.

Not always, however, regional and local policy makers see the potential of nature-based solutions for economic development. As highlighted in the Interreg Europe Policy Learning Platform thematic workshop on natural heritage, **GI is often seen as a luxury in urban areas** and its potential to bring

[7] Platform's policy brief on ecosystem services

[8] Urban heat island effect describes the relatively higher temperatures found in urban areas compared with rural surroundings.

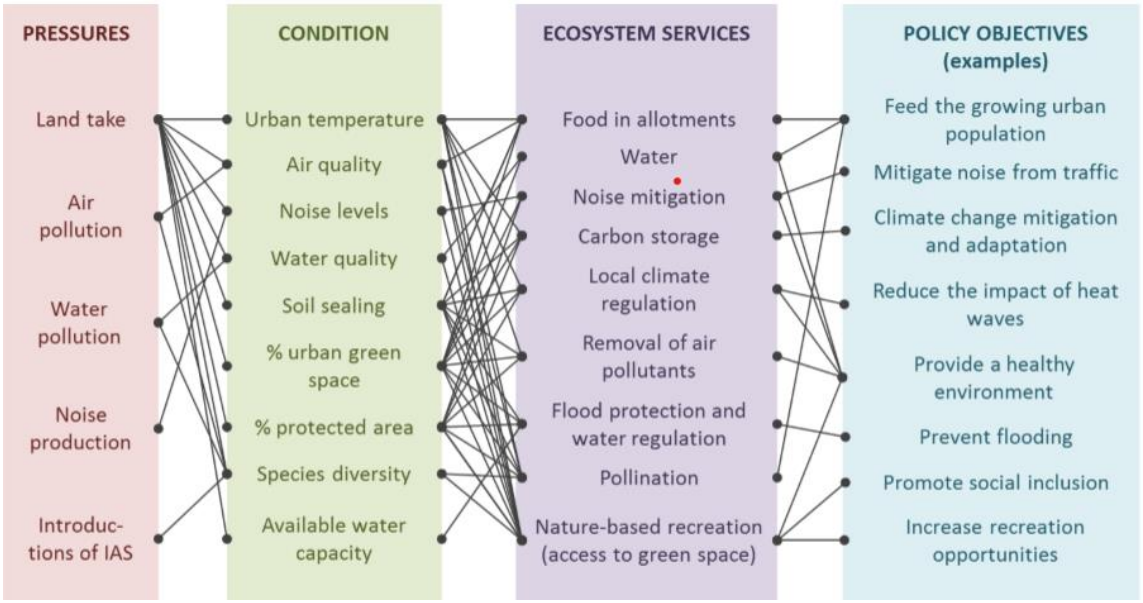
[9] Nature-based solutions to societal challenges are solutions that are inspired and supported by nature. They are cost-effective and simultaneously provide environmental, social and economic benefits and help build resilience. Further information is available here.

multiple benefits is not fully recognised and explored. For example, GI is not widely used by decision-makers as a cost-efficient solution to health issues despite the acknowledged positive link between GI and human health.

Pressures on urban ecosystems

Unhealthy urban ecosystems can lead to environmental degradation, social problems, economic decline, deteriorated human health and further disconnection from nature. There are several specific challenges that hinder the development of healthy and prosperous urban eco-systems (Fig.2):

Figure 2: Links between pressures, condition and ecosystem services in urban ecosystems



Source: EC, Mapping and Assessment of Ecosystems and their Services, Discussion paper 2018

- The sustainability of urban ecosystems is adversely affected by **land take and the pressure on economic valorization of land** which results in conversion of forests, wetlands, farmlands etc. for residential, industrial, commercial, and transportation uses. Such development path has negative impacts on the urban ecosystem at different levels: for instance, it is a source of pollution arising from industrial activity and soil contamination, or it implies a significant reduction of urban agriculture.
- The effect of **noise pollution** has been found to negatively impact the well-being and health of exposed citizens as well as the wildlife. Planting "noise buffers" made of trees and shrubs can reduce noise to the human ear.
- **Air pollution** harms human health and the environment. Although emissions of many air pollutants have decreased substantially over the past decades in the EU, air pollutant concentrations are still too high. Exceedance of air quality standards is an issue in many cities as ozone, nitrogen dioxide and particulate matter (PM) pollution pose serious health risks.

Specific legislation[10] is put in place to minimize exposure of citizens to these harmful substances.

- Throughout Europe, cities face increasing pressure from the **urban heat island** effect and face challenges related to adaptation to climate change. With the rapid urbanisation, building resilience into the densely populated urban environments becomes crucial.
- **Invasive Alien Species (IAS)** can have harmful effects on biodiversity and ecosystems, as well as on human health. Europe's towns and cities are particularly vulnerable to the threat posed by invasive species. Urban environments in many cases host an important proportion of the overall biodiversity, and as a result, IAS represent a serious threat to the native wildlife in urbanised areas. Improvement of policies addressing IAS is the main focus of INVALIS project. The project focuses on knowledge gaps in ecosystems' vulnerability to biological invasions, lack of awareness about IAS risks as well as cooperation between key stakeholders for the implementation of IAS management measures.

The EU Policy context

EU strategies and policies

In response to rapid increase in urbanisation rates across the world and in EU Member States in particular, the European Union has been increasing the focus on urban environment through its environmental legislation on air, water, nature and biodiversity, waste.

- The **7th Environmental Action Programme (EAP)** is the overall EU strategic document in the field of the environment. It includes a specific policy objective "To enhance the sustainability of EU cities". The Action Programme states that by 2020: "…a majority of cities in the EU are implementing policies for sustainable urban planning and design…" and that the Commission should develop "…a set of criteria to assess the environmental performance of cities". The evaluation report of the 7th EAP recognises that such set of criteria has been established and incorporated into a tool that allows for this assessment to be undertaken. The indicators underpinning the Green City Tool (Box 3) are based on city governance. The report acknowledges that many cities have started applying sustainable development approaches, but more cities need to be mobilised to achieve real change on a European scale. For example, further efforts are needed in meeting air quality standards. As highlighted by PERFECT project partners, these efforts should combine not only the removal of emissions from the air through vegetation, but, critically, the reduction of air pollutants at source[11].

- The importance of green infrastructure (GI) for addressing urban challenges has also been highlighted in the EU urban policy. The **Urban Agenda for the EU** is an integrated and coordinated approach to address urban dimension of the EU as well as national policies and legislation. By focusing on concrete priority themes within dedicated Partnerships, the Urban Agenda seeks to

[10] E.g. 2008 Ambient Air Quality Directive
[11] PERFECT article "GI and air quality in urban areas: a critical review"

improve the quality of life in urban areas**.** Aspects related to urban ecosystems are addressed under the theme “Sustainable use of land and nature-based solutions”. A partnership under this theme was launched in 2017.

- Even more specifically, the Commission adopted an **EU Strategy on green infrastructure in 2013** to enhance the economic benefits of GI by attracting greater investment in Europe’s natural capital to achieve its biodiversity objectives by 2020. Despite the progress made, in its 2019 review of the EU Green Infrastructure Strategy, the EC concludes that the deployment of GI needs to be further scaled up. The Commission urges European policy makers to engage in a more strategic approach, in mainstreaming GI in their regional development policies and in a better use of the future EU funding instruments.
- In addition, in September 2019, the European Commission published two new guidance documents implementing the Commission’s EU Action Plan for nature, people and the economy (2017). First, the **EU Guidance on integrating ecosystems and their services in decision-making** (part 1, part 2, part 3) aims to help decision-makers improve the impact, cost-effectiveness and sustainability of their policies and investments. Second, the **EU Guidance on a strategic framework for further supporting the deployment of EU-level green and blue infrastructure** defines criteria, and available technical and financial support instruments that can help planners integrate natural landscape features into strategic "green and blue infrastructure".

Instruments for supporting nature-based solutions in urban and peri-urban areas

Financing instruments

- **Cohesion Policy:** During the 2014-2020 programming period, urban areas are supported **by European Regional Development Fund (ERDF)** in areas such as sustainable urban mobility, regeneration of deprived communities and improved research and innovation capacity. For the future programming period (2021-2027) the urban dimension of Cohesion Policy will be strengthened, with 6% of the European Regional Development Fund dedicated to sustainable urban development strategies. The new European Urban Initiative (part of the Cohesion policy) will also support cities to innovate, access knowledge, and support networking and capacity building. Many Interreg programmes foresee specific priorities dedicated to natural heritage or GI.

- **LIFE Climate Action sub-programme**: under this programme ‘projects with demonstration and transferability potential are encouraged, as are green infrastructure and ecosystem-based approaches to adaptation’. In 2014-2015, one third of the projects from the LIFE priority area ‘climate change adaptation’ involved green infrastructure measures, mostly in urban areas[12].

- **The Natural Capital Financing Facility (NCFF):** it combines EIB financing and the Commission’s funding under the LIFE Programme and it is implemented by the European Investment Bank (EIB). It also supports a specific project category on green infrastructure, including green roofs, green walls, ecosystem-based rainwater collection/water reuse systems, flood protection and erosion control.

[12] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019SC0184&from=EN

Box 1: Athens – Green infrastructure for urban resilience

The first NCFF operation integrating nature-based solutions in a city targets Athens, in Greece. A 5MEUR NCFF loan supports the integration of green components into the restoration of public squares and streets, the creation of green corridors between different greened areas. The objective of this project is to support the implementation of the Athens Resilience 2030 Strategy and thus to contribute to reducing urban heat islands, increase natural water infiltration and improve the overall attractiveness of the project areas. Further information about the project is available here.

- **Horizon 2020 Programme:** it provides support to demonstration projects for the assessment and deployment of nature-based solutions (NBS). The Programme has been funding projects on ecosystem services, restoration and NBS using GI to address societal challenges. The aim is that evidence about the multiple benefits provided by nature-based solutions triggers prioritisation of GI. Horizon 2020 supports projects focusing on NBS for water and climate resilience in urban areas (2016, 40 MEUR) as well as projects on NBS to enhance health, wellbeing and social cohesion in cities through inclusive urban regeneration (2017, 44 MEUR). These are presented in Box 2. As highlighted during the Policy Learning Platform's thematic workshop on urban ecosystems in 2020 new NBS-related calls of the Programme are envisaged with focus on:
    - Innovative nature-based solutions for carbon neutral cities and improved air quality;
    - Enhanced natural treatment solutions for water security and ecological quality in cities;
    - Multi-hazard risk management for risk-informed decision-making in the EU; and
    - Climate Resilience of European coastal cities[13].

Box 2: Horizon 2020 projects on nature-based solutions

These eight H2020 projects together are expected to provide a robust evidence at the EU-level of the value of NBS to address the different challenges that cities are facing nowadays. They will develop and implement monitoring schemes to assess the performance of NBS, as well as methodologies for replication and up-scaling, identify and assess barriers and establish sustainable data platforms on NBS.

Source: Based on the presentation made during the thematic workshop on urban ecosystems organised by the Policy Learning Platform

[13] https://www.interregeurope.eu/fileadmin/user_upload/plp_uploads/events/Brussels_Urban_ecosystems/3._The_EU_R_I_agenda_for_Nature-based_Solutions_-_Julie_Delcroix.pdf

Scientific and other support

- **The EU initiative on mapping and assessing ecosystems and their services (MAES):** launched in 2013, it provides methodological guidance for the EU and its Member States for mapping and assessing the state of ecosystems and their services. The fourth MAES report on urban ecosystems provides guidance on mapping and assessing urban green infrastructure and the services it provides.
- The European Commission is encouraging cities to **evaluate their environmental performance**. An example of a tool that was designed to facilitate these endeavors is presented in Box 3.

Box 3: The Green City Tool

The Green City Tool is a user-friendly self-assessment tool that allows cities to benchmark their environmental performance, assessing progress in comparison with other similar cities, sharing best practices and tracking improvement over time. It has been designed for cities over 50,000 inhabitants and covers the following topics: air, mobility, energy, climate change adaptation, nature and biodiversity, noise, water, climate change mitigation, waste, green growth and innovation, land use and governance. Cities can use the tool anonymously or register officially on the Green City map, to show others where they are in terms of sustainability.

- **Awards**: the EU aims to promote and expand existing initiatives that support innovation and good practices in cities, encouraging to show how they progress on sustainable urban development. Examples of initiatives allowing cities to showcase their environmental performance are presented in Box 4:

Box 4: The European Green Leaf Award and European Green Capital Award

The **European Green Leaf Award** is a competition aimed at cities and towns across Europe, with population between 20,000 and 100,000 inhabitants. The objectives are to award cities demonstrating a good environmental record and commitment to generate green growth and encourage them to actively develop citizens' environmental awareness and involvement. Also, the award aims to identify cities able to act as 'green ambassadors'.

European Green Capital Award was conceived to promote and reward the efforts of cities in improving the environment, to spur them to commit to further action, and to showcase exchange of good examples among European cities. GI has been included in the award criteria of both awards.

The 2019 European Green Leaf title was awarded to both Cornellà de Llobregat in Spain and Horst aan de Maas in the Netherlands. Oslo is the European Green Capital 2019.

Opportunities for developing sustainable urban ecosystems: good examples from Interreg Europe

Interreg Europe provides support to policy makers wishing to adopt nature-based solutions in urban areas and improving urban ecosystems. Several funded projects already identified good examples and offer insights and inspiration in the following main areas:

- *Sustainable planning in urban and peri-urban areas*
- *Urban and peri-urban agriculture*
- *Funding urban renewal*

Sustainable planning in urban and peri-urban areas

Sustainable urban planning is crucial for securing the long-term wellbeing of citizens and can play a transformational role in shaping the cities. To be effective, the planning system must be capable of dealing not only with land use but with the broader social, environmental and economic aspects of urban ecosystems and strike a balance, in which the development needs are met in the most sustainable way. In addition, successful urban revitalization needs an integrated long-term strategy that includes measures related to several policy areas such as mobility, housing, cultural heritage, start-up support. For example, such integrated approach was implemented across municipal boundaries by the French city of Mulhouse[14] and affected positively the economic activity and quality of life.

Some European cities have adopted strategies and plans specifically dedicated to GI (e.g. Barcelona[15] , Manchester[16]), while many others have integrated GI aspects into broader city plans and strategies. Also, as noted in MAES 2016 report on urban ecosystems policies, urban ecosystems and urban GI are sometimes covered by other policies or strategies so that in reality there is a dedicated policy on green urban areas but it is less visible: urban GI is embedded in climate planning, in environmental protection or in sustainable development. Despite these specificities it is undeniable that **the role of regional and local authorities in implementing GI is crucial** as in most countries they are in charge of spatial planning decision making. Collaboration across different administrations at local level is essential as well as the input and involvement of relevant professionals.

[14] https://www.interregeurope.eu/fileadmin/user_upload/plp_uploads/events/Brussels_Urban_mobility/1._Two_decades_of_urban_renewal__the_rebirth_of_Mulhouse_-_part1.pdf

[15] https://climate-adapt.eea.europa.eu/metadata/case-studies/barcelona-trees-tempering-the-mediterranean-city-climate/11302639.pdf

[16] https://www.manchester.gov.uk/downloads/download/6314/manchester_green_and_blue_strategy

Integrating green infrastructure in spatial planning: the example of city of Graz (Austria)

The Urban Development Concept of Graz (UDC) is a legally binding instrument integrating GI into spatial planning. The document determines a set of mandatory regulations: greening of roofs and facades, maximum degree of soil sealing in built-up areas, minimum green areas per m²/inhabitant to provide the multi-benefits of improved air quality, adaptation to rainfall and flooding.
UDC has been strongly influenced by the Green Net Graz, a conceptual study on improving living conditions within a constantly growing city by means of green spaces. The study recommends that each citizen should live within 300 meters of a green space. As a result, there are existing green areas in high density parts of Graz and the number of green roofs is growing.
The idea of maintaining Green Net Graz as a reference document in spatial planning in parallel with an increasing pressure on open spaces due to development demands can be interesting for other urban areas. The practice can be useful for other public bodies interested to incorporate GI solutions in spatial planning and raise awareness about multiple benefits of GI.

It is worth noticing that the involvement of politicians from Styria in PERFECT project events contributed to raise their awareness about GI and enhance the role of GI in the spatial planning law of Styria. Specifically, in November 2019 the spatial planning and the building up law of Styria were renewed and additional regulations were introduced with regards to decreasing the ceiling factor, reducing parking spaces for cars in shopping areas, etc. To influence also the councillors of other Styrian municipalities to implement more GI in their planning instruments the project partner developed a "cookbook"[1] with recipes for green and healthy planning.

Further information about the practice is available here.
Presentation delivered at the thematic workshop on urban ecosystems available here.

Urban planning also needs to be harmonised with **sustainable planning of peri-urban areas**. Peri-urban areas are a transitional zone between the city and countryside and are usually characterised by diverse land uses. They can be found at the urban fringe along the edges of built-up area and comprise lower density settlements and urban concentrations around transport hubs. Peri-urban areas may be predominantly large green open spaces such as urban woodlands, farmland and nature reserves in the urban periphery, and as such are often characterised by a mix of fragmented urban and rural functions. Peri-urban areas tend to be affected by the expansion processes of the cities and pressure from the real estate market that in many cases lead to biodiversity loss, soil sealing and further degradation of natural assets. These challenges are dealt with by PROSPERA and RENATUR projects that aim to improve the effectiveness of regional policies in this area.

Sustainable planning in peri-urban areas requires **strong stakeholder engagement** in order to move from the 'not in my backyard' attitude to a more productive cooperation. An integrated approach is needed to achieve development objectives with focus on environmental protection, the provision of ecosystem services, the creation of green infrastructure alongside local economic development, and the maintenance of quality of life. A successful example in tackling these challenges, identified by U2L2 project, is the Nordpark Pulheim. The inner-city green areas in Pulheim (DE) were not sufficient to meet the citizens' needs for green areas. The city authorities launched an initiative aiming to transform an area between the city and the adjacent farmlands into a park. A new urban landscape with field paths, tree-lined avenues and parcelled fields was implemented offering new use forms for the citizens while enhancing biodiversity. This innovative idea, its participatory approach in the planning process, its results and lessons serve as a model for other cities.

Nordpark Pulheim. Source: UL2L

Urban ecosystems in modern urban planning are often linked to the **regeneration of derelict areas such as former industrial sites, mining sites or other cultural heritage sites.** As stressed by UL2L partners[17] the combination of architecture, art, culture, heritage, environmental gains and social improvements is a key factor for a new urban landscape. An inspiring example in this regard is **the Emscher Landscape Park (ELP) in Germany (**UL2L project[18]), one of the biggest landscape investment programmes in Europe. The ELP consists of several individual parks, industrial natural landscapes, artificial landmarks. Elements are interconnected via green corridors and small-scale green slinks with leisure trails, e.g. cycling tracks on defunct railway lines and riverside trails.

[17] https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1548061714.pdf
[18] https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1548061714.pdf

Urban and peri-urban agriculture

In recent years, there has been an increasing interest in **urban and peri-urban agriculture**[19]**.** It has shown a significant number of benefits on several aspects of the citizens' quality of life: first, it responds to the growing need expressed by the citizens to ensure sustainability of the food chain "from farm to fork" and thus contributing to circular economy objectives: it tackles (food) waste, reduction of energy consumption and the demand for more quality foods. Secondly, it contributes to the preservation of biodiversity. Also growing food and non-food crops in and near cities contribute to healthy communities by engaging residents in work and recreation that improves individual and public well-being. Finally, urban faming also offers possibilities for small-scale entrepreneurship (agri-tourism, social care, kindergarten farms or nursery-school services).

There are great varieties of urban agriculture, like community gardens, allotments, backyard gardens, rooftop gardens, vertical gardens, urban farms or city farms or the so-called ZFarming (zero-acreage farming) [20]. As a new use form of urban landscape, **urban gardens** are more appealing and useful when they are well planned and designed. For example, the city of Ferrara (Italy), a partner in PERFECT project, developed a regulation for participatory management of public green areas to improve the maintenance and foster community integration. The initiative brought positive outcomes related to the improvement of common kitchen gardens and green urban spaces and contributed to social integration.

Urban garden in Ferrara. Source: PERFECT

[19] A distinction is often made between urban agriculture (involving food production in an urban area) and peri-urban agriculture, which occurs on the fringes of cities.
http://www.europarl.europa.eu/RegData/etudes/IDAN/2017/614641/EPRS_IDA(2017)614641_EN.pdf

[20] http://www.europarl.europa.eu/RegData/etudes/STUD/2018/617468/IPOL_STU(2018)617468_EN.pdf

There are just a few examples of **healing gardens**[21] in public parks in Europe. One of these is located in the inner-city park of the Swedish city of Kristianstad and has been identified as a good practice by UL2L project. The construction of the healing garden was initiated by the municipality with the aim to include special needs groups in a health preventive activity and increase their well-being.

The healing garden of Kristianstad. Source: U2L2 project

The City Zen project explores the business opportunities that **urban farming** brings to the ecosystem and the links to innovative entrepreneurship and supply chains. One of the successful approaches comes from the city of Beja, Portugal. The process followed in Beja is focused on fostering community-building, setting-up of proper structure and regulatory framework within the municipality, providing the needed support and continuous monitoring and maintenance of the urban farms.

Peri-urban areas also offer significant potential for agri-food production. Some cities address the issue of increasing land consumption by promoting the return to peri-urban agriculture and reconversion of land to rural use. An interesting example demonstrating the potential of peri-urban agriculture comes from the municipality of Reggio Emilia, a partner in PROSPERA. Near the Italian city of Reggio Emilia, the Operational Group 'Edible Park' has set up an agroforestry-based farm that supplies fresh products to the city inhabitants. The farm spans about 1 ha of farmland, with 80 mulberry trees planted in rows between the crops. This enhances biodiversity and helps to maintain the traditional rural landscape of the area. Led by a social cooperative, with the inclusion of disadvantaged workers, the park offers high quality products to their customers and explores new supply chain models[22].

[21] A "healing garden" is a garden or landscape designed for a specific population, place and intended positive health outcome (Sachs, 2016). Further information is available here.

[22] https://www.interregeurope.eu/urbanecosystems/conclusions/

Funding urban renewal

In addition to Cohesion Policy funds allocated towards “innovative urban actions” there are other funding schemes. Some cities are taking more active role to involve private sector in revitalizing urban ecosystems. For example, the Belgian city of Ghent[23] set up a crowdfunding platform to allow citizens to share ideas for climate change solutions and fundraise. It also offers a municipal subsidy for the crowdfunded projects, an approach that links public and private financing for nature-based solutions. A good example in developing a subsidy scheme at city level for redesigning schoolyards is illustrated below:

Amsterdam Schoolyard Incentive

The Amsterdam Schoolyard Incentive (ASI) is an annual subsidy scheme supporting the design or redesign schoolyards in Amsterdam. The objective is to make schoolyards more accessible outside regular school hours, support the creation of more playgrounds in the city and green space for schoolchildren. School boards and district committees can apply for funding and will also receive support from a team of experts at the City of Amsterdam in planning their new schoolyards.

The budget for ASI was 3.5 MEUR for 2016-2018. There are currently 24 schoolyards which have been redeveloped through this scheme. As a result of the initiative, 77.000 m2 green, attractive and safe playgrounds were established as well as 30.840 m2 extra (semi) public playgrounds. 19.200 m2 extra green space was added to the city.

ASI has developed a transferable checklist to advise cities on what to look for to improve schoolyards, what are the challenges and what are the multi-benefits such as durability, addressing flooding problems, mobility, education, green maintenance, participation. ASI can serve as a source of inspiration for the cities which are aiming to support the creation of more playgrounds and green spaces in the city. Improving accessibility of schoolyards outside of regular school hours and using them as a community asset is not a common practice.

Further information about ASI here.

[23] https://oppla.eu/strategies-financing-nature-based-solutions-clever-cities-and-call-input

What can cities and regions do next?

Interregional cooperation offers the possibility to share good practices and policies, explore synergies and discover new perspectives for improving urban ecosystems.

Planning

- Urban policies increasingly use green infrastructure and nature-based solutions in the planning process. Also, an increasing amount of data is becoming available to support these policies as noted in MAES 2016 report on urban ecosystems policies. Implementation of urban green infrastructure projects needs to be further encouraged, in particular the **bottom-up initiatives** which increase local ownership. In addition, policies should stimulate developers and local authorities to consider nature-based solutions from the beginning of any urban project or strategy.
- Urban regeneration requires a long-term strategy and in addition to environmental objectives, policy measures in areas such as land-use, mobility, housing should be also considered.
- Further efforts are needed with regards to **mainstreaming GI in the regional and local development policies** as highlighted in 2019 review of the EU Green Infrastructure Strategy. To achieve this, there is a need to further raise awareness and build capacity on the linkages between GI and other sectors. Better use of integrated spatial planning processes, improved capacity of decision-makers and improved cross-sectoral cooperation are important elements to address this challenge.

Political support

- There is a need to **ensure political commitment and support** as emphasised during the thematic workshop on urban ecosystems. The experience of Styria in strengthening GI in the amended spatial planning law can serve as positive example in keeping politicians informed about the benefits of GI and the need to take more ambitious steps in this field. Emscher Landscape park is an inspiring example of the transformation of a former industrial landscape based on political consensus on a regional and state level, a long-term strategy and funding programmes, as well as the joint work of twenty municipalities, two districts, three regional governments, a federal state and other authorities.

Stakeholder engagement

- Public authorities need to pay particular attention to the **engagement of citizens in restoration actions.** Specifically, there is a need **to initiate projects focusing on reconnecting people with nature,** to facilitate project ownership, to build a sense of community and to support shifts in mindsets and behaviours. The transformation of an area between the city and adjacent farmlands into a park, as in the case of Nordpark Pulheim is a positive step that can be inspirational for other cities.
- Highlighting the multiple benefits of GI including health benefits can be also essential for securing the support of multiple stakeholders as well as investments. The Handbook on rethinking green infrastructure developed by PERFECT partnership includes case studies, participation tools and

stakeholder involvement processes aimed at decision-makers that can be interesting for other cities.

Integrating results from research and innovation

- Managing Authorities of Structural Funds and other policy makers need to **take up the results of GI-relevant research and innovation** and add ambition in terms of scale of interventions and coherence among them. This was also recommended in the recent Review of progress on implementation of the EU green infrastructure strategy**.**

Financing

- In the 2019 review of the EU Green Infrastructure Strategy it is highlighted that the opportunities embedded in the various EU financing instruments have not been fully used and that **access to finance remains to be improved**. In addition cities need to **create financial schemes** for supporting investments in GI elements in urban areas as illustrated by Amsterdam Schoolyard Incentive. Improving knowledge on how to **combine different sources and better use of future EU funding** instruments is also essential for stimulating the deployment of GI.
- The increasing evidence of economic benefits of green infrastructure should be used to create a strong business case to demonstrate the value of investing in it. Financial incentives (subsidies, vouchers) for private companies that consider nature-based solutions were recommended during the discussions at the Policy Learning Platform's thematic workshop on urban ecosystems. Participants at the workshop also noted that managing of conflicting interests with regards to land use patterns, balancing economic vs. environmental goas is also essential.
- There is an enormous potential for **sustainable agriculture development in peri-urban areas** with opportunities for job creation and innovation. To unlock this potential, public authorities need the appropriate mix of funds and policies. Besides, smarter logistics can shorten the distance between producers and consumers, stimulating market opportunities for local farmers and giving citizens access to healthy and sustainably grown food.

Sources of further information

Policy learning platform publications:

- Policy brief on protection and sustainable management of heritage in coastal and fluvial regions
- Policy brief on biodiversity and natural heritage
- Policy brief on ecosystem services: Interregional cooperation for sustaining the European natural capital
- Policy brief on Development of green infrastructure in EU regions
- Thematic workshop on natural heritage, workshop brief
- Thematic workshop on urban ecosystems, workshop brief

Other sources

- EC, EU Action Plan for nature, people and the economy, 2017
- EC, Mapping and assessment of ecosystems and their services: urban ecosystems, 2016
- EPRC, Urban agriculture in Europe, 2017
- EC, Towards an EU R&I policy agenda for nature-based solutions and re-naturing the cities, 2015
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#natural heritage, #urban ecosystems #cooperation

Environment and resource efficiency

Interreg Europe Policy Learning Platform on Environment and resource efficiency

Thematic experts:

Venelina Varbova, Astrid Severin & Ruslan Zhechkov

v.varbova@policylearning.eu a.severin@policylearning.eu r.zhechkov@policylearning.eu

www.interregeurope.eu

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