

RESILIENT MODERN CITIES, WITH A LITTLE HELP FROM OUR NATURE

Green infrastructure integration into urban spatial planning

THE CHALLENGE

European cities are facing a wide range of challenges as the urban population is growing, the environmental degradation is increasing and the effects of climate change are starting to impact our daily lives. The projections indicate that 82% of Europe's population will live in cities by 2050, which will involve a wide array of social, environmental and economic changes. Concerns about the quality of life in urban environments are growing and it's becoming evident that the current urbanization models are not compatible with our needs. Air pollution, heat stress, high levels of obesity and related diseases due to low physical activity levels and noise pollution are just some of the challenges that urban areas in Europe are currently facing. Climate change is expected to increase the frequency and intensity of heat-waves, floods and droughts, which will trigger other challenges.

A big task is now in front of regional and local authorities – **creating sustainable, healthy and resilient cities that will be able to afford to withstand future challenges and provide well-being to its citizens.**

DID YOU KNOW?

- IF THE AVERAGE TEMPERATURE INCREASES BY **2,5°C**, THE ANNUAL DAMAGE TO THE EU ECONOMY WOULD BE **€20 BILLION**
- IF THE AVERAGE TEMPERATURE INCREASES BY **5,4°C**, THE ANNUAL DAMAGE TO THE EU ECONOMY WOULD BE **€65 BILLION**

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**DID YOU
KNOW ?**

**BY 2050, 82% OF EUROPE'S POPULATION
WILL LIVE IN CITIES.**

HOW CAN NATURE HELP?

Cities depend on green spaces for many services. By integrating nature into our urban society, we can achieve multiple benefits for people and the environment. One of the most effective ways to mainstream nature into urban developments and to maximise the benefits for citizens and the environment is by having more **green infrastructure in cities**.

WHAT IS GREEN INFRASTRUCTURE?

Green infrastructure (GI) is a network of green spaces conceived to provide **multiple benefits both for people and for nature**.

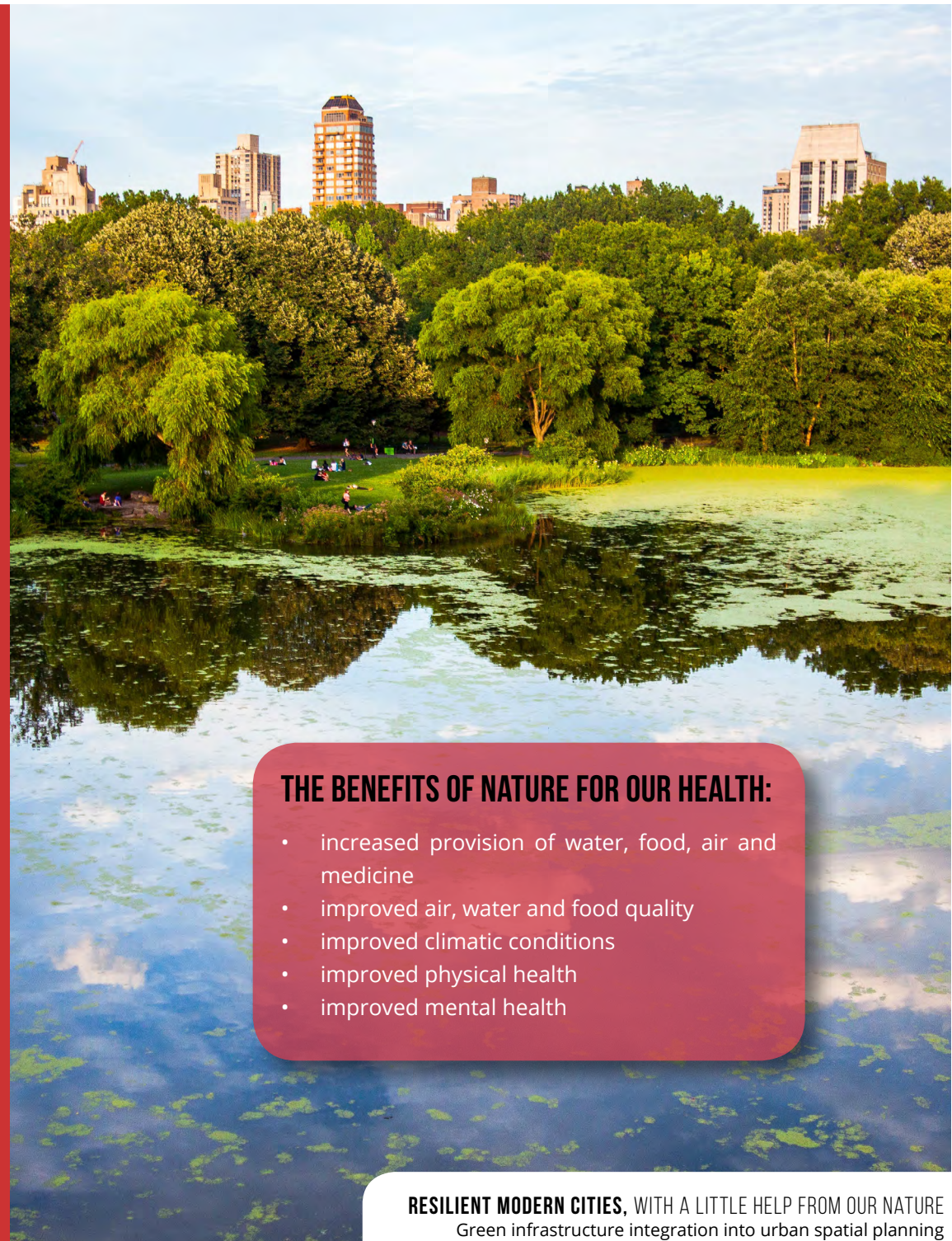
Parks, gardens, tree lines, orchards, woodlands and other green spaces (or "green infrastructure elements") have always been around us, and are now getting more and more popular as growing urban population is seeking to reconnect with nature. They are present both in urban and rural settings and can range from small-scale urban spaces such as green yards, indoor gardens and green roofs, to very large areas such as nature reserves. The extended GI concept also includes the so-called blue elements that are linked to water, such as ponds, streams and wetlands.

Moreover, the added value of green infrastructure is in putting these elements together into a network in order to enhance their connectivity and thus strengthen the multiple benefits that they provide for all. It also allows creating a framework for a more structured approach to the management of those benefits.

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WHY SHOULD OUR CITIES BE GREENER?

- To fight **climate change effects**: green areas in the city can hold large amounts of water and create cooling areas with natural shade. Urban trees and green roofs can provide multiple benefits in cities by reducing the overall temperature. This can lead to significant savings and long-term solutions, especially considering the high costs of the predicted damage by climate change
- To **improve our health**: urban nature has a positive effect on a whole series of health issues: it contributes to providing sufficient clean water thanks to the vegetation that retains sediments and absorbs water pollutants; it provides better air quality; reduces noise levels by absorbing sound; it decreases physical inactivity which is linked to chronic diseases by motivating citizens to spend time in nature and engage in physical activities; it leads to improved mental health and social wellbeing by creating healthier communities. These too can ultimately lead to healthcare savings
- To **make us smarter**: spending time in nature can strengthen learning and the development of the brain – making nature accessible to schools and the public provides opportunities for learning about plants, animals and the physical environment
- To **provide more healthy food**: urban gardens contribute to the intake of locally produced food and mitigate the loss of connection to food production
- To **create new jobs**: the development of green infrastructure requires technical knowledge and maintenance



THE BENEFITS OF NATURE FOR OUR HEALTH:

- increased provision of water, food, air and medicine
- improved air, water and food quality
- improved climatic conditions
- improved physical health
- improved mental health

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WHY SHOULD OUR CITIES BE GREENER?

- To **increase property value and attract investments**: green infrastructure improves the aesthetics of an area, which in turn can affect the property value and attract investment. This can bring improvements in terms of access to public services, living and working conditions and good quality housing
- To support **connectivity between urban and rural areas**: If nature is burdened with too many barriers that were built without considering nature's services for people, such as dense road networks, river dams or inadequately positioned power lines, then nature is not able to deliver its benefits for people and the environment. That can lead to severe disasters such as flooding or droughts. Without properly functioning ecosystems, extreme events, such as floods and droughts are more difficult to handle. GI provides this missing link by connecting different species and their living space
- To **conserve biodiversity**: green urban areas protected as Natura 2000 sites, which are present in over half of the capital cities in EU, harbour 40% of the threatened habitat types, half of the bird species and a quarter of the rare butterflies listed in the EU Nature Directives
- To **decrease our energy demand**: urban green areas can cool their surroundings by shading building surfaces, deflecting radiation from the sun and releasing moisture into the atmosphere. This helps to reduce the area's overall energy demand and thus contributes to the moderation of the temperature in the cities, which is usually significantly higher than in surrounding rural areas, a phenomenon known as the 'urban heat island' effect

GREEN INFRASTRUCTURE AND CITIES: EUROPEAN EXAMPLES

THANKS TO INCREASING EVIDENCE ON THE BENEFITS OF GREEN INFRASTRUCTURE, THIS CONCEPT HAS GAINED MOMENTUM IN RECENT YEARS IN PLANNING FOR SUSTAINABLE LAND USE IN URBAN AREAS.

VICTORIA, LONDON (UNITED KINGDOM)

In the recent years there have been significant efforts to improve the urban space around the Victoria area in London, a process led by a business partnership (The Victoria Business Improvement District). The improvements included introducing more green roofs, green walls, rain gardens (vegetated surfaces designed to attenuate rainfall), tree planting and garden spaces. The aim of these activities was to obtain benefits both for nature and people: increase the available space for species that inhabit urban green areas, reduce flood risk by slowing the flow of rainwater into the drainage system, cool the air and filter pollution. An evaluation among the stakeholders (businesses, workers, visitors and residents) has shown that as a result of these activities local businesses have started to increasingly recognise the value of GI in terms of attracting customers and maximising spending (with people spending more time in the area); workers and residents feel happier with more GI; employees with dedicated green spaces report improved morale at work and believe investing in GI is worthwhile for larger businesses; workers perceive increased opportunities to interact with colleagues in a more relaxed setting. When naming concrete benefits, the respondents have made connections between the GI and wider environmental concerns (air quality, flooding, climate change) and nature (pollination, habitats for wildlife). Victoria now has one of the largest and most environmentally beneficial living walls in London and is actively involved in GI research and analysis of its further benefits to the urban environment.

BARCELONA GREEN INFRASTRUCTURE AND BIODIVERSITY PLAN 2020 AND THE TREES MASTER PLAN 2015-2035 (SPAIN)

The Barcelona Green Infrastructure and Biodiversity Plan 2020 sets the goals for Barcelona to become a city where natural and urban blend together and enrich each other. It also aims to tackle challenges such as climate change adaptation, changes in population and health. New forms of green infrastructure will be incorporated into the city to increase acoustic comfort (lower noise levels), along with climate comfort and air quality. Increasing the area of green spaces in the city will encourage people to get outside and be active.

People can also become more active in the community gardens through a program called Horts Urbans. These gardens provide citizens with the opportunity to grow their own nutritious organic vegetables and to practice recreational outdoor activities. Thirteen different elements of GI will be built, including green corridors. Within this framework, the city has developed The Trees Master Plan 2015-2035. Currently, the city counts with over 200 000 trees, approximately one tree every 10m of street, which already represents an above-average value in the EU. By planting more trees in the future, more than 5,000 net tons of CO₂ and 305 tons of pollutants will be removed from the air yearly.

CHRUDIM (CZECH REPUBLIC)

Chrudim has been part of the WHO Healthy Cities Project for more than a decade now. It has invested in green infrastructure to promote sustainable living in a healthy city. The city has run a programme of greening to deliver health benefits to its citizens and visitors. Notable activities include investing in arborists to care for city trees, developing new public parks, greening housing estates, and providing residents with new opportunities for outdoor recreation. The town has developed a Plan of Municipal Greenery Maintenance, which included the creation of 11,000 m² of additional green space. Around 1000 people participate in voluntary projects organised by the city each year. Furthermore, the city has a number of ongoing campaigns to promote healthy lifestyles and the links with biodiversity.

Chrudim continues to promote healthy living, for example with its "Health Plan 2015-2018", which aims to address several issues such as active ageing, non-infectious diseases, and reducing alcohol-, drug- and tobacco-related harm. The Health Plan is based on data and statistics on the current health status of the citizens of Chrudim. This is supported by a number of health/biodiversity promoting campaigns ongoing, such as the "Days of Health", the "Day of the Earth" and the "Bio-market". The citizens have indicated that they are now cycling more and actively using the cycling paths that were built in the town.



WHAT CAN YOU DO?

Despite the recent increase in development of green urban areas, there is still a high untapped potential for green roofs, tree-lined streets and wider urban greening, which in turn can support the delivery of improved health and social benefits.

In urban planning, it is very important to establish an **approach based on the multifunctionality of green infrastructure**, which can contribute to cost-effectiveness and to gaining stakeholder support. In doing so, it is necessary to take into account the benefits of urban natural capital and **provide incentives** for protecting and restoring natural systems, recognising their multiple functions and values. For GI to contribute effectively to urban sustainability, it should be practiced in a transdisciplinary manner. That way it is possible to meet the needs of stakeholders, gain support of decision makers, engage scientists and engineers, and motivate planners and designers to innovate.

HOW CAN WE ENHANCE THE ROLE OF GI IN URBAN ENVIRONMENTS?

- **Map and evaluate current green areas** (including Natura 2000 sites) and their connectivity in order to better define the needs for improvement;
- **Promote strategies, plans and investments** that take into account the social, health and wider benefits of nature in urban environments, to meet the interest of their citizens;
- **Integrate GI elements into policies, strategies and plans**, such as noise mitigation plans, health and climate adaptation strategies and plans;
- **Integrate urban and peri-urban Natura 2000 sites** into landscape management plans, communicate and promote them as recreation areas;
- **Support, promote and invest in GI projects:** investing in wetlands, urban forests and parks, green walls and roofs, and creating green corridors to connect cities with surrounding rural areas have great potential to bring substantial benefits to all urban citizens;
- **Promote the benefits of green infrastructure** for a quality life in urban environments through education and capacity building: increasing knowledge can help to integrate nature's solutions into urban planning and practice and support cities in strengthening their capacity to adapt to social, environmental and economic change;
- **Support the exchange of knowledge and best practices:** lessons learned and best practice cases can provide significant input for projects in development;
- **Involve stakeholders:** getting together practitioners from different disciplines and city departments as well as inhabitants, scientists and NGOs can help increase support for projects and motivate further actions and collaborations.



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GREEN INFRASTRUCTURE IN SPATIAL PLANNING-RELATED POLICIES AND INITIATIVES

EU Regional Policy, also referred to as **Cohesion Policy**, calls for an integrated approach to urban development, which includes the environmental dimension of urban life, among others: “Measures concerning physical urban renewal must be combined with those promoting education, economic development, social inclusion and environmental protection”.

The UN Human Settlements Programme (UN-Habitat): a UN agency for human settlements and sustainable urban development. It includes the Cities and Climate Change Initiative and it also works towards the UN Sustainable Development Goals (Goal 11: Sustainable Cities and Communities), both of which have a significant environmental component.

Covenant of Mayors for Climate and Energy Initiative: gathers thousands of local and regional authorities in EU countries voluntarily committed to implementing EU climate and energy objectives on their territory. Signatory cities pledge action to support implementation of the EU 40% greenhouse gas-reduction target by 2030 and the adoption of a joint approach to tackling mitigation and adaptation to climate change. Each signatory has to develop a Sustainable Energy and Climate Action Plan (SECAP) outlining the key actions they plan to undertake.

The **EU Green Infrastructure Strategy**: although not a spatial planning policy, it does aim to mainstream the concept of GI in spatial planning and territorial development.

CURRENT EU FUNDING POSSIBILITIES FOR INTEGRATING GREEN INFRASTRUCTURE AND URBAN SPATIAL PLANNING

EUROPEAN REGIONAL DEVELOPMENT FUND (ERDF):

Thematic objective 1 – strengthening research, technological development and innovation – it is possible to develop concepts and solutions for GI linked to eco-innovation. This could be used for the development of smart innovations that include GI elements in cities.

Thematic objective 5 - promoting climate change adaptation, risk prevention and management- it is possible to have dedicated investments for adaptation to climate change which can include developing green infrastructure to ensure local/regional adaptation to climate change. Specifically, urban infrastructure developed through this objective can include GI elements. Also, it enables developing ecosystem based solutions for protection from natural disasters such as floods and landslides. The same objective is present in the **Cohesion Fund (CF)** as well.

Thematic objective 6 - protecting the environment and promoting resource efficiency - it is possible to develop, implement and monitor elements of GI in urban and peri-urban areas through the actions that aim to improve the urban environment, more effective wastewater treatment and to protect green areas of cultural significance, such as historical gardens.

Thematic objective 10 - investing in education, skills and lifelong learning by developing education and training infrastructure, it can be possible to educate spatial planning professionals on the benefits and the importance of green infrastructure in urban development.



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CURRENT EU FUNDING POSSIBILITIES FOR INTEGRATING GREEN INFRASTRUCTURE AND URBAN SPATIAL PLANNING

EUROPEAN SOCIAL FUND (ESF):

Thematic objective 11 - enhancing institutional capacity and efficient public administration - it can be used to develop institutional capacity for integrated spatial planning, long-term and sector-overarching management of GI.

COMMUNITY-LED LOCAL DEVELOPMENT (CLLD) and **INTEGRATED TERRITORIAL INVESTMENTS (ITI)** are EU's territorial cohesion tools also funded through the above mentioned funds. They offer the opportunity to develop projects at interregional and sub-regional levels that can include the development of GI for the protection of natural heritage and improved resource management, and thus facilitate sustainable territorial development. These can be adequate tools for the development and connectivity of GI in nearby urban areas.

In order to access these funds, please check the relevant **Operational Programme (OP)** in your country or contact CEEweb for Biodiversity for more info.

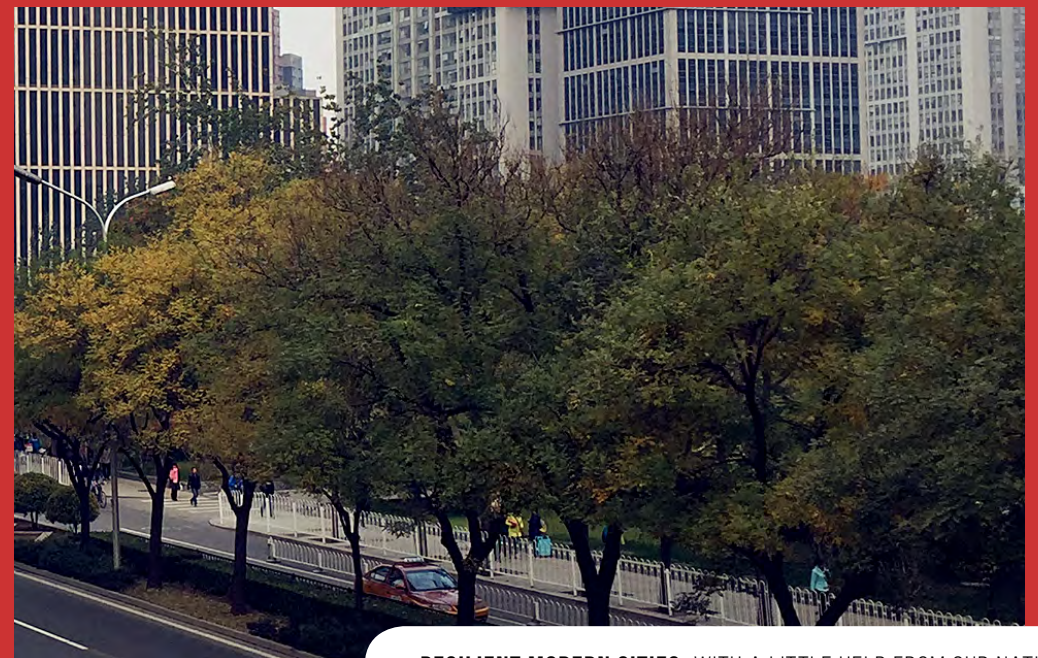


URBACT III PROGRAMME

European Territorial Cooperation programme that aims to foster sustainable integrated urban development in EU cities by enabling cities to work together to find solutions for urban challenges. The environment is among the main topics covered by this programme and it could include the development of GI as a new approach to creating resilient and sustainable cities.

LIFE PROGRAMME

EU's financial instrument that supports environmental, nature conservation and climate action projects throughout the EU. It offers possibilities of applying for big projects that can include multiple aspects of urban GI (including Natura 2000 sites) and is an excellent tool for the development of innovative and groundbreaking ideas.



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THE EUROPEAN GREEN CAPITAL AND GREEN LEAF AWARDS

The European Green Capital and Green Leaf Awards are European Commission initiatives that identify and reward local efforts to improve the environment, the economy and the quality of life in bigger and smaller EU cities, respectively. The idea is to provide an incentive for cities to inspire each other and share best practice, and at the same time raise awareness on local levels that EU citizens have the right to live in healthy urban areas. Cities should therefore work

towards improving the quality of life of their citizens and reducing their impact on the global environment. The requirements for the applicant cities is that they have a consistent record of achieving high environmental standards, are committed to further environmental improvement and sustainable development and can act as a role model to inspire other cities and promote best practices. Identifying cities who can act as role models (*green ambassadors*) is essential for

mainstreaming sustainable and green development of European cities.

The European Green Capital for 2017 is the city of Essen in Germany, while the European Green Leaf was awarded to Galway (Ireland). Any European city can apply for one of the two awards (depending on its size) and we are strongly encouraging you to do so!



WHERE CAN I FIND FURTHER INFORMATION?

CEEWEB FOR BIODIVERSITY has vast experience in all aspects of green infrastructure, including policy and project development, providing training for stakeholders and implementing projects at local, national and international level. This experience is further maximized and enhanced through our network of non-governmental organizations in Central and Eastern Europe. We have collected extended knowledge on green infrastructure and its beneficial role in providing a healthy and pleasant urban environment.

You can consult our Green Infrastructure Hub with a large number of articles and videos at: www.ceeweb.org/green-infrastructure/ or you can contact our *Biodiversity Policy Officer* **Biljana Aljinović**: biljana.aljinovic@ceeweb.org

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GREEN INFRASTRUCTURE INTEGRATION INTO URBAN SPATIAL PLANNING

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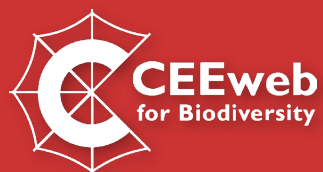
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CEEweb for Biodiversity is a network of non-governmental organizations in the Central and Eastern European region working for 20 years in 20 countries. Our mission is the conservation of biodiversity through the promotion of sustainable development.



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