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Embracing biodiversity: Paving the way for nature-inclusive cities

How many different species of animals and plants can you spot in a city? How often do you immerse yourself in urban nature? Are today's city-dwellers alienated from nature more than ever?

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Cities: biodiversity threat or hotspots?

Cities are at the forefront of both the causes and impacts of major environmental challenges, such as the climate crisis, pollution and biodiversity loss. Urban ecosystems tend to have lower levels of biodiversity than natural environments due to the intensive use of land, fragmentation of green spaces, and the introduction of non-native species.

Over recent decades, urbanisation has been a major driver of habitat loss and "residential and commercial development" is the third most frequently cited threat to species in the IUCN Red List. Such threats displace native flora and fauna and decrease the abundance and diversity of species. Moreover, urbanisation creates physical and chemical barriers that can prevent the movement and dispersion of species, limiting their ability to find food, shelter, and breeding partners.

However, cities are also at the forefront of our responses to these crises, providing opportunities for biodiversity conservation and enhancement. Well-managed urban areas can support high levels of biodiversity, and many cities are already located within globally recognised "biodiversity hotspots". Urban green spaces, such as parks, gardens, and green roofs, can support a diverse range of native species and provide important habitats for pollinators, birds, and other animals.

By incorporating nature-based solutions (NbS) into urban design and planning, cities can promote ecological connectivity and support the resilience of local ecosystems. Furthermore, urban biodiversity can have important benefits for human well-being, such as improving air quality, reducing urban heat island effects, and providing recreational and educational opportunities.

How policy is addressing urban biodiversity

The EU has developed a range of policies and initiatives to promote urban biodiversity, recognising the important role that urban green spaces and NbS can play in enhancing the resilience and sustainability of urban areas. The EU Biodiversity Strategy for 2030, adopted in May 2020, includes a specific target to enhance urban biodiversity by creating and restoring green and blue infrastructure and improving connectivity between urban and peri-urban areas. The strategy also aims to mainstream biodiversity into urban planning and design and promote the integration of NbS into urban areas to support climate change adaptation and mitigation. With the new EU Nature Restoration Law the Commission set an overarching target to restore 20% of the EU's land and sea area by 2030 and all ecosystems in need of restoration by 2050.

Given the severe consequences of biodiversity loss, it is imperative that cities step up and assume a leading role in addressing this critical issue and actively work towards reversing the current situation.

Why does urban biodiversity matter?

Conserving urban biodiversity is not only beneficial to animals, but also to humans. Biodiversity can provide a number of benefits to urban residents, such as reducing flood risk by improving soil drainage, controlling pest populations, pollinating local flora, and contributing to mental health and psychological well-being.

It is estimated that each hectare of urban green area provides a range of between €2,500 and €16,500 of benefits every year in terms of carbon storage, stormwater reduction and pollution removal **Elmqvist, et al., 2015 (https://www.sciencedirect.com/science/article/pii/S18773435150004337?via%3Dihub)**). Further, tree shade and evapotranspiration can reduce temperatures by 1-5 °C, thus reducing the negative health impacts of the urban heat island effect (**EPA, 2022 (https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands)**).

Birdwatching and listening to bird songs have been shown to have positive effects on mental health, and many urban residents value the presence of wildlife in their communities and support conservation efforts. Beyond the benefits to our health, conserving urban biodiversity and spending time improving local parks can help to build a sense of community and promote social cohesion.

The presence of wildlife is also an indicator of environmental health - if animals are attracted to an area, it’s a good sign that this space is free of chemical, air, and noise pollution and a safe place for people to pass time in.

Discover more about the many benefits of biodiversity below:

1. **Improved Air Quality**: Green spaces can improve the quality of the air we breathe. Green spaces, including trees and vegetation, help mitigate air pollution by capturing and filtering harmful pollutants (**Diener, Mudu, 2021 (https://www.sciencedirect.com/science/article/pii/S0048969721036779)**).
2. **Enhanced Mental Well-being**: Access to nature in cities has been linked to improved mental health and well-being. Research conducted by the University of Exeter Medical School demonstrated that individuals living in neighbourhoods with higher levels of green space reported lower levels of mental distress and better overall well-being (**White et al., 2013 (https://journals.sagepub.com/doi/10.1177/0956797612464659)**).
3. **Climate Regulation**: Urban green areas aid in regulating local climates by providing shade, reducing the urban heat island effect, and cooling the surrounding areas. A study published in the journal Landscape and Urban Planning found that an increase in urban vegetation cover can lead to a temperature reduction of up to 6°C in cities during day time (**Ossola et al., 2021 (https://www.sciencedirect.com/science/article/abs/pii/S0169204621000098)**).
4. **Biodiversity Education and Awareness**: Urban biodiversity serves as a unique opportunity for education and fostering environmental awareness. By creating green spaces and urban wildlife habitats, cities can engage communities in nature-based activities, ecological restoration projects, and educational programmes (**Konijnendijk et al., 2013 (https://www.researchgate.net/publication/267330243_Benefits_of_Urban_Parks_A_systematic_review_-_A_Report_for_IFPRA)**).
5. **Ecological Resilience**: Diverse urban ecosystems are more resilient to environmental changes, including extreme weather events and climate change impacts. A study published in the journal Nature Education Knowledge shows that higher levels of biodiversity are better able to provide ecosystem services and adapt to disturbances (**Wall & Nielsen, 2012**

(https://www.nature.com/scitable/knowledge/library/biodiversity-and-ecosystem-services-is-it-the-96677163/)).

6. Supporting Pollinators: Urban areas can serve as crucial refuges for pollinators, such as bees and butterflies, which play a vital role in food production and ecosystem functioning. According to the European Commission, pollinators contribute to the production of approximately 80% of European crops (European Commission, 2021 (https://ec.europa.eu/environment/pdf/nature/conservation/species/pollinators/Progress_in_the_implementation_of_the_EU_Pollinators_Initiativ
7. Recreational Opportunities: Urban biodiversity offers recreational opportunities for residents, providing spaces for relaxation, physical activities, and connection with nature. According to a survey conducted by the National Recreation and Park Association, individuals who lived near green spaces had significantly improved mental health up to three years after their move, compared to pre-move mental health scores (NRPA, n.d (https://www.nrpa.org/our-work/three-pillars/health-wellness/parksandhealth/fact-sheets/parks-improved-mental-health-quality-life/).).
8. Economic benefits: More than half of global GDP – some €40 trillion – depends on nature. However, the global population of wild species has fallen by 60% over the last 40 years and continues to decline (European Commission, 2020 (https://commission.europa.eu/system/files/2020-05/env-20-002_factsheet1-vbo-en-b.pdf)). NbS for infrastructure could cost 50% less than grey infrastructure alternatives alone and deliver 28% in added value such as carbon sequestration, cleaner air and water, better health, recreational services, jobs and opportunities for growth in other sectors (e.g. water, health, tourism) (WEF, 2022 (https://www.weforum.org/agenda/2022/01/biodivercities-infrastructure-cities-nature/)).

Eight cities in the North Sea region taking action for biodiversity

A transition is underway in the North Sea region, with cities introducing NbS to become greener and more resilient. Biodiverse Cities (https://www.interregnorthsea.eu/biodiverse-cities), an Interreg North Sea project, will accelerate action for biodiversity by implementing urban investment programmes enriched with innovative NbS that halt biodiversity loss, support ecosystem services and balance the co-existence of people and nature, towards nature-inclusive societies.

Under the leadership of the City of Dordrecht in the Netherlands, Biodiverse Cities aims to implement biodiverse NbS in five pilot cities - Aarhus (DK), Bremen (DE), Växjö (SE), Lille (FR), and Dordrecht (NL), - and plan their replication in 3 pollinator cities - Hamburg (DE), Brest (FR), and Bergen (NO). The pilots cover the full range of city areas (densely built centres, peri-urban, etc.) and different types of greening activities (restoration of water ponds, reforestation, implementation of ecological corridors, etc.) to understand what works where and to deliver high-quality green and blue spaces.

The cities will deploy innovative community engagement methods using spatial experimentation and social design to bring citizens closer to nature, enhancing nature connectedness and improving physical and mental health. Citizens of the five pilot cities will be involved in spatial experimentation, temporarily transforming public spaces into green areas for community use with mobile gardens. This creative placemaking method will help citizens experience more nature in their vicinity and aims to increase NbS acceptance. Community activities (including nature therapy) will be organised locally to raise environmental awareness and involve citizens in the protection of biodiversity in public and private spaces.

The project will go beyond existing organisational practices to integrate biodiversity criteria in urban planning, urban development, and investments. Biodiverse Cities also aspires to influence relevant policies of regional and national governments to integrate biodiversity action. To ensure successful implementation the cities are guided and supported by top international and local experts in the field of ecology, ecosystem services, conservation, community engagement, co-creation and governance: Aarhus University, University of Bremen, Aeres University of Applied Sciences, Open Kaart, Vogelnest, Bremen Umwelt Beratung e.V and IUCN.

The partnership in the next four years aims to create valuable knowledge on how to effectively integrate biodiversity in urban environments while training and encouraging more cities in Europe and beyond to follow their lead.

Join the action!

The time has come for cities around the world to take the lead in protecting and restoring biodiversity, recognising that our own health and prosperity are intrinsically linked to the health of the ecosystems we inhabit. Through collective efforts, collaborative partnerships, and a commitment to sustainable urban planning, we can forge a future where thriving biodiversity coexists harmoniously with thriving urban communities. Let us embrace the opportunity to build greener, more livable cities that serve as beacons of hope and inspiration for generations to come.

Biodiverse Cities is co-funded by the Interreg North Sea Programme. More information on Biodiverse Cities will be soon available on the project's ***website*** **(https://www.interregnorthsea.eu/biodiverse-cities)**.

Biodiverse Cities | Interreg North Sea | Co-funded by the European Union

Photo: Biodiverse Cities / Interreg North Sea, co-funded by the European Union

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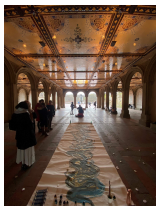

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