



## ACHIEVING IMPACT: HOW TO REALISE THE POTENTIAL OF URBAN NATURE-BASED SOLUTIONS?



### KEY FINDINGS

- Policy makers and planners have not yet tapped the full potential of nature-based solutions as a tool to overcome diverse urban pressures.
- Wider implementation and uptake requires increased buy-in, funding and integration across sectoral policies and augmented financial sector involvement.
- Coordinating between stakeholders that each capture some of the (multiple) values of an urban nature-based solution is a key challenge.
- Mandatory requirements through planning policies and regulations can strengthen the mainstreaming of nature-based solutions as an alternative or complement to grey infrastructure.
- Development practices need to be able to accommodate long-term outlooks and shift incentives to be more sustainable.

### THE NATURVATION PROJECT

NATURE-based URban inNOVATION is a 4-year project involving 14 institutions across Europe in the fields of urban development, geography, innovation studies and economics. We are creating a step-change in how we understand and use nature-based solutions for sustainable urbanisation.



## Rethinking urban development: What role for nature-based solutions?



The importance of urban green areas as a refuge to city dwellers and as a foundation for ‘recovering better’ has gained significant attention in light of COVID-19 and global lockdowns. The pandemic, while causing immense social and economic damages, also provides an opportunity to rethink urban development and spending for recovery plans. Nature-based solutions can be a powerful ally for cities aiming to achieve a sustainable, cost-effective and nature-positive recovery.

EU policy is increasingly recognising this potential, with new opportunities for strengthened investment in nature-based solutions emerging out of the European Green Deal and EU Biodiversity Strategy for 2030. Targeting the preservation and restoration of Europe’s natural capital, the Biodiversity Strategy places a special focus on urban areas and encourages European cities of at least 20,000 inhabitants to develop ambitious Urban Greening Plans by the end of 2021. These should, amongst other goals, help urban populations to adapt to the effects of climate change, mitigate the impact of natural disasters and increase the access of European citizens to high quality green spaces. With support from an EU Urban Greening Platform under the new ‘Green City Accord’ and the public support generated through individuals’ experiences with nature during the pandemic, there has never been a better time increase urban nature-based solutions action across Europe.



Yet while wide recognition and evidence of these and other potential benefits of nature-based solutions exist, a substantial gap persists between their promise and actual uptake. There is significant room for increasing political, financial and public support from the local to global levels. As a result, the application of nature-based solutions remains largely marginalised, fragmented, and disproportionate within and between cities, with the use of single-objective grey infrastructure continuing to dominate urban development. Wider implementation requires – amongst other factors – greater buy-in, funding and mainstreaming across sectoral policies. Valuing and financing nature based on these multiple benefits presents a critical opportunity for making these solutions competitive.

## Exploring the evidence to realise nature-based solution potential

The NATURVATION project has gathered evidence on how *urban infrastructure regimes* (i.e. the mix of institutions, techniques and artefacts in a city which shape their urban processes and the urban metabolism<sup>2</sup>) can shape the uptake of nature-based solution innovations in the regulatory arena, urban development area and financial systems. The urban infrastructure regimes of six countries – the United Kingdom (UK), Germany, Hungary, Spain, Sweden and the Netherlands<sup>3</sup> – as well as that of the EU were examined to identify the current roles of policy makers, urban planners, project developers, financial institutions, investors and other actors. Based on the evidence gathered, a key challenge was identified: How can the diverse stakeholders that each capture some of the (multiple) values of an urban nature-based solution best be coordinated for effective deployment?

<sup>1</sup> The multiple values of urban nature: Evidence from 1,000 European nature-based solutions, NATURVATION Briefing Note

<sup>2</sup> Monstadt, J. (2009). Conceptualizing the political ecology of urban infrastructures: Insights from technology and urban studies. *Environment and Planning A*, 41(8), 1924–1942. <https://doi.org/10.1068/a4145>

<sup>3</sup> These countries were selected as they are the six countries participating in the NATURVATION research project and vary based on planning traditions, environmental conditions and sociocultural traditions.

<sup>4</sup> Structural Conditions for Integrating Nature-Based Solutions: Regulatory Domain, NATURVATION, Deliverable 5.2; Structural Conditions for Integrating Nature-Based Solutions: Finance Domain, NATURVATION, Deliverable 5.3; Structural Conditions for Integrating Nature-Based Solutions: Urban Development Domain, NATURVATION, Deliverable 5.4



The present brief responds to this question and outlines comparative insights into the ways in which a regulatory framework, the urban development sphere, and financial systems can increase the uptake of nature-based solutions. It further highlights how the conditions that limit the use of nature-based solutions can be overcome to support a wider systemic integration into urban development practices<sup>4</sup>.

## Key challenges in governing and financing urban nature-based solutions

The benefits of nature-based solutions are widely recognised within the research and scientific communities, but translation into policy and financing has not yet been mainstreamed. Recognition of the multiple values of nature-based solutions should be inherent to its implementation, and delivering multi-functionality depends on collaboration between different government departments and funding streams as well as with wider urban stakeholders. A disconnect between sectoral actors, a preference for grey infrastructure on the basis of missing data and lack of understanding for the benefits of nature-based solutions, as well as a ‘business as usual’ mind set and the perpetuation of the status quo hinder such collaborations. A general understanding of the barriers to wider nature-based solutions uptake and of potential means to overcome these barriers are presented as a basis for identifying opportunities for action.

### Policy barriers

While nature-based solutions have demonstrated cross-cutting benefits for European priority areas such as infrastructure, health, climate adaptation, and sustainable development, urban budgeting, policy design and city planning processes often fail to integrate nature-based solutions as a viable solution. In cases in which nature-based solutions are foreseen for implementation, financial responsibility and decision-making power is often fragmented across different departments during the planning, construction and maintenance phases. This can result in an eventual neglect of implemented nature-based solutions or scaling down of the scope of the project in order to save on maintenance and construction costs. Decision-makers may also be hesitant to set strict requirements for the quality, quantity and distribution of nature-based solutions for fear of decreased interest of developers and investors. Even in cases in which green standards do exist, public administrations may be hesitant to enforce them due to a culture of risk aversion as well as the long-standing status quo of favouring grey over innovative green infrastructure. In addition, overly restrictive regulatory environments for urban space act as a hindrance for piloting novel, innovative and experimental nature-based solutions, thereby hindering necessary solution-oriented research to increase the evidence and data basis surrounding nature-based solutions’ benefits and values.

### Technical barriers

Grey infrastructure solutions are often preferred over nature-based solutions in urban development decision-making processes. This status quo is reinforced by urban development practices that value, for example, engineering expertise, established quantitative data, and single-objective solutions with proven effectiveness to what is perceived as a ‘more risky’ longer-term delivery of multiple benefits through nature-based solutions. As the urban development sector relies on quantifiable data to make planning decisions, the often case-specific nature of nature-based solution’s data and divergent methods underlying data on benefits can generate pushback from engineers and technicians. Technical skills (e.g. how to install resilient green roofs), data and experience with understanding the costs and risks of various types of nature-based solution, are required for confident funding support. While site-specific evidence is available in many cases, upscaling or transferring it to another region or context while ensuring accuracy remains difficult. The degree of technical expert consultancy required to advise cities on site-specific nature-based solutions may be unavailable or costly. Moreover, nature is unfortunately still often only viewed as an add-on at a later stage of urban planning rather than being integrated at the strategic level. Such practices make it

---

<sup>4</sup> Structural Conditions for Integrating Nature-Based Solutions: Regulatory Domain, NATURVATION, Deliverable 5.2; Structural Conditions for Integrating Nature-Based Solutions: Finance Domain, NATURVATION, Deliverable 5.3; Structural Conditions for Integrating Nature-Based Solutions: Urban Development Domain, NATURVATION, Deliverable 5.4

difficult to pursue many types of nature-based solutions, which would need to be considered earlier in project development in order to maximise the delivery of multi-functional benefits.



### **Financial barriers**

Concerns about the cost of nature-based solutions go beyond the site-specific expertise demanded by nature-based solutions for implementation, but also relating to uncertainty about construction and long-term maintenance costs and the relative long-term payback in urban infrastructure development. Large, institutional investors continuously overlook NBS as part of their standard investment routines on the municipality level, not only due to a knowledge gap, but also because a market-based challenge remains. Either projects are too small to finance separately (i.e. a green roof), the investor's return on the project may become attractive in the long run, but beyond their investment horizon (i.e. sustainable urban drainage system), or, because nature-based solutions may lack an evidence base due to their innovative nature, a standardised assessment to include NBS in their investment portfolios can be an issue. Developers' concerns about the impact of nature-based solution's costs on development profitability limit adoption of nature-based solutions as well. Inability to measure the performance in turn leads to uncertainty about whether and when the investment will be earned back. Also, developers often do not consider the wider benefits of nature-based solutions, as these often take the form of public goods and are not limited to those financing the nature-based solution. This is compounded by the lack of accepted methodologies to account for the full range of nature-based solution benefits (extending beyond their main objective), let alone to translate these into monetary figures. This thus further limits their consideration alongside grey infrastructure options.



### **Social barriers**

Nature-based solutions are often perceived to be a mainly ecological sustainability measure in the building construction industry, without broad recognition of the social and economic benefits. This perceived ineffectiveness or skepticism of nature-based solutions in solving social and economic challenges, together with a lack of capacity to innovate new methods to measure socio-economic benefits, stalls their uptake and hinders risk averse parties from the private sectors, such as real estate developers, from investing. It can also be the case that multiple

co-benefits are realised, but not actively 'owned' by any specific actor (e.g. green roofs provide biodiversity benefits, noise reduction, increased aesthetic appeal), leading to positive externalities which are not able to be 'claimed' by investors. Finally, it was found that where the urban development regime lacks a culture of cooperation between interested parties in the nature-based solutions realm, it can be challenging to create interdisciplinary partnerships to effectively plan and implement projects.

### **Integrating nature-based solutions into urban policies and planning processes**

The potential of nature-based solutions to help overcome diverse urban challenges is far from being reached. The barriers to reaching sufficient nature-based solution financing and implementation are manifold and to overcome these requires, amongst other actions, a range of political steps to be enacted. By making public funding available and including nature-based solutions in different sectoral or cross-sectoral policies and strategies, green solutions have the potential to become mainstream interventions with wide-reaching impact for sustainable urban development. Supporting the creation of innovative methods for assessing benefits of nature-based solutions will improve investors'



perceptions and foster investments and political support. Concrete political actions to benefit the uptake and mainstreaming of nature-based solutions are outlined below.

### **Frame nature-based solutions as a solution under diverse policy paradigms**

On the global level, nature-based solutions have led to a punctual convergence of the climate and biodiversity discourses, gaining attention for their ability to both protect biodiversity and support climate mitigation and adaptation goals. Increased awareness and recognition of nature-

based solutions' potential in this regard has also widened the scope of available funding streams. The EU reflects this trend, with the European financial sectors (e.g. banks, institutional investors and insurers) requiring increased transparency on the exposure of their investment portfolios to climate-related risks and climate mitigation under EU regulation. This combined momentum within public authorities and financial institutions to integrate climate change mitigation and adaptation measures into mainstream practices has already begun to result in a higher valuation, funding availability, incidence and implementation of related measures. This creates an opportunity to position urban nature-based solutions as a cost-effective adaptation and mitigation measure, unlocking funding stream which have previously been dedicated to more traditional grey infrastructure investments like sewage pipes or flood walls or – in some cases – solutions which can themselves exacerbate climate-related problems, such as installing air-conditioning in buildings to minimise the impacts of extreme heat. It is thus critical for public actors to engage the insurance sector as a key stakeholder of the risk reduction value of nature-based solutions. This is an approach that can be applied in other policy paradigms as well, such as the blue economy.

### **Establish a regulatory framework and standards for nature-based solutions**

#### **Utilising nature-based solutions to combat and reduce the effects of climate change in the urban environment**

The European Green Deal and its accompanying documents have outlined the Commission's plan for a sustainable green transition, including reaching climate neutrality in the EU by 2050, protecting human life, animals and plants by cutting pollution and helping ensure a just transition. The urgency to respond to climate change and in particular to extreme heat and flood risks is an opportunity to include nature-based solutions in national and local climate change adaptation plans and the Nationally Determined Contributions under the UNFCCC. As public funding is made available for the implementation of climate change adaptation and mitigation strategies, it is important to position urban nature-based solutions as a cost-effective complement or replacement to traditional grey infrastructure solutions.

Mandatory requirements and measurable targets through planning policies and regulations are helpful to support nature-based solutions' mainstreaming and implementation. This can be achieved through the development of dedicated greening policies, such as those called for by all European cities with over 20,000 inhabitants under the EU Biodiversity Strategy for 2030, or can take the form of city, regional or national standards and regulations (e.g. distance or access to green space, amount of green space per capita). Policy instruments - including regulations, strategies, programmes, action plans, and financial incentives - can be dedicated to nature-based solutions. They can also require the usage of nature-based solutions to address urban sustainability challenges such as climate

adaptation, integrated stormwater management, urban regeneration, and integrate them in a list of measures for their neighbourhood development plans as well as green roof subsidy programmes to incentivise the adoption of nature-based solutions.



### **Implement and regulate co-governance and funding mechanisms (public)**

Including diverse stakeholder groups, such as communities and citizens, water utilities and the insurance sector, as co-funders of urban nature-based solutions can create solutions that are more cost-effective. Co-financing a nature-based solution lets the overall risk be shared by all involved parties, while each may obtain their targeted benefits. To realise such a co-governance model, stakeholders need to work together, build trust and accountability, and implement a suitable mechanism to coordinate the process and responsibilities with a long-term view of the nature-based solution's maintenance and secured financing.



### **Align nature-based solution benefits with new stakeholders (private)**

Although the benefits of mainstreaming urban nature-based solutions through smart co-governance are widely recognised, current governance and funding mechanisms face challenges in trying to implement non-traditional models and approaches. An improved coordination and alignment of novel actors to the nature-based solutions realm (e.g. from the insurance sector, urban development sector, housing companies) and better communication of potential benefits of nature-based solutions could assist in making investments more attractive. Including new stakeholders as private investors or as partners in public-private-partnerships could lead to a significant cost reduction for cities in financing urban nature-based solution interventions.

### **Government-led or neutral third-party funding**

A typical co-governance mechanism that could help realise the implementation of nature-based solutions is a government-led or neutral third-party fund in which a variety of actors can participate to realise joint investments. Such a funding mechanism would need a transparent governance structure with clear investment criteria, such



as integrating nature-based solutions as a requirement for adaptation or infrastructure-related spending, decided upon jointly by the involved stakeholders. A monitoring approach is also needed to confirm that the multiple values sought by the different stakeholders are realised in practice. When developed on public space, nature-based solutions requires a public accountability structure to secure a just allocation of funds.

A novel approach to financing sustainable urban development is through 'green' labeled debt (e.g. public and private sector issued green bonds, green mortgages). Green bond offerings are attractive to municipalities since they can be obtained at a discount compared to regular debt and support the city's green reputation. Packaging sustainable urban infrastructure into green bond offerings is one way to overcome challenges related to what would otherwise be small and fragmented funding sizes. While nature-based solutions do not yet make up a large proportion of projects within green bonds, green bond issuers are interested in including projects that enhance biodiversity, environmental management, and climate resilience and present novel opportunities to increase the inclusion of nature-based solutions. Green bonds as funding instruments are, however, more suitable for established rather than cutting edge urban sustainability projects since they seek to deliver returns on investment with low risk to investors and, since different nature-based solutions have more financial return (or clearer risk mitigation properties) than others.

### **Develop and apply innovative knowledge tools**

Harnessing and applying innovative knowledge tools and co-design practices can further the uptake of nature-based solutions. Nature-based solutions can be incorporated into existing tools that play an influential role in the urban development sector, such as green building certifications. Nature-based solutions can also be mainstreamed by promoting the use of new knowledge practices and tools that better recognise their benefits. To overcome knowledge deficits, stakeholders can, for example, collaborate with research institutes. Meanwhile, pilot nature-based solutions projects, often involving research, can create shared learning and knowledge development, as well as increase the level of awareness of nature-based solutions and its benefits. Pilot projects can also allow stakeholders to explore possible collaboration and co-creation, and learn how to navigate conflicts in urban development, such as the perceived conflict between nature-based solutions and high-density development. Innovative tools may provide evidence-based monetisation of non-financial benefits and could increase investments into urban nature-based solutions. Furthermore, improving the data and modelling of nature-based solution's impact can increase valuation and reduce risk averseness.

### **Actions for increased nature-based solution impact**

The NATURVATION project has identified many challenges jeopardising the successful adoption and implementation of urban nature-based solutions. These relate to policy, financing, social structures and technical knowledge. In response to these challenges, NATURVATION recommends the following actions as pathways to realise the full potential of nature-based solutions:

- **Integrate mandatory requirements through planning policies and regulations**, particularly if policies include details about achieving high quality urban nature and that specify nature-based solutions to achieve multiple sustainability goals. Policies do not have to be specifically focused on nature-based solutions in order to present opportunities for their mainstreaming; instead, stakeholders can position nature-based solutions as a solution within a related policy paradigm.
- **Build capacities for stakeholders** to work and learn together about nature-based solutions through for example pilot projects, public-private co-funding, or formal processes that require collaboration. This can build knowledge-based confidence in nature-based solution as a complement or alternative to grey infrastructure.



- **Apply innovative tools and practices** to integrate nature-based solutions, such as green bonds. Nature-based solutions can be incorporated into existing tools that play an influential role in the urban development sector, such as green building certifications. Nature-based solutions can also be mainstreamed by promoting the use of new knowledge practices and tools that better recognise their benefits.
- **Change development practices** so that they are more integrated and can accommodate long-term outlooks. New practices in urban development can support nature-based solutions' mainstreaming by reconsidering priorities in the development process so that nature expertise is incorporated earlier rather than as a final step. Particular attention should be paid to shifting incentives during urban development in order to motivate cooperation. In addition, taking advantage of development practices where long-term thinking is already practiced can support the integration of nature-based solutions.
- Seize opportunities to **integrate nature-based solutions into planned infrastructure projects** by capitalising on the sector's interest in green infrastructure, which allows for the integration of nature-based solutions into existing investments rather than requiring new ones.

While some of these points refer to city-level actions and local considerations, there is great scope for the provisioning of support along these pathways from the EU and national levels as well. The planned EU restoration strategy, for example, provides an excellent opportunity to set measurable targets for restoration as a nature-based solution across Member States. It can also promote the integration of nature-based solutions into relevant national policies and inspire local action. Similarly, the EU call for European cities to develop Urban Greening Plans, which is underlined by an EU Urban Greening Platform, can provide cities with support, help develop capacities and share innovative tools and practices for nature-based solutions. Ultimately, while nature-based solution action is implemented on a local or regional scale, its success depends on financial, political and public support and mainstreaming at not only the local but also the subnational, national and EU scales to achieve its full potential.