



MAINSTREAMING NATURE-BASED SOLUTIONS

Sustainable
Development Goals

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Led by Durham University, NATURVATION involves 14 institutions across Europe working in fields as diverse as urban development, innovation studies, geography, ecology, environmental assessment and economics. Our partnership includes city governments, non-governmental organisations and business. We will assess what nature-based solutions can achieve in cities, examine how innovation is taking place, and work with communities and stakeholders to develop the knowledge and tools required to realise the potential of nature-based solutions for meeting urban sustainability goals.

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SERIES INTRODUCTION

Cities are increasingly seen as a key arena for governing global environmental, social and economic challenges. Nature-based solutions – such as green roofs, parks or sustainable urban drainage – are gaining traction as a promising approach to sustainable urban development. They are a cost-effective and efficient strategy that can address multiple challenges in cities simultaneously.

The mobilisation of nature to enhance urban sustainability is taking place through various experimental projects. But such solutions have yet to be widely adopted and implemented. In order to realise their potential, there is an important need to develop our understanding of how to generate promising pathways for mainstreaming nature-based solutions.

Nature-Based Solutions (NBS) are defined by IUCN as actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.

Drawing on extensive research in the UK, Sweden, Germany, the Netherlands, Spain, Hungary and at level of the EU, we have identified 20 actions – stepping stones – that can build the potential for mainstreaming nature-based solutions. Rather than seeking universal pathways for mainstreaming nature-based solutions, diverse combinations of stepping stones can support their uptake to address different sustainability challenges and under diverse urban, financial and policy conditions.

This series of five reports presents promising pathways for mainstreaming nature-based solutions to address: climate change; biodiversity; economic regeneration; social inclusion and the sustainable development goals agenda. Each report asks: how can the mainstreaming of nature-based solutions be supported through this agenda? And what in turn can working with nature-based solutions do to ensure that sustainability challenges are mainstreamed at the urban level? We find a variety of complimentary pathways that can help to foster more sustainable cities for the future.

EXECUTIVE SUMMARY

This report presents insights on how nature-based solutions can contribute to achieving the Sustainable Development Goals (SDGs), defined in the 2030 Agenda, and recommends several pathways for doing so.

The 2030 Agenda and its 17 SDGs, adopted in 2015 by all United Nations member states, are an overarching global plan of action toward a more sustainable future. The 2030 Agenda addresses all three dimensions of sustainability – environmental, social and economic – and emphasises the need to tackle these dimensions in an integrated manner. The 2030 Agenda also stresses that different actors, including public authorities, companies and civil society all need to work together across the national, regional and local levels. Furthermore, the SDGs are organised by targets and indicators, and thus driven by results-based monitoring.

This report argues that nature-based solutions can contribute to achieving the SDGs because they often address public interest objectives and sustainability dimensions at the same time. This makes nature-based solutions effective instruments for addressing sustainability-related challenges in an integrated manner. Nature-based solutions simultaneously require and enable the collaboration of various actors in society and – given their cross-cutting nature – the collaboration of different administrative departments. Finally, nature-based solutions can support an indicator-driven policy approach.

This potential of nature-based solutions to contribute to sustainable development is, for the time being, under-used. This paper identifies five pathways and respective stepping stones (actions) for how nature-based solutions can contribute to achieving the SDGs and be mainstreamed. These pathways are:

Pathway 1: Involving a wide spectrum of actors

Pathway 2: Strengthening the local level

Pathway 3: Addressing multiple sustainability objectives at the same time

Pathway 4: Making institutional arrangements for integrated sustainable development

Pathway 5: Monitoring and assessing sustainable urban transformation.

These pathways do not work in isolation from each other; combining them will be necessary for mainstreaming nature-based solutions and contributing meaningfully to achieving the SDGs.

Decisions taken today by policy-makers, companies, researchers and civil society from the local to the international levels will steer our societies closer or further away from sustainable development.



			
Provide a public mandate	Regulate for No Net Loss	Include in contractual requirements	Align with strategic priorities
The mainstreaming of NBS can benefit from policy-makers and investors giving a clear mandate for NBS to be included in urban development through tender and procurement policies, policy instruments (e.g. land use planning guidance), and where possible mandatory regulation.	No net loss / net gain regulation for urban nature (biodiversity) has the potential to generate greater interest in NBS across Europe. Developing harmonised regulation across Europe with strong monitoring and sanctioning to increase effectiveness has the potential to support NBS mainstreaming	Utilities (e.g. water, waste, energy) and network service providers (e.g. road and rail authorities, waterway authorities) are either publicly owned or operate on long-term contracts that are bound by regulatory requirements for service provision. Including NBS as required for the delivery of mandated functions (e.g. water quality treatment) or for the upkeep of land-holdings (e.g. train sidings, roadside verges) provides an important avenue for mainstreaming.	Positioning urban NBS as generating benefits for prioritised policy goals through generating narratives and evidence (i.e. climate change mitigation & adaptation, circular economy and healthy urban living) can widen their relevance and community of practice.
			
Create intermediaries	Generate partnerships	Establish demonstration projects	Engage insurance sector
In order to overcome institutional silos within both public and private sector organisations, new organisational forms that work across these divisions are required. Intermediary units can either be established within organisations or outside (by external bodies) and provide co-ordination between departments as well as platforms for innovation.	Stimulating partnerships between public, private and third sector organisations for the co-design, development and maintenance of urban NBS is critical for generating initial action on the ground and increasing support for mandatory urban greening policies.	Demonstration or pilot NBS projects, often involving research, can create shared learning and knowledge development as well as providing tangible demonstrations of how NBS can work in practice, creating confidence amongst partners about their potential.	Engage the insurance sector to support upscaling of urban NBS based on their risk reduction needs and damage cost expertise

			
Facilitate community-based action	Provide economic incentives	Develop markets	Build co-financing arrangements
Facilitate and support community-based action for local urban NBS through improving citizen awareness and support	Provide economic incentives (tax cuts, subsidies) for integrated delivery of urban NBS as a component of urban sustainable development.	Positioning NBS as a sustainability solution offering wide societal and reputational benefits can support the development of demand for NBS projects which in turn can stimulate supply.	Build governance arrangements between the public and private sectors to enable co-funding for NBS development and maintenance
			
Work with investment cycles	Stimulate institutional investment for risk reduction	Target areas of low land value	Improve data & monitoring
Integrating urban NBS into infrastructure projects and renovation cycles to increase their (multi)functionality and can save costs by reducing the need for additional outlay and drawing on existing budgets	Institutional investment for urban NBS is likely to be forthcoming based primarily on their climate risk reduction value (adaptation and mitigation), and specific data/modelling may be required to realise this potential.	NBS can face competition from other land-uses which return a higher rate on investment. Using urban space with a lower value can suit some forms of NBS and provide a more cost-effective means of urban greening (e.g. street green, pocket parks and building-integrated green)	Mainstreaming NBS will require the development of evidence on their performance urban NBS, through the use of 'big data' and new assessment tools that can support effective monitoring, evidence-building and assessments of their effectiveness in addressing key urban goals.
			
Advance valuation models	Grow practitioner expertise	Incorporate in green investment products	Promote certification schemes
Making the case for NBS requires that we develop and disseminate valuation models that specify the different (monetised) benefits and costs of NBS, to facilitate public and private investment decisions.	Make practitioner-oriented expertise on urban NBS available to facilitate integration of NBS in the actual urban development process (i.e. practitioner guides and collaborative design).	Include urban NBS into (existing and new) green / impact / sustainable investment products in order to enable projects to access this source of finance.	Integrate urban NBS criteria into green certification schemes, in particular for buildings, based on recognition of NBS the contribution NBS can make towards sustainability goals.

URBAN NATURE-BASED SUSTAINABLE DEVELOPMENT GOALS

In 1987, the Brundtland report introduced to the international political scene the need to reflect on development and environment in an interdependent way: “Sustainable development is ... development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Since then, there has been a growing international community of organisations active on environmental and development issues. Important milestones along the way have been the Rio Summit (1992), the adoption and implementation of the Millennium Development Goals (2000) and the Rio+20 conference (2012), during which the SDG process was launched. While the idea of international sustainability goals has been on the agenda since the 1990s, only in 2000 was the first set of 8 initial goals launched. Then in 2015, responding to evaluations that showed the original goals had not been integrated enough, and after intense debates and negotiations, the UN General Assembly adopted the 2030 Agenda, “a historic decision on a [...] set of universal and transformative Goals and targets” with the aim of leading humanity toward sustainable development.

Overall, the 2030 Agenda is a comprehensive global plan of action on how societies can become more sustainable. At the core of the Agenda was the development and adoption of 17 SDGs. The SDGs address all three dimensions of sustainability (environmental, social and economic) and are based on the understanding that these need to be addressed in an integrated manner.

Our research shows how nature-based solutions can contribute to achieving the SDGs and suggests pathways for realising that potential. This is due to certain characteristics of the SDGs explained below and the processes required to reach them, as well as the fact that nature-based solutions often deliver various benefits simultaneously. For example, a large park in a city can enhance urban biodiversity, while at the same time cooling down the area, providing a recreational and meeting space for citizens and offering health benefits. These multiple benefits make nature-based solutions very useful for achieving progress towards the SDGs.

With regards to the 2030 Agenda and its SDGs, five characteristics are particularly relevant for the present context:

- 1) The significant ambition of the SDGs means that they require action from all sectors and actors in society, notably public institutions, business, civil society, and researchers.
- 2) The SDGs recognise the importance of the local level in sustainable development.
- 3) The SDGs are “interlink[ed] and integrated [in] nature”. Achieving them requires policies that integrate various dimensions of sustainability, while being mindful of synergies and trade-offs between different SDGs.
- 4) The SDGs call for cross-sectoral planning and implementation, and appropriate institutional arrangements.
- 5) The SDGs require monitoring and reporting, as well as indicators and procedures serving these purposes.

On the basis of these characteristics, this paper proposes five pathways supporting the wider uptake of nature-based solutions while also delivering against the SDGs as a global transformative plan of action. For each pathway specific actions are identified.

This paper does not narrowly focus on specific SDGs. Conversely, the paper looks at how, overall, nature-based solutions are important to this global transformative plan of action. Nonetheless, it is worth noting that nature-based solutions may also

contribute directly to achieving some of the specific SDGs. These include, within the EU, in particular 'healthy living and well-being' (SDG3), 'water and sanitation' (SDG6), 'cities and human settlements' (SDG11), 'climate change' (SDG13), 'life below water' (SDG14) and 'ecosystems and biodiversity' (SDG15). Therefore, it is no coincidence that some of the policies that support nature-based solutions, for example at the EU level, also refer to the SDGs or sustainable development more broadly as one of their rationales. However, the argument of how and to what extent the SDGs promote the wider uptake

PATHWAY 1: Involving a wide spectrum of actors

This pathway is about involving a wide spectrum of actors in the transformation towards more sustainable societies. The 2030 Agenda stresses that efforts from various sectors are needed to achieve the SDGs. Relevant actors for SDG implementation include the public sector (governments, administrations, municipalities, policymakers), the private sector (businesses, investors, entrepreneurs), and civil society (informal communities, non-profit organisations, non-governmental organisations). The same need for diverse actors is true for implementing nature-based solutions. For example, private-sector financing and knowledge may be needed for a municipality to be able to plan and implement a green space in the city, while at the same time strong input from citizens may be crucial to ensure that the needs of the local population are met. A well-facilitated process involving all relevant actors can help identify issues and opportunities, make additional expertise available, offer a space to address concerns, generate support for a project or policy, and create a sense of ownership.

There are some actors whose involvement is particularly important regarding the wider uptake of nature-based solutions, and it is important to strengthen their contribution to the SDGs at large.

Public authorities can support the advancement of both nature-based solutions and SDGs in parallel, as well as contributing to the SDGs by implementing nature-based solutions more widely, when given a clear **mandate** and playing an active role in this regard. In particular, public bodies have important functions in adopting and implementing policies and regulations and in providing funding for sustainability-related purposes such as nature-based solutions. An example of regulations relevant for nature-based solutions are laws requiring developers to compensate for biodiversity losses caused by their projects. Public sector institutions can also lead by example on sustainability, for instance by greening their own municipal buildings. Well-designed regulation and funding for nature-based solutions can **create markets** for sustainability-related products and services, including nature-based solutions, which may facilitate a stronger involvement of the private sector in sustainability efforts.

In the private sector, the potential of **insurance companies and banks** to contribute to nature-based solutions and sustainability efforts at large can be more widely harnessed. The insurance sector has a vested interest in reducing risks and damages from environmental disasters which could warrant investment in nature-based solutions. To convince more private sector organisations to invest in sustainability efforts, there is a need for emphasising the economic, reputational and societal benefits of doing so.

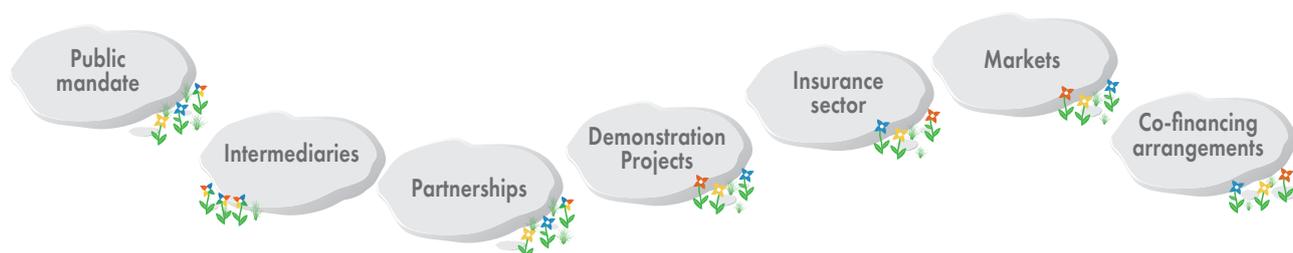
The implementation of nature-based solutions and sustainable development more broadly also requires a strong participation from civil society. When organised in a transparent way, civil society participation contributes to co-design, co-implementation and co-management process in democratic ways. In some European countries (e.g. Hungary), there is a potential for civil society initiatives to become more strongly engaged in urban transformation processes.

It is important to **generate partnerships** between public, private and civil society organisations, with each of them fulfilling their specific roles. Capacity-building on a variety of urban topics may help identify common ground and common interests. In the context of nature-based solutions and sustainable urban development, facilitating interdisciplinary cooperation is an important element of generating partnerships. Notably, landscape architects, architects, urban planners and engineers often have different perspectives on matters of sustainable urban development. To facilitate partnerships around nature-based solutions, it is recommended to combine bottom-up and top-down processes, to build the capacities of municipalities, to incentivise collaborative design processes and to integrate nature expertise early in the development process. Moreover, legal frameworks can be useful in this regard (e.g. the *Environmental and Planning Act and associated Environmental and Planning Visions* in The Netherlands).

Intermediaries that have the capacity to facilitate dialogue and cooperation between different stakeholders have been found to positively impact the design and implementation of nature-based solutions. Oftentimes, such roles are taken by municipalities, NGOs and knowledge institutions. Once in place, intermediaries can enable broader engagement of diverse actors and have the potential to support implementation of the SDGs. Professional associations can play an important role in bringing different professions and expertise closer together and in creating a common understanding about what nature-based solutions and SDGs are and how they can be achieved. Professional associations have a good understanding of the domain they operate in and can promote key concepts and practices to their members and society in general. Well organised professional associations, exist, for example at the EU level, in the UK, Germany and in The Netherlands.

Co-financing arrangements are a particular way of building partnerships. These arrangements address the fact that public funders do not always have sufficient means for funding sustainability-related efforts at the scale needed, whereas private funders may be hesitant to invest in the absence of a clear business case. Examples of public-private funding models for nature-based solutions from the UK include leasing green and blue infrastructure to trusts and citizen groups, habitat and carbon banking, a decreased water connection charge for including sustainable urban drainage systems in new urban development projects, and water utilities paying landowners in order to reduce flood risks.

WHAT IS NEEDED TO ACTIVATE THIS PATHWAY?



Broad involvement of actors in The Netherlands



The Netherlands has a complex governance system with numerous actors, combining top-down and bottom-up processes. The country benefits from a strong and stable economy, a well-regulated procurement process and a democratic culture of dialogue and consensus. As a result, the private sector and civil society participate regularly in the process of urban transformation. These actors are actively engaged in different stages of the development of nature-based solutions and contribute to the SDGs.

Both the national government and the provinces of The Netherlands play central roles in facilitating and monitoring processes. They actively encourage experimentation and innovation, for example through mechanisms called City Deals, as well as knowledge exchange and the development of assessment tools such as TEEB City. The provinces act as intermediaries between urban development companies, banks and other investors, housing corporations, landowners and municipalities, as well as between municipalities and the national government. In some cases the provinces have been instrumental in launching new networks relevant to sustainable development and urban greening (e.g. Utrecht 2040, platform green capital Noord-Holland). Moreover, they also facilitate knowledge exchange between municipalities, and sometimes contribute knowledge to support actors and institutions experimenting with urban greening approaches.

(Picture credit: You X Ventures on Unsplash)

PATHWAY 2: Strengthening the local level

This pathway is about strengthening the local level for implementing nature-based solutions to contribute to the SDGs. The “local level” refers to both the physical space, the citizens, residents and users of that particular space, as well as local actors and organisations. Important actors at this level are municipalities, which have significant power to determine how the respective urban context develops, and implement EU and national legislation. The importance of the local level in sustainable development is recognised in the SDGs, in particular SDG 11, which focuses on cities and human settlements. The local level is also the context in which urban nature-based solutions are put into practice.

Municipalities, which **have a mandate** for the development of nature-based solutions, can support them in various ways. For example, in Germany some cities have created their own funding programmes for nature-based solutions, while funds for urban nature-based solutions are also provided at the regional and country levels. Designing and enforcing sustainability-oriented planning rules and processes is another way in which municipalities can contribute to both achieving the SDGs and mainstreaming nature-based solutions. Importantly, strengthening the local level has the potential to improve the mainstreaming of nature-based solutions, but only when funding is matched with capacity building and sufficient staff and resources, particularly for smaller cities and regions.

The public sector will only be able to do what is needed to achieve the SDGs in cooperation with others. **Community-based action**, particularly support and funding for nature-based solutions, is important and there are various ways of involving citizens. For example, in The Netherlands, a local crowdfunding platform stepped in when local initiatives lacked funding because of public budget cuts. To facilitate long-term and sustainable action, marginalised groups should not be left behind in mobilisation efforts. Therefore, when designing and implementing nature-based solutions, there is a need to use accessible language and varying communication formats to reach different audiences. Furthermore, different groups have different needs, so nature-based solutions should also be designed to accommodate the preferences of different users, depending on the local context.

Using nature-based solutions as **demonstration projects** for showing citizens the multiple benefits of green solutions is a promising way for garnering wider public support for mainstreaming sustainable development.

WHAT IS NEEDED TO ACTIVATE THIS PATHWAY?



Planning requirements at local level



Some municipalities in the UK have developed planning regulations that include specific green components. The Greater London Authority, for example, has requirements about how much outdoor open space must be made available for each unit of development and has a green infrastructure plan. Furthermore, green roofs (living roofs) and green walls (living walls) are promoted and driven by the Living Roofs and Walls Policy (2008) and several technical reports. These aspects had a positive effect on the city and contributed to the development of a dedicated green roof market. In 2019, 42 per cent of the green roof market in the UK was based in London.

(Picture credit: chuttersnap on Unsplash)

PATHWAY 3: Addressing multiple sustainability objectives at the same time

The 2030 Agenda for Sustainable Development stresses that the SDGs and their targets are indivisible and call for integrated solutions. Therefore, policies, tools and funding mechanisms need to address various objectives at the same time, thus contributing to the integration of the social, environmental and economic dimensions of sustainable development. Nature-based solutions can, when designed and implemented properly, serve more than one dimension of sustainable development. For example, synergies may occur when aligning nature-based solutions with flood risk management, and public health promotion.

There is a need for the public sector to pursue agreed **strategic priorities** on sustainable development and align policies and regulations with these priorities. One way of gaining broad support for such policies is the use of narratives and visions that demonstrate how environmental policies also have economic benefit in the long-term. Nature-based solutions, ecosystem services or green infrastructure can be useful concepts in this context.

At the local level, a specific approach that aligns practices on the ground with strategic priorities is the inclusion of sustainability-related **contractual requirements** in agreements with utilities (e.g. water, waste, energy) and network service providers (e.g. road and rail authorities, waterway authorities).

Nature-based solutions are oftentimes visible and accessible projects. They have the potential to function as **demonstration projects** that can increase public awareness of and engagement with environmental issues, while also increasing environmental expertise and understanding of the multiple benefits of nature-based solutions. Demonstration projects can facilitate a design that is informed by various perspectives, and they bring together various actors who might otherwise not interact with each other.

It is important to create opportunities for improved coordination across “silos” in decision-making. Well-facilitated multi-disciplinary cooperation can soften the boundaries between sectors, professions and methods of working, allowing for a more comprehensive understanding and better-designed solutions. Oftentimes, what is considered a good solution for one group of actors can have unintended negative consequences for another group. For example, due to the way that urban development is organised, landscape architects are often only given the opportunity to share their views on a design after most decisions have already been made. Often, there is tension between professionals working on the built environment, such as construction engineers, and the natural environment, such as landscape architects. Developing solutions for integrated sustainable development demands the involvement of all relevant experts from the beginning of the process. In complex urban and territorial transformation processes, urban and spatial planners play an important role of balancing differing objectives and brokering compromises.

WHAT IS NEEDED TO ACTIVATE THIS PATHWAY?



Cross-cutting institutional structures in Sweden



In the Swedish city of Malmö, the water utility VA-Syd successfully asked the municipal Streets Department to employ a water expert. This expert is tasked with changing how the city plans streets, with a view to improving the centrality of water infrastructure in planning. The expert often works closely with the water utility, which is publicly owned, but operates independently, resulting in more integrated planning.

Sweden has also recently formed a Council for Sustainable Cities, which is made up of the heads of relevant agencies and has a mandate to promote sustainable urban development.

(Picture credit: Scott Blake on Unsplash)

PATHWAY 4: Making institutional arrangements for integrated sustainable development

Achieving the 2030 Agenda depends on public sector institutions capable of addressing the various dimensions of sustainability and related challenges in an integrated and cross-sectoral manner. This requires, for example, institutional arrangements for ensuring that environmental and social considerations are properly addressed in all types of political and economic decisions. Similarly, the implementation of nature-based solutions often requires cooperation between various departments – for example, city planners have to cooperate with specialists for nature protection within a city’s administration, or with public sector institutions. The focus of this pathway is therefore on how institutions can develop arrangements for integrated sustainable development.

In order to overcome institutional silos within public and private sector organisations, there is a need for institutional arrangements to bridge these divisions. **Certification** processes for sustainable buildings are an example of processes that bring various actors together during project planning processes. Similarly, encouraging the use of tools and concepts that express the value of nature-based solutions can help to break down silos. An example is the concept of ‘natural capital’, which can show the value of nature-based solutions for different sectors, including economic development, health and tourism.

Intermediaries can either be established within existing organisations or externally, providing coordination between departments as well as platforms for innovation.

WHAT IS NEEDED TO ACTIVATE THIS PATHWAY?



Using funding for nature-based solutions to address several policy goals in Spain



In Spain, several public institutions have set up contests for funding nature-based solutions that promote citizen engagement. In Barcelona, for example, the municipality is requesting proposals for urban green infrastructure, giving more weight to proposals that target larger audiences and pursue a variety of objectives. For example, projects that involve the use of nature-based solutions within a school or a hospital not only raise awareness and acceptance of nature-based solutions with many people, but can also have educational and health benefits.

(Picture credit: Denise Stokes on Unsplash)

PATHWAY 5: Monitoring and assessing sustainable urban transformation

The 2030 Agenda defines 17 sustainability goals and 169 targets, many of which are quantified and measurable through specific indicators. Ascertaining whether progress is made towards achieving the SDGs and their targets requires appropriate methods and processes for monitoring as well as reporting, from the local to the international levels. At the same time, research suggests that the wider uptake of nature-based solutions can be supported by better demonstrating their added value and impact. This pathway therefore focuses on monitoring, specifically through tools, methods and indicators that assess the broad sustainability impact of nature-based solutions, which could also be used for monitoring progress towards the SDGs.

Improving data and monitoring around the value of nature-based solutions can help to overcome scepticism towards these solutions. For example, in The Netherlands, UK and Hungary, nature-based solutions are not widely taken up in the urban development sector because the values and risks associated with grey infrastructure are easier to quantify. Standardised and quantified evidence regarding the (monetary) advantages of nature-based solutions could leverage more private investment in urban nature-based solutions. It can also be effective to express the environmental and social benefits of nature-based solutions in a monetised way. This can be achieved, for example, using tools or metrics for assessing the value or ecosystem services provided by urban nature (e.g. the Building with Nature scheme in the UK). In The Netherlands, some municipalities invest in their own internal knowledge base on sustainable urbanisation, knowledge that could also be used in reporting for the 2030 Agenda. Private and public sector actors in the insurance and banking sector can also contribute important knowledge in this regard. For example, sustainable banks in The Netherlands have developed methods to calculate the ecological footprint of their loan and investment portfolios by sector, often using water and land use indicators. The Spanish public insurer *Consortio de Compensación de Seguros* is actively mapping all flood losses in Spain and shares this data with the academic community and public sector upon request.

Not all benefits of nature-based solutions and other sustainability efforts can be quantified and monetised, and there are varying perspectives about the benefits of doing so. Therefore it is important to advance a **variety of valuation models** for nature-based solutions, but also for sustainability-related efforts at large. For example, firms and hospitals may receive a financial return from healthy and green buildings in the form of more productive and healthy employees or the quicker recovery of patients, although this positive impact is challenging to measure in financial terms.

Another avenue for supporting both nature-based solutions and the SDGs is the promotion of **green certification schemes** for sustainable buildings. These schemes are often goal and target-oriented and provide indications of progress on sustainability in the urban development sector. However, there is improvement needed in the way these schemes account for the multifunctional values offered by nature-based solutions.

Our research reveals that actors interested in sustainable development need to integrate nature-based solutions into existing sustainability tools and promote the use of new knowledge practices that recognise the various benefits of nature-based solutions. The Building Information Modelling system (BIM) is one of the **tools** used in the Netherlands and Germany to coordinate design and implementation processes across various actors involved in construction projects. However, the BIM currently focuses on buildings and infrastructure and offers very limited features for terrain, landscape and nature. Incorporating nature-based solutions features in the BIM tool could help address several SDGs in an integrated manner.

WHAT IS NEEDED TO ACTIVATE THIS PATHWAY?



Using assessment tools in the UK



In the UK, the Department for Environment, Food and Rural Affairs (Defra) has led the way in developing assessment tools to enable local actors to deliver quality green infrastructure. For example, the Biodiversity Metric contributes to the integration of green infrastructure into housing developments. The metric is a widely accepted technical standard that is used to calculate biodiversity loss of new urban developments, which developers are required to compensate for. In addition, the UK Office for National Statistics provides annual assessments of natural capital, including for urban areas. The Natural Capital Committee has worked closely with five pioneer projects in England to pilot guidance provided by the Committee on how to value natural capital in particular places.

(Picture credit: Shutterstock ID242841172)

CONCLUSION

This paper has identified five pathways, each showing several stepping stones for mainstreaming nature-based solutions to help achieve the SDGs.

Pathway 1: Involving a wide spectrum of actors

Pathway 2: Strengthening the local level

Pathway 3: Addressing multiple sustainability objectives at the same time

Pathway 4: Making institutional arrangements for integrated sustainable development

Pathway 5: Monitoring and assessing sustainable urban transformation

These pathways reinforce each other and include some core interventions that are fundamental for building strong pathways for nature-based solutions, such as the creation of partnerships and improving data and monitoring. No one pathway will be sufficient on its own for mainstreaming nature-based solutions, rather they offer complimentary routes that can be taken together to enable synergies between nature-based solutions and the Sustainable Development Goals.

While the relevance of these pathways to specific urban contexts will vary, the underlying stepping stones can be applied in diverse settings. We encourage you to use these resources to explore how you can take the next steps, together with stakeholders and communities, to realise synergies between nature-based solutions and the Sustainable Development Goals through action at national and local levels.

Our findings indicate that urban nature-based solutions offer clear opportunities for supporting the implementation of various SDGs. Investing in nature-based solutions will almost automatically contribute to some SDGs (such as SDG 11 on cities and human settlements). There are likely synergies with other SDGs but these will not occur automatically. To enable the contribution of nature-based solutions to multiple SDGs, effective planning, research, assessment and continuous monitoring of nature-based solutions are all key actions. Regulations, policies and funding opportunities for nature-based solutions need to encourage cross-sectoral partnership. Nature-based solutions do not automatically involve a broad range of local actors; there is a potential for implementing them in a top-down manner. Thus an enabling regulatory framework that is specifically designed to bring actors together (resonating with Pathway 1) is an opportunity to ensure broader participation and ownership and mobilise nature-based solutions toward the achievement of the SDGs.

Both nature-based solutions and sustainable development in general require the active participation of a wide spectrum of non-governmental actors, including the private sector and civil society, in decision-making and in the implementation of projects. This is paramount for ensuring that economic, environmental and social aspects are considered in the process from start to finish.



Mainstreaming Nature Based Solutions

Promising Pathways for Sustainability Goals



The NATURVATION project uncovered specific pathways that advance Nature Based Solutions and address challenges as diverse as climate change, biodiversity, social inclusion, and economic regeneration. Each pathway is made up of stepping stones, which are summarized in a set of 20 briefing cards. The stepping stone highlight actions in the realms of either policy, finance, or urban development, as well as real-world examples collected during research in the UK, Sweden, the Netherlands, Germany, Spain, Hungary, and at the EU level. Policymakers and others interested in pursuing Nature Based Solutions may select a pathway that aligns with their particular context, and use the designated stepping stones to learn about key actions that will advance that pathway.



Climate Change

With the race to reach 'net zero' targets and build back resilience, nature-based solutions are increasingly seen as a critical tool for responding to climate change. Whether by cooling cities and reducing energy demand or providing new ways of managing flooding, nature-based solutions are gaining support globally. We identify four pathways through which mainstreaming is taking place: recognising their potential as a climate solution; investing to reduce climate risk; integrating climate action with other sustainability goals; and learning through practical experience on the ground.

Biodiversity

As the world seeks to develop a transformative agenda for biodiversity over the next decade, we explore how mainstreaming nature-based solutions can enable cities to conserve, restore and thrive with nature. Four pathways are identified based on regulating for 'no net loss' of biodiversity, developing co-governance arrangements for public-private finance, integrating biodiversity with existing sustainability priorities, and integrating biodiversity into urban development and the built environment.

Social Inclusion

Nature Based Solutions such as new parks, rooftop gardens, and tree-lined streets play an important role in improving wellbeing and enhancing community spaces. However, the potential for gentrification and displacement of lower income groups means that these solutions must actively foster social inclusion and tackle inequalities. We identify three pathways that strengthen social inclusion: broadening community participation, securing genuine political commitment and policies that support social inclusion, and pursuing social inclusion measures as a way of achieving health and wellbeing.

Economic Regeneration

Nature-based solutions can create economic regeneration through increasing economic activity and employment and by improving the quality of life. Nature-based solutions both directly contribute to economic vitality and well-being, and leverage new forms of economic activity in cities that generate opportunities. Mainstreaming for economic regeneration takes place through developing partnerships for investment, increasing our knowledge of their economic value, seizing opportunities emerging from other sustainability initiatives, and stimulating market demand for nature-based solutions.

Sustainable Development Goals

To achieve the SDGs, urban development must prepare for growing populations while also creating sustainable and inclusive cities. Nature Based Solutions can address a range of sustainability goals from climate resilience to health to economic development. For example, green space provides cooling, reduces pollutants, and encourages physical activity. Pathways that engage urban Nature Based Solutions to address SDGs include: involving diverse actors, strengthening local engagement, addressing multiple sustainability objectives simultaneously, establishing institutional arrangements that integrate sustainable development, and monitoring and assessing sustainable urban transformation.



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