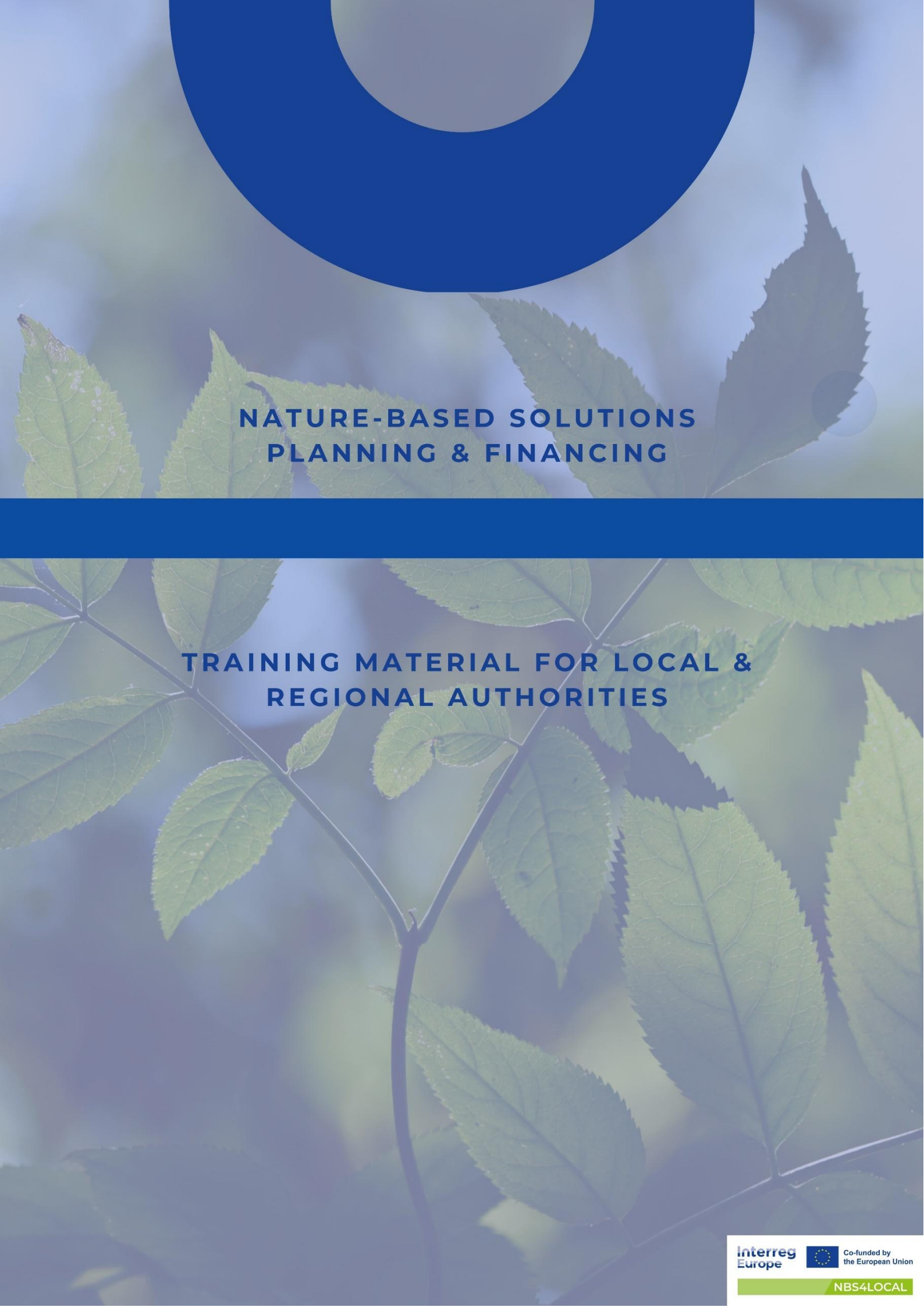




NATURE-BASED SOLUTIONS PLANNING & FINANCING

TRAINING MATERIAL FOR LOCAL & REGIONAL AUTHORITIES

Planning & financing Nature-based Solutions

Training material for local & regional authorities

NbS4Local project

<https://www.interregeurope.eu/nbs4local>

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<https://burstgroup.eu/>

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INTRODUCTION

This training material has been developed under the NbS4Local (Adopting Nature-Based Solutions to Improve the Climate Resilience of Local Governments) project. Supported by the INTERREG EUROPE Programme, NbS4Local aims to enable local and regional public authorities to prioritise and support NbS in crucial areas such as water management, urban greening, forestry, and land use. By systematically incorporating NbS into local and regional policy instruments, partners attempt to ensure that these sustainable, eco-conscious approaches become an integral part of wider frameworks in the long run.

Indeed, NbS offer innovative solutions that address environmental concerns while also promoting societal well-being through the protection, sustainable management and restoration of ecosystems. However, the implementation of these interventions is inherently complex, requiring a deep understanding of diverse geographical contexts and the coordination of multiple sectors. This complexity highlights the necessity of collaboration and a bottom-up approach. To effectively engage diverse stakeholders, it is critical to raise their awareness and boost their capacities, so they can meaningfully contribute to the deployment of NbS.

Recognising this need, NbS4Local focuses strongly on awareness raising and capacity building, especially at the local level. This training material, one of the project's key deliverables, is designed to provide local and regional public bodies with comprehensive insights and practical guidance on planning and financing NbS interventions. It empowers these authorities to navigate the complexities of NbS while offering practical tools and guidance for organizing local capacity-building sessions to boost stakeholder awareness.

Importantly, the material is not limited to NbS4Local partners. It is designed to be a valuable resource for any public authority in Europe, as it covers topics relevant across various regions. Through these efforts, the benefits of NbS4Local extend well beyond the project's geographical scope and lifespan, fostering long-term awareness and capacity in sustainable practices.

The material is developed by BURST ([Bright Urban Solutions Team](#)), the Advisory partner of the NbS4Local project.

SUMMARY

This training material focuses on the **planning and financing of Nature-Based Solutions (NbS)** and the enhancement of related **capacities**. It consists of **three modules**: Learning Module 1 on planning NbS interventions, Learning Module 2 on NbS financing, and Learning Module 3, which provides guidance on organizing stakeholder capacity-building.

Creating greener, more resilient, and liveable spaces is increasingly **on the agenda** for European regions. NbS interventions are **effective** tools to address these needs and are becoming more and more **popular**. Successful implementation of NbS relies on **thorough planning and smart financing**. Therefore, the first two modules of the present material provide essential **knowledge** on these topics, with both modules being iterative and reflective of each other, requiring a **combined reading**.

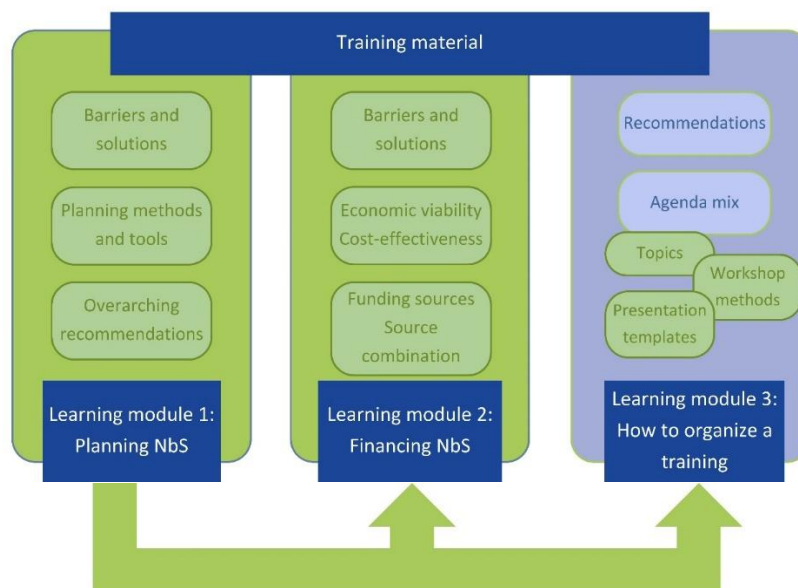
Learning Module 1 offers a basic understanding and practical steps for the effective **planning** of NbS interventions. It addresses the **challenges** that local and regional governments face in this process, offering **solutions** such as adopting a **holistic** approach, integrating NbS into **policy** frameworks, and utilizing research and **data** for interventions **tailored** to local conditions. It also emphasizes the importance of **engaging** a wide range of actors and gives guidance on the **identification, analysis, and coordination** of relevant stakeholders. The module introduces an NbS **planning cycle**, detailing each step with a focus on overcoming planning challenges and minimizing the risk of failure.

Learning Module 2 highlights the **challenges** associated with NbS **financing**, including the limited (public) resources, the infancy of impact evaluation methods, and the difficulties in quantifying co-benefits. The module provides guidance on overcoming these barriers, explores various **public and private funding sources**, and offers insights into the smart **combination** of those.

Learning Module 3 is to provide guidance for implementing a **training** for local and regional stakeholders on the topic of NbS planning and financing. Firstly, **practical** considerations are listed for the organisation of a successful training. Secondly, respective **tools** are provided, including a list of adaptable presentations, suggested topics and workshop methods. These tools form part of an **'agenda mix' to be tailored to the local context** and to the knowledge needs of the target group. This module is enriched with the recent experiences of NbS4Local partners, organising stakeholder trainings in 2024/2025.

The knowledge from **Learning Modules 1 and 2** is summarized in the presentation templates which form the **thematic backbone** of a training. The recommendations, presentations, topics and workshop methods are to be considered as a **toolbox to "pick and choose"** from for delivering this thematic backbone to the stakeholders.

Together, the learning modules provide a solid and adaptable framework for organizing effective training sessions, supporting European regions in overcoming the challenges of planning and financing NbS interventions.



1. Figure: Training material structure

NATURE-BASED SOLUTIONS (NBS)

International Union for Conservation of Nature (IUCN) defines NbS 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.”¹ In other words NbS are “deliberate actions or interventions that involve, enhance or copy nature in order to provide solutions to a wide range of societal challenges such as air pollution, flood risks, and urban heat islands.”²

The key lies in shifting the paradigm: instead of merely harvesting nature, our society can take proactive and thoughtful steps to protect, manage, and restore natural ecosystems to address major societal challenges.

NbS can mean various types of interventions such as reforestation, wetland restoration, sustainable agriculture, green infrastructure in urban areas (like green roofs and walls), or the conservation of natural habitats.

“We need to learn how to work with nature, rather than against it”³



¹ <https://www.iucn.org/our-work/nature-based-solutions>

² COST-EFFECTIVENESS OF NBS IN THE URBAN ENVIRONMENT Authors: Toke Panduro (AU), Doan Nainggolan (AU), Tim Taylor (UNEXE), Marianne Zandersen (AU), - with contributions from Yifei Zhang (ZJUT), Yiwei Wang (ZJUT), 2021

³ David Attenborough From ‘A Life on Our Planet’, 2020, <https://rewilding.academy/ecosystem-restoration/sir-david-attenborough-rewilding-our-planet/>

LEARNING MODULE: PLANNING NbS INTERVENTIONS

INTRODUCTION

As communities and regions strive to create greener, more resilient and liveable spaces, NbS interventions become more and more popular. This chapter aims to provide basic understanding and practical steps necessary for the effective **planning** of these interventions.

Successful implementation of NbS relies, among others, on **thorough and strategic** planning. Good planning ensures that interventions are tailored to **local/regional contexts**, address specific environmental and social challenges, and are **integrated** into broader development strategies. If done effectively, it can maximize the **benefits (and co-benefits)** of NbS, such as reducing flood risks, improving air and water quality, or creating recreational spaces for communities. It also fosters stakeholder **engagement** and contributes to community building which enhance the **sustainability** of interventions.

Despite the numerous benefits, planning for NbS interventions can encounter several **obstacles**. **Financial constraints** often pose significant challenges, particularly in areas with competing priorities. Existing **regulations and policies** may not always support the integration of NbS, necessitating reforms. Designing and implementing NbS requires specialized and interdisciplinary **knowledge**, as well as reliable **data** which may not be readily available. A lack of **awareness** and understanding among decision-makers and stakeholders can hinder acceptance and support. Furthermore, breaking **silos**, engaging diverse stakeholders and managing their varying interests can be complex and time-consuming.

To overcome these challenges, planning should adopt a **holistic approach** that considers the interconnections between natural and human systems. This includes integrating NbS into **broader planning frameworks** considering their multifunctional benefits. Utilizing **scientific research and data** to inform the design and implementation in selecting interventions tailored to local conditions. It is crucial to **engage a wide range of actors**, including public authority staff, local/regional community members, experts, and policymakers. Calculating **costs** (both for intervention and maintenance) and **benefits**, exploring various funding **sources**, and ensuring financial **viability**.

This eco-conscious, holistic approach must trickle down from strategic planning through regional and local planning into site-specific management or maintenance plans, including all relevant areas like the management plans for green infrastructure, the management of forests, lakes, streams, the management of invasive species, and nuisance species (mosquitoes, beavers...) as well. Poor, business as usual, or even mismanagement might reduce or cancel out the positive effects of NbS and increase the maintenance burden for municipalities, while changing the management practice in many cases itself proved to be an effective and efficient NbS intervention.

This chapter will provide advice and examples to **adhere to these principles** along the key planning barriers and knowledge gaps, focusing on the most delicate ones. Finally, it will introduce **planning methods and guidance** to overcome challenges and minimize the risk of failure. Financial aspects will be described in the second part of the material in details.

BARRIERS

The numerous benefits NbS can bring are often actually those complicating their adoption. For instance, their strength in flexibly addressing specific local problems can pose an obstacle to replication and standardization. The bottom-up approach of NbS, which ensures that interventions effectively address area-based challenges, requires public involvement and the engagement of various stakeholders. This approach also involves addressing trade-offs, making the process even more demanding and time-consuming. Furthermore, the multifunctionality of NbS, which provides benefits across various fields such as environmental and social issues, requires cross-sectoral cooperation which is often missing. Its multifunctionality and complexity can also make it difficult to measure the full range of benefits accurately. While, in contrast to grey infrastructure, NbS can lead to the development of a self-sustaining ecosystem with relatively low maintenance requirements within a foreseeable time, the vegetation establishment period of 3-5 years after its completion usually requires more physical labour compared to grey infrastructure. This difference can be addressed, for example, in the framework of guarantees or warranties for interventions.

Local and regional governments encounter several challenges in NbS planning. Below a non-exhaustive list of these can be seen, which will be followed by a more detailed description of the most delicate ones.



2. Figure: Potential planning barriers of NbS interventions

Barrier nr. 1 & response- Awareness and commitment

Commitment of decision-makers

The successful promotion and implementation of Nature-based Solutions (NbS) within local and regional municipalities depends heavily on the personal commitment and awareness of decision makers (and key stakeholders). While external incentives and requirements can provide a framework, the most crucial factor is often the **personal conviction** of leaders such as mayors or other politicians. Their dedication can create the necessary supportive environment for NbS initiatives. From a wider development policy point of view, it is crucial to find and support the 'mission' municipalities.

“It is important, though, that leaders are fully engaged. We will only achieve the goals and targets of the Kunming framework through a whole government approach.”⁴

The general public

When citizens are also sensitive to environmental issues and expect their elected representatives to consider NbS, it becomes easier for politicians to form alliances with them. This **public backing** can serve as a powerful trigger in council meetings and decision-making processes, helping to advance NbS agendas. To reach this the importance of consistent and systematic **awareness raising of the community** should not be underestimated. Slowly but steadily the public pressure is to have an effect. The best NbS projects are community-driven interventions, with public involvement throughout all planning levels, the design and financing steps, overseeing implementation and actively taking part in maintenance and monitoring as well. Conversely, NBS interventions not only lead to resilient urban environments but also build resilient communities.

⁴ Dr David Cooper, Secretariat of Convention on Biological Diversity (CBD) <https://climate-diplomacy.org/magazine/environment/qa-what-progress-has-been-made-protecting-nature-year-cop15>

Gain knowledge

Besides, fostering a culture of **innovation and experimentation** can encourage the adoption of NbS. Pilot projects and demonstration sites can serve as testing grounds for new ideas, allowing cities and regions to explore innovative NbS approaches with manageable risks. Learning from these experiments can provide valuable insights and pave the way for broader implementation.

Smaller municipalities often face resource and capacity limitations that make it challenging to engage in piloting or in **transnational knowledge exchange projects**. However, they can still benefit from the experiences of more ambitious **pioneer cities from neighbouring areas**. Committed mayors and politicians in these smaller regions can act as leaders by showcasing tested solutions, disseminating their learnings, and sharing their results.

An efficient way for a municipality is to build a project management organisation, starting with a few employees, later generating self-sustaining projects while creating highly qualified jobs within the local market. For smaller municipalities, the way forward is collaboration, primarily within existing structures like Naturparks or Waterbasin organisations, though topic-based or smaller area collaborations like river contracts can be efficient as well.

Capacity-building initiatives are vital for equipping decision-makers and stakeholders with the knowledge and skills needed to implement NbS successfully. Trainings, workshops, and knowledge exchange platforms can enhance understanding of NbS principles and practices, empowering local leaders to implement these solutions. For instance, <https://oppla.eu/> and <https://networknature.eu/> are well-known and useful knowledge repositories.

Mindset change

One significant barrier to the uptake and implementation of NbS is the **path dependency** of organizational decision-making. This concept refers to the tendency of decision-makers to rely on past experiences, which often leads to resistance to change. Traditionally, grey infrastructure has been the go-to solution for addressing challenges and enhancing built-up areas for economic growth.

Changing the mindset towards NbS and overcoming path dependency requires a concerted effort to shift both individual and societal behaviours. To facilitate this shift, it is to be highlighted that NbS should not be viewed solely as an alternative to grey infrastructure in an 'either-or' sense.

Instead, **hybrid solutions** that blend nature-based applications with engineered systems offer optimal outcomes. For example, extreme flood protection or water purification in densely populated urban areas often cannot be achieved solely through NbS. In such cases, integrating NbS with grey infrastructure, or adopting green-grey solutions, can provide effective and sustainable results. Sustainable urban drainage systems (SUDs) that combine green and grey solutions can reduce flood risks and minimize pollution diffusion downstream while offering additional co-benefits. This approach not only addresses functional requirements but also helps to break the path dependency towards grey infrastructure.

In developments aimed at disaster management, both in the case of grey and green infrastructure, there are residual risks that need to be well communicated, along with the actions expected from the population in such cases. Only such clear and transparent communication can lead to the avoidance of disappointment in the NbS, for example, in the event of a major thunderstorm following project handover.

Barrier nr. 2 & response- Whom to involve in NbS planning

Building partnerships and collaboration enhances the effectiveness of planning, as well as of implementation and ensures credibility and legitimacy. This cooperation should happen both within and beyond the institution being primarily responsible for the given NbS project. Also, the adequate capacities of these stakeholders are crucial for the viability of any intervention.

Cross-sectoral Approach:

When it comes to cooperation within an organisation (e.g. regional authority or a city), institutional fragmentation, often referred to as ‘sectoral **silos**,’ presents a significant barrier. Departments often operate within their own vision, legal and administrative procedures, often using sector-specific language. This fragmentation leads to confusion about responsibilities and hinders the incorporation of innovative planning or management. Especially in the case of NbS, due to its **multidisciplinary** character, **cross-sectoral cooperation** within public institutions is to be a priority. Often, the most difficult thing is to have the members of different departments of municipalities or government institutions to have a seat at a common table and openly discuss relevant issues. The breaking of silos ensures understanding the priorities, interests, and goals of other departments and of the institution/geographical area as a whole and helps identify cross-linkages. Establishing **NbS working groups** within authorities or **dedicating a person** to cross-sectoral alignment can help break down these silos.

Co-design/-creation/-production/-...

Moving beyond silo-based approaches also requires improving cooperation between the institutions and other public and private actors, including citizens, scientists, experts, policymakers, and practitioners. While traditional cooperation models have followed a top-down approach, the general tendency, especially in the case of NbS, is to benefit from a bottom-up approach. These partnership models, as engaging multiple actors, address the **complexity** of NbS compared to grey solutions and results in better projects **tailor-made** to the specific area. Moreover, involvement ensures that the intervention meets local community **needs**, increases **legitimacy** and **ownership**. This inclusivity can also **stimulate private investments**, and the building of **networks**.

“Beyond its incorporation into policy, NbS has huger potential as a communications tool for broader society...NbS are a partnership between people and nature, and the solution is to provide benefits for both”⁵

Engagement should not be a separate activity but an **integral part** of the planning (and later on of the implementation and monitoring) process. Involvement starts with **mapping** the stakeholders relevant to have a stake and this first step obviously has a key importance. Various methods for mapping are available in the literature. The approach also depends on the specific region, on the type of organisation coordinating this engagement, on the targeted intervention, as well as on the cultural values. Also, it is advised to **continuously**

⁵ Beth Turner Nature based Solutions Initiative, <https://www.youth4nature.org/blog/reflections-nature-based-solutions-or-nature-based-excuses>

analyse stakeholders' evolving objectives, interests, constraints, and expectations and re-do the stakeholder mapping. It may happen that not the same group of actors are to be involved at different phases of planning, financing, implementing or monitoring.

All these require **competence** in

- managing difficult decisions and judgments,
- building and maintaining trust,
- good communication, moderation and mediation
- technical/process management, punctual documentation

that are challenging to develop. A **dedicated team or person** within the local/regional authority should coordinate these efforts.



Recommended reading list:

1. *Stakeholder Mapping to Co-Create Nature-Based Solutions: Who Is on Board?* This study has explored the stakeholder constellation of 16 NBS implemented in Europe. It identifies which stakeholders and stakeholder types are part of the collaborative planning process this way offering guidance to the local coordinator or initiator or facilitator in the setting-up and steering of their collaborative planning process:
<https://www.mdpi.com/2071-1050/12/20/8625>
2. *Harnessing the power of collaboration for nature-based solutions:* This briefing paper presents practical examples and inspiration for local decision-makers on utilizing co-governance approaches to promote participatory processes and collaborative creation of nature-based solutions:
<https://op.europa.eu/en/publication-detail/-/publication/44494727-276f-11ee-839d-01aa75ed71a1>

Barrier nr. 3 & response- Policies, regulations, permitting procedures

Regulations, legislation, and permission procedures could also serve as enablers for sustainable development and environmental resilience. However, actually, those are often posing obstacles and challenges to such interventions. Below the main barriers are listed along each type of policy followed by a list of overall recommendations.

1. Regulatory Frameworks and Compliance:

Current regulatory frameworks are typically **designed around conventional infrastructure solutions**, such as grey infrastructure. These regulations often do not account for the unique characteristics and benefits of NbS, leading to compliance problems. For example, environmental regulations may not recognize the **multifunctional** benefits of NbS, such as biodiversity enhancement and climate resilience, thus favouring traditional solutions. Moreover, the absence of standardized guidelines for NbS can result in **uncertainty** and inconsistency in their application and approval.

2. Legal and Institutional Barriers:

Legislation can govern land use, water management, or urban planning. As NbS can fit in each of them, the integration to **various** legislations, all of which delivered by different agencies or departments, can lead to **fragmentation** and the lack of coordinated efforts. Additionally, legal frameworks that **prioritize property rights and economic development** over environmental sustainability can further complicate NbS adoption.

3. Permitting Processes:

Traditional infrastructure projects often have **established procedures and streamlined processes** for obtaining necessary permits. In contrast, NbS projects may require navigating **multiple permitting agencies**, each with its own set of criteria and timelines. Besides, because of its **multidisciplinary** nature, NbS requires technical **expertise** in various fields such as environmental science, ecology, or landscape architecture, which are often not collectively available within the permitting agency. All these can discourage municipalities and developers from planning and submitting NbS projects or can lead to delays, increased costs, or inadequate implementation of NbS.

4. Risk and Liability Concerns:

Regulations often emphasize risk management and liability, which can be challenging for NbS due to their **variability and dependency on natural processes**. Regulatory bodies may perceive NbS as riskier compared to conventional solutions, resulting in stricter requirements and higher scrutiny. Liability concerns related to the **performance** and **maintenance** of NbS can also deter adoption. Municipalities may be reluctant to implement NbS without clear guidelines on managing risks and liabilities.

Overcoming these regulatory or policy-related barriers is a challenging mission. Overarching recommendations are listed below.



First of all, **getting familiar with the relevant policies** and regulations (at both EU, national and local level) are important. NbS initiatives **aligned** with the implementation of policies or goals have more chance of being implemented.

The most relevant EU Directives may encompass the Environmental Impact Assessment (EIA) Directive, the Strategic Environmental Assessment (SEA) Directive, the Habitats Directive, the Water Framework Directive (WFD), the Invasive Species Directive and the Floods Directive. The Common Agricultural Policy (CAP) may also be relevant. The OPERANDUM project⁶ mapped the legislation related to NbS at the European level⁷. On the national level, there are many policy documents where NbS could be integrated: documents defining environment protection, hazard management, land use, building and construction⁸. On regional and local levels, the potential policy instruments are varying. The **NbS policy mix on local/regional level** consists mostly of the following types of instruments⁹:

1. Legislative, regulatory and strategic instruments:
 - Dedicated strategy, plan or law (e.g. green infrastructure, urban forestry or green space strategy or plan)
 - Overarching/cross-sectoral strategy, plan or law (e.g. smart city strategy, action plan on (innovation/green) public procurement, local environmental program)
 - Sectorial strategy, plan or law (e.g. adaptation, biodiversity, climate change, mobility, SECAP)
 - Urban planning mechanisms (e.g. spatial, infrastructure or socio-economic development plans)
 - Standards (e.g. green public procurement standards)
2. Economic and fiscal instruments:
 - Disincentives (e.g. taxes and charges/fees, tariffs)
 - Payments as rewards/for ecosystem services, subsidies, incentives (e.g. subsidies or payments to landowners/ private actors for practices; public financing/grants)
 - Financing mechanisms /market-based instruments (e.g. 'green finance' instruments; blended finance; payments for ecosystem services (PES); public-private-partnerships (PPP))
3. Agreement-based or cooperative policies:
 - Community-based agreement with the support of the government (e.g. citizen assemblies, neighbourhood development plans)
 - Public-private community-based agreement (e.g. participatory budgets, partnerships for ecosystem restoration or climate action; local networks of stakeholders that promote NbS action)
 - Public-private business agreement (e.g. Public-private collaborations for improving urban greening)
 - Public-community agreement (e.g. Community management of green spaces, citizen science programs)
 - Private business agreement with the support of the government (e.g. business parks and biodiversity investments)
 - Joint regional planning between municipalities (e.g. inter-municipal plans for environmental management and restoration)
4. Knowledge, communication and innovation:
 - Communication/awareness raising (e.g. targeted educational programs, certification (labelling) or ranking, awareness raising campaigns)

⁶ OPERANDUM, D2.1, OPEn-air laborATories for Nature baseD solutions to Manage hydro-meteo risks: synthesis report of authorization/permission requirements at national level (2019). <https://www.operandum-project.eu/deliverables/>

⁷ Somarakis, G., Stagakis, S., & Chrysoulakis, N. (Eds.). (2019). *ThinkNature Nature-Based Solutions Handbook*. ThinkNature project funded by the EU Horizon 2020 research and innovation programme under grant agreement No. 730338. doi:10.26225/jerv-w202

⁸ Somarakis, G., Stagakis, S., & Chrysoulakis, N. (Eds.). (2019). *ThinkNature Nature-Based Solutions Handbook*. ThinkNature project funded by the EU Horizon 2020 research and innovation programme under grant agreement No. 730338. doi:10.26225/jerv-w202

⁹ <https://interlace-hub.com/uga-methodology>

- Knowledge and innovation (e.g. living labs, workshops)

Advised to **create a city/region- tailored own NbS policy-mix** (existing or newly identified potential ones) and systematically **detect and highlight any regulatory barriers** or inconsistent policy documents to tackle.

Furthermore, find **solutions** to each of these barriers and advocate for the **inclusion** of NbS in the relevant local or regional, regulatory frameworks or seek policy reforms that recognize their benefits.

Collaborate with regulatory bodies to streamline the permitting process for NbS could involve creating **dedicated NbS permitting pathways**. Integrate NbS considerations into existing processes also enhancing guidance on **liability and maintenance** responsibilities.

Valuable examples are available all over Europe when it comes to supporting NbS via policymaking. For instance the Edinburgh's Community Empowerment Act 2015 recognises the role of various actors and empowers the community to manage public lands and legislation such as the EU flood directive which supports NbS development: <https://www.gov.scot/policies/community-empowerment/>

Another example of legislation as an enabler of NbS is the Swiss Landscape Concept (SLC) setting 14 landscape quality objectives to be applied by the landscape-relevant stakeholders at federal, cantonal and municipal level to achieve high landscape quality: <https://www.bafu.admin.ch/bafu/en/home/topics/landscape/info-specialists/landschaftskonzept-schweiz-lks.html>

The Strategic Green Infrastructure and Biodiversity Plan of Barcelona city considers NbS's perspectives in the social-ecological system this way facilitating and mainstreaming the concept of NbS: <https://interlace-hub.com/green-infrastructure-and-biodiversity-plan-barcelona>

NbS can make significant **contributions to national economic, social and conservation targets** and help achieve commitments to EU-level or international processes.

Making these linkages explicit, documenting and disseminating them can help to further support the profile and role of NbS regionally or nationally, enhancing lasting political commitment.

Collaboration, capacity building and experimentation are obviously key for regulatory bodies and public staff to understand NbS.

Training and education can help address knowledge gaps and reduce resistance to innovative solutions. Also, **pilot** projects can further showcase the benefits of NbS building trust and support among regulators and the public. **Developing regular knowledge-sharing platforms, information channels, sharing lessons learnt** with any decision makers or practitioners having a role in NbS policy-making or regulation, or eventually being interested in replicating the process is a way to trigger transformative change.

Public administration needs more information and evaluation reports about the multiple and multidimensional advantages of NBS.

Baseline data and **data** monitoring systems to better analyse the services and benefits that existing NbS provide to the ecosystem, to the urban development or to the population would significantly enhance policy- making and the formation of any regulatory frameworks or permissions.



Recommended reading list:

1. *More inspiration on the integration of NbS into planning policy can be taken from Glasgow's Open Space Strategy: <https://www.glasgow.gov.uk/openspacestrategy>*
2. *OPERANDUM project deliverables: OPERANDUM delivered tools and methods for the demonstration and market uptake of Nature-Based Solutions to reduce hydro-meteorological risks. Various guidance on data, multi-impact assessment or stakeholder engagement, as well as on permission and authorization is available here: <https://www.operandum-project.eu/deliverables/>*

Barrier nr. 4 & response- Data

Lack of data and information providing an evidence base for the effects and benefits of NbS, is in almost all cases identified as a critical barrier limiting the planning, implementation and uptake by decision makers. The planning process cannot be full without researching and collecting data. However, because of NbS's local-specific and multipurpose character, the knowledge and willingness to collect data is limited. The standardisation and comparison of data is also problematic and expensive. Therefore, widely- acknowledged data collection and measurement systems are missing. Methods and databases are often not harmonised and in certain cases need further investigation regarding their consistency, quality, and accuracy¹⁰.

In many cases, the measurement of impacts may not even be reasonable or even feasible at a city or region scale as the change brought by a single NbS intervention is too small. For example, the impact of a single green area (e.g. a capsule park) on the heat-island effect or air quality at the city level is minor and is only important at the micro-scale (street level).

Moreover, various (especially social benefit) factors are mostly **qualitative, hindering clear measurement** and the making of the case.

In any case, it is strongly recommended to **create a specific database** for the city or region (or upgrade already existing ones with NbS related data) ensuring baseline and enable monitoring, providing accurate information on vegetation, water or soil conditions. For this, various advice and sources are listed below.

Baseline

A well-founded (evidence-based) understanding of the current state of the ecosystems is needed. The baseline assessment needs to be broad enough to characterise the ecological state, drivers for ecosystem loss and options for improvements.

Targets

Ideal outcomes are to be identified, benchmarked and regularly assessed. Basic biodiversity values should be established for example, the target could be the percentage of ecosystem area restored or the return of keystone species.

The most commonly known evaluation framework for NbS is **EKLIPSE** developed by an expert group under the umbrella of the European Commission¹¹. EKLIPSE is advised to be studied when considering any NbS interventions being either small or bigger size.

Think big, act small

Aggregate the effect of NbS implementations on city or regional level to have a measurable effect. For this, adopt a common monitoring strategy for all projects with consistent indicators and measurement. Also, continuous collaboration among the NbS projects in data collection and monitoring is needed.

Make use of it

¹⁰ Somarakis, G., Stagakis, S., & Chrysoulakis, N. (Eds.). (2019). *ThinkNature Nature-Based Solutions Handbook*. ThinkNature project funded by the EU Horizon 2020 research and innovation programme under grant agreement No. 730338. doi:10.26225/jerv-w202

¹¹ <https://eklipse.eu/methods/>

Data use can serve several purposes, all of which can be advantageous:

- dissemination and communication of NbS benefits to diverse target groups. This would increase the acceptance and uptake of NbS.
- data can support the decision-making at the level of public or private actors in relation to conservation policies or the implementation of concrete actions and projects
- data can contribute to reporting tasks, whether voluntary (more related to dissemination) or mandatory (e.g. linked to EU directives)

"Warsaw takes good care of nature, and through our projects, we have demonstrated that nature too cares about us, bringing us benefits, including economic ones. This year we have implemented a pilot project involving the appraisal of tree ecosystem services. We learned that the air-cleaning, oxygen production and carbon dioxide storage services provided by trees in Warsaw alone are worth a whopping PLN 170 million a year (about EUR 37.69 million). This led us to launch a Green Fund, allowing the private sector to contribute to green projects across the city. The Fund aims to encourage businesses to support Warsaw's development, and to build a sense of community and co-responsibility for the city's space."¹²

Risks

Nature and environment are complex systems with often unknown or unpredictable processes. There will always be a level of uncertainty in how an ecosystem and its components will react to specific interventions or other external changes. NbS should be planned and monitored on a way to minimise and mitigate unexpected changes or negative outcomes.

Multiple sources:

Due to its innovative and multidimensional character, NbS data is to feed from multiple sources a combination of which can lead to reliable results:

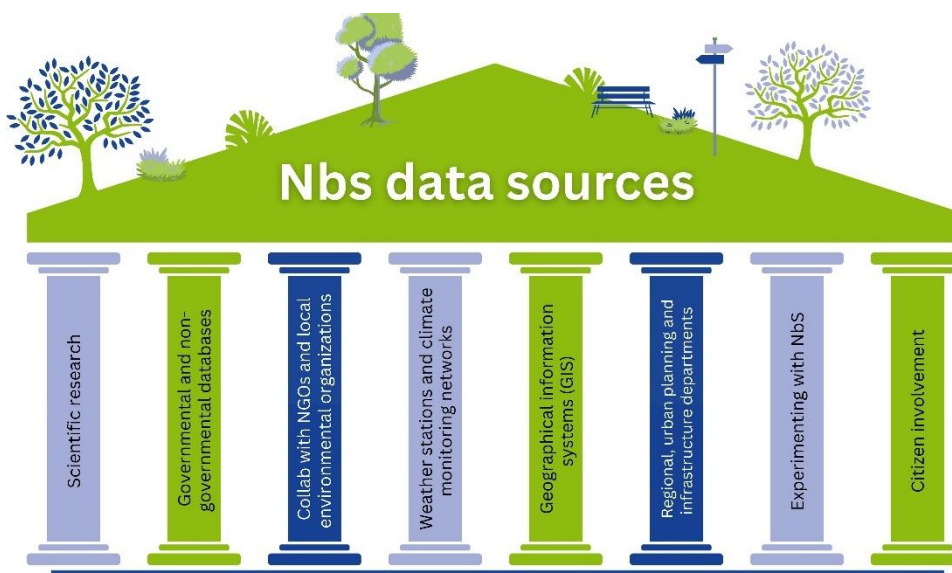
- **scientific** research comes from environmental studies, and research institutions' reports and can offer insights and guidelines for planning and executing NbS interventions
- **Governmental and non-governmental databases** can bring climate information, statistics, water quality, wildlife populations, and other environmental metrics.
- collaborating with **NGOs and local environmental organizations** can also provide access to specialized datasets and on-the-ground observations

¹² Rafał Trzaskowski, Mayor of Warsaw (Speaking at the Connecting Nature Enterprise Summit, 29-30 June 2021)

NBS4LOCAL

- **weather** stations and climate monitoring networks offer (historical) data on temperature, rain or snow, and extreme weather events
- **geographical information systems (GIS)** and remote sensing technologies help the collection and analysis of spatial data, to map land use patterns, identify vulnerable areas, or monitor environmental changes over time (satellite provides up-to-date information on vegetation cover, or water bodies, which are crucial for planning NbS projects).
- incorporating data from **regional and urban planning and infrastructure departments** on existing infrastructure, zoning laws, and urban development plans can help integrate NbS into broader urban planning frameworks
- **experimenting** with NbS is a smooth way to implement and evaluate solutions in a controlled environment and to learn from mistakes without significant losses
- **citizen involvement** through surveys, participatory mapping, and public consultations can bring qualitative data on local environmental issues from those interacting daily with the given ecosystem. It reflects community needs, and traditional knowledge for instance historical land use or flood patterns, that may not be documented in scientific literature.

Citizen involvement not only enriches the data pool but also fosters community support and ownership of NbS initiatives. Such approaches consider citizen and community perspectives and help decision-makers confront critical trade-offs. Citizens can catalyse the “tailoring to local context” of NbS, which further increases the likelihood of a successful outcome. Participatory biodiversity monitoring, community engagement, environmental education are all examples of applications where biological data plays a central role.



3. Figure: NbS data sources



Recommended reading list:

1. *Handbook Evaluating the impact of nature-based solutions: a handbook for practitioners to independently design and implement NbS impact evaluation schemes:* <https://op.europa.eu/en/publication-detail/-/publication/d7d496b5-ad4e-11eb-976701aa75ed71a1>
2. *The Copernicus Global Land Service offers freely available products monitoring the status and evolution of the land surface on a global level at mid-to-low resolutions (300 m and 1 km) and in near-real-time. These can serve as valuable inputs for environmental monitoring and the identification of conflict areas:* <https://land.copernicus.eu/en>
3. *CURE (Horizon 2020) developed 11 cross-cutting applications (e.g. Urban Heat- Island assessment, Health Impacts) between the Copernicus Core Services to leverage the usage at the local scale. CURE provides spatially disaggregated environmental intelligence to facilitate urban planning and management strategies:* <https://cure-copernicus.eu/thecuresystem.html>
4. *“Cooperation for the implementation of a decentralized Biodiversity monitoring in Wallonia”: a good practice from INTERREG EUROPE Project CIBIOGO on citizen involvement in data collection:* <https://www.interregeurope.eu/good-practices/cooperation-for-the-implementation-of-a-decentralized-biodiversity-monitoring-in-wallonia>

NbS PLANNING METHODS AND TOOLS

Regarding guidance on NbS planning, the problem is not the lack of such. The issue is rather which one to pick-up from the numerous tools, methods, advices. In this section the most used key steps of a planning cycle are listed, along with a description of some frequent tools (e.g. MCDA, LCA). A long list of those can be found for more details in the recommended reading list. Finally, an overarching list of recommendations is provided, synthesizing key conclusions from the different solutions discussed.

Planning cycle

The framework presented in this section is mainly relevant for regions and cities that are planning to incorporate NbS interventions and are looking for ways to decrease the risk of failure as much as possible¹³. This framework includes three simple steps for planning. These steps are hardly differing in case having more ambitious targets or while studying other methods in the literature. Obviously, these cycles go forward towards implementation and monitoring. These two are not targeted by the present material. The back-and-forth interaction among planning-implementation-monitoring is to be taken as obvious. This approach emphasizes the inclusion of different actors in each step.



4. Figure: NbS planning framework¹⁴

¹³ Key Enablers of and Barriers to the Uptake and Implementation of Nature-Based Solutions in Urban Settings: A Review, June 2019, DOI:10.3390/resources8030121, https://www.researchgate.net/publication/334122219_Key_Enablers_of_and_Barriers_to_the_Uptake_and_Implementation_of_Nature-Based_Solutions_in_Urban_Settings_A_Review

¹⁴ Recommended steps are taken from „Key Enablers of and Barriers to the Uptake and Implementation of Nature-Based Solutions in Urban Settings: A Review“, June 2019, DOI:10.3390/resources8030121, https://www.researchgate.net/publication/334122219_Key_Enablers_of_and_Barriers_to_the_Uptake_and_Implementation_of_Nature-Based_Solutions_in_Urban_Settings_A_Review

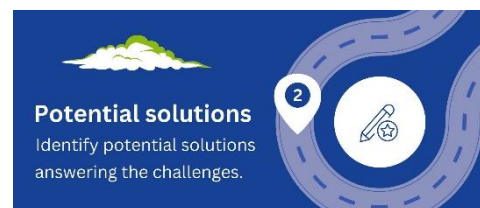
Step 1: envision the challenge areas and objectives for using NbS

- Hereby not only environmental, but also social challenges are to be considered.
- Considering that the resources are often limited, an inclusive step may be to prioritise among the challenges identified. Various tools and methods for comparison and prioritization are available below.
- The identification of challenges and the prioritization is to be aligned to the strategic development plans and concepts of the region or of the city. The recognition of envisaged development routes can help to identify the challenges to tackle.
- Involvement of stakeholders and citizens in defining the priorities is implied



Step 2: identify potential solutions to the challenges

- This to be supported by benchmarking different scenarios via cost-benefit analyses or similar. For this numerous information sources such as current laws and regulations, spatial information, economic and market conditions, heritage issues are to be analysed.
- Citizen information is to be integrated into the analysis, but the analysis itself should already happen based on criteria and KPIs agreed previously by all citizens and stakeholders.
- The combination and mutual reinforcement effects of various solutions should be evaluated to determine which combinations bring the highest overall positive impact also considering potential cascade effects.
- The choice is closely connected with the target location(s) and having already an actual place for the intervention can highly influence the choice.



Step 3: identify barriers to and enablers for the implementation of NbS and define the interactions among them

Step 3.a.: explore and predict the barriers

- A good understanding of the challenges will help you identify project goals in collaboration with all the stakeholders involved.
- Each and every region or city will face a unique set of barriers such as place or fund limitations, legislative problems or the lack of knowledge. These should be concretised as much as possible.



- Barrier identification may result in changes to the initial vision and/or preferences for particular solutions.

Step 3.b. Recognize all enablers

- Setting collaboration between various stakeholders and sectors may be the most important enabler.
- Furthermore, effective monitoring, financial instruments, plans and legislations, education and training, combination with grey infrastructures, open innovation and experimentation can appear on this list.



- As in step 3a barrier identification, the presence of multiple actors can enrich the identification of enablers.

The process results in the selection of the most appropriate intervention(s).

Tools to evaluate and select from potential NbS solutions (Step 1 & 2)

The Nature-Based Solutions Handbook of the Think Nature H2020 project discuss different types of assessment methods and decision-making tools as a basis for the assessment and selection among various potential NbS solutions while planning interventions effectiveness¹⁵. From these several options are presented in the “Economic viability and cost-effectiveness” chapter of the present material. These can help to implement in practice the Step 1&2 of the above-described planning cycle.

The more simple and traditional methods, such as the Cost Effectiveness Analysis (CEA) or Life Cycle Costing (LCC) are recommended to be used in the planning phase while selecting from potential solutions. Once the solution is decided, more sophisticated calculations are advised (already rather in the execution and not in the planning phase) by Environmental Impact Assessment (EIA) or by Cost-benefit analysis (CBA). Several methods are considering social and welfare benefits on top of quantitative cost calculations.¹⁶

Considering the multiple purposes and numerous benefits NbS can bring, it is advised not to choose one from the numerous tools and methods, but rather to smartly combine them based on the locally available information and the characteristics of the area, as well as the type of intervention. This approach is expected to lead to a comprehensive evaluation fitting best to the needs and circumstances.

“It’s absurd to ask if solutions should be nature based. ALL solutions should be nature based.”¹⁷

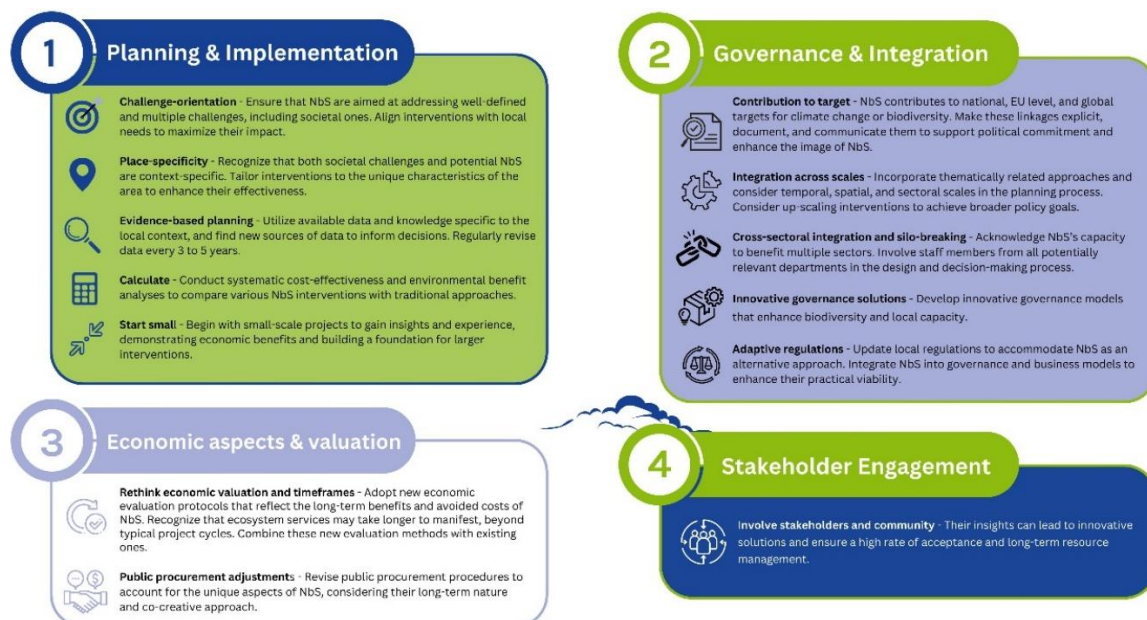
OVERARCHING RECOMMENDATIONS

¹⁵ Somarakis, G., Stagakis, S., & Chrysoulakis, N. (Eds.). (2019). *ThinkNature Nature-Based Solutions Handbook*. ThinkNature project funded by the EU Horizon 2020 research and innovation programme under grant agreement No. 730338. doi:10.26225/jerv-w202

¹⁶ See more in chapter „Economic viability and cost effectiveness“.

¹⁷ David Suzuki, Geneticist, environmental activist and broadcaster, <https://environment.umn.edu/education/susteducation/cop25/part-4-solution-stories/>

There are no one-size-fits-all solutions, particularly in the context of NbS. Nevertheless, a comprehensive list of recommendations is provided below to support the planning of NbS by local and regional public bodies.



5. Figure: Planning NbS- Overarching recommendations



Recommended reading list:

1. *ThinkNature Nature-Based Solutions Handbook: a complete and thorough investigation of each NbS aspect, including planning and implementation:*
<https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5c7061325&appId=PPGMS>
2. *Planning nature-based solutions: Principles, steps, and insights: give suggestions of how planning NBS can be conceptualized and applied in practice by merging insights from literature and a case study of the Lahn river landscape, Germany.* [*Planning nature-based solutions Nature-based Solutions in River Landscapes*](#)
3. *The Urban Nature Atlas was developed in 2017 as an output of the Naturvation project (Horizon 2020). It offers a searchable database of over 1000 NbS from European cities and beyond. These are not only described but also can be filtered and compared with the help of an analysis tool, using two different approaches: search based on a challenge to address, or search based on potential NbS solutions:*
<https://una.city/analysis-0>
4. *An interactive NbS decision-support tool is available on the Regreen H2020 project's website:*
<https://nature-solutions.eu/decision-support-tool/>
5. *The nature-based solutions planning support system: A playground for site and solution prioritization: An NbS Planning support systems (PSS) is developed and tested in the city of Eindhoven:*
<https://www.sciencedirect.com/science/article/pii/S2210670721008738>

LEARNING MODULE: FINANCING NBS

INTRODUCTION

Financing NbS is crucial for building resilient and sustainable communities, particularly in the face of increasing environmental challenges. These solutions are cost-effective, provide multiple co-benefits, and can enhance biodiversity while mitigating climate change impacts. However, local and regional public authorities face numerous challenges when it comes to NbS financing including limited resources, the complexity of valuation methods and insufficient data.



6. Figure: Obstacles to effective financing of NbS interventions

Overcoming these challenges requires a strategic approach, including the development of clear business cases, the establishment of policies and regulations, and obviously, appropriate knowledge of the financial opportunities.

The following chapters provide support to local and regional authorities in formulating their approach by offering **guidance to overcome barriers, descriptions of various public and private funding sources, and a 'smart financial engineering' guide**. As this material is general in nature, specific local and national public sources will not be covered. Instead, the focus will be on **direct EU funds and transnational cooperation projects**. Additionally, forward-looking approaches, including **'non-traditional', private, and blended funding opportunities**, will also be discussed. The **economic viability** and the issue of **cost-effectiveness** are also integral parts of the topic, and it is important to understand how to emphasize and exploit the opportunities within. To make the picture full when it comes to NbS valuation, apart from the **positive effects**, the potential **undesired impacts** are also mentioned. The issue of biodiversity and economic data are key when it comes to viability and funding. These were examined already beforehand, linked to the planning of NbS.

ECONOMIC VIABILITY AND COST-EFFECTIVENESS

The economic viability of NbS is an essential aspect that underscores their growing adoption in regional and urban planning, climate adaptation, and sustainable development strategies. By leveraging natural processes and ecosystems, NbS can provide a range of **economic benefits while contributing to biodiversity conservation and climate resilience**. This viability is supposed to be evident. Moreover, according to the IUCN Global Standard on Nature-based Solutions¹⁸, NbS by default needs to be economically viable to be recognized as such.

Indeed, by providing essential ecosystem services, reducing costs associated with climate impacts, and offering diverse funding opportunities, NbS represent a **sustainable and economically sound** approach. To increase their uptake and fully capitalize on their potential, it is also essential to **demonstrate this viability** in a credible way when communicating towards stakeholders or the general public.

“NbS costs much less than other engineered interventions... some estimate postulate \$54 billion (NbS) vs. \$228 billion (without NbS); almost a 4-fold saving”.¹⁹

How to approach? Re-think!

Re-thinking of traditional approaches is needed when calculating the economic viability of NbS interventions. Firstly, as it is well known, NbS interventions require the **involvement of various departments or sectors** within the administration. In other words, not only the environmental department but others such as transport, water management, agriculture, social welfare may have an interest or role to play. Involving all these stakeholders can be **complex** and may lead to a situation where the issue **lacks clear ownership**. However, this **holistic approach** ensures that all aspects of NbS are carefully considered, resources are efficiently identified, and potential costs are thoroughly calculated.

Another area for rethinking is the approach to funding. Rather than solely seeking for new sources of funding consider using the existing investment capacity to shift from conventional approaches to NbS. In other words, it's not only about finding new sources of funding on the top of the existing ones, but **to use the already existing ones differently**²⁰. This shift in mindset can already move considerable sources towards financing Nbs.

¹⁸ IUCN (2020). Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. First edition. Gland, Switzerland: IUCN. <https://www.iucn.org/resources/publication/iucn-global-standard-nature-based-solutions-first-edition>

¹⁹ Exploring the role of Nature-based Solutions (NbS) in addressing climate change by Kairos Dela Cruz, Natalia Rossi, Mor Seye, Fall, Mekalia Paulos, Julika Tribukait https://beahrselp.berkeley.edu/sites/default/files/Beahrs%20ELP%20CC%20Group%20Project_final%20version_20211012.pdf#:~:text=URL%3A%20https%3A%2F%2Fbeahrselp.berkeley.edu%2Fsites%2Fdefault%2Ffiles%2FBeahrs%2520ELP%2520C%2520Group%2520Project_final%2520version_20211012.pdf%0AVisible%3A%200%25%20

²⁰ Núñez Rodríguez, M.; Sheikholeslami, D.; Moncorps, L.; Gionfra, S. (2023). Financing NbS in municipalities: Exploring opportunities from municipal funding. Factsheet drafted by IUCN for NetworkNature (H2020 project No. 887396).



A potential tool of using funds in a way of moving forward to NbS is the **Green Public Procurement (GPP)**. Local and regional public authorities obviously play a fundamental role in GPP given that their procurement activities account for around 14% of the EU's GDP²¹. **Green Public Procurement (GPP)** is the process where public authorities procure goods, services, and works by promoting (in the context of NbS) solutions that utilize natural processes to address various environmental and social challenges, such as water management, or biodiversity conservation. GPP helps public authorities achieve sustainability goals by prioritizing products and services that contribute to environmental protection and resource efficiency. This way public authorities leverage their purchasing power to procure goods and services that have a reduced environmental impact, including those that support NbS.

In the context of NbS, these authorities:

- identify the need for NbS projects and initiate the GPP process
- secure initial funding
- ensure that projects comply with environmental regulations and standards
- oversee the procurement process to guarantee transparency and fairness, and monitor the implementation and performance of NbS projects
- facilitate collaboration between various stakeholders
- promote the benefits of GPP and NbS to the public, raising awareness and building support for sustainable procurement practices
- share successful case studies to inspire similar initiatives elsewhere

For instance, Turin has integrated GPP into its urban planning to develop green corridors and parks, which improve air quality and provide recreational spaces. The city's procurement policy favours suppliers that use sustainable materials and practices, thereby supporting local green businesses and reducing the carbon footprint

²¹ https://link.springer.com/chapter/10.1057/978-1-137-55269-3_19

of municipal projects https://sustainable-procurement.org/fileadmin/templates/sp_platform/lib/sp_platform_resources/tools/push_resource_file.php?uid=24a22d81

However, public authorities are facing various challenges when it comes to GPP. In the context of NbS, these challenges are as follows:

- Existing public procurement practices are often too **rigid** for an NbS implementation. The “NbS approach” requires a much more **complex line of thinking**.
- **Long-term, performance-based** procurement approaches should be prioritized over the regular short-term cost-benefit analyses. However, there is no consensus on reliable **measurement** and quantification, leading to insufficient information on costs and benefits.
- The estimation of **costs** is challenging due to local context dependency, influenced by the regional/landscape/urban needs.
- NbS often provide benefits to a much larger area than conventional engineering solutions, and, since these are living solutions, the **benefits** are also expected to last for much longer further complicating cost and benefit accounting.
- While some benefits can be **quantified**, procurement officers often lack the tools and skills to assess diverse benefits (environmental, social, and economic).
- All these, with limited NbS experience may struggle to present a **convincing** business case for the NbS solution.
- Managing taxpayers’ money, procurement officers may favour **risk-averse**, predictable processes and conventional solutions.
- The diversity of NbS needs and technologies makes the development of any **systemic classification** difficult as well, complicating procurement service identification and performance criteria.
- Procurement officers often **lack a common language and technical expertise** for effective communication with suppliers, hindering ecosystem service valuation.
- **Low contract values and high technical requirements** discourage suppliers from bidding on NbS projects, leading to low or zero bid numbers and consequently, reduced competition.

Several recommendations are available fostering NbS procurement based on the publication of the European Commission DG for Research and Innovation²². Here below the key messages are summarised:

Policy development towards NbS

As public procurers do not always have the expertise to assess the wide- range of NbS benefits, the business case may often be difficult to demonstrate. It is, therefore, useful to rely on a different, but strong strategic case for the NbS proposals, rooted in supportive policies. By developing a set of policies that explicitly support NbS, city governments can encourage public procurers to include related requirements in calls for tenders.

Cross-sectoral/cross-departmental knowledge exchange

²² Public Procurement of Nature-Based Solutions, Addressing barriers to the procurement of urban NBS: case studies and recommendations by Ernesta Mačiulytė (University of Stuttgart IAT) and Elsa Durieux (ICLEI), 2020 Directorate-General for Research and Innovation, EUR KI-02-20-672-EN, Doi: 10.2777/561021, https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/public-procurement-nature-based-solutions_en

NbS often requires interdisciplinary knowledge. Multidisciplinary teams/cross-departmental units and/or knowledge-sharing occasions could help increase the awareness of public procurement officers and city administration officials to better understand NbS-friendly procurement.

Challenge-based approach

Given the complexity of NbS interventions and the wide range of technical solutions available for NbS, public procurers may face difficulties in drafting clear technical specifications for their projects. Consequently, it is often better not to define those specifications, but to describe only the desired outcome in the call asking suppliers to come up with their own ideas and related technical solutions. Preliminary market competition is advised to ensure that the market is capable of delivering the desired outcomes.

Merging projects

It may be challenging to find suppliers when contract values are low. Merging several smaller contracts in a single call may be motivating. Inter-city collaboration may be beneficial with a joint procurement of NbS projects, augmenting contract value.

Find knowledge in other European regions

NbS projects are more and more spreading across Europe. Connecting with any platforms or interest groups may help public administration and public procurers share thoughts and workable solutions with peers.

Pilot projects

The lack of trust and/or the lack of community interest can be improved by delivering quick wins. Procuring smaller, pilot-type projects can be a good tool to involve the community and demonstrate that their views and considerations are incorporated into the intervention. This could be a step zero before going forward towards larger-scale projects and co-design processes.

Recommendations fostering Nbs procurement by EC DG for Research and Innovation



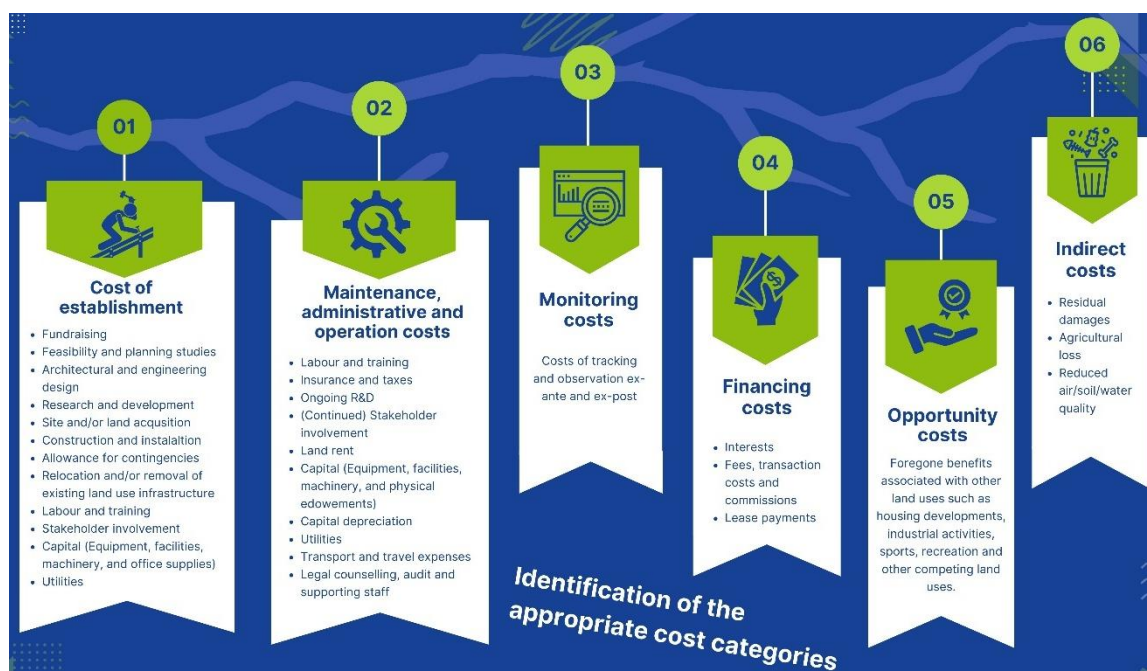
7. Figure: Fostering NbS procurement- recommendations

Identification of the appropriate cost categories

When calculating potential intervention costs, it's crucial to account for all categories comprehensively. The following list used by the INVEST4NATURE project²³ is a good example when looking for an exhaustive overview of NbS cost categories, covering both time-related and category-specific expenses:

- 1) costs of **establishment** (initial investments and expenses incurred before starting project operations),
- 2) **maintenance**, administrative, and operation,
- 3) **monitoring** costs (implies the collection of information, data or field measurements, which can be gathered, recorded and updated on a timely basis for analytical purposes and sampling surveys),
- 4) **financing** costs,
- 5) **opportunity** costs (the foregone benefits associated with other land uses such as housing developments), and
- 6) **indirect costs** (costs of disservices, side effects and unintended impacts of the NbS project, for instance: residual damages, agricultural loss).

²³ Lozano, J. E., Nainggolan, D., Zandersen, M., Kofler, V., Kernitzkyi, M., Staccione, A., Bidoli, C., & Mysiak, J. (2023). Value categories and approaches to assess NbS economic and financial performance. Invest4Nature Deliverable 2.1. Invest4Nature. Horizon Europe Grant no.101061083. <https://doi.org/10.5281/zenodo.10834731>



8. Figure: NbS cost categories²⁴

Evaluation methods

After identifying the appropriate cost categories, the next step is to estimate these costs and, where relevant, compare them with those of alternative intervention options. Additionally, incorporating more sophisticated methods that account for qualitative aspects or ecosystem services is recommended for a comprehensive evaluation. On top of the below-listed ones²⁵, several such methods exist, see more in the recommended reading list.

Cost Effectiveness Analysis (CEA): The CEA method is used when the intervention primarily targets a single problem e.g. combatting noise pollution and/or there is a fixed budget available. The cost estimates for different interventions cover both operational and maintenance costs. The method is simply seeking answers on the level of result (e.g. lower noise) for the fixed amount. However, a shortcoming of this method does not consider the multiple benefits of NbS.

Life Cycle Costing (LCC): In LCC, the focus is on financial aspects. The costs over the entire lifetime of the intervention are compared over a fixed (long) term horizon. LCC can be difficult in terms of estimating long term maintenance costs and again, the co-benefits of NbS are often underestimated.

Multi-criteria assessment (MCA): An MCA scores various measures against multiple criteria. The scoring is advised to be based on expert/ stakeholder opinions, while the criteria (environmental, social, or economic aspects) should be chosen along the challenge targeted. MCA is very useful when multiple stakeholders are involved in the assessment. For instance, in the case of flood risk mitigation criteria such as flood mitigation,

²⁴ Lozano, J. E., Nainggolan, D., Zandersen, M., Kofler, V., Kernitzkyi, M., Staccione, A., Bidoli, C., & Mysiak, J. (2023). Value categories and approaches to assess NbS economic and financial performance. Invest4Nature Deliverable 2.1. Invest4Nature. Horizon Europe Grant no.101061083. <https://doi.org/10.5281/zenodo.10834731>

²⁵ Lozano, J. E., Nainggolan, D., Zandersen, M., Kofler, V., Kernitzkyi, M., Staccione, A., Bidoli, C., & Mysiak, J. (2023). Value categories and approaches to assess NbS economic and financial performance. Invest4Nature Deliverable 2.1. Invest4Nature. Horizon Europe Grant no.101061083. <https://doi.org/10.5281/zenodo.10834731>

economic benefits social benefits, ecosystem services benefits, etc. are identified. Afterwards, the potential measures such as basin restoration or seasonal wetland are scored using a scale from 1 to 5 along the criteria.

The above three methods are recommended to be used while choosing from potential solutions. More complex calculations are listed below, and advised to be used before the execution of the intervention. In case of simple NbS solutions with limited financial constraints, even one the above three might be enough for the detailed analysis.

Environmental Impact Assessment (EIA): EIA is the most well-known assessment method also regulated by a standalone EU directive. Also used for the assessment of grey infrastructure projects. As such it is not described in detail hereby. It involves evaluating the potential environmental, social, and economic effects. This assessment considers both the benefits, such as enhanced biodiversity or increased climate resilience and the costs, including potential ecological disturbances and financial investments.

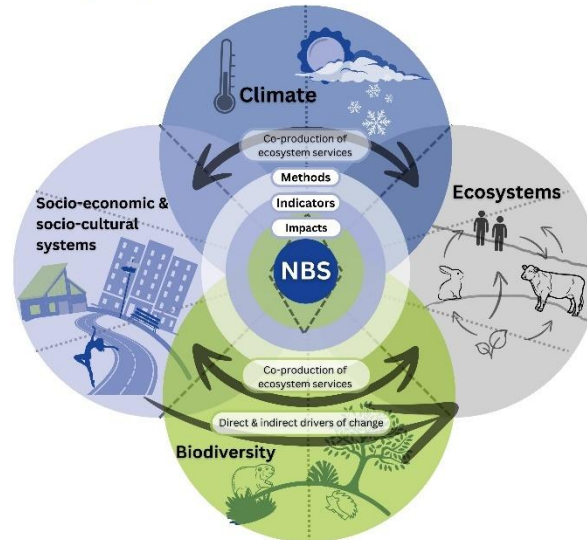
Cost-benefit analysis (CBA): The method can give enough room for the evaluation of co-benefits and certainly has a key role when multiple parties are involved in the financing of the intervention. CBA compares the costs to the welfare effects and benefits (as well as to the negative impacts) of the project. It is a useful tool to compare various intervention options or when comparing NbS with an alternative grey project.

Social and Environmental CBA (SCBA): SCBA introduces the concepts of social and/or environmental values and sustainability into the traditional CBA. The method is quantifying social and environmental costs and benefits, this way measuring welfare and comparing it across different types of interventions. This is particularly useful for NbS projects, having both socio-economic and environmental components.

MAES (Mapping and Assessment of Ecosystems and their Services): Through MAES the European Commission is assisting Member States in the assessment of ecosystems and their services, as well as assessing the economic value of such services. This framework considers co-benefits. A NbS directed towards a given challenge has its own objectives and actions. Each of these can be linked to impacts assessed using a set of indicators, and methods for assessing those indicators²⁶:

²⁶ Raymond, C.M., Berry, P., Breil, M., Nita, M.R., Kabisch, N., de Bel, M., Enzi, V., Frantzeskaki, N., Geneletti, D., Cardinaletti, M., Lovinger, L., Basnou, C., Monteiro, A., Robrecht, H., Sgrigna, G., Munari, L. and Calfapietra, C. (2017) An Impact Evaluation Framework to Support Planning and Evaluation of Nature-based Solutions Projects. Report prepared by the EKLIPSE Expert Working Group on Nature-based Solutions to Promote Climate Resilience in Urban Areas. Centre for Ecology & Hydrology, Wallingford, United Kingdom

Framework illustrating the relationships among elements of biophysical and social systems, climate resilience



2. Figure Framework illustrating the relationships among elements of biophysical and social systems, climate resilience

There are many more assessment methods on top of the above-listed ones. The EKLIPSE expert Working Group report gives a throughout listing of these linked to 10 major challenges potentially addressed by NbS. The report links economic, environmental and social indicators to each challenge, with respective measurement units and related impact assessment methods, also introduces a case study to each: <https://oppla.eu/product/17511>

Choosing the right valuation method depends on the context and available data. In most cases it is recommended to combine several methods to reach a stronger and more complete valuation.

Example: Compare costs with other types of interventions

When calculating the maintenance costs of NbS, it's also important to compare these costs with those of other types of interventions to gain a comprehensive and comparable perspective. Some of the above-listed calculation methods are appropriate for such comparison. The table below shows a simple example. It describes the management needs (in working hours) of different types of green areas. It outlines the economic advantages of switching from a conventional management (here called structured or functional), generally linked to low biodiversity and ecosystem services, to a nature-based management (country or nature), with higher ecological integrity and delivering a more extended range of ecosystem services²⁷.

²⁷ <https://besjournals.onlinelibrary.wiley.com/doi/10.1111/1365-2664.12876>

	Structured garden with a lot of flowers	Structured garden	Functional garden	Country garden	Nature garden
Level and type of management	High level of management. Frequent mowing, regular pruning	High- medium management. Frequent mowing, basic pruning	Basic management, Basic pruning, Reduced mowing	Basic to minimum management. Occasional mowing	Minimum management. Mowing max once a year
Average	2800 h/ha/an	1200 h/ha/an	800 h/ha/an	250 h/ha/an	90 h/ha/an
Minimum	2500h/ha/an	750h/ha/an	450 h/ha/an	200 h/ha/an	70 h/ha/an
Maximum	4600h/ha/an	1200 h/ha/an	1200 h/ha/an	450 h/ha/an	200 h/ha/an

9. Figure: Labour time for urban park management²⁸

Case studies to convince and demonstrate

Once resources are identified and calculations are made, a next step is to prove and demonstrate those on a convincing way.

When it comes to convincing, it is useful to rely on case studies of similar interventions or areas.

In the report “Cost-effectiveness of NbS in the Urban Environment” (see below at the recommended reading list), two cases are presented, comparing NbS to traditional interventions. These evaluations showed for instance, that a runoff water treatment with retention pond in the city of Aarhus (NL) costed 146 EUR/m³ compared to the costs of a closed basin, which summed up to 1394 EUR/m³.²⁹

Another example is a complex case study comparing a traditional flood protection strategy in Belgium involving the construction of storm basins with an NbS approach focused on floodplain restoration. The study found that the NbS not only mitigated flood risks effectively but also provided additional ecological and recreational benefits. While the traditional approach had a more predictable and immediate flood mitigation capacity, the NbS offered a more sustainable and cost-effective solution over time, with fewer environmental drawbacks. The method SCBA (see above at calculation methods) has been used for the comparison of the two approaches.³⁰

²⁸ Núñez Rodríguez, M.; Sheikholeslami, D.; Moncorps, L.; Gionfra, S. (2023). Financing NbS in municipalities: Exploring opportunities from municipal funding. Factsheet drafted by IUCN for NetworkNature (H2020 project No. 887396). <https://networknature.eu/sites/default/files/uploads/networknature-nbs-factsheet-4.pdf>

²⁹ Núñez Rodríguez, M.; Sheikholeslami, D.; Moncorps, L.; Gionfra, S. (2023). Financing NbS in municipalities: Exploring opportunities from municipal funding. Factsheet drafted by IUCN for NetworkNature (H2020 project No. 887396). <https://networknature.eu/sites/default/files/uploads/networknature-nbs-factsheet-4.pdf>

³⁰ Turkelboom, F., Demeyer, R., Vranken, L. et al. How does a nature-based solution for flood control compare to a technical solution? Case study evidence from Belgium. *Ambio* 50, 1431–1445 (2021). <https://doi.org/10.1007/s13280-021-01548-4>

CO-BENEFITS

While primarily designed to tackle specific issues, NbS offer a range of co-benefits that extend beyond their initial purpose. These co-benefits refer to the additional, often unanticipated, advantages that arise from implementing NbS. They encompass a broad spectrum of positive outcomes, including enhanced ecosystem services, improved public health, increased biodiversity, and greater social and economic resilience.

The notion of co-benefits emphasizes the multi-dimensional value of NbS, highlighting how these interventions can simultaneously address multiple objectives and create synergistic effects. For example, an NbS intervention aimed at improving green spaces can also contribute to mitigating climate change, fostering community well-being, and recreation, reducing air- pollution and boosting local economies.³¹

The topic of cost-effectiveness naturally leads to the consideration of the co-benefits of an intervention. Any financial or cost analysis must be expanded to account for the multiple services ecosystems provide. NbS investments, while addressing a particular challenge, also offer benefits to other issues that were not the primary focus of the intervention. If policy objectives are ranked stepwise in the decision-making process, the examination of these co-benefits of NbS interventions must be part of this ranking.

However, quantifying or financially evaluating these co-benefits remains a challenge, often leading to their undervaluation in traditional cost-effectiveness analyses. To fully leverage the potential of NbS, it is essential to adopt a holistic approach that integrates these additional benefits into decision-making processes. By doing so, regions and communities can make more informed, and sustainable choices, ensuring that the diverse advantages of NbS are realized and maximized.

“The Natura 2000 network, which covers 18% of the EU’s Land area, is estimated to provide economic benefits worth between €200-300 billion per year through ecosystem services such as carbon sequestration, water purification, and tourism. ... implementing nature-based solutions in urban areas across the EU could create up to 400,000 jobs by 2030”^{32,33}.

These co-benefits are hard to measure, nonetheless, they are very diverse and impressive. Demonstration of all co-benefits can considerably support decisionmakers to decide for NbS instead of grey investment. The

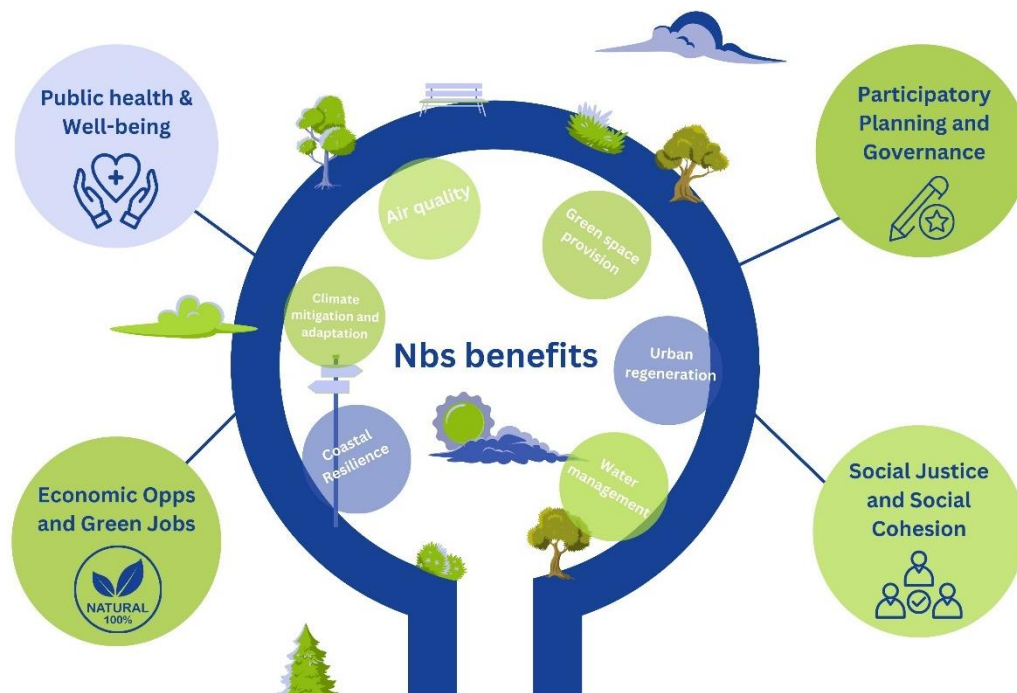
³¹ Hereby important to mention the notion of ecosystem services. These are to be distinguished from NbS co- benefits. Ecosystem services are the benefits that humans receive from natural ecosystems. While ecosystem services are the broad benefits provided by ecosystems, co-benefits are specifically the supplementary advantages gained from NbS interventions. These co-benefits often include enhanced ecosystem services, but they also encompass broader social and economic advantages.

³² Source: European Commission (2013). The Economic Benefits of the Natura 2000 Network

³³ Source: European Environment Agency (2020). Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction

assessment of these co-benefits can happen along various dimensions that may appear simultaneously when implementing NBS³⁴:

1. Environmental Co-benefits: those unexpected environmental effects deriving further from an intervention such as trade-offs and synergies to biodiversity, protection of species and inhabitants, improved air and water quality, and increased resilience to environmental changes.
2. Social Co-benefits: Enhanced human health and well-being, mitigation of noise and heat, recreational opportunities, and community cohesion, improved public security, potential for citizen's involvement in governance and monitoring.
3. Economic Co-benefits: stimulation of local economy, increased property values, job creation, reduced costs for infrastructure and disaster management, reduced energy consumption at buildings.
4. Cultural heritage protection or preservation for instance at gardens related to historical heritage, or local native and landrace plants



10. Figure: Nbs- Co-benefits

Each NbS can deliver various co-benefits, again, requiring a case-by-case analysis. It is advised to rank these effects by for instance low, medium and high levels of probability. Besides, it is worth estimating certain target values, such as the nr. of new people having access to green/blue infrastructure, nr. of citizens involved in green infrastructure projects, temperature reduction in the area, etc.

³⁴ Raymond, Christopher M.; Frantzeskaki, Niki; Kabisch, Nadja; Berry, Pam; Breil, Margaretha; ÓáNita, Mihai Razvan et al. (2017): A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas. <https://www.sciencedirect.com/science/article/pii/S1462901117306317>

Apart from this, the potential benefits of the interactions across elements of socio-cultural, economic system, biodiversity, ecosystems, and climate can also be considered (i.e. a benefit can stimulate or reinforce another benefit).

Various examples for assessing these effects are available in the recommended reading list. And in the Learning knowledge Module 1. of the present material.

UNDESIRE IMPACTS

Although the idea is that NBS produces benefits, it is nevertheless possible that it may bring undesirable impacts or lead to unintended consequences that offset some of the anticipated benefits. These effects are to be carefully thought over already in the planning phase.

For instance, introducing trees in cities or their surroundings is likely to bring carbon sequestration and decrease the heat island effect, but at the same time, it may result in emissions of biogenic volatile organic compounds³⁵, allergic reactions, or fire risks.

Another example is when the creation of green spaces, intended to improve urban air quality may increase property values, leading to higher rents and potentially displacing lower-income residents. This can diminish the overall social equity benefits of the intervention.

A classic rebound effect can occur as well when the creation of a new green area (a wetland or a park) attracts a large number of visitors who travel by car, leading to increased air pollution and littering in the area. This can counteract the intended environmental benefits of the park, such as improved air quality and ecosystem health. Furthermore, transport during construction as well as emissions due to maintenance need to be considered.

ADDITIONAL CONSIDERATIONS

The above pages showed us that the evaluations of NbS interventions are not straightforward. Those are typically complex assessments always requiring the involvement of numerous aspects, players and methods. A thorough examination and a holistic approach can support this process. To contribute to this approach, certain key aspects of NbS interventions, not mentioned beforehand, are listed below:

Scale

These interventions are usually part of broader projects, and it is not always clear if they should be assessed individually or as part of a larger system. Typically, the latter approach is ideal. For example, a peri-urban intervention will not only have local impacts but will also contribute to a larger network of green areas surrounding the city, collectively supporting the preservation of vulnerable species in the broader region.

Combination

³⁵ VOCs are small particles emitted as gas that become pollutants in the air. They are typically associated with chemicals found in household cleaning products and building materials, but it turns out that trees also emit VOCs. More information: <https://earthzine.org/the-trouble-with-trees-volatile-organic-compounds-exacerbate-climate-change-and-air-pollution/>

Several NbS solutions are not mutually exclusive. Decision-makers often have the option to choose between multiple NbS solutions or a combination of them.

Context-Specificity

NbS is highly context-dependent, and influenced by geographical, social, and various other factors. As a result, these calculations are always specific to the context, with no “one size fits all” solutions. Therefore, demonstrating the economic viability of a concrete intervention always requires effort.

"Other options"

In densely populated areas, green and blue spaces serving as NbS often occupy land that could be used for other purposes, such as parking lots or housing. This is a land-use competition or land-use opportunity cost. Careful consideration is required, including the possibility of combining these functions.



Recommended readings:

1. *The economics of Nature-based Solution: an exploration of NbS typologies across six landscape types and thematic areas, along with an inventory of valuation methods. It examines the costs and benefit categories associated with NbS.* <https://doi.org/10.5281/zenodo.10834731>
2. *Financing nature-based solutions in cities: Exploring opportunities from municipal funding. A factsheet by IUCN in the frame of the Network Nature project explores how implementing NbS can be a more financially viable alternative to conventional approaches.* <https://networknature.eu/sites/default/files/uploads/networknature-nbs-factsheet-4.pdf>
3. *Cost-effectiveness of NbS in urban environment: published in the frame of the ReGREEN project gives very detailed and reader-friendly support for considering costs/effectiveness/benefits of NbS interventions, including multiple examples and calculation methods*
[Microsoft Word - Regreen_D2_3_Cost-effectiveness of NBS_final.docx \(regreen-project.eu\)](https://regreen-project.eu/Microsoft%20Word%20-%20Regreen_D2_3_Cost-effectiveness%20of%20NBS_final.docx)
4. *A user-friendly and detailed guide on GPP drafted by [Grants Europe Consulting](#), commissioned by the Ministry of Foreign Affairs and Trade of Hungary, relevant for any European municipality: [Green Public Procurement Guidance Booklet for Project Partners](#)*
5. *Quantifying co-benefits and disbenefits of Nature-based Solutions targeting Disaster Risk Reduction. The report provides guidance on quantitative pre-assessment of co-benefits and disbenefits. Interestingly, the evaluation focuses on the change of the estimated co-benefits and disbenefits as well.* <https://www.sciencedirect.com/science/article/pii/S2212420922001856>
6. *Estimating the social value of nature-based solutions in European cities: a scientific report aggregating the social value to urban residents of 85 NBS projects implemented across Europe:* <https://doi.org/10.1038/s41598-022-23983-3>
7. *Action 5 of the EU Biodiversity Strategy requires the Member States, with the assistance of the European Commission, to map and assess ecosystems and their services. As a response, the Joint Research Centre developed a series of maps of ecosystem services. This data collection is made available here:* <https://data.jrc.ec.europa.eu/collection/maes>
8. *On the 22st of September 2023 Marija Bočkarjova (University of Twente) gave an inspirational talk entitled "On assessing co-benefits of NbS" at the Naturance General Assembly hosted by IVM in Amsterdam.* https://www.youtube.com/watch?v=fLFzr5cSX_0

SOURCES OF FINANCE

After discussing the key aspects of cost-effectiveness and economic viability, including the calculation of co-benefits, the next step is to explore the potential financial sources available for implementing these interventions. Effective funding strategies are key for local and regional authorities aiming to implement NbS, in order to deliver environmental and social benefits to their territories.

A simple approach to identifying potential financial resources (on top of existing, own resources like municipal or regional budgets) is to group them into two main categories: public funds and private financing sources.

1. Public Funding Sources

- Local or Regional Funding, e.g. regional development funds
- National Funding, e.g. dedicated government grants and subsidies
- EU Funding, incl.
 - National & Regional Operational Programmes,
 - European Territorial Cooperation Programmes, incl. interregional, transnational and cross-border Interreg Programmes, Directly managed EU funds

2. Private Financing Sources

- Private Sector Funding, e.g. Corporate Social Responsibility (CSR)
- Market-Based Instruments, e.g. Payment for Ecosystem Services (PES)
- Innovative Financing Mechanisms, e.g. Blended finance
- Philanthropic and Community-Based Funding, e.g. donations, crowdfunding
- Credits/loans (market-based, subsidised)



11. Figure: Potential funding sources

This classification may help to comprehensively assess and exploit the full range of funding options available. A smart combination of these is not only advised but often necessary to achieve the required results. In any case, blending public, private, and European funds can maximize the resources available.

Public funding sources

When it comes to financial resources, the local, regional and national budgets have significant importance. Besides, national and regional operational programmes funded under the EU's cohesion policy represent a large volume. These are diverse and specific across Member States and regions, best known „at place". The current training material is a generic guidance targeting potentially any regions in Europe. Therefore, these aforementioned sources are not presented. Focus is on direct EU funds, European Territorial Cooperation programmes³⁶ and on non-traditional/private sources. Besides, cooperation programmes described in this material are only those available on EU level, i.e. in a larger geographical area

European Territorial Cooperation Programmes and directly managed EU funding programmes

European Territorial Cooperation Programmes provide an opportunity for cross-border, transnational or interregional cooperation, capacity building, knowledge sharing, strategy making and pilot actions. Directly managed EU funding programmes highly favour innovative approaches, but they are very competitive and need substantial capacities from applicants to develop a successful proposal.

When engaging to such projects, the funding of operation and maintenance costs after the end of the implementation should also be secured.

Interregional programmes

Amongst European Territorial Cooperation Programmes, **URBACT** provides the most flexible framework in terms of topic. URBACT is dedicated to local governments, helping them to jointly work on specific urban challenges. The programme does not set any thematic priorities but follows a bottom-up approach. As such, it is clearly open to projects working on NBS as well.

Funding programme	URBACT IV
Relevant part of the programme	whole programme
Beneficiaries	Exclusively focuses on municipalities of all sizes and local municipal associations from any EU Member State. Typical partnership consists of 8-12 partners, showing a balanced geographic coverage.
NBS related thematic focus	Promoting Integrated Sustainable Urban Development through cooperation, following a bottom-up approach, based on interest areas defined by the projects.
Type of intervention it supports	Awareness raising, partnership building, transnational networking, local strategy making
Available funding in the 2021-2027 period	ca. EUR 100 million (EUR 50-80 thousand per city)

³⁶ Information is provided regarding the 2021-2027 programming periods.

NBS4LOCAL

EU funding rate	70% (national co-financing for most of the beneficiaries, with a percentage depending on the legal status and the country)
More information	https://urbact.eu/

Funding programme	Interreg Europe
Relevant part of the programme	whole programme
Beneficiaries	National, regional, local public authorities and other relevant bodies responsible for developing and/or implementing regional development policies, from any EU member states and IPA-I countries. Typical partnership consists of 8-12 partners from 5-8 countries.
NBS related thematic focus	Projects contributing to improved implementation of local / regional / national policies relevant for achieving a greener, climate-neutral and resilient Europe can be supported.
Type of intervention it supports	Awareness raising, capacity building and strategy development via interregional cooperation among local, regional, national policy actors, knowledge exchange and transfer of good practices and innovative approaches with the specific aim of preparing the integration of the lessons learnt into regional policies and actions.
EU funding rate	80% for public bodies, 70% for private non-profit bodies (national co-financing for most of the beneficiaries, with a percentage depending on the legal status and the country)
Available funding in the 2021-2027 period	EUR 334 million total (cca. 1,5 m per project)
More information	https://www.interregeurope.eu/

Transnational and cross-border cooperation programmes

URBACT and Interreg Europe cover all EU member states. Apart from these, various transnational cooperation programmes, such as Interreg CENTRAL Europe, Danube Transnational Programme, Interreg Alpine Space or Euro-Med involve territories from certain countries forming larger macro-regions. They promote better cooperation and regional development via a joint approach to tackle common issues, providing this way more efficient solutions as if only acting at national level. Similarly, Cross-Border cooperation programmes, known as Interreg A, support territorial cooperation among two or more Member States or neighbouring non-EU countries sharing a common border.

Such projects are certainly important ones for NbS, as many natural environments, such as forests and rivers, do not adhere to political boundaries. Addressing environmental challenges through NbS often necessitates transnational and cross-border collaboration, focusing on the shared natural resources that connect and sustain those regions. Various areas such as risk prevention, restoration, climate adaptation and environmental protection are among the priorities of these Programmes.

Directly managed EU funding programmes

Funding programme	LIFE
Relevant part of the programme	The current LIFE Work Programme runs from 2021 to 24 and from 2025 till 2027 a new edition of the Work Programme will apply. In 2024 two subprogrammes have highest relevance regarding the topic: LIFE Subprogramme Climate Change Mitigation and Adaptation - Standard Action Projects (2021-2024) LIFE Subprogramme Nature and biodiversity - Standard Action Projects (2021- 2024)
Beneficiaries	Any legal entity from any EU Member States and LIFE Associated Countries Partnership size can vary between 6-15 partners, involving specialised knowledge organisations, municipalities as demo sites, national / regional public authorities and agencies, forestries, national parks, NGOs, etc. A transnational partnership is not a requirement, the consortium may consist of local entities.
NBS related thematic focus, type of intervention it supports	Subprogramme Climate Change Mitigation and Adaptation: climate adaptation, resilience and mitigation, including drought management and sustainable use of water, special attention on promoting investment in NBS and measuring its positive impact Capacity building and strategy development, implementing small scale pilot actions or large-scale investments, e.g. NBS in the management of land, adapting cities and regions to climate change, climate-proofing and resilience of infrastructure and buildings, adaptation solutions for farmers, forest managers, Natura 2000 managers and other land managers, water management, preparedness for extreme weather events. Subprogramme Nature and biodiversity: natural habitats and native species, governing nature and biodiversity management Any actions contributing to the development, implementation, monitoring and enforcement of EU legislation and policy on nature and biodiversity, including capacity building; policy development; implementing small scale pilot actions; implementing large-scale investments.
EU funding rate	60% (national co-financing can be applied for, varying from country to country)
More information	https://cinea.ec.europa.eu/programmes/life_en

Funding programme	Horizon Europe
Relevant part of the programme	The current Horizon Europe Work Programmes run from 2023 to 24 and from 2025 till 2027 a new edition of the Work Programme will apply. In 2024 the below Horizon Europe work programmes have highest relevance regarding the topic: EU Missions, incl. calls under Mission: Adaptation to Climate Change; Mission: Restore our Ocean and Waters by 2030; Mission: 100 Climate-Neutral and Smart Cities by 2030; Mission: A Soil Deal for Europe

NBS4LOCAL

	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment, incl. calls for Biodiversity and ecosystem services,
Beneficiaries	Any legal entity from any EU Member States and Horizon Europe Associated Countries. Partnership size can vary between 8-30 partners, involving research organisations, universities, public authorities (incl. municipalities, often as demo sites), NGOs, companies developing innovative solutions / services or providing specialised knowledge, etc. Usually a transnational EU-wide partnership is required.
NBS related thematic focus, type of intervention it supports	Research & Innovation Actions, e.g. to develop scientific insights and research results for advancing knowledge on NbS and for their policy uptake & mainstreaming Innovation Actions, e.g. testing and demonstrating transformative solutions increasing climate resilience Coordination & Support Actions, e.g. gathering and disseminating knowledge, tools, state-of-the-art solutions, creating networks and multi-level governance structures for knowledge sharing
EU funding rate	100% for public authorities
More information	https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

Funding programme	European Urban Initiative (EUI)
Relevant part of the programme	Innovative Actions strand of the EUI programme, i.e the successor of the Urban Innovative Actions Programme (UIA) is most relevant for designing and implementing state-of-the art urban NbS.
Beneficiaries	Any urban authority over 50 000 inhabitants (or associations / groupings of territorially adjacent urban authorities in accordance with specific eligibility rules) in local partnership with stakeholders, including any relevant organisation, e.g. NGOs, public utility companies, knowledge institutions, financial institutions or private companies.
NBS related thematic focus	Topics focus on priority fields defined per call, in line with priorities of the Urban Agenda for the EU. NbS may be included directly or indirectly in various topics, such as earlier calls focusing on greening cities or sustainable land use. .
Type of intervention it supports	EUI includes two strands: (a) support of innovative actions, and (b) support of capacity and knowledge building. Innovative actions strand aims to foster the deployment of proof-tested urban innovations across the EU and to provide opportunities for cities, as enablers of innovation, to take the risk to turn ambitious and creative ideas into pilot projects that can be tested in real urban settings.
Available funding	EUR 450 million (EUR 1-5 million per project)
EU funding rate	80% (national co-financing for most of the beneficiaries, with a percentage depending on the legal status and the country)

More information

<https://www.urban-initiative.eu/>

Beyond the above listed funding opportunities being particularly relevant for local and regional actors, there are other programmes as well that can clearly contribute to wider uptake of NbS but address different target groups. One specific example for river restorations is the Open Rivers Programme, financing planning and intervention: <https://openrivers.eu/>

Governance and education for instance are particularly important “enabling factors” for promoting NbS. Erasmus+ is a directly managed EU programme, which promotes education, training, youth and sport. The 2021-2027 programme places a strong focus on the green and digital transitions. Besides learning mobility of individuals, it also supports cooperation among organisations and institutions with the aim to improve quality of education and training. Considering skill gaps in the field of NbS, Erasmus+ programme may be particularly relevant to develop and improve training and education programmes in the field via transnational cooperation.



Recommended reading list:

1. *European Commission, Directorate-General for Environment, Find your EU funding programme for the environment: a guide to finding the right EU funding programme for the environment has been published by the European Commission. It contains examples of funding programmes and funded project, as well as a cross-reference table to identify appropriate funding programmes, whether you are seeking funding as a business, public authority, NGO or research institution. <https://data.europa.eu/doi/10.2779/768079>*
2. *INTERREG EU website covering European CBC, transnational and interregional opportunities: <https://interreg.eu/>*

Private financing options for NbS

NbS often **competes for funding** with other public services, such as health or education, creating budget allocation dilemmas for local governments. It is more and more acknowledged, that **public finance alone will not be sufficient to meet any environmental goals** and the call to mobilise private capital is increasing.

However, the potential for **private financing in NbS remains relatively unknown** among local and regional authorities, as well as the general public. This partly relates to the fact that a significant proportion of funding for nature historically originates from public sector budgets.

“Public funding currently only covers about 14% of the total investment needed to meet biodiversity targets, highlighting the urgent need for private sector contributions”³⁷.

Given the clear insufficiency of public funds to fully protect ecosystems and halt biodiversity degradation, the need to raise awareness about private investment in NbS is more critical than ever.

Alternative funding options- shortlist

Private Sector Funding

- **Corporate Social Responsibility (CSR):** Companies invest in NbS as part of their CSR initiatives to improve community relations, environmental stewardship, and corporate image.
- **Environmental, Social, and Governance (ESG) Investments:** Investments driven by ESG criteria focus on sustainable and ethical impacts, where funds are directed towards projects like NbS to achieve positive environmental outcomes.

Market-Based Instruments

- **Green Bonds:** These are bonds specifically earmarked to raise money for climate and environmental projects. Local authorities can issue green bonds to finance NbS, attracting investors interested in sustainable development.
- **Payment for Ecosystem Services (PES):** This mechanism involves compensating or providing financial incentives to landowners or resource managers for maintaining or enhancing ecosystem services that benefit the public, such as water purification or carbon sequestration.

Innovative Financing Mechanisms

- **Blended Finance:** Combining public and private financing to reduce the investment risk for private investors, thereby mobilizing additional private capital for NbS projects.

Philanthropic and Non-Governmental Funding

- **Donations and Sponsorships:** Funds from individuals, foundations, or corporations to support NbS projects. These can include direct financial donations or in-kind contributions like materials or volunteer time.
- **Crowdfunding:** Leveraging online platforms to raise small amounts of money from a large number of people to fund specific NbS projects.

³⁷ OECD (2020). <https://www.oecd.org/environment/resources/biodiversity/report-a-comprehensive-overview-of-global-biodiversity-finance.pdf>

Community-Based Funding

- **Local Partnerships and Cooperatives:** Collaborations with local businesses, NGOs, and community groups to jointly fund and manage NbS projects.
- **Community Shares and Bonds:** Community funding models where local residents invest in bonds or shares to support and benefit from local NbS projects.

Most frequent funding options are spelt out in more detail in the below sections.

Payment for Ecosystem Services (PES)

Local and regional public authorities can

- create frameworks for PES schemes, set up monitoring systems, and establish criteria for payments,
- can also allocate public funds or secure external funding to ensure the sustainability of PES programs,
- the facilitation of stakeholder engagement lies in the hands of public authorities via engaging landowners, beneficiaries, NGOs, and other stakeholders to foster collaboration and support for PES initiatives.

Payment for Ecosystem Services (PES) is an innovative financial mechanism designed to incentivize landowners, farmers and resource managers to maintain or enhance ecosystem services. These services include water purification, carbon sequestration, flood regulation, biodiversity conservation, and more. The fundamental idea is to compensate those who manage their land or resources sustainably, thereby benefiting the broader society. Individuals, businesses, or public authorities can all be beneficiaries willing to pay for the preservation or enhancement of the ecosystem. Payment can take the form of direct payments, subsidies, tax incentives, or market-based instruments.

Below some examples are listed for PES programs:

1. **Vittel, France:** In Vittel, a PES scheme was established by Nestlé Waters to protect water quality. Local farmers received payments and technical assistance to adopt sustainable agricultural practices that reduce nitrate contamination of the water. This initiative has been successful due to the strong support from local authorities, which played a critical role in the program's design and implementation. <https://www.iiied.org/g00388>
2. **Emscher Region, Germany:** The Emscher Cooperative Agreement is a PES scheme aimed at improving water quality and ecological health in the Emscher River catchment. Local municipalities, businesses, and other stakeholders contribute financially to support measures such as wastewater treatment and river restoration. The scheme highlights the role of regional authorities in coordinating and funding environmental improvements. <https://interlace-hub.com/emscher-future-master-plan>

Corporate Social Responsibility (CSR) and Environmental, Social, and Governance (ESG) in the Context of NbS

Local and regional public authorities can attract these investments by

- creating a favourable regulatory environment,
- offering incentives,
- partnering with private investors to co-finance NbS projects, and
- can also ensure transparency and accountability in how the CSR, and especially ESG criteria are applied to local projects.

Corporate Social Responsibility (CSR) refers to the practices and policies undertaken by enterprises to manage their business processes in ways that produce an overall positive impact on society. CSR initiatives in the context of Nature-based Solutions (NbS) often involve companies engaging in environmental conservation and sustainability projects that go beyond their immediate business interests.

Examples:

1. **Heineken Spain:** Heineken has developed several CSR initiatives focused on water stewardship, including restoring wetlands and implementing water-saving technologies. This collaboration with local authorities helps ensure sustainable water use in regions where they operate. <https://www.heineken.com/global/en/sustainability>
2. **Volkswagen Slovakia:** The company has undertaken tree-planting projects in collaboration with local municipalities to enhance urban green spaces and improve air quality. <https://www.biodiversity-premises.eu/en/volkswagen-slovakia.html>
3. **ForestaMI** is a fund approved in November 2019 aiming to plant 3 million new trees by 2030 in the Metropolitan area of Milan implemented with the cooperation of enterprises, associations, citizens and institutions. <https://forestami.org/en/dona/>

Environmental, Social, and Governance (ESG) criteria are a set of standards for a company's operations that investors use to screen potential investments. Environmental criteria consider how a company performs as a steward of nature, including how they manage energy use, waste, pollution, natural resource conservation, and the treatment of animals. In the context of NbS, ESG investments support projects that enhance ecosystem services and promote sustainability.

The responsibility of business when it comes to environmental protection, climate issues as well as societal terms is more and more of the agenda. A series of pivotal EU ESG reporting regulations are being created in 2024 reshaping CSR and ESG practices.³⁸

Example:

1. **London's Green Finance Initiative:** The city has attracted ESG investments to support various NbS projects, including urban greening and sustainable drainage systems to manage stormwater and reduce flooding risks. <https://www.greenfinanceinstitute.com/>

"A survey conducted by Eurobarometer found that 93% of Europeans believe that businesses should play a role in

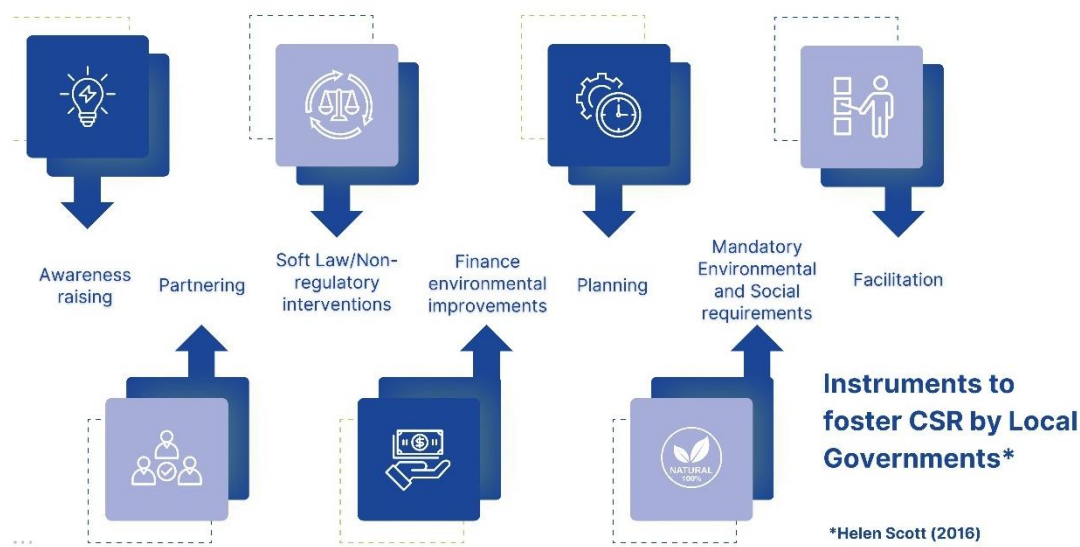
³⁸ On 24 April 2024, the European Parliament have adopted the Proposal for a regulation on the transparency and integrity of ESG rating activities (the "Regulation"). ESG ratings provide an opinion on a company's or a financial instrument's sustainability profile, by assessing its exposure to sustainability risks. More information: <https://www.consilium.europa.eu/en/press/press-releases/2024/02/05/environmental-social-and-governance-esg-ratings-council-and-parliament-reach-agreement/>

protecting the environment and combating climate change.”³⁹

Public attention is being shifted to the social and ethical performance of enterprises. Based on these tendencies, these days collaboration with businesses is an emerging type of alliance when it comes to NbS interventions.

According to Helen Scott, Centre for Urban Research, there are seven proven instruments for how local governments can foster corporate responsibility⁴⁰.

1. **Awareness**-raising that can spread the word via business awards or information platforms.
2. **Facilitation** that may help to coordinate local business networks or assist regional and global business connection.
3. **Partnering** may entail Public Private Partnerships (PPPs) or government-business contracts.
4. **Soft Law, or ‘non-regulatory’ interventions** such as procurement strategies requiring suppliers to meet certain environmental and social criteria or codes of conduct for contractors may change business practices and behaviours more than regulation.
5. **Financing** may include grants to implement **environmental improvements or differentiated rating** rewarding social or environmental criteria.
6. **Planning** such as land-use planning as function of local government or zones that restrict different activities to particular geographic locations may be a powerful outcome changer.
7. The setting and enforcing **mandatory environmental and social requirements** for business - for example via local regulations, or licensing of business - may be more effective than strictly voluntary measures.



12. Figure: How local governments can foster corporate responsibility⁴¹

Green Bonds for Nature-Based Solutions

³⁹ Eurobarometer (2021). European Citizens' Views on Climate Change and Energy

⁴⁰ Scott, Helen. (2016) Local Government Guide to Fostering Corporate Responsibility. <https://apo.org.au/node/89251>

⁴¹ Scott, Helen. (2016) Local Government Guide to Fostering Corporate Responsibility. <https://apo.org.au/node/89251>

Local and regional public authorities can:

- issue green bonds to raise funds for local environmental projects,
- ensure that the projects funded by green bonds meet environmental standards and contribute to sustainability goals,
- raise awareness about green bonds and encouraging investment,
- ensure that these investments deliver the intended environmental benefits.

Green bonds are a type of fixed-income instrument specifically earmarked to raise money for climate and environmental projects. They offer investors a way to support sustainability initiatives while earning returns. Green bonds have become a popular method for financing NbS, providing the necessary capital for large-scale projects aimed at enhancing ecosystems, biodiversity, and climate resilience. Similar to traditional bonds, green bonds are issued by governments, municipalities, corporations, or financial institutions to raise capital.

Examples:

1. The city of Paris has issued green bonds to finance various environmental projects, including energy-efficient public buildings, renewable energy projects, and urban biodiversity initiatives. These bonds have enabled Paris to advance its sustainability agenda and combat climate change effectively. [City of Paris Sustainability Bond Framework](#)
2. Gothenburg was the first city in the world to issue green bonds in 2013, and financed projects such as energy-efficient buildings, renewable energy installations, and sustainable transportation initiatives. This has helped the city improve its environmental footprint and promote sustainability. <https://goteborg.se/wps/portal/enhetssida/investor-relations/green-bonds>

Public-Private Partnership (PPP)

Local and regional public authorities in PPPs for NbS, can be:

- facilitators and coordinators identifying potential NbS projects and
- initiate the PPP process by bringing together relevant stakeholders from both the public and private sectors,
- engage with local communities to garner support for NbS projects, ensuring that they meet public needs and preferences,
- they can coordinate project planning, ensuring alignment with local and regional development goals and with environmental regulations and standards, also oversee the permitting process and enforce compliance throughout the project lifecycle,
- finally, they supervise implementation, and monitor results and impacts,
- public authorities often contribute through co-funding the private investment or by securing grants and subsidies. They can also offer financial guarantees to reduce investment risks for private partners.

Public-Private Partnerships (PPPs) are collaborative agreements between public authorities and private sector entities designed to finance, build, and operate projects that serve the public interest. In the context of NbS, PPPs offer an innovative financing mechanism to support sustainable and resilient infrastructure projects. By leveraging private sector expertise and investment, PPPs can enhance the implementation and scalability of NbS initiatives, ensuring their long-term viability and success.

PPP is mostly suitable for projects that deliver an attractive return to a private entity, for example, reducing the O&M costs, generating a profit, or providing other benefits that are essential for a private entity.

Examples of PPPs in NbS:

1. The ROOM for the River Project, Netherlands: This project aims to increase flood safety while enhancing the environmental quality of the river areas. Through a PPP framework, the Dutch government collaborated with private contractors to create more space for rivers to safely overflow, reducing flood risk and simultaneously creating new recreational and ecological zones. The private partners were responsible for financing part of the project and bringing in technical expertise, while the public authorities oversaw project planning, implementation, and ensured compliance with environmental regulations. <https://www.dutchwatersector.com/news/room-for-the-river-explained>
2. The Thames Tideway Tunnel, United Kingdom: Although primarily a grey infrastructure project, it incorporates significant NbS components such as riverbank restoration and the creation of new habitats. This initiative is a collaboration between the UK government and private investors, led by Bazalgette Tunnel Limited. The project is designed to reduce sewage overflows into the Thames River, enhancing water quality and supporting biodiversity. Public authorities played a crucial role in project approval, regulatory oversight, and securing initial public funding, while private entities managed the construction and long-term operation. https://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/2022-03/gih_showcaseprojects_thames-tideway.pdf
The Tunnel website itself offers a great insight into the progress and the involvement of various actors: <https://www.tideway.london/>

Blended finance

Local and regional authorities

- can be the initiators and implementors of blended financing structures,
- engage stakeholders,
- and ensure that projects align with broader environmental and socio-economic goals.

Blended financing refers to the strategic use of public and private funds to support projects that deliver social, environmental, and economic benefits. In the context of Nature-based Solutions (NbS), blended financing can mobilize resources for large-scale environmental restoration, conservation, and sustainable development initiatives. This approach combines different sources of capital, such as grants, concessional loans, and private investments, to reduce risk and attract private sector participation in projects that might not otherwise receive funding.

Examples:

1. The Urban Water Buffer in Rotterdam, Netherlands: This project addresses urban flooding and water shortages by creating underground water storage. The project exemplifies blended finance by combining municipal funds with private investments and grants from environmental organizations. <https://www.fieldfactors.com/case-studies/urban-waterbuffer-at-sparta-soccer-stadium-rotterdam>
2. European Investment Bank (EIB) and Natural Capital Financing Facility (NCFF): The EIB, in partnership with the European Commission, launched the NCFF as a pilot programme from 2015 to 2022, to support projects that promote biodiversity and climate adaptation. This facility blended public funds with private investments

to finance NbS projects across Europe, such as ecosystem restoration and green infrastructure.
https://www.eib.org/attachments/documents/ncff_municipalities_en.pdf

Crowdfunding

Role of Local and Regional Public Authorities:

Due to their close connection with the communities they serve, local and regional authorities can facilitate crowdfunding by:

- Providing initial seed funding to kickstart campaigns,
- offering logistical and regulatory support to ensure project viability and compliance,
- promoting projects through official channels to reach a broader audience,
- engaging with local stakeholders to foster community buy-in and participation,
- they can enhance the credibility of the campaign, building trust and
- ensuring that the given project is in line with the local/regional environmental and sustainability policies.

Crowdfunding for Nature-Based Solutions (NbS) involves pooling small financial contributions from a large number of individuals, typically via online platforms, to fund projects that leverage natural processes to address environmental challenges. This approach allows communities to support and invest in sustainable projects, fostering greater public engagement and shared responsibility for environmental stewardship.

Examples:

1. CoFarm Cambridge is a community farm that leverages crowdfunding to support its initiatives. The farm promotes sustainable agriculture and biodiversity by growing a diverse range of crops and creating wildlife habitats. The project engages local volunteers and provides fresh, organic produce to the community, enhancing food security and environmental awareness. The farm was established through the collective efforts of the community, demonstrating the potential of crowdfunding to mobilize local resources for sustainable development. <https://www.cofarm.co/whats-on/2020/6/8/cofarm-cambridge-market-garden-set-up>
2. Give Back Nature to Salla is an environmental initiative focused on the restoration and conservation of natural habitats in Salla, located in Lapland. This campaign aims to protect and rejuvenate local forests and peatlands, contributing to biodiversity conservation and climate resilience. The initiative relies on a combination of public funding, private donations, and crowdfunding campaigns to finance its activities. Crowdfunding allows individuals from around the world to contribute to conservation efforts. <https://www.visitsalla.fi/en/give-back-to-local-nature/>
3. Rewilding Europe Capital: This initiative supports various rewilding projects across Europe, including efforts to restore natural habitats and improve biodiversity. One notable project funded through a combination of crowdfunding and loans is the removal of obsolete dams in the Ukrainian Danube Delta. The campaign raised nearly €20,000 from Dutch donors to dismantle 10 Soviet-era dams, which will significantly benefit local wildlife and ecosystems. More information about this project can be found here. <https://rewildingeurope.com/news/crowdfunding-campaign-to-enable-multiple-dam-removal-in-ukrainian-danube-delta/>

Two models of crowdfunding are the most well-known: donation-based and reward-based crowdfunding.

- **Rewards-Based Crowdfunding:** contributors fund the NbS projects in exchange for non-monetary rewards. These rewards can be symbolic or tangible and are directly related to the environmental or social benefits of the project, such as Naming rights to a tree or a specific area within the project, updates on the environmental impact of their contribution (e.g., how many tons of CO2 were offset), or small eco-friendly products or services, such as seeds, eco-tours.

Platforms: Kickstarter, Indiegogo, and other similar platforms are used for such campaigns.

- **Equity-Based Crowdfunding for NbS:** contributors provide funds in exchange for equity or a share of ownership in the NbS project. This model is more investment-oriented, where a return on investment (ROI) is expected if the project generates financial returns, such as shares in the reforestation company or the eco-tourism enterprise that is developing or managing the NbS project profits from the sale of ecosystem services, such as carbon credits or sustainable agriculture products.

Platforms like SeedInvest, Crowdcube, or dedicated environmental investment platforms are known as facilitators of such investments.

The crucial elements of crowdfunding are

- community building, strong marketing, storytelling skills, and a range of different communication materials
- clear and transparent reporting on the environmental and social impacts to maintain trust and engagement
- regulatory compliance with financial or data protection regulations, which can vary by country and region.

SMART FINANCIAL ENGINEERING

Overview

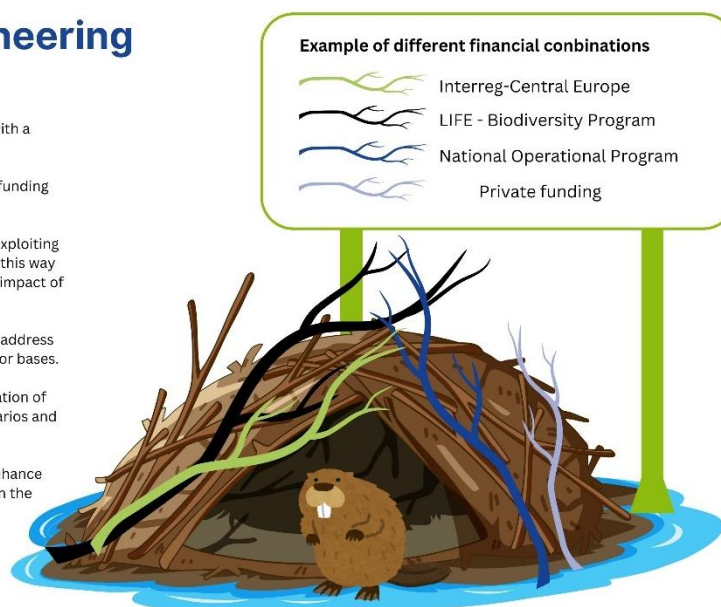
By effectively **combining diverse public sources with each other and with private funding**, local and regional authorities can implement several NbS projects that deliver multiple benefits. A combined and holistic approach ensures that NbS initiatives are not only financially viable but also sustainable in the long term.

This approach can be labelled as “smart financial engineering”, which, in the context of the present material, focus on the smart design, structuring and combination of different EU funds with each other and with private funding sources. This method could be an effective vehicle to gain as much financial support as possible to realise the final goals set by the city or region. The key pillars of the approach are as follows:

Smart Financial Engineering

The key pillars

- 1 Having a firm but flexible development trajectory with a clear vision for the area
- 2 Sophisticated understanding and structuring of all funding opportunities available
- 3 Combining and optimizing these opportunities via exploiting the synergies and multiplier effects between them, this way creating leverage effect and increase the scale and impact of the intervention(s)
- 4 Not afraid of using innovative forms of financing to address certain needs and to attract diverse range of investor bases.
- 5 Managing risks with the diversification and combination of funding sources, and by creating contingency scenarios and plans
- 6 Creating a supportive regulatory environment to enhance this process (local/regional strategies and policies in the topic, local taxes or tax returns)



13. Figure: Smart Financial Engineering- The key pillars

The interests and investment plans of the private sector or the requirements and conditions of support set by a funding programme often do not entirely fit or only partly cover the needs of the local/regional community. By breaking down the different needs into separate, but interrelated projects and interventions it is possible to align them better to the interests of investors or to the requirements of funding schemes. This approach allows these projects to be financed by external sources, ensuring that their outputs still harmonise with the planned development trajectory of the area.

In practice, this approach can result in a series of projects (the planned development trajectory broken down to a number of interrelated projects and interventions), each of them having a chance to get funding from a public and/or private source and each of them contributing to getting closer to the long-term vision of the city or region.

Examples of smart combinations:

Cities can successfully implement NbS by **initially securing own or EU funds for small-scale pilot projects**. These projects serve as proof of concept, demonstrating the effectiveness of the intervention.

Once the benefits are evident, municipalities can allocate their own funds or seek additional EU or private sources for scaling up these initiatives. **Amsterdam** utilized EU Horizon 2020 funding to pilot green roofs and walls, and later expanded the initiative with municipal funds due to its success in improving urban resilience⁴².

Any **investment is worth to be coupled with capacity planning and know-how transfer** from interregional cooperation projects. A smart use of EU funds can also mean obtaining knowledge and support for the development of local/regional private funding/CSR policies and practices, paving the way for actual private financing actions later on.

⁴² <https://interlace-hub.com/es/casestudy/19449>

A good example is **the ACROSS INTERREG EUROPE** project focusing on the alignment of public and corporate sustainability goals, establishing long-term cooperation between economic actors and public authorities, which may pave the way for upcoming private investments.

Having a clear vision and supportive regulatory environment are important pillars when combining resources. The **city of Ljubljana** (in 2016 awarded as European Green Capital) created the “Ljubljana 2025 Vision” which included a **list of concrete development projects**.

In contrast to many similar plans that remain general without a clear action list or implementation priorities, the “Ljubljana 2025 Vision” provided a focused list of projects prioritized by the mayor’s team. This allowed them to concentrate on issues they considered crucial, and to prioritize. Built upon the clear vision, strategic and implementation spatial plans, numerous sectoral programs, and action plans were developed. Examples include the Sustainable Urban Development Strategy, Sustainable Urban Mobility Plan, or Ljubljana Tourism Strategy. These plans further described objectives and activities related to specific topics. These served to find viable solutions for uncertain or complex, and normative problems that were too detailed to address within the general planning framework. By emphasizing actions necessary for achieving the desired future, these action plans became active forces in enabling change⁴³.

The **Municipality** of the 12th District (Hegyvidék) is the local government body responsible for administrating **Budapest’s** greenest district, a hilly - partly suburban - area in the western part of the Hungarian capital. Hegyvidék can be divided into three zones: a densely built-up zone in the centre, a mostly residential zone with large private gardens and many historical villa buildings, and a forest zone called Normafa, one of the most important green areas in Budapest, protected by the Duna-Ipoly National Park. The district area does not only have ordinary green spaces, but it is also the home of rare, endangered and even endemic species. As the greenest district in Budapest, Hegyvidék has a huge responsibility to maintain the greenery, properly communicate with the residents, and, as the most local form of government, raise their awareness of environmental issues. Understanding that green is a common value has been achieved through **a series of transnational cooperation projects, complementary to each other**. Important knowledge on innovative themes has been captured, and later on, capitalised by local and national funds, and Hegyvidék has also achieved a nationwide as well as an international reputation.

The most important projects:

1. The first one, the **Urban Green Belts** (UGB) within the CENTRAL EUROPE Programme was developed after a local census targeting the development goals of Normafa, when it became clear for local decision-makers that it was high time to make something different regarding urban green spaces.
2. Hegyvidék transferred the European good practice of Ljubljana (**BeePathNet**) to urban beekeeping. It addressed urban environmental, biodiversity and food self-sufficiency challenges linked to urban beekeeping through integrated and participative approaches. Hegyvidék focused on **urban biodiversity** issues during the transfer process and a whole range of activities started within the project is still active now.
3. Hegyvidék led the URBACT network **Health&Greenspace**, which was about improving urban green spaces to promote mental and physical health in our communities.
4. **Life in Runoff** is a still-running LIFE project tackling urban climate adaptation in the field of rainfall management by finding and strengthening synergies between green, blue and grey infrastructures.

⁴³ Dimitrovska Andrews K, Nikšič M, Mladenovič L, Cotič B, Mušič B, Kerbler B. Ljubljana—European Green Capital 2016: From Strategic Spatial Planning to Governance. Sustainability. 2024; 16(8):3332. <https://doi.org/10.3390/su16083332>

The most important outcomes derived from transnational activities:

1. **The Green Office.** The most important outcome of the first project was the establishment of the Green Office in 2016 as one of the departments of the municipality that has several roles to address the needs of the residents and to develop the district's sustainability further.

The Green Office's main tasks can be divided into 3 main areas:

- Day-to-day tasks connected to official issues (littering, noise, uprooting ragweed, planting trees etc.)
- Organising and joining programs to address local needs (e.g. awareness-raising activities and programs, participatory activities and events, programs to give guidance and aid residents)
- Manage and implement national and international projects to learn and share new approaches from all around Europe and beyond, to build a solid local network and communication among the residents, NGOs, private sector, academy sector, business sector, etc. in the district.

2. **Residential programme.** Very often the most urban green area is owned privately. In the shadow of the ecological crisis, it is thus crucial to engage residents and local companies, nurturing them to more pro-environmental behaviours and using more biodiversity-driven approaches in their gardens making them more resilient to the negative impacts of climate change too. The Green Office has a massive, ever-growing [Residential Programme](#), which seems inspiring for many municipalities in Hungary and abroad. Among other this programme includes the provision of a free-of-charge branch-cutting service, provision of composting boxes, promotion of fruit trees among residents, distribution of native trees among residents, organisation of a yearly competition and certification for nature-friendly gardens, implementation of a Bird-Friendly City, promotion and distribution of climate-tolerant, native, and pollinator-friendly flowers, support of residents with tree pest control or in rainwater harvesting.

3. **Being a frontrunner through innovative pilots.** Within the UGB project for instance, the municipality developed a tree replacement strategy for the district, with special attention to district trees and tree rows, and in collaboration with experts from the International Dendrological Foundation. Following the creation of the strategy, the municipality launched the [Hegyvidék Sapling and Young Tree Program](#) in 2019, in which it began the experimental planting of young, untrained saplings in the district instead of pre-grown nursery trees.

Experimenting with innovative themes within transnational cooperation projects has multifaceted benefits, most importantly they financially support innovative pilots. In general, these benefits can be summed up as follows based on the case of Hegyvidék:

	URBACT	Interreg CE	LIFE
Do I know what I want?	It is about getting knowledge and defining actions.	It is about understanding operational mechanisms and testing small-scale actions.	It is about implementing already tested, but still innovative solutions with a much higher budget and measuring impact.
What to focus on?	Building up common goals, governance structure and stakeholder group, developing policies.	Developing policies, and piloting solutions in transnational cooperation.	A clear focus on environmental issues and measuring the impacts.



I have an idea, what can I implement within these programs?	Stakeholder group, strategy creation and action planning.	Implementing small-scale pilots, monitoring, and policy outcomes.	Provision of already tested solutions on a higher scale (real investment).
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A checklist for smart financial engineering

When combining various EU funding sources with each other, and with private funding for NbS, local and regional authorities should reflect upon several factors to ensure effective and sustainable financing. Below is a list of recommendations along each factor. These factors are organized chronologically where applicable, and each one provides guidance for public (European) and private funding interventions. Some advice is relevant for both funding options, while others are specific to one funding option only. Each is marked with different colours.

Combination of public (European) resources with each other and with private sources		
Factor	Funding option	
	Public (EU) funding	Private funding
1. Make a plan	First, detect strategic areas of intervention and financing needs. Break them down to a list of potential projects. Consider both hard and soft interventions. Classify.	
	Consider if separate, combined or simultaneous implementation is the best. Find connections for combination, scalability and leverage effect. This includes to design outputs of projects in a way that an output of a project can serve as asset in the other project, implemented later. Classify.	
	Identify a longlist of potential EU funds along with the list of projects. Match. Revise the list of projects if new ideas arise while monitoring EU funds & calls regularly. Also review own resources. Match the projects with resources.	Create a list for potential private sector investment and align each to various funding sources (e.g. PPP or crowdfunding). This can be an alternative list (in case other public funds are also available), or a direct one targeting explicitly private options.
	Create potential combinations of public and private funds. Include the timing as a new aspect. Make a time plan.	
2. Engagement	Form partnerships with other EU cities or regions to strengthen funding applications through collaborative efforts. Engage the key partners (the ones that are indispensable in achieving the vision), then extend the circle and involve partners with specific expertise and strong interest in the programme where the funding is expected from.	Actively involve private sector stakeholders from the beginning. This increases their commitment and investment in the project.
	Break the silos within and outside the organisation, involve stakeholders, with regular meetings and joint documents to gain expertise and find comprehensive solutions.	
	Engage local communities to gain support and ensure the intervention meets local needs and preferences, increasing sustainability.	
3. Aligning Objectives	Policy coherence: ensure that NbS projects align with EU funding priorities, such as those outlined in the Green Deal or Horizon	Mutual benefits: align project objectives with private investors' interests. For example, a green infrastructure project that



	Europe to facilitate easier access to funds and ensure long-term sustainability.	improves local air quality and attracts eco-conscious businesses.
	Set the objectives of the project in a way that reflects the specific character of the funding programme along with programme priorities.	The potential impacts of NbS projects are to be valued (monetary/non-monetary) and based on this valuation projects can be rated in terms of attractiveness for private sector investors or for hybrid investment.
	Synergy among goals: Ensure that the goals of the municipal, EU, and private funding sources are aligned. This enhances cooperation and smooth integration of funds.	
4. Capacities	Plan the capacities as well. Estimate the volume, type (expertise, time, nr. of personnel) and the timely availability of own resources and assign them to potential projects. If resources are deficient, consider external resource involvement or capacity building. Think over if capacities can be built/raised via any projects and update the list of projects, if relevant.	
	Build the capacities. Focus on building staff capacities in project management, in the various regulations of different funding programmes, and in public procurement processes. Consider trainings in stakeholder involvement and innovative techniques such as co-creation.	Train public staff in public-private partnership management, focusing on fundraising, negotiation skills and investor relations.
	Put in place actions to increase the level of consumer awareness of the benefits of NbS, this way also increasing the need, demand and pressure for opportunities for public, private and consumer investment.	
	Participate in knowledge-sharing platforms and networks to learn from others and build network.	
	Explore cases. Oppla or the Network Nature offers a comprehensive database of case studies on NbS, detailing various funding strategies and outcomes: https://oppla.eu/case-study-finder https://networknature.eu/network-nature-case-study-finder EU Horizon 2020: This program has numerous examples of successful NbS projects funded by a combination of EU grants and other sources. Detailed project reports and findings can provide valuable insights. The website offers search by filters: EU Horizon 2020 Project Result Database	
5. Comprehensive Financial Positioning	Conduct detailed cash flow projections to align different EU funding disbursement schedules to accommodate the staggered release of funds.	Create multiple financial scenarios of private sector participation, including partial funding or phased investments.
	Calculate with the uncertainty and the timing of funding. Programmes or schemes are operating with different funding periods which are not (exactly) known at the time of the application. In addition, it is not even known in most cases, if the application will be successful.	
	Scenario planning: Develop multiple scenarios from the combinations to prepare for various outcomes. This includes best-case, worst-case, and most-likely scenarios to manage risks effectively.	
6. Risk Management	Avoid reliance on a single funding source and diversify your application portfolio towards various options (i.e. opting for various funding sources). Prepare with multiple scenarios of the mix of funds to	Structure agreements to share risks between the municipality/public body and private investors, such as cost-sharing for initial development and operational phases.



	spread risks and ensure project continuity if one source becomes unavailable.	
	In the course of implementation, focus on potential delays in fund disbursement, reduction of project budgets in conditions or decommitment phase, ineligible costs.	
	Contingency planning: Set aside a contingency fund to address unforeseen expenses or delays.	
7. Regulatory Compliance and supportive environment	Familiarize yourself with the regulatory requirements and compliance standards associated with EU funding to avoid legal issues and potential funding losses.	Ensure that the project complies with local regulations and standards acceptable to private investors, such as environmental impact assessments.
		Be aware of the regulatory environment governing private investments, such as tax incentives for green investments.
	Screen potential legal or regulatory barriers or inconsistent policy documents to tackle. Try to find solutions to each of these barriers (e.g. inclusion of NbS in the relevant local or regional regulatory frameworks, collaborate with regulatory bodies to streamline the permitting process).	
8. Transparency	Transparency is ensured while following the communication and publicity requirements of funding programmes.	Establish clear, accessible reporting mechanisms that disclose how funds are allocated, project outcomes, and any risks or returns. These are to be laid down in agreement with the investor and to be communicated on a regular, credible and clear way to the public.
		Consider third-party audits and assessments to verify the transparency of the investment. This adds a layer of credibility and helps reassure both the public and private investors that the investment is being managed responsibly.
		Ensure that all contractual agreements with private investors are transparent (and publicly available).
	Transparency allows to build trust towards all stakeholders and the general public, to trace the utilization of their financial contribution or of their participation. This supports engagement, ownership and sustainability. The active involvement of stakeholders in the planning or decision-making supports transparency.	
9. Monitoring and Evaluation	Reporting and monitoring obligations are usually set by the funding sources. However, various internal monitoring and evaluation structures on the top of these is advised to be set up. These may target sound financial management or the tracking of continuation/spin-off projects.	Develop performance metrics to monitor project outcomes and demonstrate value to private investors. Metrics could include return on investment (ROI) and environmental / social impact measures.
		Implement regular audits and transparent reporting mechanisms to maintain trust and accountability with all funding partners.
	Be prepared to adapt project plans based on monitoring results and stakeholder feedback.	
	Use data and evidence from implemented projects to build a strong case for additional funding.	

The effective combination of resources described previously necessitates expertise in the development and management of (EU-funded) projects, as well as in engaging private entities and individuals. Acquiring this expertise primarily involves practical experience in the field, with less emphasis on theoretical learning. Still, here are some practical tips and insights for each.

CRITERIA OF SUCCESSFUL EU PROJECTS

The ability to define and implement projects, particularly high-quality ones, is essential for success. The below guidance may help to understand the characteristics of projects that are likely to be judged successful with a good chance of gaining funding. In this context, the term "project" primarily refers to those seeking funding from interregional/direct EU sources.

Success may be understood in relation to three stages of a project's life (development, implementation, sustainment). Most programme's selection criteria for projects aim to assess these factors, too. Some of the below criteria can be relevant in case of private projects as well.

1. **Successful project proposal (a proposal with a high chance to receive funding). The most critical factors are:**

Alignment with EU policies and with the goals and objectives of the funding programme

In the 2021-27 financing period, it is an overriding expectation for projects to comply with the new EU policy, the DNSH principle (do no significant harm, https://knowledge4policy.ec.europa.eu/glossary-item/do-no-significant-harm_en), and even more so for NbS projects. For example, an NbS project should not convert a good-quality habitat into a semi-natural landscape element. Projects, calls with low self-contribution and a high ratio of community support, tend to be distorted by the financial mechanisms (well described as OPM – Other People's Money phenomenon by David Zetland, in 'Living with Water Scarcity': <http://www.riversimulator.org/Resources/Books/LivingWithWaterScarcityZetland2014.pdf>). To avoid the serious failures above, it is suggested to go forward as it is in the IUCN definition, protect, manage and create:

- First, determine what needs to be protected and conserved (an old tree, a wetland, some important species...).
- Second, what management practices need to be changed to have an ecologically better, healthier status.
- Third, where, what and how the new ecosystem can be created.

Another important EU initiative is the NEB (the New European Bauhaus https://new-european-bauhaus.europa.eu/index_en), NbS projects basically should be NEB projects as well, namely sustainable, inclusive and beautiful. The aesthetics and sustainability of NbS projects do not need more explanation. Inclusiveness means not only community involvement in planning, design, implementation, monitoring and maintenance, means not only accessibility, but among others, taking care of the marginalised communities, fighting against the gentrification of newly developed green areas.

Projects must align with the support scheme's overall and specific objectives as well. Overall objectives are broad, long-term goals based on the funding programme's values that the programme considers important and meaningful and worth using public money. Specific objectives are technical, quantifiable, and linked to performance indicators.

The clearer and – e.g. in terms of quantified targets – the greater the contribution of the project to the objectives is the greater the chance of success is (i.e. value for money). Similarly, the more convincing the applicant's capabilities are to actually bring about changes towards the objectives of the programme, the more chances the project has to get funding.

Reacting to Real-world Problems and Needs

A good project always clearly relates to a problem or an opportunity: to the solving of the problem (such as weakness or lack of something) or to exploit an opportunity that allows for making a positive change. Either the problem or the opportunity shall be described concretely, it shall be quantifiable and needs to be proved by data which is evidence-based. In successful applications, the applicant organisation(s) emphasizes its actual capability to take part in solving the problem / exploiting the opportunity.

Transferability

Projects should offer solutions that can be transferred to other contexts or target groups. This includes analysing which elements are transferable, to whom, and how they can be applied elsewhere. Transferability is increasingly required by funding programmes.

Innovation and Novelty

Especially directly managed EU programs require projects to be innovative, to create a European added value and move beyond the state-of-the-art. This could involve applying new scientific solutions or using existing solutions in new ways.

The Right Partnership

Effective projects involve strong, complementary partnerships who are committed, have their interest, and the relevant expertise. Partnerships should not be too narrow or too wide and should balance geographical and sectoral representation. Clear leadership is critical, with a lead partner having proven experience in managing diverse partnerships.

Detailed Project Planning and Budgeting

A detailed implementation plan is essential, outlining elementary steps, deliverables and (well-balanced) responsibilities of partners, linked to each of these. Financial planning should be based on the implementation plan. It is to be realistic and detailed, also ensuring balanced financial involvement of all partners. Proper cash flow planning is crucial in case of no or limited pre-financing and/or when own resources or revenues are used as co-financing sources.

High-Level Proposal Standards

Proposals should be clear, informative, and well-structured, with an engaging summary at the beginning. They should follow the funding programme's preferred style and terminology, also using some trendy references and buzzwords but not to an exaggerated extent. A well-presented proposal "reads like a novel", has its own coherent story (matching objectives, actions), characters (partners, with their motivations) and leads clearly from the beginning (problems, opportunities, motivations) to the end-game (expected outcomes and results).

2. Successfully implemented project. The most critical factors are:

Management capabilities of the partnership

A strong team is to be set up at each organisation involved with a clear division of roles, and solid knowledge of the project actions. In case needed, administrative and technical capacities of selected staff members are to be raised in the field of project management, regulations of different funding programmes, public procurement processes, involvement of stakeholders, etc.

The same applies to the consortia. A detailed and feasible implementation plan and the clear assignment of responsibilities for activities and results to partners are essential along with regular consultations and monitoring.

Engagement

In the implementation phase, the participative approach involving key stakeholders and local communities is to be sustained.

Eligibility of costs

Specific type of costs are eligible in various funding programs and various eligibility conditions apply to each budget category (e.g. personnel costs, subcontracting, travel and accommodation, etc.). These are to be carefully studied and matched with the internal needs and conditions.

Avoidance of double-funding

Usually when financing various actions from various sources, the question of double financing arises. Careful internal coordination, in harmony with all national and program level regulations are to be considered. e.g. costs of working hours of a project participant cannot be reimbursed from more than one source unless the hours spent on the various projects are duly recorded, split and are proportionally financed according to the participant's input to various outputs of the project.

Cash-flow planning

Most of the programmes operate with ex-post financing so that most of the costs need to be advanced. Even if advance payment is made by the donor, it covers usually just a tiny part of the financing. Additionally, payments in many programmes may prolong well over reasonable periods. Thus, co-funding needs to be planned in terms of cash-flow, too, especially in cases when the beneficiary implements more than one project.

Use of lump-sums / flat rates

More and more programmes offer the possibility of using simplified cost-reimbursement options. In case flat rate is opted for, room for manoeuvre will be wider, as in this case the actions funded (such as administration, travel, etc.) may be in practice supporting other projects, too. Nevertheless, the amounts to be used this way are not too big. If selecting real-costs-based reimbursement, costs need to be clearly and unambiguously associated with the activity of the project, the subject of the funding.

Procurements

Public procurement may be relevant and obligatory for beneficiaries who implement projects with public funding, even if the beneficiary is not subject to these obligations otherwise. Compliance with the rules may be time- and resource-consuming. In projects run in parallel, rules can be different according to the rules of the fund, or values of the individual purchases in the different projects may add-up and may require more complicated and more expensive procedure to follow.

Financial monitoring

Beneficiaries need to have a continuously operating system of monitoring of the projects they run. In case more projects are implemented in parallel, it is even more important to have real-time information regarding the under- and overspendings and cash-flow in the projects. Well-working system also may allow for optimisation of cash-flow or even reimbursement of certain costs among the projects run in parallel.

Appropriate contingency- and risk management

Considering ineligible funding, the built-in percentage of a 5-10% “risk reserve” may also be advised.

3. Sustainable project (a project with lasting benefits for its stakeholders). The most critical factors are:

Right Partnership

Select partners based on their long-term interest and commitment to the topic. Ensure partners have a shared vision for sustainability. Formulate a common vision providing a long-term perspective and a sense of direction. Choose a common concept that fits you; it is to be as simple in words as possible, while as complex in meaning

as possible in your own language. Good examples are Living City, Edible City, One Planet City, Swimmable City, One Water City.

Stakeholder Engagement

Involve stakeholders appropriately in both development and implementation phases can help sustainability later on. Maintain relationships with stakeholders even after the project ends to ensure ongoing support and engagement.

Outputs that match target group needs

Develop outputs that are tailored to the needs of target groups, ensuring they are practical, relevant, and beneficial. This can also lead to enhanced ownership and to potential revenue streams from the project.

Realistic Financial Plans

Create realistic financial plans for post-project funding that cover operating costs or forecast revenue streams.

Long-term Impact

Design the project with a focus on long-term impacts. Establish mechanisms to measure and evaluate the project's outcomes over time, ensuring that benefits continue beyond the project's lifecycle.

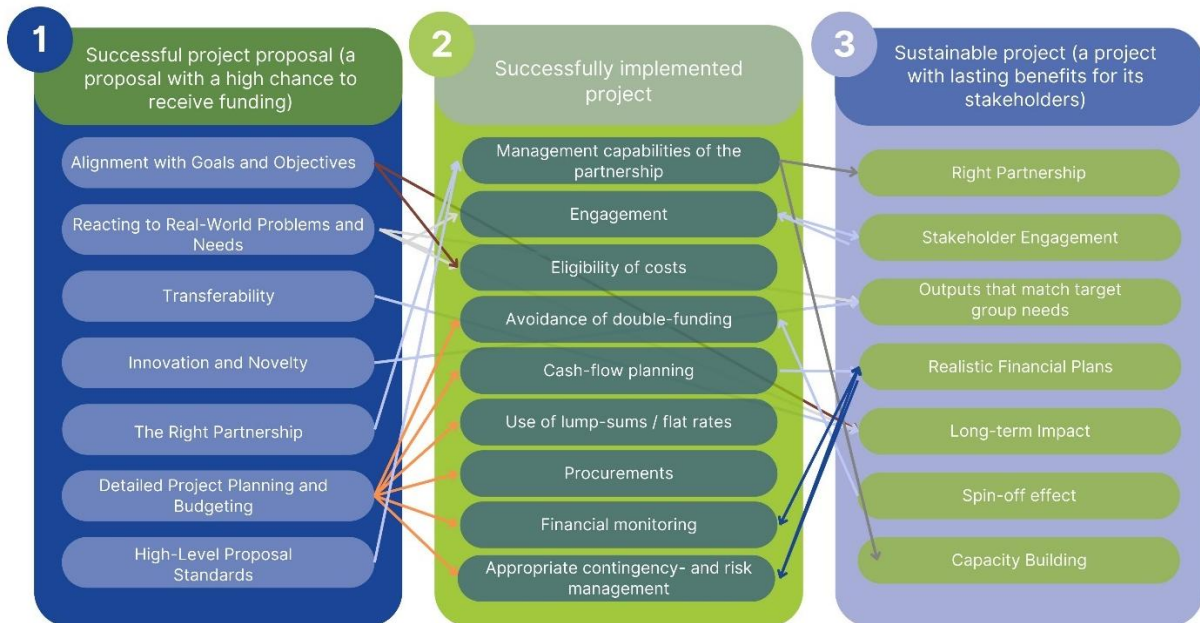
Spin-off effect

During the implementation phase, and particularly as the project approaches its end date, special attention should be given to potential continuation and spin-off projects. These projects are usually new initiatives funded by the same or similar sources. Additionally, private funding options, or a combination of both, should be considered at this stage. Such funding can support the maintenance or enhancement of actions and results. Furthermore, new topics or thematic areas may emerge if the partnership systematically reviews actions and results with the aim of continuing the project.

Capacity Building

Invest in building those capacities that enhance skills and enable partners and stakeholders to sustain the project's benefits independently.

The factors listed above at each stage are summarised below.



14. Figure: Criteria of successful projects

FURTHER CONSIDERATIONS OF SUCCESSFUL PRIVATE SECTOR ENGAGEMENT

Various alternative funding options, advices and the related roles of public authorities are already listed in the present material. On the top of these, a further consideration to enhance private sector engagement is to understand what drivers for their investment might be and to clarify and emphasize the benefits that the private sector can gain from implementing NbS.

Understand the key motivations driving these private investments:

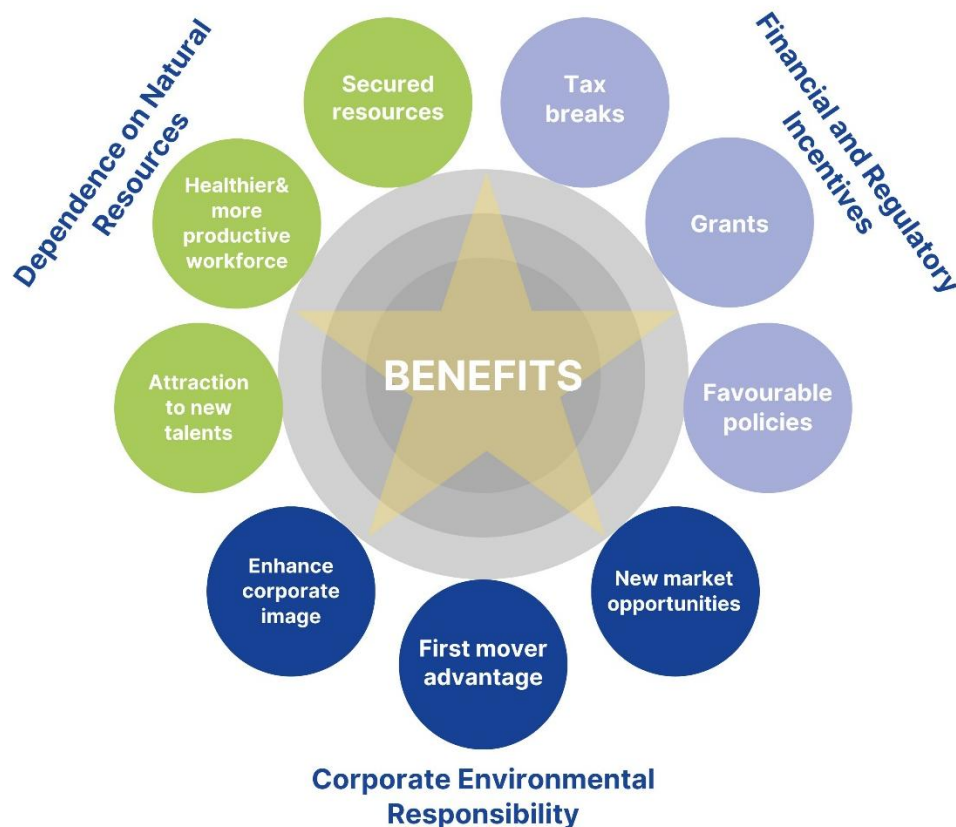
1. Dependence on Natural Resources:

- Companies whose business models rely on natural resources, such as water utilities and mineral water companies, farmers & food producers, tourism service providers, etc. are increasingly motivated to invest in NbS to mitigate their vulnerability to climate threats. By protecting and restoring ecosystems, these businesses can secure the resources they depend on and ensure long-term sustainability.
- Additional benefit can be the attraction of new talents to the company,
- as well as the healthier, more productive workforce in the long run.

2. Financial and Regulatory Incentives: Public authorities play a pivotal role in encouraging private investment through financial incentives and regulatory frameworks. Mechanisms such as tax breaks, grants, and favourable policies can significantly enhance the attractiveness of NbS investments for private actors.

3. Corporate Environmental Responsibility: Many businesses are driven by corporate environmental responsibility programs.

- Investing in NbS allows companies to demonstrate their commitment to sustainability, enhance their corporate image, and meet the growing expectations of consumers and stakeholders for environmentally responsible practices.
- Within unpathed context, the first mover advantage can also be harvested
- and eventually these can lead to unlocking new market opportunities.



15. Figure: Key motivations driving private investments

The present material dedicated a separate section for the notion of environmental data or of collaboration. The importance of these gets even more clear when reading the key factors that hinder companies from investing in nature:

- lack of **data**: the shortage of baseline data makes the effects difficult to measure this way there is a missing link between the financial investment and the positive increase in the ecosystem services
- challenge of generating attractive **short-term cashflows** through nature conservation as the timeframe of such projects to become profitable is higher
- not clear, **qualitative** aspects with the involvement of various actors and citizens. These are making such interventions sometimes hardly tangible therefore giving room for misunderstanding, or criticism



Recommended reading list

1. *The Local Government Guide to Fostering Corporate Responsibility* by Helen Scott is a digestible paper focusing on the role of public sphere in CSR, by listing tools to be used by local governments, and (not only European) examples: <https://apo.org.au/node/89251>
2. *Final text of the Proposal for a Regulation of the European Regulation and the Council on the transparency and integrity of Environmental, Social and Governance (ESG) rating activities*: <https://data.consilium.europa.eu/doc/document/ST-6255-2024-INIT/en/pdf>
3. *For a detailed description and more case studies on PES, you can visit the European Commission's page on Payments for Ecosystem Services (Environment)*: https://environment.ec.europa.eu/economy-and-finance/ensuring-polluters-pay/payments-ecosystem-services_en
4. *EC Report on Public Procurement in NBS: This report provides an overview of the major challenges facing NBS procurers in the EU, along with case studies of success in addressing those barriers* https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/public-procurement-nature-based-solutions_en
5. *The H2020 funded project REGREEN is investigating crowdfunding as a tool for financing NBS projects. They developed a website to offer knowledge exchange and support on the financing of innovative green projects. More information:* <https://nature-solutions.eu/fund-and-share/>
6. *ThinkNature Nature-Based Solutions Handbook. ThinkNature project funded by the EU Horizon 2020 research and innovation programme delivered valuable knowledge in NbS. In this handbook, NbS is investigated, from project development to financing and policy making, and is presented in a concise and comprehensive way.* https://www.researchgate.net/publication/339983272_ThinkNature_Nature-Based_Solutions_Handbook

LEARNING MODULE: HOW TO ORGANISE A LOCAL TRAINING?

The present document aims to provide guidance to local and regional public authorities in the planning and financing of NbS, especially when it comes to **raising the capacities** of staff members and stakeholders in these topics.

Therefore, the third module of this paper is to provide guidance and concrete tools for the actual implementation of a local training. Firstly, this module offers certain **advice and considerations for the organisation** of a successful training. Secondly, it provides actual support via an “**agenda-mix**” featuring a variety of potential **presentations, topics, and workshop methods** for a training on the planning and financing of NbS interventions. These agenda items are **flexible** and can be **customized** to fit the specific knowledge needs of the target group and the desired outcomes of the training. This way the agenda items are to be considered as parts of a **puzzle**. The organisers of a local training can put together “**their own picture from the puzzles**” via choosing any or all pieces of this puzzle and can complement it with own ones. This selection and completion depend on the actual knowledge needs of the target group, and on the envisioned outcome of the training.

The **presentations** draw from the content of the first and second modules (Planning and Financing). These templates are **freely available and can be adapted** to suit local contexts and requirements. Similarly, the **topics and workshop methods** serve as an **inspirational** list from which organizers can “**pick and choose**” to create a tailored agenda for their training.

INVITATION AND SELECTION OF PARTICIPANTS



The success of a training session depends significantly on having the right mix of participants.

The identification, selection and categorisation of stakeholders have been described already in the “Learning module- NbS planning”. Similar considerations and steps are valid when organising a training.

It is essential to identify, and select those who will **benefit** most from the training, who have an **interest** in the issue, and/or who will **contribute** to its objectives in the best possible way with their **knowledge/competence or power**. The target group can be a **diverse**, or a more **homogenous** one, depending on the targeted result. The training this way can target a variety of different stakeholders but can also bring together actors with a similar background.

To boost participation, it can be highly effective to **invite a prominent figure**, such as a state secretary, as attendees are often more inclined to participate when high-level officials are present.

Furthermore, it is beneficial to **interlink local and state-level stakeholders** when gathering participants for the training to foster broader collaboration and shared understanding.



Consider the topic you target or the aim you want to reach.

Your local training can have the **general** purpose of raising capacities in the topic of NbS planning and financing. Also, it is possible that you wish to focus either on only one or both of these aspects (**planning and/or financing**). Furthermore, if you already have a concrete area, a challenge, or eventually a potential NbS solution at hand, the training can **focus** on the planning and financing of that issue at stake.



Invite and advertise (in time)

It is not only enough to have a good list of invitees, it is also a key that the potential participants are **aware** of the event, related **information is clearly communicated** and it reaches them **in due time**.

Think over various **channels** to reach potential participants such as e-mail, social or local media, or community networks. Send **invitations well in advance** to allow participants to schedule their attendance. Be careful not to overlap with holiday seasons or other important events organised in parallel. Also, any local or international event (e.g. Earth Day) can be a good opportunity to raise publicity for your training.

To expand reach and provide accessibility, consider online streaming or recording the training sessions. These recordings can then be disseminated later on platforms such as YouTube, serving as a valuable resource for those unable to attend or for future reference.

THE IMPORTANCE OF A GOOD COORDINATOR AND MODERATOR

A well-organized event relies heavily on the roles of the local coordinator and moderator. These key individuals ensure the smooth running of the training and facilitate effective interactions among participants.

An interesting experience is the personal storytelling for setting the tone and enhance engagement from the outset. Consider starting the meeting with a personal story or a compelling statement linked to the NbS topic.

A dedicated person or a team

A **dedicated** person or team is to be set up, if not exist already. The list of **actions**, and the **division** of tasks, including **timing** should be clear. The person(s) involved are to have sufficient **time** and **capacity** to fulfil their roles in a professional way.

Competence

The dedicated person or team is to manage logistical arrangements, communicate with participants, prepare materials, facilitate, encourage active participation and ensure the smooth running of the event. All these require strong communication, interpersonal and organizational **skills**. A good understanding of the topic, and ideally a good level of **knowledge** of the local/regional context and issues. Competence, commitment and a proactive approach are also important.

CREATE AGENDA

A well-structured agenda is essential to the success of the training. It ensures all relevant topics are covered and provides a clear schedule for participants to follow. A list of agenda items developed specifically for an NbS training on planning and financing is visible below. These are to be considered as a puzzle to be pieced together freely along the actual topic and goal. A good mix and match of various agenda items is suggested.

Agenda Development

Design a **clear** and **detailed** agenda with allocated time slots for each session, including breaks and networking opportunities. While creating an agenda always put on the question “what is the **purpose** to be reached?” and align each item to this goal.

Balanced agenda

Obviously, **mix** presentations with interactive workshops to maintain engagement. A good **start** is to set the context and objectives. Important to allocate time for **questions** and **discussions** to deepen understanding. Depending on the envisioned outcome presentations, interactive workshop elements, potentially including action planning, are to be at place.

To maximize the tangible benefits for stakeholders, it is worth making combinations and creating linkages. For instance, the training can be used as a platform to present an upcoming call for proposals that is relevant for the stakeholders, providing them with immediate, actionable opportunities.

Consider structuring the training as a series of workshops, perhaps over three days, to allow for sufficient time to delve deeply into topics and ensure continuity (the agenda of a day built on the results of the previous day), leading to more valid and comprehensive conclusions.

Furthermore, co-design exercises can be particularly effective in motivating stakeholders by enabling them to collectively create a joint, concrete result. These exercises are ideally organised with diverse participants to incorporate multiple perspectives. The effectiveness is enhanced when the objective of the co-design is clearly defined and concrete (the more tangible the better).

DOCUMENTATION AND EVALUATION

Documenting the training session ensures that all key points and discussions are recorded, which helps to deliver proof, post-event analysis and future planning.

List of documentation

The basic list of documentation consists of attendance records, agenda, minutes or notes and evaluation forms to assess the effectiveness of the training and gather suggestions for improvement.

Follow-up

In case relevant the training results in certain action steps or has a continuation eventually. A potential outcome can also be an action plan for the implementation of a targeted NbS intervention.

It is highly beneficial to agree on concrete actions to be implemented following the training and to follow up on their progress. Translating the results of the meeting into immediate, concrete, and forward-looking outcomes can be a strong motivator for stakeholders. Additionally, identifying a clear track for continuity, such as a specific topic or theme for a subsequent gathering, can help sustain cooperation and ensure ongoing engagement.

LOGISTIC CONSIDERATIONS

Logistical arrangements are crucial to the smooth execution of the training. Considerations such as venue selection, timing, and materials need careful planning.

For remote settlements or to encourage wider participation, consider offering a hybrid meeting option instead of an entirely in-person training. If opting for a hybrid format, it is advisable to incorporate more workshops and interactive sessions to maintain participant interest and attention. Such interactive elements can be more time-consuming to facilitate effectively in a hybrid setting.

Venue Selection

Choose a suitable **place** with adequate space for both plenary sessions and small group work. Ensure it is accessible and equipped with the necessary facilities and equipment. Arrange the room to fit to the **purpose**, e.g. to facilitate interaction use round tables or a U-shaped table.

Consider enhancing the engagement with tangible experiences beyond theoretical presentations. It can be motivating for participants to engage with physical examples related to NbS. Integrating a practical demonstration, such as a field visit to an existing Nature-Based Solution project or an NbS laboratory, into the training agenda can be a good option.

Other considerations

Ensure all necessary **materials**, such as handouts, pens, and notepads. Offer **refreshments** to keep participants comfortable and focused. Ensure **technical support** is available for presentations and other digital needs.

AGENDA MIX

Below is a list of potential agenda items. Think of these items as pieces of a puzzle that can be assembled to create a training agenda best suited to the specific topic, stakeholders, and objectives of the session.

For instance, an organiser can decide to focus exclusively on the financing aspects and skip planning or might only include chapters of NbS planning relevant to the financing. Another example is to only focus on the private financing options and deep-dive into that topic.

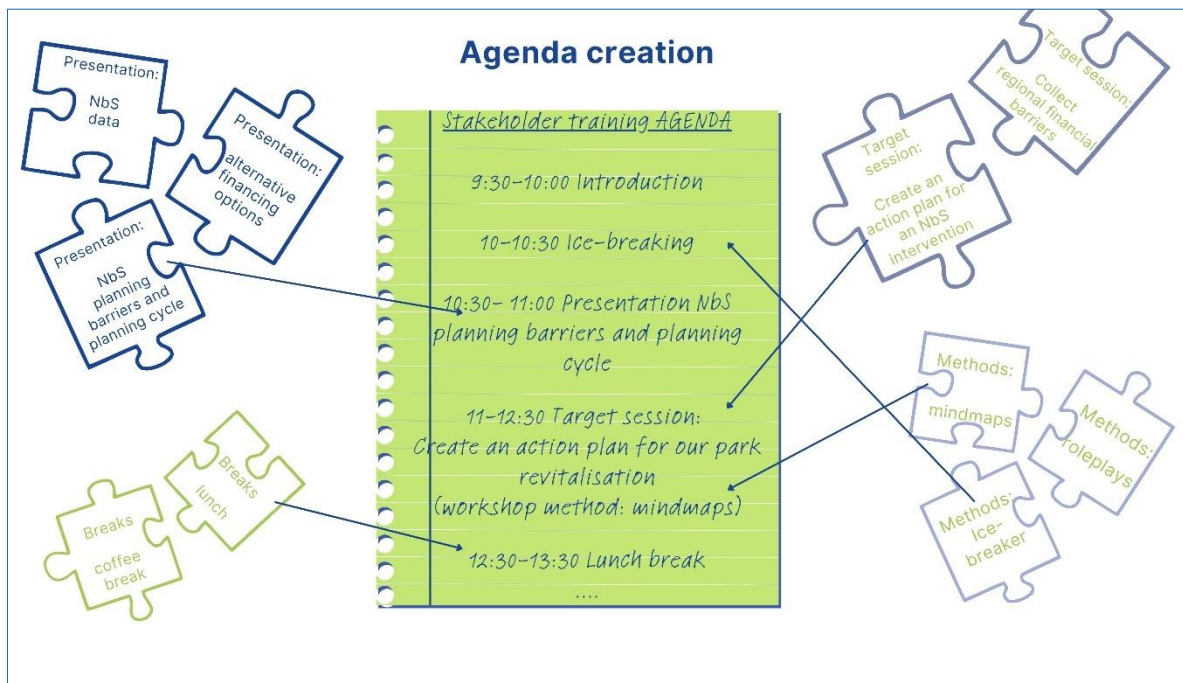
The four elements (puzzles) are:

- presentations,
- breaks (coffee- break, lunch- break),
- target sessions and

- workshop methods.

A non-exhaustive list of potential topics is provided for each element. These topics are meant to **inspire** rather than dictate the exact agenda. Organizers can **select** and **order** items as needed and eventually can **add new items** tailored to the specific needs of their group or area.

1. The presentation templates linked to certain agenda points are available in the Annex section and can be freely **translated and tailored** to the local training context.
2. The “target session” are agenda items that aim **to reach a certain outcome or results**, such as listing the barriers of a potential NbS intervention, identifying conflicting interests in the region, or creating an action plan for a park revitalisation.
3. The **target sessions may be interlinked with the workshop methods, which latter can also be applied to any other relevant topic**. Some suggestions for this are given.



16. Figure: Agenda creation (pick and choose technique)

Adaptable presentations

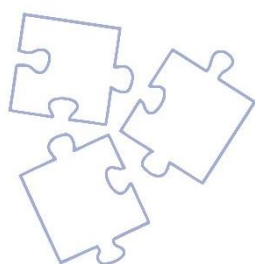
These adaptable PPT presentations break down the 2 Learning Modules into “segments”, resulting in total 10 (+1 introductory) presentations. Each PPT starts with a content summary and marks the place of the given segment within the Learning Module. At the end of each presentation, you can find a slide on the next lecture, recommended to continue with. This way the presentations are interactive, referring to each other, but can also be used separately.

There are certain repetitions in some of the PPTs that help better understanding, and also, to help using PPTs independently (pick and choose approach).

List of PPTs:

0. Introduction & What is NbS?

Learning Module 1 on planning NbS interventions



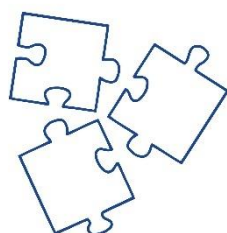
1. Barriers&Solutions Part 1: Awareness and commitment - Whom to involve?
2. Barriers&Solutions Part 2: Policies, regulations, permitting procedures
3. Barriers&Solutions Part 3: data utilization to research and interventions
4. NbS planning methods and tools - the planning cycle

Learning Module 2 on NbS financing

5. Introducing barriers & Economic viability and cost-effectiveness
6. NbS Co-benefits and Undesired impacts
7. Sources of finance Part 1: Public funding sources
8. Sources of finance Part 2: Private Financing sources
9. Sources of finance Part 3: Smart Financial Engineering
10. Criteria of successful EU projects

Target sessions

- target session to create an action plan for a concrete NbS intervention/collect ideas to revitalize an area
- target session to establish a supportive regulatory and policy environment for NbS/identify policy improvement measures
- session discussing NbS ideas against grey infrastructure methods (linked to a certain intervention area or in general)
- target session aiming for conflict resolution (e.g. to examine and smoothen conflicting interests of stakeholders)
- session aiming to set up cross-sectoral cooperation within an institution or city/region among roleplayers



- target session to identify/collect NbS planning and/or financing barriers in the city/region
- target session to create a regional biodiversity database (identify baseline data sources and create monitoring strategy)
- target session to organise an NbS awareness-raising campaign

Workshop methods

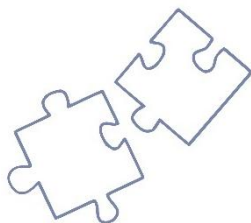
1. Icebreaking

Icebreaking activities are designed to **warm up** the conversation among participants, helping them to relax and **get to know each other**, if relevant. These are particularly useful **at the beginning** to set a positive tone and foster a sense of community. Examples include fun questions or brief introductions with interesting facts about themselves.

2. Networking

Networking methods are useful for creating opportunities for participants **to connect or to build professional relationships**. Activities such as “**speed networking**” can be employed, where participants have brief, timed conversations with each other before moving on to the next person. Networking is often used at the beginning, linked to lunch breaks or at the end of meetings.

3. World Café



The World Café method involves participants **moving between a series of tables** or stations to discuss different topics in small groups. Each table has a **host** who stays while others **rotate**, summarizing the previous discussion to newcomers. This format encourages **collaborative dialogue, knowledge sharing, and collective intelligence**, as participants build on each other's ideas. It is particularly useful for exploring complex issues from multiple **perspectives**.

World Café can be used for instance for the following target sessions:

- target session to create an action plan for a concrete NbS intervention. The series of world café tables can represent different aspects or chapters of the action plan (e.g. sources, preparatory steps, financial resources or timeplan)
- target session to create a regional biodiversity database (identify baseline data sources and create monitoring strategy)
- target session to create a local/regional NbS policy mix, identify potential policy improvement measures targeting supportive policy and regulatory environment for NbS and/or the creation of new instruments.
- target session to organise an NbS awareness-raising campaign

4. Roleplays

Roleplaying exercises allow participants to simulate **real-life scenarios**, helping them develop problem-solving skills and gain different **perspectives**. Participants can take on various roles, such as the Dreamer who focuses on creative and innovative ideas, imagining the best possible outcomes without worrying about constraints, the Critic who analyses ideas critically, identifying potential difficulties to implementation, the Obstacle or Idea killer representing external or internal barriers that may hinder the plan.

This method is effective for target sessions

- aiming for conflict resolution (e.g. to examine and smoothen conflicting interests of stakeholders)
- aiming to set up cross-sectoral cooperation within an institution or city/region among roleplayers in the topic
- target session to create an action plan for a concrete NbS intervention
- discussing NbS ideas against grey infrastructure methods

5. Mindmapping

Mindmapping is a visual **brainstorming** tool that helps **participants organize their thoughts and ideas around a central concept**. Starting with a core idea, participants add branches for related subtopics and details, creating a map of interconnected ideas. This method fosters creativity, aids in the visualization of complex information, and helps in organizing thoughts logically.

This method is particularly useful for planning and strategy sessions:

- target session to create an action plan for a concrete NbS intervention/area revitalization
- target session to create a regional biodiversity database (identify baseline data sources and create monitoring strategy)
- target session to identify/collect NbS planning and/or financing barriers in the city/region
- target session to organise an NbS awareness-raising campaign

6. Storytelling

Storytelling involves participants **sharing personal or professional stories** related to the workshop topic. This method humanizes the learning process, making abstract concepts more convertible. It encourages participants to connect on a personal level.

This method is useful to illustrate key points or highlight real-world applications of theoretical concepts:

- target session to create an action plan for a concrete NbS intervention/revitalize an area (especially if that area has any historical or cultural past)
- target session to identify/collect NbS planning and/or financing barriers in the city/region

7. Brainstorming with “round-robin” or “freewriting”

Certain brainstorming sessions encourage participants to generate as many ideas as possible within a set timeframe, **without initially judging or critiquing** them. This method is effective for creativity and innovation, allowing for a **free flow of ideas** that can later be refined and evaluated. Techniques like “**round-robin**” or “**freewriting**” can be used to structure such sessions. In a round-robin method, participants take turns contributing ideas or solutions in a sequential manner. This ensures inclusivity, and it can be useful for generating a broad range of ideas. Freewriting is a similar exercise where participants write continuously for a set period without worrying about grammar or topic constraints. This method encourages creativity and helps participants to express their thoughts and ideas freely, often uncovering unexpected insights and solutions.

Free brainstorming can be useful in case of sessions where the targeted result is not concrete (yet), these can be:

- target session to create a local/regional NbS policy mix and identify potential policy improvement measures targeting supportive regulatory and policy environment for NbS and/or the creation of new instruments.
- target session to organise an NbS awareness-raising campaign
- target session to create an action plan for an NbS intervention/area revitalization (especially if no preliminary concept is established yet)

8. Appreciative Inquiry

The technique focuses on identifying **what works well** in an organization or community and building on these strengths. Participants (usually coupled or divided into groups) engage in **positive** questioning to explore

successes and envision future possibilities. Participants first share stories of past successes and peak experiences related to the topic. They explore what worked well, what they valued, and what made these experiences successful. Based on the stories shared, participants **envision an ideal future**. In the second half of the session participants work together to design **practical steps** and innovative strategies **to achieve their envisioned future**. They identify key actions, roles, resources, and establish timelines. This second half can be interlinked with other group work techniques such as the world café.

The appreciative inquiry fosters a constructive and optimistic approach to planning and problem-solving. May be useful for the target session:

- aiming to set up cross-sectoral cooperation within an institution or city/region among roleplayers in the topic
- discussing NbS ideas against grey infrastructure methods
- target session to create a local/regional NbS policy mix and identify potential policy improvement measures targeting supportive regulatory and policy environment for NbS and/or the creation of new instruments.

9. Field visit

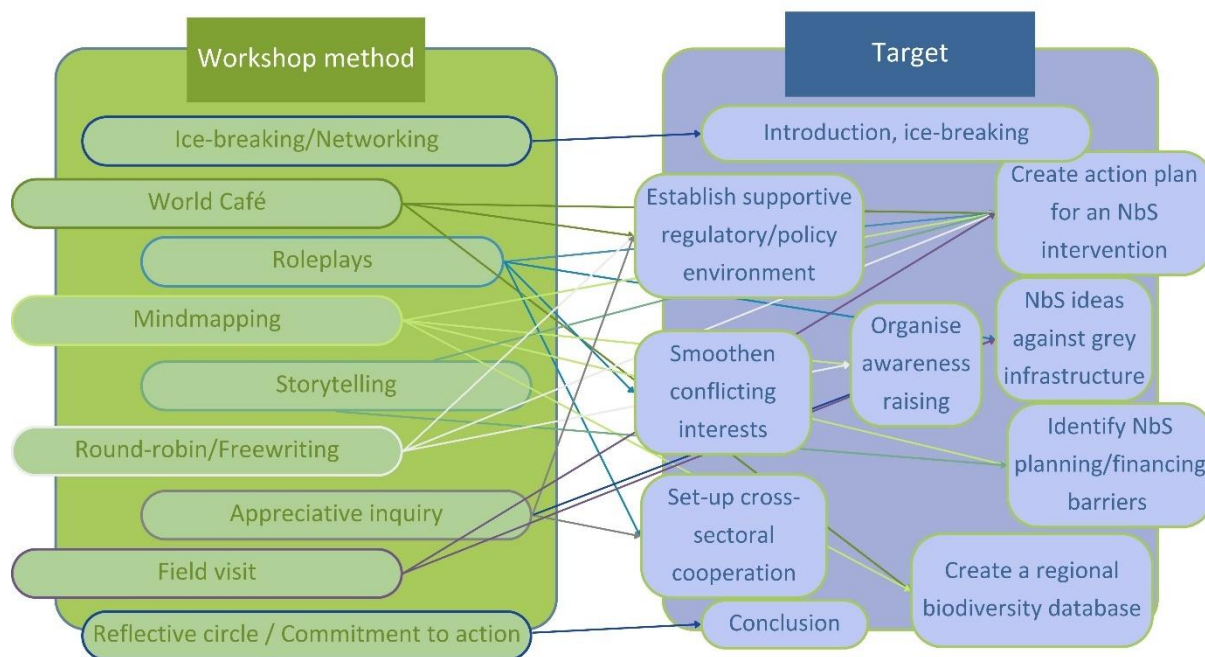
A field visit takes participants to a relevant site outside to observe and engage in the “real-world” the topic or the actual concepts being taught. In the case of a visit, it may be important to define what is the actual **purpose** of the visit, and what the participants should learn or achieve? And, to have a **post-visit** activity where participants can share their observations, discuss what they learned, and reflect on the experience. This might involve brainstorming sessions or action planning using some of the workshop methods listed above.

Obviously, a field visit is suggested for:

- discussing NbS ideas against grey infrastructure methods (via visiting good examples of NbS and/or examples of grey solutions)
- target session to create an action plan for a concrete NbS intervention/area revitalization (visit the area where the intervention should take place)

10. Conclusion phase

No training is complete without a proper conclusion, as it reinforces learning, provides closure, and ensures that participants leave with clear takeaways. A suggested method is the “**Reflective circle**” where participants sit in a circle and share their key takeaways and reflections on the day. This helps participants to consolidate their learning and provide feedback to the organizers. Besides, in case any concrete action or purpose has been envisioned, the “**Commitment to action**” technique is recommended to conclude. In this method, participants are asked to write down one or more specific actions they will take as a result of what they learned during the training. They then share these commitments in plenary.



17. Figure: Choose workshop methods to a target session

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