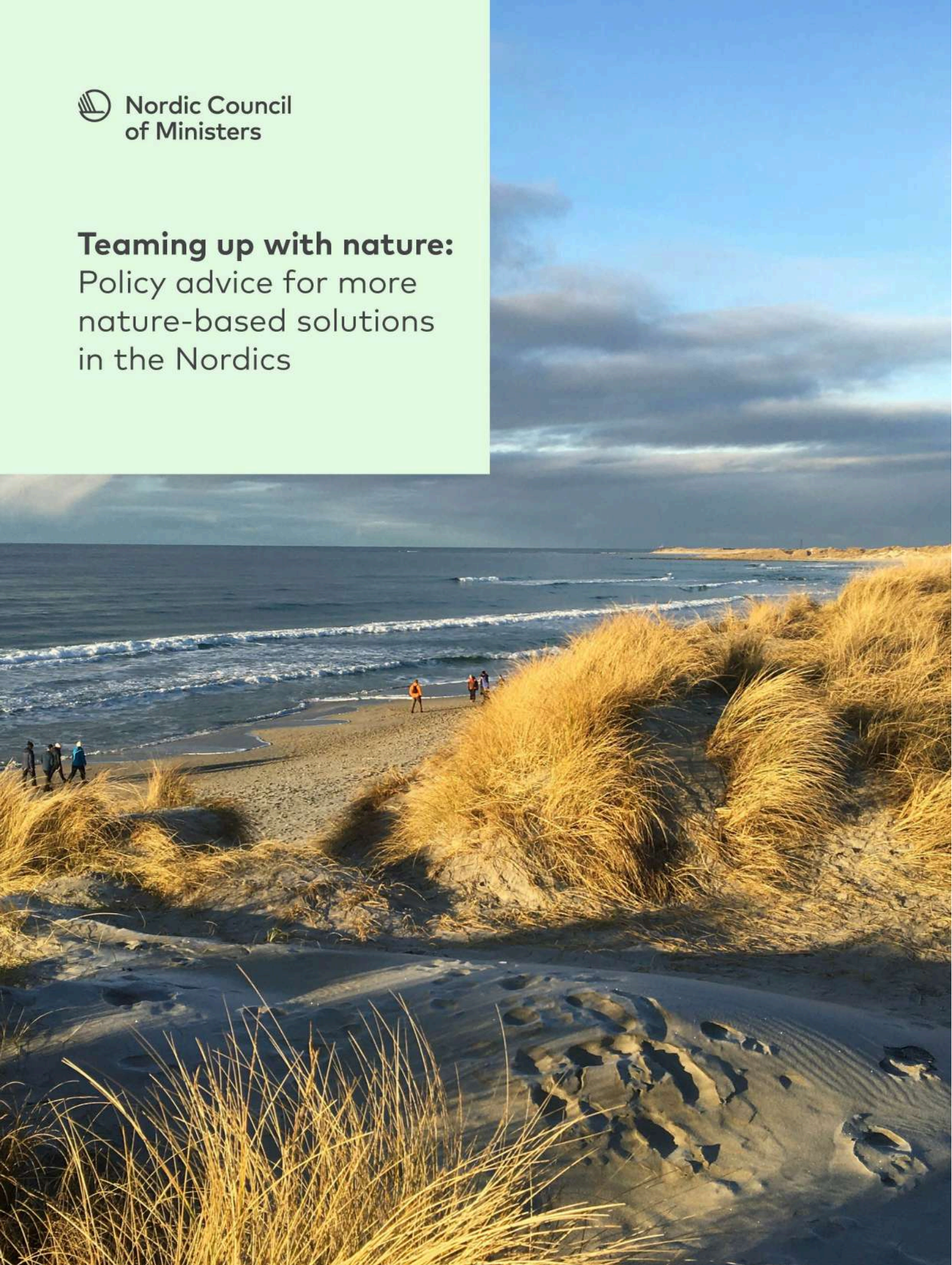
Nordic Council of Ministers

Teaming up with nature: Policy advice for more nature-based solutions in the Nordics



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About this report

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This is the TemaNord report from the project. The complete handbook is accessible online on www.nbspolicy.org

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Foreword

National and local authorities are at the forefront of implementing climate adaptation strategies that balance sustainability with regional needs. This guidance on policy development for nature-based solutions (NBS) is a strategic resource developed to support Nordic policymakers in their efforts to meet climate and environment commitments through sustainable use of natural resources and ecosystem services, as well as the protection and restoration of ecosystems. Recognizing the diverse climatic zones, ecosystems, and populations across the Nordic countries, this project compiles actionable insights, national case studies, and best practices that can be adapted to various local contexts.

By providing examples and guidance on policies that can support the mainstreaming and upscaling of NBS, this report supports regional collaboration and goal achievement. The guidance also emphasizes the role of NBS in meeting international goals, including targets under the Convention on Biological Diversity (CBD), the UN Sustainable Development Goals (SDGs), and the Nationally Determined Contributions (NDCs) within the Paris Agreement framework. Our aim is to equip authorities with knowledge and strategies that drive climate resilience, support sustainable development, and restore biodiversity.

We hope that this document and the online handbook serves as a practical tool for Nordic authorities, fostering cooperation and innovation for a sustainable and resilient future across our region.

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1. Introduction

The Nordic NBS policy handbook provides advice and suggestions for approaches to develop policies aiming at mainstreaming and upscaling the use of nature-based solutions (NBS). It is mainly targeted toward policy- and decision-makers at local, regional, or national levels in the Nordic region, yet other actors such as the private sector and organisations can also find relevant inputs and examples. The handbook can serve as both an inspiration and a source of practical tips and insights. The handbook may also be useful to anyone who is interested in learning more about policies supporting NBS.[1]

Why nature-based solutions?

The world, including the Nordic region, is currently facing two parallel and interlinked crises: climate change and loss of nature and biodiversity. A changing climate in combination with land use change is accelerating the loss of key species and habitats. Climate mitigation and adaptation actions must focus on a range of solutions that target climate neutrality, building resilience, contributing to biodiversity and human health, and social capacity building. NBS have been developed as a concept building on ecosystem-based approaches, including green infrastructure and ecosystem services. NBS are considered important elements in the efforts to address key societal challenges related to the climate crisis and accelerating loss of biodiversity.

NBS are defined by the United Nations (UN) as "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human wellbeing, ecosystem services, resilience and biodiversity benefits" (UNEP, 2022a).

1. This is the TemaNord report about the policy handbook. The online handbook can be found here: https://www.nbspolicy.org/

While the term might be new to some readers, concepts such as nature protection, sustainable management of natural resources and supporting different functions of nature, are closely related to NBS. For example, a strategy for planting and protecting urban trees can contribute to climate adaptation as trees can help infiltrate stormwater, provide shade and protection against wind and noise. Trees, when planted to provide ecological value can also contribute to urban biodiversity enhancement by providing habitats for insects and other species. In addition, increasing access to urban trees can be beneficial for human health and wellbeing as it can provide recreational areas and aesthetic values. Some concepts, such as ecosystem services can be criticised for viewing nature mainly as a resource or service provider for humans. However, with respect to NBS, it is an inherent part of the definition that they also need to benefit nature and biodiversity.

Why a policy handbook for the Nordic countries?

NBS require joint efforts across disciplines, sectors, and governance levels to deliver a range of co-benefits. Although NBS have been recognised as contributing to international climate and biodiversity goals (European Commission, n.d.a; CBD Secretariat, n.d.), the concept is still not widely used in all Nordic countries. Obstacles such as lack of knowledge on how to design NBS, uncertainties about their performance, lack of funding, weak collaboration with stakeholders, lack of sufficient regulations and governance practices are some of the challenges that can hinder mainstreaming of NBS. Well-designed policies and targeted policy instruments are needed to accelerate the uptake of NBS and build an evidence base of their performance.

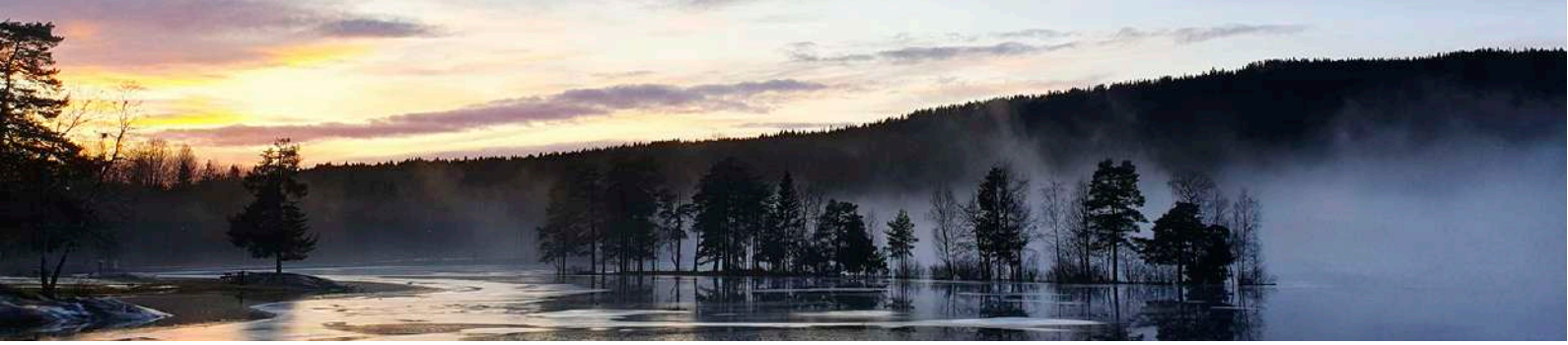
The Nordic vision is to become the most sustainable and integrated region in the world by 2030 (Nordic Co-operation, 2019). The Nordic countries already have a good foundation of policies and instruments facilitating nature and biodiversity protection and key solutions to build on. This potential is quickly developing. While there are differences between the Nordic countries in terms of governance systems and legislations, there are also many common prerequisites. Existing policies that support NBS in the Nordic countries show that there is much to learn from each other, such as the development of climate adaptation strategies, building knowledge and capacity, financing of NBS, as well as integrating NBS in policy and planning. Network Nature has also established a Nordic Hub as a platform for exchanging knowledge and experiences contributing to addressing local barriers to NBS, which is administered by the coordinator of the Nordic Council of Ministers' Nature-based solutions programme in the Nordic region.[2]

2. https://networknature.eu/networknature-nordic-hub

What to expect from the handbook?

The Nordic policy handbook is about NBS and effective policies to support, mainstream and upscale them. It presents examples of existing policies, legislation and policy instruments that are already supporting or have the potential to support wider NBS implementation. Potential users in public administrations and other experts in the Nordics have been consulted during the development of the handbook. The handbook summarises practices and provides examples that the readers can learn from and be inspired by across countries, nature types, sectors, and governance levels.[3]

3. We appreciate any feedback and inputs on the contents of the handbook. Please visit the website www.nbspolicy.org to let us know your opinion.



2. How to use the online handbook

The Nordic NBS policy handbook provides general advice on how to create effective policies and use different policy instruments for mainstreaming nature-based solutions (NBS). The handbook is hosted online, at www.nbspolicy.org. This TemaNord report contains a compilation of its main content.

2.1 About this report

The text that is presented in this report is also included in the online handbook. A list of the additional advice and examples included in the online handbook is provided in Chapter 9, with links to further details.

The structure for this TemaNord report about the policy handbook is as follows:

- **What are NBS and policies?** An introduction to the concept of NBS and what is meant by policies and policy instruments in this book (chapter 3).
- **Ways to support policy development for NBS.** An introduction to different types of policies for NBS and background knowledge on what are the important factors that make such policies work (chapter 4).
- **Main gaps and opportunities for NBS.** An overview of gaps and barriers to implementing NBS and what drivers and enablers that exist based on stakeholder consultations (chapter 5).
- **International targets and obligations relevant for NBS.** An overview of key international targets and obligations and how policies supporting NBS can contribute to achieving them (chapter 6).
- **The Nordic policy landscape**. General overview of the state of policy development for NBS in the Nordics and a brief explanation of the context in each country, including some key national policies related to NBS (chapter 7).

- **Introductions to the handbook categories**. A brief summary and introduction for each of the main categories used in the handbook: eight different societal challenges, four different categories of policy instruments and three different governance levels (chapter 8).
- **Cross-cutting policy advice.** General advice and suggestions for policy development to support NBS that can be applied across different societal challenges, policy types and governance levels (chapter 9.1).
- **List of specific policy advice**. A list of the specific advice and examples of effective NBS policies across the Nordic region provided in the online handbook (chapter 9.2).
- **Key takeaways**. A summary of general findings and content in the handbook on how typical gaps can be addressed and where to identify enablers for mainstreaming of NBS in the Nordics through policies (chapter 10).
- **Appendix.** Contains background information, including an introduction to the A-DVICE project and methodology for creating the handbook (chapter 12).

2.2 Navigating the online handbook

To make it easier to navigate, the online handbook is structured according to different dimensions and categories, including governance levels, societal challenges and type of policy instruments, which the user of the handbook can select based on their interest.

Decisions affecting the use and implementation of NBS can be made in a range of different policy domains and on different governance levels. Some topics addressed in the handbook are common to most policies supporting NBS, such as stakeholder engagement, organisation, and financing mechanisms. Others may be more relevant for a specific sector or governance level.

Users of the online handbook can search for different topics and filter the content according to what tags and categories they find most useful. The advice in the online handbook is tagged with different categories that users can use to filter and search for relevant information. Table 1 contains an overview of all the tags used in the handbook.

Table 1. Categories used to navigate in the online handbook. More information about the different categories can be found in chapter 12 on methodology the appendix.

Societal challenge	Nature type	NBS action	Policy type	Governance level	Country
Biodiversity enhancement	Agriculture and cultural landscapes	Issue-specific ecosystem approaches	Administrative practices and strategies	Local level	Denmark
Climate change adaptation and mitigation	Coastal and marine landscapes	Sustainable management and use of ecosystems	Economic instruments	National level	Faroe Islands
Disaster risk and preparedness	Forests	Protection of ecosystems	Information, guidance and other voluntary measures	Regional level	Finland
Economic and social development	Mountains	Restoration of ecosystems	Laws and regulations		Greenland
Food security	Rivers, streams and lakes				Iceland
Human health and wellbeing	Urban environments				Norway
Social justice and capacity building	Wetlands and peatlands				Sweden
Water management					Åland

The advice included in the online NBS policy handbook follows this hierarchy:

1. **Cross-cutting advice:** Some advice is more general and can apply to most sectors, ecosystems and societal challenges.
2. **Advice for specific issues:** Some advice is more specific and usually concerns specific challenges, governance levels, sectors or types of policy instruments.
3. **Examples on how it can be addressed:** Examples of NBS policies in the Nordic countries are provided to illustrate the advice and potential solutions. For each set of advice, there may be several examples from different Nordic countries.

For more details on how to implement NBS in practice, the handbook also links to the GuideNBS handbook (available at nbsguide.org) which has been developed in parallel with the NBS policy handbook.

Important notes for the users of the handbook:

- Application of best practices should always consider what might be possible given the unique social, ecological, and administrative contexts. The handbook provides suggestions and examples, but their transferability might depend on the unique circumstances of the different countries. NBS and policies supporting them should always be designed with the local context in mind.
- Policies change continuously, and the handbook does not aim to cover all policy fields, nor provide a complete overview of all existing NBS policies in all Nordic countries. It rather aims to give concrete suggestions and inputs by highlighting good practices and examples to learn from. We also acknowledge that depending on the time of publication and access, there will be new developments and information that may not be included.



3. What are nature-based solutions and policies?

This is a brief introduction to the two key terms used in the handbook – nature-based solutions (NBS) and policies, which may be useful for readers who are not familiar with the terms. Some terms are used differently in different contexts. The following is therefore to clarify what is meant by the terms within the context of the handbook and this report.

3.1 What are nature-based solutions?

Nature-based solutions (NBS)

"...are actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits."

United Nations Environmental Assembly resolution (UNEP, 2022a)

NBS has emerged more widely in the climate change adaptation context as an umbrella concept encompassing different related approaches, including ecosystem-based adaptation, ecosystem services and blue-green infrastructure. Some concepts, such as ecosystem services can be criticised for viewing nature mainly as

a resource or service provider for humans. For NBS, it is part of the definition that they also need to benefit nature and biodiversity.

NBS aim to holistically address climate change or other societal challenges while simultaneously providing economic, environmental and social benefits. This is based on a recognition that healthy and well-managed ecosystems are providing a range of benefits to humans, including resilience to the effects of climate change, but also that nature is threatened by human pressures and has an intrinsic value. The basis of NBS is in many ways to create a more balanced relationship between humans and the environment such that both benefit.

NBS are multifunctional, which means they can be effective ways of solving several fundamental challenges at the same time. For example, green spaces in cities can, in addition to improving recreational areas, mitigate effects of climate change by providing shade and water retention and improving biodiversity as habitats for different species.

NBS can take different forms and scales. To differentiate between them, different types of NBS have been proposed and used since 2015 (Eggermont et al., 2015; European Commission, 2021a). One way of categorising NBS is to look at the degree of ecosystem intervention. This can broadly be divided into categories from minimal intervention to the most engineered solutions (combinations of solutions are also possible):

- Improved use of ecosystems (such as establishment of protected areas and conservation efforts)
- Management approaches for multifunctional ecosystems (such as integrated water resource management and innovative design of agricultural landscapes)
- Creation and management of new ecosystems (such as green roofs, bioswales, restoration of heavily degraded/polluted ecosystems)

Several NBS definitions have been developed over the years, including by the European Commission (n.d.b). The International Union for Conservation of Nature (IUCN)'s definition of the concept in 2016 has been widely influential (Cohen-Shacham et al., 2016). In 2022, a definition was multilaterally agreed at the United Nations Environmental Assembly (UNEP 2022). The UN resolution clearly puts NBS in the context of ecosystems,[4] thus strengthening the biodiversity and integrity aspects. Biodiversity loss, degradation of ecosystems and poor conservation of habitats pose risks to the delivery of ecosystem services[5] and the impacts of

4. An ecosystem is a "a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit." (The Convention on Biological Diversity (UN, 1992)). Read more: https://biodiversity.europa.eu/europes-biodiversity/ecosystems
5. Ecosystem services are "the services that an ecosystem supplies and on which humans depend." Read more: https://eur-lex.europa.eu/EN/legal-content/glossary/ecosystem-services.html

climate change are more visible and costly (European Commission, 2021b). That is why there is great potential in NBS as they are largely associated with delivery of ecosystem services (Maes et al., 2020) and benefits for improving the state of ecosystems (EEA, 2020) which is also highlighted in the UN resolution. Different NBS can support the ecosystem services (EEA, 2021):

- Provisioning services are benefits that are extracted from ecosystems (e.g., water and food supply);
- Regulating services arise from the ability of ecosystems to regulate their physical, biological, chemical and other processes (e.g., air quality, carbon sequestration, flood regulation);
- Cultural services include the non-material benefits provided by nature (e.g., tourism, recreation);
- Supporting services are those sustaining the natural processes and integrity of ecosystems (e.g., pollination, nutrient cycling).

More action is needed to protect and restore the ecosystems in EU as well as for meeting the ambitions targets of EU Biodiversity Strategy to 2030 (European Commission, 2021c). The benefits of using NBS for addressing the challenges associated with climate change in different ecosystems (e.g., urban, wetland, forest) has been recognised at different levels. Nature, climate and environment focused frameworks at the global and EU levels are increasingly incorporating NBS in their agenda with the most prominent examples being the European Green Deal (European Commission, n.d.c), EU Biodiversity Strategy to 2030, EU Strategy on Adaptation to Climate Change (European Commission, 2021b) and UN Decade on Ecosystem Restoration (n.d.). To streamline their use, the first major pursuit of standardising the development and use of NBS was developed by IUCN in their Global Standard for NBS in 2020 (IUCN, 2020a). The IUCN Global Standard sets the framework for design and implementation of NBS as well as their upscaling and it is a good starting point for anyone working with NBS. IUCN also provides a guidance for using the standard including a self-assessment tool (IUCN, 2020b).

Common definitions and criteria are especially important when working with NBS to ensure that they have the quality and functionality needed to solve the societal challenges as intended (Sowińska-Świerkosz & García, 2022). Concerns have been raised regarding the potential for misusing the NBS term to 'greenwash' climate emissions and actions not benefitting biodiversity (Nature-based Solutions Initiative, 2021; NetworkNature, 2021; Gałecka-Drozda et al., 2021). There is clear evidence that NBS can significantly contribute to solving societal challenges, including those exacerbated by climate change, when properly designed and implemented. However, using NBS is not an alternative to drastic cuts in climate emissions or other harmful activities – both needs to happen at the same time (Mercer et al., 2022; Seddon, 2022).

3.2 What are policies and policy instruments in the context of NBS?

There are various options for engaging actors into implementing NBS more extensively and at greater scales. To make environment-focused targets a reality, a policy needs to be operationalised using policy instruments. In the context of A-DVICE, a policy is defined as "a set of requirements and their objectives, targets and measures that regulate the behaviour of entities (public authorities, business and individuals) towards a desired state" and multiple instruments in addition to regulatory measures can serve the purpose of changing attitudes and behaviours (Davis, Cuevas & Gvein, 2024).

Regulatory measures such as regulations and laws that legally require meeting goals and targets, are the most direct way of ensuring the implementation of solutions targeting climate change adaptation as well as mitigation. However, in practice the development of multiple policies targeting different goals is difficult to achieve as coordination and horizontal and vertical alignment of policies are necessary to avoid contradictory requirements. Evidence-based policy making through stakeholder consultations is increasingly regarded as key to design effective policies (OECD, 2021).

On different governance levels, market-based and economic instruments such as financing mechanisms, incentives for business and diversifying funding sources can provide clear mechanisms for action especially for smaller municipalities and the private sector. Softer policy instruments such as establishing cooperation, knowledge and awareness-raising instruments (cooperation, innovation and awareness raising) benefits all governance levels and actors by generating the prerequisites for any climate action – knowledge and awareness of nature and benefits of ecosystems. Different barriers such as the competition over land use and lack of knowledge and resources prevent wider implementation of NBS and its mainstreaming. Policies are key instruments to achieving sustainability transitions and wider sustainability goals (Van Der Jagt et al., 2022) and they should be developed based on evidence and best available practice (European Commission, n.d.d). The NBS policy handbook does not go into resources and recommendations for policy development in general but provides information and examples that are specifically relevant for NBS.

Policies and policy instruments [6]

A policy refers to a set of requirements and their objectives, targets and measures that regulate the behaviour of entities (public authorities, business and individuals) towards a desired state. In A-DVICE, policies and policy instruments encompass regulatory approaches (laws and regulations) market-based and economic instruments (financing mechanisms), administrative practices (including management systems, strategies, action plans), information and guidance, as well as voluntary instruments for cooperation, knowledge and awareness-raising on all governance levels.

6. Definition for the context of this project is based on OECD, 2023; EEA, 2016; Davis, Cuevas & Gvein, 2024 and the EU Horizon project CrossGov: https://crossgov.eu/. See also Chapter 12.1 on methodology.



4. Ways to support policy development and implementation

In this chapter, we summarize some key points on strategies for implementing and upscaling nature-based solutions (NBS) through policy development. There are now many reports and academic literature on how to support the use and upscaling of NBS through policies (Martire et al., 2022; Davis, Cuevas & Gvein, 2024; IEEP, 2024; Sekulova & Anguelovski, 2017). There are also many studies on the barriers to uptake and mainstreaming of NBS (IEEP et al., 2024; NetworkNature, 2021). Many of these barriers can typically be addressed through policies, such as lack of financing and the need for cross-sectoral collaboration. Some of the main barriers are further described in chapter 5.

Transformative change and interplay of policies

In recent years, NBS have received more attention as effective and inclusive solutions to societal challenges. Challenges such as climate change, pollution and biodiversity loss require fundamental societal changes also in terms of viewing and addressing the challenges jointly (Mauchaza et al., 2024). They concern all of society and cannot be addressed through one specific sector or field. To achieve transformative change, there is need for innovation as well as designing policies with complementary goals across domains in climate, biodiversity and health. This requires political will and strategic vision. At the same time, we need to maintain and strengthen what is already working today. Finally, some management practices and policies may have a negative effect and function as barriers, and here disruption is needed.

Integrating NBS in existing policies

Many policies already support protection of nature and biodiversity, restoration of degraded or damaged ecosystems and sustainable use of natural resources. These policies are also working toward strengthening the argument for NBS. In such cases, NBS can be argued for by enforcing and strengthening the policies that already provide a strong base for climate adaptation work. Other existing policies supporting the same targets such as climate adaptation, water management and biodiversity enhancement can additionally contribute to NBS work. In many cases, these policies can support NBS, but sometimes need to be specified or adapted to enable the use of NBS.

In the policy handbook we aim to illustrate both how existing policies can be adjusted or strengthened to better support NBS, as well as examples of new approaches.

Criteria and assessments for NBS policies

Policy development starts with an issue that needs to be solved through policy measures. Setting clear and SMART (Specific, measurable, achievable, relevant, and time-bound) goals is a clear recommendation from several studies. Targets can provide a clear outline of policy priorities and the strategic direction that policymakers need to adhere to. Policy targets that include action on climate adaptation and mitigation, conservation of nature and biodiversity as well as targets on human health and wellbeing are the basis for the integration of NBS into policymaking. To design and implement effective NBS policies, there is also a need for measurable indicators and criteria.

Different criteria and standards can be used both to develop new policy instruments and assess current frameworks. For example, the IUCN Global standard for NBS has a set of eight criteria to assess implementation of NBS in practice. IUCN later applied the standard to address the effectiveness of policy instruments for NBS. In the new methodology, the eight criteria for NBS are adapted to policy development (IUCN, 2022a). It asks the following questions: Do national and sectoral policies relevant to disaster risk reduction and climate change adaptation enable NBS that…

- address societal challenges? (criterion 1)
- account for design at scale? (criterion 2)
- produce net biodiversity benefits? (criterion 3)
- are economically feasible? (criterion 4)
- are inclusive and equitable? (criterion 5)
- allow for balancing trade-offs? (criterion 6)

- re-adaptively manage? (criterion 7)
- are mainstreamed and sustainable? (criterion 8)

Another example is a study (Davis, Cueva, Gvein, 2024) of 250 policy instruments for NBS which identified the following six criteria for good practice: policy should be effective, inclusive, innovative, locally appropriate, support multifunctional NBS, sustainable in the long-term and upscalable/replicable.

Policy coherence and harmonisation is also necessary to consider in terms of how well different policies work together, or whether they are in fact contradicting or creating barriers for each other. This can be assessed specifically for NBS across policy domains.

Incremental changes and scaling up

Implementing solutions to complex societal challenges through policy can seem like an overwhelming task. It is therefore important to bear in mind that change can happen on all levels, and even very small steps can have an effect. NBS can be a large wetland area, but also smaller measures such as rain gardens and urban trees can make a difference. In many cases, the new strategy or policy that contributes to increased implementation of NBS can start with a small change. This is why scalability and replicability are key factors when working with NBS – first we test and see what works on a smaller scale, then we scale that up.

Holistic approach

What is unique for NBS is that there is a fundamental requirement for them to be multifunctional and work toward better conditions for humans and nature at the same time. This can be both a barrier and an opportunity. As NBS require cross-sectoral approaches, the current system with sector-based policies can be challenging to navigate. On the other hand, as NBS can solve several challenges at once, they may also be the preferred option when there is lack of space, and it may increase the likelihood of their implementation if it benefits several different sectors. It is important to address this both through cross-sectoral collaborations and holistic approaches.

In the handbook we further expand on five key aspects of policy development for NBS (cross-cutting advice in chapter 9.1):

- Education, capacity building and awareness raising
- Financing and economic incentives
- Stakeholder involvement and collaboration
- Evidence-based and adaptive management
- Policy integration and cross-sectoral approaches



5. Main gaps and opportunities for nature-based solutions in the Nordic policy context

This chapter summarises some of the typical cross-cutting barriers, gaps, opportunities and enablers for the nature-based solutions (NBS) policy inclusion identified during the policy study, expert consultations and workshop.

5.1 Gaps and barriers

The cross-Nordic gaps and barriers identified through the A-DVICE project are greatly in line with those identified in other studies. They are mainly related to the topics of funding, cooperation, planning, knowledge, strategy, and local level administration.

Funding

Lack of financing is an often-mentioned barrier for NBS implementation. At the current stage, there is economic data missing on the benefits of some NBS, meaning that it can be seen as a less attractive solution compared to other, more well documented solutions to climate adaptation and other challenges. For NBS to gain more acceptance, there is a need to generate more evidence of the economic benefits.

Available public funding initiatives in the Nordic countries can enable NBS. However, there are shortcomings which can also stand in the way. In some instances, the funding is short-termed, meaning that it can cover implementation of NBS, but not maintenance or evaluation. Another barrier is funding that does not cover the entire project cost or does not account for reporting efforts. This makes grants less attractive to apply for, which in some cases leads to a reduction of available funds,

since they cannot be proven popular among the targeted actors. Reduction of available funds has also been the case with agricultural funds, where farmers are responsible for applying for funding, and insufficient interest in implementing environmental measures can lead to a reduction in the grants available.

In many cases, municipalities are investing in NBS as part of the municipal budget. This can be a challenge, as municipalities are very different in size as well as in availability of resources. Often in the Nordic countries, sparsely populated municipalities will have more natural resources and less of the municipal budget to protect them, while municipalities with higher population densities typically have larger budgets to instead be focused on infrastructure expansion projects. This imbalance in the funding and land available can be seen in river estuaries, where upstream municipalities typically have access to less funds, but theoretically have the opportunity to prevent flooding through implementation of NBS and keeping the water upstream. On the other hand, municipalities downstream are typically closer to the coast with less access to land available for NBS.

Cooperation

Planning processes greatly influence the if, how and when of NBS implementation. Lack of designation of NBS in national planning legislation influences this, making it difficult for regional and local authorities to appoint suitable areas. Lacking cooperation between the administrative levels can therefore be a challenge, especially when goals are different on different levels.

There is currently a lack of communication related to NBS between municipalities and private landowners and businesses in general, and industry engagement is missing. In some instances, cooperation with certain sectors, such as the building sector, works as a barrier for NBS when the sector is too conservative. Another issue involves the planning requirements from municipalities, which already try to focus on multifunctional planning and that have specific requirements to the functions of certain areas. It can cause issues in municipal-private cooperation, as this can be a barrier for the contractors, who in theory would like to implement or invest in NBS, but who cannot always document that a NBS will be able to live up to all the requirements in terms of design or multifunctionality.

Local level administration

Some of the barriers identified for NBS policy implementation are connected to local governments, and especially municipalities. It is well known that there are common practices in municipal land use planning that may collide with climate adaptation and NBS efforts, such as building housing close to water where it is profitable, but at the same time increases the risk of flooding. This is a case of misdirected economic incentives. In most Nordic countries, there is also lack of requirements from the national level to consider NBS.

Another barrier is the size of some municipalities, and the related room for action. Some Nordic municipalities are very small, and as a result of this also lack the necessary knowledge and resources to carry out NBS policy and practice. Meanwhile, national legislation does not always fit with local conditions, and small municipalities may have difficulties in reaching these goals. In this case, it is dependent on whether local politicians are engaged and interested in implementing national goals or introducing local policies.

Knowledge

Lack of knowledge is seen as another barrier for supporting NBS through policy. NBS is a relatively new term, and in many public administrations, there are still insecurities surrounding the term itself, as well as the principles of NBS. In addition to this, there is a lack of evaluation of implemented NBS efforts, making it difficult to foresee the effects of these types of solutions. There is also a strong need for monitoring and documenting the NBS that are implemented, as it is the impacts of NBS that will drive more evidence-informed decisions.

The NBS knowledge sources that exist are often scattered, and it can be a tedious task for actors to find information that is relevant for them. Lack of more comprehensive data sources and knowledge material directed towards different actor groups has therefore been a barrier for implementation of NBS. Some areas in the Nordics also lack data on the environmental status of certain areas, making it difficult to develop NBS for these areas.

Strategy

Policy gaps for fields such as climate adaptation, green infrastructure or agricultural production can lead to a lack of strategic direction and missed opportunities for implementing NBS. Stakeholders included in this study have mentioned that while NBS is interesting as a concept, they cannot be motivated to use it until it is specifically appointed through strategy. Strategy also needs to be accompanied by guidelines for implementation to be brought into life.

5.2 Opportunities and enablers

Several opportunities and enablers have been identified throughout this project, which are applicable at a wider scale across the Nordics. Naturally, some of the themes can be recognised as gaps in the above section since the same things that may present issues and cause problems when they are lacking, can be important opportunities or enablers when they are in place.

Funding

Funding through grants, EU programs, and private funds has been pointed out as one of the main enablers for NBS implementation. It is clear that to alter the status quo and apply NBS instead of other solutions, there is a need for economic incentives and initiatives that cover the economic risk. A clear enabler for NBS is earmarked funding, which is not pooled with financing for, e.g., other types of climate adaptation. This allows specific financing streams for NBS. Earmarked money can be applied in national budgets, in public tenders, and as criteria for state funding for municipal projects. Private funding is also seen as a strong opportunity for implementing more NBS.

Cooperation

NBS requires increased cooperation across spatial and temporal scales as well as across governance layers. Successful examples often point to extensive dialogue among all involved stakeholders as one of the key enablers. This is often connected to a step away from classical top-down or bottoms-up governance models, and a step towards network-oriented governance which includes novel partnership structures anchored in local communities. In some cases, designated coordinators have been hired to facilitate projects across actor groups, such as across a specific river basin district. This designated responsibility focuses resources and knowledge which can drive NBS development forward.

Planning

Planning processes are at the core of NBS. In most cases, NBS requires space, although this can be at very varying scales, ranging from small urban areas to landscapes. Integration of NBS in spatial planning, either formally through outspoken integration in planning processes and regulation, or informally through increased knowledge among planners at municipal level, is therefore a clear opportunity to put NBS into practice. Involving knowledgeable actors, for example from a municipal environmental office, country administrative office or consultancy, early in the planning process is key to include NBS in comprehensive plans. If NBS are not included in municipal plans, it may be difficult to add them into zoning plans at a later point. Using blue-green factor planning has been one successful way to integrate NBS early in the planning process across several Nordic countries.

Knowledge

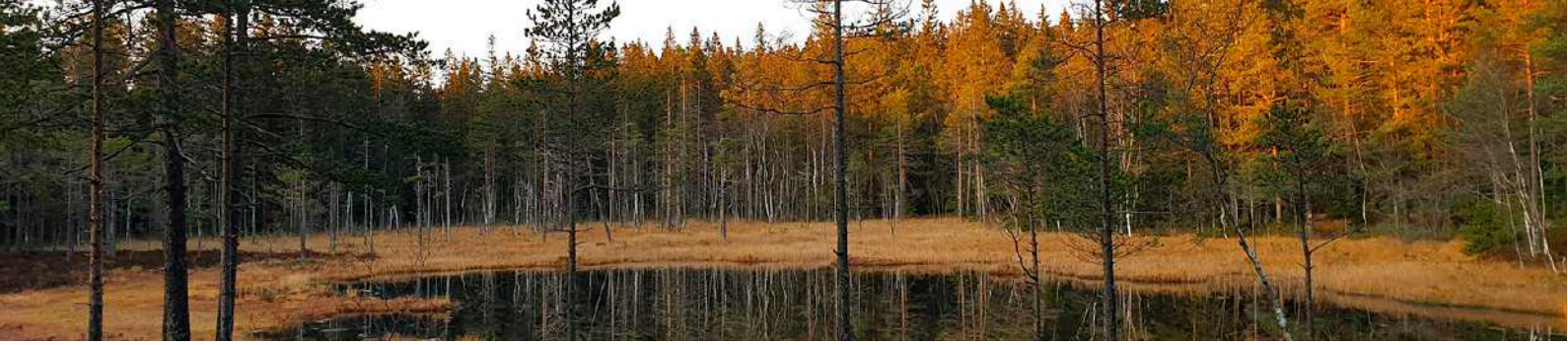
Access to knowledge of NBS principles, policy frameworks and successful examples of implementation are the prerequisites for successful implementation and have been pointed out as another key opportunity for increased uptake of NBS. In some cases, knowledge is accessible from key personnel in the local or regional

administration, which provides opportunities for establishment of local projects driven by NBS "enthusiasts". In other cases, national guidance and guidelines provide knowledge resources which can be used by local administrations when planning and implementing NBS.

At a national level, knowledge can be anchored through an interdisciplinary working group in one agency or across agencies. By facilitating conversation across agencies and sectors, an internal network contributes to mainstreaming of NBS across departments.

Strategy

Strategy documents at all governance levels set the direction for climate and nature interventions at a wider scale. A finding in successful NBS implementation is that NBS projects are scoped based on strategy which explicitly mentions NBS or the synergy of positive effects between biodiversity and climate. International agreements and panels such as the Convention of Biological Diversity, the Ramsar Convention and IUCN provide useful frameworks to develop and use NBS strategies, supporting the individual countries and administrations in developing NBS policy.



6. International targets and obligations relevant for nature-based solutions

This chapter describes key international obligations and targets related to nature and climate that the Nordic countries have committed to, and how nature-based solutions (NBS) can be a part of fulfilling them. It also covers some relevant EU instruments (e.g., directives and strategies) that support NBS implementation, and the commitment of the Nordic Ministerial Declaration on NBS.

6.1 International goals and agreements

The Nordic countries have committed to a variety of international goals and obligations on climate change, biological diversity, and other matters that touch upon NBS, and where NBS will be of use in implementing said commitments. The two largest agreements that the Nordic countries have committed to are the Paris Agreement (2015) under the United Nations Framework Convention on Climate Change (UNFCCC), and the Kunming-Montreal Global Biodiversity Framework (GBF) (2022) under the Convention on Biological Diversity.

The Paris Agreement (UN, 2015) sets long-term goals to guide all nations to:

- Substantially reduce global greenhouse gas (GHG) emissions to hold global temperature increase to well below 2°C above pre-industrial levels and pursue efforts to limit it to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change,
- Periodically assess the collective progress towards achieving the purpose of this agreement and its long-term goals, and
- Provide financing to developing countries to mitigate climate change, strengthen resilience and enhance abilities to adapt to climate impacts.

As part of the Paris Agreement, all countries are required to submit their nationally determined contributions (NDC), where they outline and communicate their climate actions and how they plan to cut emissions. The Nordic countries have submitted their NDCs, together with the European Union (European Commission, 2019), committing to cutting their net GHG emissions by at least 55% by 2030 compared to 1990 levels (European Council, 2023). Great effort is needed to achieve this goal, and NBS are one of the methods that can be used to do so.

NBS, such as conservation and restoration of ecosystems like forests and wetlands, reforestation, sustainable land management, and blue-green infrastructure, can contribute significantly to both mitigation, reducing emissions, and adaptation, increasing resilience to climate impacts. The integration of NBS into policy on climate, and in other policy areas, is a way to enhance the overall effectiveness and sustainability of climate action, enabling governments to work towards their goals for the Paris Agreement.

Although NBS were not directly named in the Paris Agreement, at the 2022 United Nations Climate Change Conference or Conference of the Parties of the UNFCCC (COP27), NBS were mentioned for the first time in a decision from the UNFCCC. The decision "Encourages Parties to consider, as appropriate, nature-based solutions or ecosystem-based approaches, taking into consideration United Nations Environment Assembly resolution 5/5, for their mitigation and adaptation action while ensuring relevant social and environmental safeguards" (UNFCCC, 2022).

The Kunming-Montreal Global Biodiversity Framework sets out an ambitious plan to implement broad-based action to bring about a transformation in our societies' relationship with biodiversity by 2030, in line with the 2030 Agenda for Sustainable Development and its Sustainable Development Goals, and ensure that, by 2050, the shared vision of living in harmony with nature is fulfilled. Among the Framework's key elements are four detailed goals for 2050 and 23 targets for 2030 (UNEP, 2022b).

NBS are one of the key tools in working towards the goals set forth in the GBF. In fact, two of the targets set forth for 2030 directly call for the use of NBS:

- **Target 8:** Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solutions and/or ecosystem-based approaches, while minimizing negative and fostering positive impacts of climate action on biodiversity.
- **Target 11:** Restore, maintain and enhance nature's contributions to people, including ecosystem functions and services, such as the regulation of air, water and climate, soil health, pollination and reduction of disease risk, as well as protection from natural hazards and disasters, through nature-based solutions and/or ecosystem-based approaches for the benefit of all people and nature.

Through nature-based solutions, such as conservation and restoration of ecosystems, sustainable land management, promotion of green infrastructure, and more, the Nordic countries can work towards their commitment to the Kunming-Montreal Global Biodiversity Framework.

Other agreements that the Nordic countries have committed to that NBS could be used to achieve are for example: The Ramsar Convention, the 30x30 conservation efforts, the UNESCO Man and the Biosphere Program, the Bonn Challenge, United Nations Convention to Combat Desertification, the African-Eurasian Waterbird Agreement, and the Berne Convention on the Conservation of European Wildlife and Natural Habitats. As the goals of these agreements align with the Paris Agreement and the GBF in many ways, more details of their goals will not be provided here.

When it comes to the **Sustainable Development Goals (SDGs)**, NBS are also relevant. The 2030 Agenda for Sustainable Development, adopted by all UN member states, provides a blueprint for peace and prosperity for people and the planet. At its heart are the 17 SDGs, a call to action to create a more just and resilient world (UN, n.d.). NBS can play a significant role in achieving the SDGs by providing a holistic, integrated approach to sustainable development, addressing environmental, economic, and social dimensions simultaneously. Although the SDGs do not explicitly mention NBS, the approach aligns with the goals of e.g., enhancing ecosystem services, promoting biodiversity, climate resilience, and sustainable management of natural resources, which are key targets under various SDGs.

6.2 European instruments

The European Union (EU) has, since the mid-2010's aimed to be at the global forefront of NBS research and innovation and has been putting NBS on the agenda of key policies (Faivre et al., 2017). NBS have therefore been embedded in several policies within the EU, especially in the context of the European Green Deal. Other key policies are the Biodiversity Strategy for 2030, and the EU Adaptation Strategy.

These policies apply to all EU member states, including Denmark, Finland, and Sweden. As members of the European Economic Area (EEA), Iceland and Norway are also affected by these policies to some extent.

The EU Biodiversity Strategy (European Commission, 2021c) focuses on the interaction between people and nature. The policy directly calls for the use of NBS to help protect biodiversity and ecosystems. It also mentions that NBS can be an essential tool in reducing emissions and in climate adaptation. One of the key commitments of the strategy is to:

"Unlock at least €20 billion a year for nature and ensure that a significant proportion of the 30% of the EU budget dedicated to climate action is invested in biodiversity and nature-based solutions."

It also emphasises the importance of ensuring that financial systems align with biodiversity objectives, to enhance governance frameworks to be able to address biodiversity loss, and to enable nature to flourish within cities and on agricultural land. The Nordic countries can therefore work towards the EU Biodiversity Strategy by using NBS.

A key element of the Biodiversity Strategy is the Nature Restoration Law, which entered into force in August 2024. The regulation sets an overarching goal for the long-term restoration of nature across the EU's land and sea areas, alongside binding targets to restore specific habitats and species. These efforts aim to cover at least 20% of the EU's terrestrial and marine areas by 2030, with the ultimate objective of restoring all ecosystems in need by 2050. EU countries are expected to submit National Restoration Plans to the European Commission within two years of the Regulation coming into force, by mid-2026, showing how they will deliver on the targets. They will also be required to monitor and report on their progress (European Commission, n.d.e).

The EU Adaptation Strategy (European Commission, 2021b) puts forth a long-term vision for the EU to become a climate-resilient society by 2050. The policy highlights three cross-cutting priorities to incorporate into policy across all levels and fields to integrate adaptation. NBS are one of these priorities, along with micro-fiscal policy and local adaptation actions. Overall, the policy calls for smarter and faster adaptation to climate change. Through NBS, such as sustainable land management, conservation and restoration of ecosystems, and the promotion of green infrastructure, the Nordic countries can work towards the goals of the EU Adaptation Strategy.

The EU has presented various other policies where NBS is a key tool. By using NBS, a variety of objectives in different fields can be targeted simultaneously, such as the restoration of ecosystems, disaster risk-reduction, carbon capturing, as well as for raising awareness and building skills in the community. EU policies where NBS are supported include: the Green Infrastructure strategy, the Action plan on the Sendai Framework, the Floods Directive, Bioeconomy Strategy, Forest Strategy, LULUCF (land use, land use change and forestry) Regulation, Water Framework Directive, Urban Agenda, Farm-to Fork Strategy and the Common Agricultural Policy (EEA, 2021).

A detailed analysis of the integration of NBS for climate adaptation in the European Union was carried out for the European Chair for Sustainable Development and Climate Transition in May 2023, where further information about NBS in the EU can be found (De los Casares & Ringel, 2023). Moreover, Network Nature have conducted a policy screening and analysis of needs and gaps until 2030 (IEEP et al., 2024).

6.3 Nordic Ministerial Declaration on nature-based solutions

The Nordic Council of Ministers have committed to upscale and mainstream nature-based solutions in the region. This was emphasised in the Nordic Ministerial declaration on nature-based solutions which was approved by the Nordic Ministers for the Environment and Climate in Helsinki on November 2nd, 2022 (Nordic Co-operation, 2022).

With their declaration, the ministers recognised the interconnectedness of climate and nature, emphasizing that nature-based solutions address the nature- and climate crises and simultaneously contribute to human welfare, health, and food security. Further, they recognised the significant potential of NBS for both climate mitigation and adaptation and committed to actively promoting the full potential of NBS, while safeguarding social and environmental standards.

The ministers committed to upscale and mainstream NBS across terrestrial, freshwater, coastal and marine ecosystems in the Nordic Region, positioning NBS as a viable and beneficial alternative to technological solutions or to be integrated into these, to promote more robust, comprehensive and cost-effective actions.



7. Nordic policy landscape and instruments supporting uptake of nature-based solutions

This chapter briefly introduces the Nordic countries and their governance systems, including some examples of central policies related to nature-based solutions (NBS). The Nordic region includes the sovereign states of Denmark, Finland, Iceland, Norway and Sweden and the autonomous territories of the Faroe Islands, Greenland and Åland. The countries have a long history of political unions, and many communalities in their governance systems, culture and economies. In the handbook we give advice across the different countries, but of course there are also unique qualities and contexts that should be considered.[7]

7.1 Denmark

Denmark does not have a mainstreamed policy around NBS and does not yet use the term NBS in policy related contexts. There is, however, many types of policy that govern nature and climate issues, and there has been a lot of development in these fields within the past few years. While the overarching legal framework is regulated by the EU for the environment and sectors such as forestry and agriculture, national law has large influence on spatial planning and climate adaptation. The state is responsible for implementation of EU directives in national law as well as guiding and partially financing municipalities in local implementation. For example, the state appoints flood-risk areas according to the Floods Directive

7. For more on the differences and similarities between the Nordic countries' environmental legislation, see: Darpö (2023); spatial planning systems: Nordregio (2016); perceptions of climate policies: Tapia, Sánchez-Gassen & Lundgren (2023).

and affected municipalities are obliged to develop risk-management plans. Similarly, the state appoints water bodies in need of restoration actions to reach good ecological status under the Water Framework Directive, obliging municipalities to select and implement actions.

Spatial planning is governed at national and municipal levels in Denmark, regulated by the Planning Act. The regional level does not have formalised governance of environmental and climate topics but have been involved through regional collaboration and development plans. In Denmark, climate adaptation is handled by the municipalities, which have developed local climate action plans. According to data from the beginning of 2024, 25% of the municipalities mentioned NBS when describing their efforts to decrease climate risks through climate adaptation (Lind & Hansen, 2023).

Some of the main efforts related to NBS in a Danish context are connected to afforestation, ceasing of agricultural protection on lowland soils, coastal protection and rainwater management. Denmark has tradition as a highly productive country, with over 60% of the land dedicated to agriculture, and this presents a challenge in terms of the spatial aspect of NBS.

In 2024, an agreement was made between the government, green organisations and industry organisations, resulting in the green partite agreement, and a Ministry for the Green partite (Regeringen, 2024). This Ministry will be responsible for the implementation of activities such as construction of 250,000 hectares of forest, extraction of 140,000 hectares of carbonaceous lowland soils, increase of protected nature areas, and reduction of greenhouse gas emissions. Two new agencies are going to work on the implementation of the agreement.

Examples of NBS relevant policies in Denmark:

Many policies influence the political landscape for NBS in Denmark. Relevant policies are currently particularly focused on coastal and marine areas, agricultural soils and forests, reflecting the countries nature and environmental challenges.

For coastal areas, interventions are regulated by the coastal protection act (Miljø- og Ligestillingsministeriet, 2024). A coastal protection fund administered by the Danish Coastal Authority provides funding for climate adaptation projects. In 2024, the fund prioritises coastal protection where NBS are integrated (Kystdirektoratet, 2024).

In terms of agricultural policy, the Danish Common Agricultural Policy announces the right to seize production on carbon-rich agricultural soils with the purpose to decrease CO_2 emissions and restore nature (Ministeriet for Fødevarer, Landbrug og Fiskeri, 2023a; Ministeriet for Fødevarer, Landbrug og Fiskeri, 2023b). Afforestation is a highly prioritised, and among the policies promoting this there is funding for afforestation on private land, funded by the EU CAP as well as national funding.

This is administered by the Danish Agricultural Agency. Specific funding is also directed towards forest biodiversity, which promotes planting of native trees. Multi-functional land distribution schemes are a policy tool that is more and more commonly used to distribute land between landowners, private and public, in order to free land which can be used for wetland construction, afforestation, or other types of NBS (Landbrugsstyrelsen, 2022). These projects have multifunctional purpose and aim to address climate adaptation, biodiversity, recreation, as well as productive land and other objectives.

7.2 Finland

Finland as part of the EU adopts the EU legislation and monitors its implementation. Governance is organised from the national to regional to local (municipal) level with elective powers at national and municipal levels. Regions have regional councils which can set targets for the regions and develop regional strategic documents. Eleven Finnish regions and cities are the signatories of the EU Mission Adaptation charter aiming to develop activities to reach the climate adaptation goals (EU, 2023). While the deciding power lies with the local governments, regions are still actively participating in developing their climate mitigation and adaptation agenda.

Local governments have the power and responsibility to manage about two-thirds of the public services, central government has the responsibility over the remaining one-third. The Finnish Local Governance Act (Kuntalaki) (Valtiovarainministeriö, 2015) grants the municipalities in Finland the power to govern and organise their own services such as stormwater collection and wastewater treatment as well as social welfare, health care, education and culture, and technical services. Regarding urban planning and nature, municipalities are responsible for planning and maintenance of public areas as well as environmental protection. The municipal level is quite advanced in terms of climate planning and many municipalities have climate strategies in place. In the recent survey by the Association of Finnish Cities and Municipalities (Kuntaliitto), 80% of the municipalities already have a climate plan or are preparing one, and 55% have climate targets integrated into their municipal strategies (Miettinen et al., 2024).[8]

Examples of NBS relevant policies in Finland:

There are several overarching laws and acts that target protection, sustainable use or management of ecosystems and natural resources as well as those establishing more general coordination. Integrity of water bodies is governed by the Water Act (Vesilaki, which implements the Water Framework Directive (Oikeusministeriö, 2011)) and Flood Risk Management Act (Laki tulvariskien hallinnasta (Maa- ja

8. 119 municipalities responded to the survey

metsätalousministeriö, 2010)), which implements the EU Flood Directive in Finland and coordinates flood risk management. The Stormwater Guide by Association of Finnish Cities and Municipalities (Kuntaliitto Hulevesiopas (Suomen Kuntaliitto, 2012)) is extensively used for planning stormwater management in municipalities and for individual properties. The Stormwater Guide is an established and trusted resource that already highlights the use of green infrastructure for stormwater management. It has strong potential for integrating and strengthening the role of NBS for stormwater management and instructing on their design and monitoring.

Nature Conservation Act (Luonnonsuojelulaki (Ympäristöministeriö, 2023)) aims to safeguard biodiversity and the natural environment. The National Biodiversity Strategy is under preparation, with a planned release in 2024. Preceding efforts included a national action plan for the conservation and sustainable use of biodiversity in Finland 2013-2020, which aimed to halt biodiversity loss (Ympäristöministeriö, n.d.a).

One of the most significant developments is the new Climate Act (Ilmastolaki (Ympäristöministeriö, 2022)) which came into force in 2022. It focuses on planning and monitoring of measures to mitigate and adapt to climate change as well as providing the possibility for the public to participate in and influence climate policy. The supporting National Climate Change Adaptation Plan 2030 (Kansallinen ilmastonmuutokseen sopeutumissuunnitelma 2030 (Finnish Government, 2024)) prepared in 2022 sets targets and goals for Finland's adaptation efforts. The new plan presents 24 targets based on ten themes and it explicitly mentions the use of NBS for preparedness against climate risks.

Land-use and Building Act (Maankäyttö- ja rakennuslaki (Ympäristöministeriö, 1999)) concerns land use and construction. It tries to promote sustainable development of land areas and building activities in the ecological, economic, social and cultural ways, and applies among many categories to town planning.

Several programmes have been initiated and implemented targeting biodiversity and ecosystems. One of the key highlights is the Helmi Habitats programme (2021-2030 (Ympäristöministeriö, n.d.b)), which aims to strengthen Finnish biodiversity and ecosystems through negotiated or voluntary restoration and protection actions. Another key programme has been the Forest Biodiversity Programme for Southern Finland (METSO, set to run until 2025)[9] which aims to preserve forest biodiversity and halt biodiversity loss of forest habitats and species through protection and conservation. A unique feature of METSO is voluntary-based conservation, which targets forest owners. The first National Nature Recreation Strategy 2030 (Ympäristöministeriö, 2022) aims to ensure that recreation is possible in healthy ecosystems and delivers health and wellbeing benefits, considering climate change and its impacts.

9. https://metsonpolku.fi/etusivu

7.3 Iceland

Iceland is not part of the EU but is an EEA Member State and thus adopts most EU directives, though certain domains, such as agriculture and fisheries, are exempt. Governance in Iceland is organized at national and local levels, each with democratically elected bodies. The responsibility for land use planning lies at the local level, authorised by the National Planning Strategy and enforced through municipal planning (Alþingi, 2024a).

Conservation and protection of nature are primarily governed by the Nature Conservation Act (Alþingi, 2024b), which emphasizes the safeguarding of natural habitats, species, and ecosystems, along with promoting the sustainable use of natural resources. In addition to this overarching law, Iceland has adopted several sector-specific regulations that contribute to the management and protection of the environment (Alþingi, 2024c; Umhverfisstofnun, n.d.). Specific provisions also exist for e.g., wetland protection and restoration (Umhverfis- og auðlindaráðuneytið, 2021a), land restoration and forestry (Alþingi, 2019), agriculture (Alþingi, 2023b), marine resource management (Alþingi, 2006), and sustainable tourism Alþingi, 2024d), integrating nature protection and climate resilience into the Iceland's broader planning frameworks.

Examples of NBS relevant policies in Iceland:

In the government's updated National Planning Strategy, for the years 2024-2038 (Alþingi, 2024a), three planning goals are set out, all of which are based on sustainable development: A. Objectives for the protection of the environment and nature, B. Objectives for the prosperity of society, and C. Objectives for a competitive economy. Under each objective, priorities are presented together with recommendations for their implementation for planning in the central highlands, in rural areas, in urban areas and in ocean and coastal areas. Municipalities are then responsible for enforcing these objectives through their zoning plans.

Iceland's National Policy on Land Restoration and Forestry (Matvælaráðuneytið, 2022) places an emphasis on the protection, maintenance and integrity of ecosystems, which should be based on an ecosystem approach. It emphasizes the promotion of NBS for climate change mitigation and adaptation, the promotion of sustainable land use, and strengthening cooperation, knowledge building and public health. It promotes the sustainable development of communities across Iceland. The policy is supplemented by an Action Plan (Stjórnarráð Íslands, 2022), where research on the impact of land restoration, forestry and wetland restoration on biodiversity, the creation of new quality criteria for the selection of land for forestry and the evaluation of carbon balances for emission accounting in climate matters, are among the defined measures. Direct actions mainly concern the restoration of

ecosystems on disturbed land, the restoration of wetlands, the restoration of natural forests and forestry. The use of NBS is encouraged to reduce the impact of natural hazards in the planning work of municipalities.

Iceland's Regulation on Sustainable Land Use (Matvælaráðuneyti, 2024) aims to ensure sustainable land use in accordance with the objectives of the Land Restoration Act. The regulation is a guide on how best to manage land to minimize the loss of valuable soil and to restore as much as possible of the ecosystems that have already been lost.

Iceland's Agricultural Policy (Alþingi, 2023a) aims to promote and support Icelandic agriculture and strengthen its pillars for the future with sustainable development as a guide. The policy promotes ecosystem approaches, increasing food security, restoration, promoting biodiversity and the circular economy, amongst other things.

Iceland's Food Policy (Matvælaráðuneytið, 2023) serves as a guideline for food production in Iceland. The policy addresses food security, promoting the circular economy, protecting ecosystems in the sea and on land, and the sustainable use of resources based on ecosystem conditions and function. The policy sets a future vision, where food production should be carbon neutral and carbon offsets based on NBS that are in line with international commitments.

Iceland's first ever Strategy for Climate Change Adaptation (Umhverfis- og auðlindaráðuneytið, 2021b), emphasises that adaptation measures should protect ecosystems and work towards their diversity, and an emphasis should be placed on NBS, such as green infrastructure, when adaptation measures are formulated.

7.4 Norway

Norway is not part of the EU, but as an EEA Member State adopts EU policies within certain domains (nature and energy is excepted, apart from water governance). The governance hierarchy include the national, regional and local level and generally rests on the principles of ministerial responsibility and local self-governance (Christensen et al., 2019). The county governor (Statsforvalter) has an important role in following up national policies at the regional level.

Climate change is affecting Norway's regions differently due to a very diverse geography with the world's second longest coastline and high variations in precipitation between the coastal and inland regions. It also includes polar climate zones and the island of Svalbard. Norway's strategy for climate adaptation is based on the principle that the actor responsible for a task or function that will be affected by climate change is responsible for adaptation. The different authorities responsible for sectors (such as environment, health and justice and preparedness) are thus required to assess risks and the need for measures within their sector. The Norwegian environment agency is responsible for coordinating these efforts

(Miljødirektoratet, 2024). The Norwegian Water Resources and Energy Directorate (NVE) is the national authority responsible for preventing flood and landslides and mentions NBS in their guidance to flood protection (NVE, 2023). Local self-government is a strong principle in Norway, and the municipalities have a central role in climate adaptation and nature management.

The responsibility for land use planning lies at the regional and local levels in the county authority (fylkeskommune) and municipalities (kommune), authorized by the national Planning and Building Act. Conservation and protection of nature through protected areas are founded on the Nature Diversity Act which also provides provisions and principles for the sustainable management and use of ecosystems. While Norway does not implement EU policies on biodiversity, the Water Framework Directive (WFD) is transposed into national legislation in the Water regulation ('Vannforskriften'). This is an important tool for ensuring ecosystem-based and coordinated water management and provides opportunities for NBS as it requires the implementation of measures to reach targets for good ecological status of water bodies. To facilitate coordinated water management following the WFD and Water regulation, Norway is divided into several river basin districts. The river basin districts are administered by the county authority and provide water management plans and programmes of measures which are implemented locally in the river sub-basin districts with the municipalities in a central role (Vannportalen, n.d.). Norway also has large marine areas with marine management plans as strategies for ecosystem-based and sustainable management and use (Ministry of Climate and Environment, 2021). While Norway has not adopted the Marine Spatial Planning Directive, an ecosystem-based management of marine ecosystems have been implemented through Ocean Management Plans in Norway (Sander, 2023). As only three per cent of Norway's total area is arable land, soil conservation is a key principle in the agriculture policy (Ministry of Agriculture and Food, 2014). Norway is not part of the EU common agriculture policy, and agricultural subsidies and measures are negotiated between the state and central farmers' unions, including a climate agreement. Different agri-environmental measures are promoted through regulations and funding schemes on regional and local level.

Examples of NBS relevant policies in Norway:

In 2018, Norway adopted a central government planning guideline for climate and energy planning and climate adaptation, founded on the Planning and Building Act. It which requires that conservation, restoration and NBS should be considered by the state, county authorities and municipalities in climate adaptation planning and justify why it has not been considered – if that is the case.

The NBS concept is becoming more familiar in Norway on all governance levels, and it is often mentioned in several recent white papers. Both the White Paper on climate change adaptation (Ministry of Climate and Environment, 2023) and the action plan on nature protection and biodiversity (Klima- og miljødepartementet,

2024) highlights the role of NBS and the authorities pledge to contribute to increased knowledge, tools and guidance on NBS. Knowledge about effects and costs related to use of NBS for flood and landslide protection is also a focus area in the white paper "A safer future prepared for flood and landslides" (Energidepartementet, 2024).

The Biodiversity Act (Klima- og miljødepartementet, 2009) represents a comprehensive framework for the preservation and promotion of biological diversity in Norway. It emphasizes the integration of biodiversity considerations into all policies and decision-making processes, requiring collaboration among various sectors and levels of government. The legislation specifies that decisions affecting biodiversity must be based on knowledge and the precautionary principle.

The Norwegian Environment Agency administers several grant schemes related to climate adaptation and nature restoration that can support NBS, including grants for nature restoration and environmental measures for water bodies (Miljødirektoratet, n.d.a; Miljødirektoratet, n.d.b).

7.5 Sweden

Sweden is part of the European Union, which means EU directives must be incorporated into Swedish law, and EU regulations become directly part of Swedish legislation. If Swedish regulations conflict with EU regulations, the EU legislation take priority. Sweden's governance is organized into national, regional, and local levels, all with democratically elected bodies, similar to Norway. Land use planning and its responsibility are managed by the county administrative boards (at the regional level) and by municipalities (at the local level), both guided by the Swedish Planning and Building Act.

Efforts for more sustainable land and water use, as well as sustainable landscapes, are both international commitments governed through the EU's biodiversity strategy and a part of Sweden's national efforts to achieve environmental quality objectives, Agenda 2030 goals, and outdoor recreation targets. Numerous laws govern climate adaptation work in Sweden, both directly and indirectly. The main law, directly related to climate adaptation, is the Planning and Building Act. An example of an indirectly related law is the Environmental Code, which aims to promote sustainable development and a healthy environment.

Examples of NBS relevant policies in Sweden:

The government has issued a regulation on climate adaptation, *Myndigheters klimatanpassningsarbete* (SFS 2018:1428), requiring 32 national authorities and all 21 county administrative boards to develop action plans for their respective areas of responsibility. The regulation also mandates that these authorities and boards conduct climate and vulnerability analyses, establish objectives/goals for their climate adaptation efforts, and create action plans to achieve these goals.

Sweden has national environmental goals that partly guide efforts related to biodiversity. There are certain interim targets relevant to climate adaptation, but none explicitly mention NBS.

Sweden has a strategy from 2022 called "*The Strategy for Sweden's Global Development Cooperation in Environment, Climate, and Biodiversity (2022–2026)*", which aims to support worldwide sustainable development, by promoting climate resilience, biodiversity conservation, and sustainable resource management through international partnerships, capacity building, and innovative solutions. The strategy also aligns with international frameworks such as the Paris Agreement and the UN Sustainable Development Goals (SDGs).

In August 2018, the government established the National Expert Council for Climate Adaptation, tasked with evaluating Sweden's climate adaptation efforts and providing recommendations for future actions. The first report was submitted to the government in 2022, which also addressed the need for NBS.

In March 2024, the Swedish government updated its national strategy for climate adaptation, emphasizing that NBS should be considered in climate adaptation measures.

Under the Local Nature Conservation Initiative (LONA), municipalities can apply for grants to create new or restore existing wetlands. Projects can also be initiated and managed by associations and other local actors. In 2018, wetlands were introduced as a separate grant category within LONA, and three years later, in 2021, the benefits of wetland restoration for achieving climate goals were highlighted.

Through the Swedish Civil Contingencies Agency (Myndigheten för samhällsskydd och beredskap), municipalities can apply for state grants for natural disasters, including support for NBS.

7.6 Autonomous territories (Faroe Islands, Greenland, Åland)

The Faroe Islands are a self-governing nation under the external sovereignty of the Kingdom of Denmark with a population of 50,000. The Faroe Islands have exclusive competence to legislate and govern independently in a wide range of areas, for example the conservation and management of living marine resources, protection of the environment, sub-surface resources, trade, taxation, industrial relations, energy, transport, communications, social security, culture, education and research (The Government of the Faroe Islands, n.d.a). Nature and environmental management are thus under Faroese jurisdiction and are mainly governed by the Act of the Faroese Parliament on Environmental Protection from 1988, Act of the Faroese Parliament on the Protection of the Marine Environment from 2005 and Act of the Faroese Parliament on Nature Conservation from 1970 (Petersen, n.d.).

This environmental legislation serves to protect the environment from human contamination both on land and at sea, but it also covers climate issues. The administration of environmental issues is divided between the Environment Agency of the Faroe Islands and Faroese municipalities (The Government of Faroe Islands, n.d.b). In 2024, the Faroe Islands passed a sustainable tourism law to safeguard both its nature and culture (The Government of Faroe Islands, n.d.c).

Greenland is an autonomous territory of Denmark and self-governing under the Self-Government Act (Statsministeriet, 2009). It has around 56,000 inhabitants, out of which around one third live in the capital city Nuuk. In 2023, Greenland became signatories of the Paris Agreement, meaning that they will develop a climate strategy and nationally determined contributions to limit carbon emissions, and define strategies for climate adaptation. Environmental policies lie with the Department for Agriculture, self-sufficiency, energy, and environment. Greenland has a Biodiversity Strategy for 2030, outlining five overarching goals for sustainability, environmental policy, monitoring and international collaboration (The Government of Greenland, n.d.a). The agricultural strategy 2021–2030, is developed to promote agricultural productivity in the country and increase self-sufficiency. Exploitation of mineral resources is a growing industry in the country, governed through the Mineral Resources Act (The Government of Greenland, n.d.b).

Åland is a self-governing province southwest of Finland with a population over 30,000 inhabitants spread over 60 islands (of more than 6,700 islands belonging to Åland archipelago). Parliament of the Åland Islands has legislative power to pass laws and set budgets including the matters of the environment. Finnish state law applies to matters related to foreign affairs, customs and other (Ålands Lagting, n.d.). Åland has been developing its sustainability agenda since 2014 and as a result developed an "Everyone Can Flourish" vision in 2016 which includes setting goals and developing policies for sustainable development in line with the SDGs and UN 2030 Agenda (The Government of Åland, 2024). Shared ownership and inclusive decision-making are among the core principles of Åland's agenda. Systematic monitoring and indicators have been developed to monitor the implementation of the vision. The archipelago set seven strategic development goals among which are preservation of ecosystems and biodiversity (Bärkraft.ax network, n.d.). The Åland energy and climate strategy to 2030 additionally sets targets and goals for climate work, energy efficiency and information sharing on climate, energy and sustainability (Ålands landskapsregering, 2017).



8. Introductions to the handbook categories

In the online handbook, the advice is tagged and sorted into different categories. This chapter includes all the introduction texts for the main categories used in the handbook: societal challenges, types of policy instruments and governance levels. For more information on how the categories were defined, see also chapter 12 on methodology.

8.1 Societal challenges

Nature-based solutions (NBS) can contribute to solving a range of different challenges in society. Existing policies supporting solutions to challenges such as climate change or food security, can in many cases also support the use of NBS. One of the criteria for assessing NBS according to the global standard of the International Union for Conservation of Nature and Natural Resources (IUCN), is that the "NBS intervention must address clearly specified challenges that have significant and demonstrable impacts on society" (IUCN, 2020a).

The eight societal challenges listed here are broad categories that group several different types of challenges. The categories are based on the IUCN framework on NBS (IUCN, 2020a) and categories used in previous work as part of the Nordic programme on NBS. Read more about this and the methodology behind the handbook in chapter 12.

Nature-based solutions are by definition multifunctional, meaning that they should be designed to address several challenges at the same time. This means that many of the policy advice provided in the handbook will be included in several different categories. Many nature-based solutions can and should provide co-benefits in addition to solutions to the main challenges they are addressing. The advice in this section is categorised according to the main challenge(s) the NBS is addressing.

Visit the online handbook: www.nbspolicy.org/societal-challenges

Biodiversity enhancement

Diversity in ecosystems, species and populations is essential to maintain and support life on Earth. Currently, state of nature is declining at accelerating rates, and this is often referred to as 'the nature crisis' or 'biodiversity loss crisis'. The main drivers of biodiversity loss are climate change and human activities such as land-use change, invasive species, pollution and exploitation of natural resources (UNEP, 2023).

Protecting and supporting biodiversity is a fundamental feature of the nature-based solutions concept. Nature restoration and protection are activities that in themselves can be defined as nature-based solutions. Nature's own ecosystem functions are usually very good at handling environmental extremes such as floods and droughts. Natural wetlands and floodplains may for example decrease the flooding extents downstream. Natural ecosystems and native species can also be more resilient to changes and pressures than degraded ecosystems.

Urban nature-based solutions such as rain gardens and stream daylighting mimic natural ecosystem functions and may therefore also contribute to climate change adaptation and biodiversity enhancement. Often, policies and legislation related to nature protection and biodiversity can also contribute to the increased use of nature-based solutions, even if they are not mentioned specifically (IPBES, 2019). Policies related to NBS are essentially also policies for nature and the environment. This means that principles such as the mitigation hierarchy (prioritising avoiding and minimising impact), adaptive management and precaution are fundamental (Kurrer & Petit, 2024).

Climate change mitigation and adaptation

Climate change constitutes one of the biggest societal challenges which need to be addressed both through mitigation and adaptation. This is also highlighted in the UN Sustainable Development Goal 13: Climate Action. Increased greenhouse gas emissions due to human activities are causing rapid and long-term shifts in temperatures and weather patterns. Protecting and restoring important ecosystems such as forests, peatlands, wetlands and kelp forests, contribute to much needed carbon storage, while sustainable use and management of forests and agricultural lands can reduce nitrogen dioxide emissions (Sandin et al., 2022; UNEP, 2021). Thus, each nations' ambitions to reach the targets in the Paris agreement can also be addressed through nature-based solutions.

Even if the Paris agreement targets are met, shifts in temperatures and weather patterns are still to be expected. Consequently, there is a need for society to adapt to climate change effects like more extreme rainfall events causing stormwater and flooding issues, landslides and erosion, higher temperatures causing heat islands, drought, shifting winter conditions, more frequent and larger forest fires, as well as

sea level rise, storm surges and wave impacts causing flooding in many cities and towns. Moreover, nature itself and the biodiversity will also be impacted by the rising temperatures and extreme weather causing among other drought and more wildfires, and NBS include strengthening both society and nature's resilience to climate change. Some examples of relevant nature-based solutions are street trees to mitigate heat island effects, protecting and restoring streams and wetlands to manage stormwater and address flooding. The Paris agreement includes commitments to adaptation planning and action, and NBS are emphasised as important adaptation measures by the international community, including the UN and EU (Climate-ADAPT, n.d.).

The natural conditions and the effects of climate change vary between the Nordic countries, thus also their focus in addressing climate change mitigation and adaptation. However, there are also similarities both in terms of nature, climate change impacts and governance. The following advice relates to addressing climate change mitigation and adaptation through policies, which includes some good examples of how the Nordic countries address this societal challenge.

Disaster risk and preparedness

Natural hazards such as extreme weather events, landslides and wildfires can cause the loss of lives, livelihoods and substantial material damages. Disaster risk is defined by the type of hazard, the exposure of people, infrastructure or other elements to the hazard and vulnerability – factors that can increase the impact of the hazard, such as physical, social and economic conditions (IFRC, n.d.).

The Nordic countries are well-prepared for many natural risks, and have good systems for planning, capacity building, training and warning systems with ongoing developments.[10] Public information and coordination are also an important part of this preparedness. However, with climate change some natural hazards are projected to increase in frequency, and vulnerability and exposure to such hazards may increase due to loss of nature and ecosystem functions. For example, the loss of natural floodplains and wetlands that can contribute to water retention during storms and heavy rain, may cause larger flood damages to infrastructure, livelihoods and potential risks to human health further downstream. Nature-based solutions should therefore be a natural part of disaster risk and preparedness strategies (IUCN, 2017).

In addition to nature protection, sustainable management of culture landscapes, such as grazing and prescribed burning may also reduce the risk of large, uncontrollable wildfires. There are also many examples of NBS working together with more traditional, grey solutions for example in coastal areas where storm flood surges threaten communities close to the shore. Highlighting the role of

10. See for example the Nordiclink project https://www.nordiclink.no/

nature-based solutions in disaster risk and preparedness efforts may increase awareness of how human communities and their health and wellbeing rely on intact and resilient ecosystems (Monty et al., 2016).

Water management

Water management encompasses several major topics including water quality and pollution, water quantity and flooding, water scarcity and droughts. Water is one of the key components for sustaining life, securing agricultural production and industrial activity, and ensuring health and wellbeing. Climate change brings more uncertainty to occurrence of extreme conditions such as flooding (excess of water) and periods of droughts (lack of water) which can impact water availability and security, and human activities can further contribute to pollution of watercourses and overextraction of water reserves.

Water distribution and access to water can become a political issue as the key recourse, especially in times of conflict. Ensuring environmental flows (water necessary for functioning of healthy ecosystems) brings additional layer of uncertainty. Water governance has been a widely discussed topic globally. It encompasses political, social, economic and administrative systems that influence who, when and how uses the water and who has the right to water and related benefits (SIWI, n.d.). Good governance of water ensures the risks related to water scarcity, pollution and flooding are addressed (OECD, n.d.).

There are two UN SDGs goals explicitly related to water: SDG 6: Clean water and sanitation addressing availability and sustainable management of water and sanitation, and SDG 14: Life below water targeting the sustainable use the oceans, seas and marine resources. SDG 13: Climate action among its targets aims at building resilience and adaptive capacity to climate related disasters and can be directly attributed to water related extreme events. However, being an overarching theme, water is key to meeting many other goals and targets such as those related to health and wellbeing, justice, sustainable cities and communities, and food security.

NBS can contribute to all aspects of water management at different scales including addressing water quality and pollution, flooding, groundwater recharge. In the urban environment, NBS can simultaneously deliver benefits associated with water management (both quality and quantity), biodiversity, health and wellbeing. Larger scale NBS such as riparian vegetation and wetlands aid in reducing the extent of floods and contribute to biodiversity as well as carbon sequestration. NBS for water management are one of the most well-studied interventions and there are documented impacts and developed best practices for their implementation (Vojinovic, 2020; Wild, 2020). NBS are recognised as key solutions for ensuring holistic water management by the UNESCO Intergovernmental Hydrological Programme 2022-2029 (UNESCO Intergovernmental Hydrological Programme, 2022).

Economic and social development

Supporting a sustainable economic development is an important task for public authorities to ensure quality of life for the population. The population's wellbeing depends on the job security and sufficient incomes, access to education and healthcare, and living standards and environmental conditions. NBS can support economic development in several ways.

NBS to support economic and social development is understudied (Dunlop et al., 2024), however, a variety of NBS interventions have been found to impact income, revenue and job creation with positive, mixed and sometimes negative results (Chausson et al., 2024).

Society and economic sectors heavily rely on nature for its functions and resources (World Economic Forum, 2020, 2024). Therefore, protecting and restoring nature is important to ensure good living conditions in the first place. This also relates to efforts to adapt society to climate change or manage disaster risk. Furthermore, investing in NBS can contribute to job creation related to planning, delivery and stewardship of the solutions. Finally, taking a nature-based approach to improving the urban environment, can also make neighbourhoods more attractive for people and businesses.

While working with NBS itself can support sustainable economic development, the choice of policy instruments can also have an impact. Some policy instruments have lower administration and transaction costs than others, while some have larger distributional effects than others.

Food security

Increased vulnerability of food production is one of the major consequences of climate change on human societies and activities. Changing weather conditions, including less reliable seasons, increasing droughts and heavy rainfall, are some of the threats to stable and secure food production. These conditions may cause issues such as the spread of pests and soil erosion. Food production also relies on healthy ecosystems that provide habitats for pollinating insects and resources that can be harvested such as fish and plants. At the same time, food production is a major source of greenhouse gas emissions and nutrient pollution of water bodies, and the use of pest control and monocultures can threaten local biodiversity.

To ensure the sustainable provision of food, a holistic approach is needed (Cohen-Shacham et al., 2016). This is also highlighted in the UN Sustainable Development Goal 2: Zero hunger. Nature-based solutions for food security can for example be to protect wild relatives to plants and animals for genetic diversity, sustainably manage fish stocks and practice restorative aquaculture (IUCN, 2022b). Other initiatives such as in community gardening can also contribute to biodiversity and

food provisioning as well as educating people. Many NBS are also related to agricultural practices, such as using cover crops and vegetation zones that keep more nutrients in the ground, reduce erosion and increase biodiversity. Other measures can ensure better access to water for irrigation or are related to land-use changes.

In the Nordic countries, the policies on agriculture and food production can vary quite much, as some are members of the EU and part of its common agricultural policy (CAP) while others are not. However, all the countries are applying NBS related to food security, and there are many good examples where we can learn from each other.

Human health and wellbeing

Human health and wellbeing are one of the key focus issues when it comes to evaluating the impacts of climate change. Extreme weather events with catastrophic consequences to infrastructure and settlements as well as growing susceptibility and vulnerability to climate change results in increased losses of lives as well as direct consequences for the human health such as increased morbidity and mortality (Romanello et al., 2021; WHO, 2023). There are also direct links between biodiversity and human health. Biodiversity supports functioning of ecosystems and delivery of ecosystem services humans depend on, including food, water and air, and is similarly impacted by climate change as well as human activity (Romanelli et al., 2015).

NBS as multifunctional solutions aim at restoring the functioning of ecosystems and (re)establishment of biodiversity as well as reducing the impact of human health and wellbeing. NBS and urban greening have been associated with, among many, mental restoration, lowering anxiety and stress, especially in children and elderly (EEA, 2023), enhanced physical activity as well as reduced exposure to air pollutants (WHO Regional Office for Europe, 2016). However, distribution of health and wellbeing benefits of NBS was found to be strongly associated with the aspects of justice and inequality.

Vulnerable populations including children, elderly, lower-income neighbourhoods, immigrants, and other marginalised groups are at highest risk of being affected by climate change due to distribution of NBS and adaptation measures (De Vries et al., 2020; Viinikka et al., 2018). Carefully designed urban green spaces can promote social health and as well as offer refuge during extreme weather events or other events such as the pandemic (Huang et al., 2023; Jakstis et al., 2022). In the Nordics, it was emphasised that integrating NBS in municipal planning and management should start with the policy level that has the potential to align the ongoing activities and tie them together. Aligning departments is another critical step towards designing and managing green spaces (Borges et al., 2024).

Social justice and social capacity building

Social justice is a key element to nature-based solutions, and criterion 5 in IUCN's global standard for NBS addresses the need for inclusion, transparency and empowering governance processes. NBS can contribute to addressing social inequity by for example supporting resilience against natural hazards and effects of climate change, which often affect vulnerable groups and communities disproportionately (UNDP, 2023). It may also ensure more equal access to natural resources, such as clean water and recreation areas.

On the other hand, some interventions such as protection of forest areas may put a larger economic burden on local communities that are economically dependent on the forest. It is therefore very important to include a social justice perspective when planning for NBS to ensure that both the benefits and costs are distributed fairly (EEA, 2024). Good processes for stakeholder engagement and inclusion of various groups can contribute to this (Boyland et al., 2022).

Including local communities and other stakeholder groups in the planning and implementation of NBS can also contribute to a feeling of empowerment. It may contribute to knowledge and capacity needed to participate in development of their local community and benefit from the NBS. A sense of ownership over the NBS and emphasising a positive relation to nature may also enhance the long-term effects and management of the NBS. The support to local capacity building, communication and collaboration is therefore a central part of ensuring the success of the NBS (Cohen-Shacham et al., 2016).

8.2 Policy instruments

For policies to be effective and achieve their aims, there are different types of instruments or interventions that can be put to use. Often, these instruments either provide an incentive to carry out activities or may also penalize certain actions. Providing information or structures for organizing actions may also motivate or affect different actors.

In the handbook, we have divided policy instruments into four key types 1) laws and regulations, 2) economic instruments, 3) administrative practices and strategies, and 4) Information, guidance and other voluntary measures. These categories are further described below.

Visit the online handbook: nbspolicy.org/policy-instruments

Laws and regulations

Laws and regulations are the primary policy instruments that establish the legal frameworks governing markets, behaviours, and activities. These are often enacted through decisions made by policymakers at the national or international level, shaping societal development and the implementation of political goals. For EU member states, laws passed by the European Union take precedence over national laws and must be adhered to, even if they conflict with national legislation.

These policy instruments play a significant role in promoting and regulating nature-based solutions, which are essential for addressing societal challenges such as climate change, water management, and biodiversity. This can include laws that protect and preserve ecosystems, green spaces, and water systems. Laws and regulations can also mandate the integration of NBS into infrastructure and urban development projects, which could lead to replacing traditional solutions with blue-green infrastructure. For instance, wetlands can be considered a solution to flooding issues, rather than relying solely on technical barriers or similar structures.

Laws and regulations can be highly impactful because they are binding and must be followed as they are ensuring legal certainty and governance. Additionally, laws and regulations are applied to protect societal interests, as well as the environment. However, sometimes they can be challenging to implement due to various reasons such as available resources or political direction. Effective policies must be aligned horizontally (across the departments) and vertically (across the political levels) to ensure synergies and complementary goals (Borges et al., 2024).

The advice in this category addresses how NBS can be included in laws and regulations, with examples from the Nordic countries.

Economic instruments

A wide range of economic instruments can be adopted to support implementation and management of NBS. Some instruments are set out to fund NBS directly, like public grants, subsidies, payments for ecosystem services, and agglomeration bonus. Other instruments aim to discourage undesirable actions, like taxes and fees which can also serve as revenue streams for funding NBS. Some of these instruments rely on the markets to incentivise investments in NBS (e.g., fees, subsidies, auctions, payments for ecosystem services). There are also debt-based instruments which may provide incentives for investing in NBS through reduced insurance premiums or loans with reduced interest rates.

The advice in this category includes examples of financing instruments already in place in some countries which can be utilised by those wanting to support implementation of NBS. Moreover, it includes advice for developing existing and new economic instruments in support of NBS.

Administrative practices and strategies

Administrative practices aim to structure and streamline the governance and implementation of nature-based solutions (NBS) at local, regional, and national levels. Often, NBS requires new types of collaboration and (re)establishment of practices that can take time to change. NBS implementation can be supported by establishing clear administrative processes and enhancing coordination between different stakeholders, including authorities, private sector, and civil society. For example, land use and infrastructure planning can include NBS as part of routines for processing applications or the initial phase of new projects. Establishing new arenas for coordination and collaboration across different departments and fields can also be part of this.

The advice in this category relates to local and/or regional strategies and administrative practices for NBS.

Information, guidance and other voluntary measures

There are also softer policy instruments that can guide stakeholders in successfully implementing nature-based solutions in the best possible way, through measures such as educational materials, information and guidelines. By providing accessible information and guidelines, both professional actors and citizens can better understand the economic, ecological, and social benefits of NBS, as well as how to integrate these solutions into their operations or daily lives. Creating awareness and engagement can lead to long-term changes in behaviors and attitudes toward sustainable development.

Voluntary measures can promote broader engagement with NBS, without the need for legislative measures. These instruments can include educational campaigns, voluntary certification systems, and other incentives that motivate stakeholders to take actions that support, among other things, more resilient communities and biodiversity.

The advice in this category relates to provision of information, guidance and voluntary instruments for cooperation, knowledge and awareness-raising on all governance levels.

8.3 Governance level

It is important to acknowledge that policies on all administrative levels can contribute to supporting nature-based solutions in the long term.

NBS are often implemented locally, requiring certain priorities and tools for support in the local administrations, usually municipalities. The regional level, for example counties or river basin districts, have important roles in coordinating and

supporting local implementation. This level can also be a link between national and local authorities. Finally, national authorities such as the government and different ministries, agencies and directorates can adopt strategies and legislation that affects all the administrative levels.

For advice concerning policies for NBS internationally, read more about this in chapter 5 (link online). In addition, each specific advice includes information on key international goals and obligations that they may contribute to.

Visit the online handbook: www.nbspolicy.org/governance-levels/

National level

Policy instruments at national level can take several forms, such as legislative, regulatory and strategic, economic or fiscal. On a national level, the government can use hard and soft policy instruments to incentivise NBS. Development of strategies that incorporate NBS and related solutions also enable to promote wider uptake of NBS. Moreover, national agencies can build knowledge and provide guidance on NBS via larger scale ministerial resources or national climate adaptation guidance, promoting information spreading and streamlining across the country.

Advice presented in this category provide examples on how the national level can promote NBS implementation through different policy instruments.

Regional level

The involvement of regional level administration in climate and nature policy varies between the Nordic countries based also on the power given to different governance levels. The regional level can be especially useful in promoting cooperation on a larger geographical scale, by coordinating municipalities and providing insights. This is important since NBS often have impact on landscape scale and larger efforts are needed to safeguard some ecosystems. Regional administrations have also been known to acquire EU grants for NBS projects, secure funding for implementation, or in other cases to administer funds for local projects.

Advice in this category are relevant for the level of regional administrations, showing how this governmental level can support increased uptake of NBS.

Local level

Responsibilities and power assigned to the local level may vary between the Nordic countries. However, NBS are often implemented and managed locally at smaller scales, requiring certain priorities and tools for support in the local administrations, usually municipalities. There is large variation between the size of municipalities and their resources. There is also large geographical variation and differences in

societal challenges from inland municipalities, coastal areas, islands and larger cities. While some municipalities have more resources in terms of financing, skills and competence in different fields of expertise, others may have less resources on topics related to the environment. Municipalities can also acquire the EU and other sources of funding for NBS work, and with many Nordic cities and regions being the EU Mission Adaptation Charter signatories, the adaptation efforts are targeted to increase.

The advice in this category includes good examples and frontrunners in local governance, demonstrating how the local level can use policy to support the implementation of nature-based solutions.



9. Advice for policy development

This chapter presents the advice for policies related to nature-based solutions (NBS). All the cross-cutting advice is included in their entirety in this TemaNord report. The specific advice can be found in the online handbook, but an overview of the advice and related examples with links to the handbook are included in the table in chapter 9.2.

Visit the online handbook: www.nbspolicy.org/all-advice/

9.1 Cross-cutting policy advice

The advice applies to policies for NBS across most sectors, societal challenges and governance levels. The cross-cutting advice is quite broad and is often based on findings and recommendations from other projects in the Nordic NBS programme as well as gaps and opportunities identified in stakeholder consultations. The cross-cutting advice concerns five key aspects of policy development for NBS:

- Education, capacity building and awareness raising for nature-based solutions
- Financing and economic incentives for nature-based solutions
- Stakeholder involvement and collaboration for nature-based solutions
- Evidence-based and adaptive management for nature-based solutions
- Policy integration and cross-sectoral approaches for nature-based solutions

Education, capacity building and awareness raising for nature-based solutions

Raising awareness and building knowledge about NBS is crucial for their implementation and can be done in many ways, from children's education to capacity building among practitioners. While access to information does not promote action by itself, it is an important stepping stone for NBS implementation.

Advice

Education and capacity building are necessary tools to promote NBS and ensure that NBS are taken from the idea stage to actual implementation.

Educational efforts can be promoted through engagement in NBS activities by schools and youth, pupils and students, and providing training programs for public administration personnel and contractors. Skills and knowledge on natural processes needs to be applied to ensure knowledge of quality and functioning of NBS.

Raising awareness through information campaigns, integration of NBS principles into strategies and plans, and introduction of support schemes are also among the ways to promote NBS. Awareness can increase the knowledge and care for nature that also promote support for NBS (Catalano, Campiotti & Baldacchini, 2021).

Capacity building through well-known approaches such as courses, written and oral guidance and assistance programs as well as through direct NBS monitoring and evaluation can increase knowledge of the terms and principles connected to NBS. Knowledge and skills related to NBS can empower local communities to establish and maintain NBS.

Iterative learning is promoted as part of NBS by embedding feedback cycles of knowledge within the NBS processes. This way, evidence and knowledge created in the NBS planning can be brought in during the implementation process, knowledge from the implementation can be used in the monitoring phase, and so on. This means that building of awareness and competences continues throughout the implementation and use phase of NBS.

Context

As the Nordics face multiple societal challenges - climate change, ecosystem degradation and natural disasters - there is a growing need for educated professionals with green skills who can seek and facilitate sustainable and functioning solutions. Working with NBS requires additional understanding of

natural processes and ecosystems, and creating NBS without such considerations can lead to unintended effects or low-quality solutions. The need for increasing education on NBS in all education levels, supporting capacity-building, and awareness raising are emphasised among the findings and recommendations from previous Nordic NBS projects.

While it is well known that information alone does not motivate people to act on environmental and social issues, awareness and capacity building serve as important stepping stones toward action. NBS provide a solution-focused angle on environmental issues, with the potential to engage both professionals and civil society if presented in a constructive way. This can reduce lack of awareness of natural processes and change attitudes toward the use of conventional, grey solutions.

Many also point towards the need for a resurrection of people's connection to nature at a societal level. Both in A-DVICE stakeholder consultations and other studies (e.g., Barkved et al., 2024; Welden et al., 2021), it is mentioned that awareness and engagement for NBS is connected to our general relationship with nature and creating positive visions for the future. This may also include changing common perceptions of how green spaces should look like and creating acceptance for "messy" nature in urban settings. In line with this thinking, many people are used to parks having tidy green lawns and straight paths with hard surfaces and when this is challenged it can create some resistance toward NBS. However, raising awareness of the benefits of for example, flower meadows and dead wood in forests, can create better understanding and acceptance (Bergesenstiftelsen, 2022). The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) highlights the need to think of nature's value not only as something humans live from, but also living with, in and as nature (Pascual et al., 2022). NBS can contribute to reducing our alienation from nature and help us realise the interconnectedness of all ecosystems and species.

Useful concideration

- Different stakeholders need different angles on education and awareness-raising, and initiatives should be specifically targeted towards specific stakeholder groups.
- While there is already access to much information and knowledge about NBS, even more can be promoted. However, legal requirements to consider the use of NBS to address societal problems are also needed in order to provide incentives for stakeholders to seek this.

- Lack of awareness, experience or understanding of the benefits of NBS can lead to a view that NBS are too costly or not as effective as other solutions – educational efforts should focus on economic aspects as well as practical.
- Promote awareness building and education across diverse knowledge fields, ranging from natural and social sciences to indigenous and traditional knowledge.

Highlighted international goals and obligations

Kunming-Montreal Global Biodiversity Framework, target 21, Ensure That Knowledge Is Available and Accessible To Guide Biodiversity Action:
"Ensure that the best available data, information and knowledge, are accessible to decision makers, practitioners and the public to guide effective and equitable governance, integrated and participatory management of biodiversity, and to strengthen communication, awareness-raising, education, monitoring, research and knowledge management and, also in this context, traditional knowledge, innovations, practices and technologies of indigenous peoples and local communities should only be accessed with their free, prior and informed consent, in accordance with national legislation".

SDG 4 Quality Education: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all".

General references for this advice

IUCN, 2020; Welden at al., 2021; van der Jagt, 2023

Learn more

Integrating Nature-based Solutions in Education: Unlocking the Potential of Transformative Learning for Sustainability:
https://networknature.eu/product/29478

Conexus key learning factsheet series - Skills Gaps for Nature-based Solutions uptake in Europe and Latin America: https://networknature.eu/product/31768

Nature-based Solutions professional certificate on IUCN Global Standard - 5th edition: https://iucn.org/events/coursetraining/nature-based-solutions-professional-certificate-iucn-global-standardtm-5th

Guidance for using the IUCN Global Standard for Nature-based Solutions - first edition: https://doi.org/10.2305/iucn.ch.2020.09.en

Financing and economic incentives for nature-based solutions

Financing nature-based solutions (NBS) requires a strategic and multi-phased approach to ensure their long-term success. Unlike many conventional solutions, NBS often take time to establish and to fully deliver the envisaged effects, so financing mechanisms should be designed with this in mind.

Advice

To effectively finance NBS, the following advice can be useful:

Establish the objectives of the financial mechanism
When developing financial mechanisms for NBS, begin by defining the specific objectives you want to achieve, including the desired outcomes and timeline. This will guide the development process. Consider whether the mechanism should target specific NBS, such as dedicated funding for green roofs, or be designed to accommodate a broader range of NBS. The decision may depend on existing programs and regulatory frameworks; for example, mechanisms at the building scale (such as green roofs, green walls, or rain gardens) may integrate more smoothly within current building regulations. Finally, ensure that the chosen financial mechanism is evaluated periodically to determine whether it achieves the intended objectives and contributes effectively to the defined aims.

Develop financing mechanisms that consider the whole life cycle of an NBS project
NBS, such as ecosystem restoration and green infrastructure development, often require years, if not decades, to reach full maturity and provide anticipated benefits, including flood control, carbon sequestration, and biodiversity restoration. Short-term funding mechanisms can significantly hinder these projects by restricting essential follow-up and long-term monitoring. Therefore, financing strategies must prioritize sustained investment and dedicated maintenance funds to maximize the effectiveness and longevity of these solutions.

Comprehensive financing mechanisms should support every phase of NBS—from research and planning through to design, implementation, and ongoing monitoring and maintenance. Allocating resources for post-implementation monitoring, maintenance, and adaptive management ensures that projects can adapt to evolving environmental and community conditions. These phases are as critical as planning and implementation in securing long-term success.

Leverage timing for rebuilding and recovery
When communities are rebuilding after natural disasters (e.g., landslides, floods, etc.), these moments present timely opportunities to introduce NBS into the recovery process. There is often an influx of emergency or recovery funding, and integrating NBS into rebuilding efforts can provide more sustainable and resilient outcomes. By taking advantage of these rebuilding windows, funding for NBS becomes more viable and attractive as part of a holistic recovery strategy. In general, aligning NBS projects with other planned building projects can help finance NBS and cut costs.

Diversify funding sources
To truly mainstream and upscale NBS, a concerted effort should be made to diversify funding sources and create innovative financing structures that engage both the public and private sectors. Internationally, NBS are largely financed by public funds (European Investment Bank, 2023*; Engelbrecht Hansen et al., 2023*). There is still a need for more impactful funding structures for NBS in the Nordic countries, according to our findings and previous studies (Barkved et al., 2024; Sandin et al., 2022).

Innovative models, such as green bonds or environmental impact bonds can offer valuable insights and could be tailored for use in the Nordics. Public funds can play a key role in de-risking private investment in NBS, particularly in contexts where there is scepticism about the effectiveness of nature-based approaches. Risk-sharing mechanisms, like guarantees or performance-based payments, can encourage more private sector participation (Sandin et al., 2022).

Engaging the private sector is crucial, as the majority NBS investments are currently done through public funds *(Engelbrecht Hansen et al., 2023)*. This can for example be achieved by emphasising clear economic returns, promoting green financing instruments, and linking NBS to corporate sustainability or environmental, social, and governance goals. Public-private partnerships are also effective in aligning shared interests, such as co-financing green infrastructure between urban developers and local governments. Furthermore, cross-sectoral business models, like payments for ecosystem services, can pool resources from various beneficiaries (e.g., farmers, utilities) to support ecosystem restoration (Jian, 2023). By diversifying funding sources in these ways, NBS can become more financially sustainable and scalable.

Context

The planning of NBS projects often stalls because of a lack of funding, and this has been identified as a common barrier. Policy mechanisms that enable financing flows to NBS are, therefore, a necessary tool to promote NBS implementation. These exist in several configurations, such as government funding programs for

municipalities, EU grants, and support from nature restoration or protection funds. Another challenge is evaluating the success of a funding scheme when funding cycles sometimes follow timeframes that are too short for NBS to deliver their full potential within the cycle.

Useful considerations

- To avoid being overwhelmed when developing financing mechanisms for NBS, it is often better to start small and simple. I.e., developing a financing program for one type of NBS that can be based on reduction of an already existing fee, then creating a full comprehensive financing program. Financing programs should be evaluated and can be adjusted and expanded over time.
- NBS projects often need adaptive management as ecosystems change over time. Flexibility in funding structures can allow for the necessary adjustments during the project's lifecycle. Mechanisms like adaptive financing allow resources to be shifted or added as new challenges or opportunities arise, ensuring that the project remains effective.

Highlighted international goals and obligations

Kunming-Montreal Global Biodiversity Framework: "Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors, in particular those with significant impacts on biodiversity, progressively aligning all relevant public and private activities, fiscal and financial flows with the goals and targets of this framework."

SDG 15, Life on Land, Target 15.A: "Increase financial resources to conserve and sustainably use ecosystem and biodiversity. Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems."

General references for this advice

Davis, Cuevas & Gvein, 2024; European Investment Bank, 2023; IEEP et al., 2024; Jian, 2023; van der Jagt, 2023.

Learn more

A vast number of resources have been published by organisations and research projects to provide inspiration and information about financing mechanisms that can support NBS, some of which are linked here:

Network Nature developed a factsheet for **exploring opportunities for NBS through municipal funding**:
https://networknature.eu/sites/default/files/uploads/networknature-nbs-factsheet-4.pdf

Guide to Biodiversity Financing for Cities and Regions, published by ICLEI:
https://e-library.iclei.org/uploads/Biodiversity-Finance-Guide_final.pdf.

Biodiversity finance decision-making tree, published by ICLEI:
https://interactbio.iclei.org/wp-content/uploads/Biodiversity-Finance-Decision-making-Tree.pdf.

UNA Biodiversity Finance Handbook, published by ICLEI Africa:
https://e-library.iclei.org/uploads/UNA-Resilience_Handbook_FINAL(2).pdf.

Financing and Business Models Guidebook, published by the Connecting Nature project: https://connectingnature.oppla.eu/sites/default/files/uploads/finance-1.pdf

Approaches to financing nature-based solutions in cities, published by the Grow Green project: https://growgreenproject.eu/approaches-financing-nature-based-solutions-cities/

NBS Business Models search engine, published by the Grow Green project:
https://growgreenproject.eu/nbs-business-models-search-engine/

Business Model Catalogue: Taking action for urban nature, published by the Naturvation project:https://www.naturvation.eu/sites/default/files/results/content/files/business_model_catalogue.pdf

Business Models & Financing Strategies, published by UNaLab:
https://unalab.eu/en/documents/d63-business-models-and-financing-strategies

The Connecting Nature Resource Centre includes several resources for financing and business models: https://connectingnature.oppla.eu/

Nature-based Solutions Sustainable Financing Inventory (with fact sheets for each financing mechanism), published by the Ponderful project:
https://www.ecologic.eu/19473

Stakeholder engagement and collaboration for nature-based solutions

Stakeholder involvement at all stages of NBS development is important to improve planning and design of NBS, ensure locally adapted NBS and balance multiple interests. Stakeholder involvement increases knowledge and awareness, acceptance and a sense of ownership, which in turn can ensure the long-term commitment and success of NBS.

Advice

Stakeholder involvement in NBS initiatives should be done in a structured and meaningful way. Make sure to:

- Engage a diverse range of stakeholders across sectors and scales;
- Analyse stakeholder dynamics, to assure that all relevant voices are heard;
- Build long-term relationships and trust through transparent inclusive processes;
- Use collaborative approaches to co-create solutions rather than imposing them
- Use tailored communication and skilled facilitation for engagement activities;
- Remember to reserve adequate resources for maintaining engagement through all stages of an NBS project, i.e., from the planning through implementation, maintenance and monitoring phases.

Context

NBS require collaborative work in a pursuit to contribute to environmental, economic and social impacts and build resilience. Involving local stakeholders can shape solutions that are relevant for local challenges, which will streamline their adoption. Contributing to generating solutions and providing local knowledge can enhance social empowerment. Local relevancy and personal involvement also create a feeling of responsibility and ownership of the solutions. Participatory processes involving stakeholders and established social relations tend to positively correlate with climate perceptions and social learning (Teodoro et al., 2021).

Meaningful engagement enables mutual learning and awareness that can stir further NBS and climate resilience development. This in turn strengthens the social learning, which contributes to supporting and mainstreaming the use of NBS, as stakeholders demand more sustainable solutions. It can also contribute to reaching a societal agreement on the benefits of NBS, which can potentially lead to commitment to their implementation.

The primary challenge is ensuring that all relevant stakeholder groups are represented in decision-making by attracting a diverse set of individuals and with varied backgrounds from multiple stakeholder groups, and encouraging their continued involvement. Stakeholders have large potential to influence how NBS are shaped and perceived. Hence, it is important to consider all stakeholders forming the quadruple helix approach to co-creating NBS innovations: academia, industry, government and citizens (Dubovik et al., 2022).

Useful considerations

- Structured engagement throughout the duration of a NBS project or initiative can contribute to strengthening the general trust in NBS.
- Demonstrating value (e.g., using monitoring data or cost-benefit analysis) can enhance engagement.
- Meaningful stakeholder engagement is a direct way of raising awareness and knowledge of NBS and thus appreciation for locally developed solutions.
- It may be challenging to attract all necessary stakeholders and go beyond the usual participants (i.e., those who tend to participate often) which can limit the number of necessary perspectives needed for identifying all local challenges.
- Each stakeholder will have their own interests and demands, which may present challenges during NBS co-creation. Thus, neutral expert facilitation is needed to navigate through the entire process.
- Ideally, stakeholders should be involved in all stages of NBS development, from planning to maintenance.
- It is important to ensure the diversity of participants to capture as many needs and perspectives as possible.

International goals and obligations

SDG 17 Partnerships for the Goals: "Strengthen the means of implementation and revitalize the global partnership for sustainable development."

Kunming-Montreal Global Biodiversity Framework, target 11: "Restore, maintain and enhance nature's contributions to people, including ecosystem functions and services, such as regulation of air, water, and climate, soil health, pollination and reduction of disease risk, as well as protection from natural hazards and disasters, through nature-based solutions and ecosystem-based approaches for the benefit of all people and nature."

Kunming-Montreal Global Biodiversity Framework, target 14: "Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors, in particular those with significant impacts on biodiversity, progressively aligning all relevant public and private activities, fiscal and financial flows with the goals and targets of this framework."

EU Adaptation Strategy: "More systemic adaptation: Supporting policy development at all levels and all relevant policy fields; including three cross-cutting priorities to integrate adaptation into: macro-fiscal policy; nature-based solutions; and local adaptation actions."

General references for this advice

Barkved et al., 2024; European Commission, 2021a; Teodoro, Prell & Sun, 2021; van der Jagt et al., 2023

Learn more

Harnessing the Power of Collaboration for Nature-Based Solutions is a report published by the European Commission that provides insights and practical examples for local decision-makers on how to effectively implement NBS through collaborative approaches: https://www.ecologic.eu/sites/default/files/publication/2023/33001-harnessing-the-power-of-collaboration-for-nbs.pdf

The EU funded UNaLab project developed resources on how to develop an Urban Living Lab and how to co-create and involve stakeholders in the innovation process related to NBS: www.unalab.eu

The EU funded Regions4Climate aims to develop and demonstrate a socially-just transition to climate resilience in collaboration with regional stakeholders: www.regions4climate.eu

Evidence-based and adaptive management for nature-based solutions

Integrating evidence and systematic use of knowledge into policy development and decision-making for nature can foster resilience in changing environments.

Advice

Evidence-based management is key when working with nature. Decisions regarding complex ecosystems need to be supported by scientific evidence and experience. If there is a lack of knowledge, impact assessments and mapping should be required. The precautionary principle should be applied when working with nature, to avoid damages that can be irreversible. To ensure that NBS become mainstream, all relevant knowledge and experiences should be gathered and made accessible.

Adaptive management can give flexibility and allow for adjustments in response to changing conditions and new knowledge. When working with NBS, there needs to be room for trying and failing to improve the solutions over time.

Context

Evidence-based management uses evidence and systematic knowledge to ensure effectiveness, sustainability and adaptability. A barrier to implementation of NBS is the perceived lack of evidence or knowledge about the effects of a NBS intervention. Ecosystems are complex and dynamic, and there is always an element of uncertainty in their management. Predicting the effects of NBS are in other words not as standardised as for other interventions or grey solutions. Most NBS are also to some degree unique to their area and context.

Evidence-based risk assessments can contribute to managing uncertainties in NBS implementation, strengthening confidence in applying these approaches. Evidence-based management can also encourage collaboration across different sectors, such as agriculture, forestry, and urban development, in that they all significantly impact biodiversity. The emphasis on knowledge-based management supports the use of strategic environmental assessments and environmental impact assessments, ensuring that biodiversity values are systematically included in project evaluations and planning processes.

Ecosystems evolve and change over time, and this is also what make NBS more resilient and multi-functional than other solutions. The 7th criterion of the IUCN global standard is that "NBS are managed adaptively, based on evidence" (IUCN, 2020a). Adaptive management is based on knowledge coming from monitoring,

science, experiences and traditional or indigenous knowledge. To expand NBS knowledge, continuous learning is key. By drawing on past successes and failures, practitioners can build a more comprehensive understanding of what works and why, allowing for more effective future planning and taking NBS into consideration.

Documenting these experiences is equally important, as it allows the wider community to benefit from lessons learned and apply them to their own contexts. This approach not only strengthens the collective knowledge base but also supports risk assessments, which are essential for managing uncertainties associated with NBS implementation. These strategies align policy with practical implementation, fostering collaboration and ensuring more effective NBS adoption.

Useful considerations

- Applying standardised Monitoring & Evaluation (M&E) to track both ecological and socio-economic outcomes will allow for continuous improvement and scalability of NBS initiatives.
- The importance of learning from both successes and failures in previous NBS efforts should be emphasised. This means also documenting unsuccessful solutions. By analysing case studies and practical experiences, practitioners can build a deeper understanding of effective strategies and potential pitfalls, leading to better-informed decision-making.
- Knowledge gathered about certain ecosystems or areas in impact assessment may not always be public. Strengthening systems to share and make this information accessible could improve transparency, support informed decision-making, and foster collaboration.
- Identifying what works and what does not, can reduce barriers to implementation of NBS both locally and across regions.
- Regular assessments of effects and impacts of NBS can help identify risks and challenges at an early stage.

International goals and obligations

Kunming-Montreal Global Biodiversity Framework, target 14: "Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors, in particular those with significant impacts on biodiversity, progressively aligning all relevant public and private activities, and fiscal and financial flows with the goals and targets of this framework."

EU Adaptation Strategy: The advice for evidence-based management and evidence for NBS aligns with the EU Adaptation Strategy, specifically under its emphasis on enhancing knowledge and evidence-based approaches for effective climate adaptation. The strategy promotes the integration of scientific research, data collection, and monitoring to inform policy decisions, ensuring that adaptation measures are robust and resilient. This knowledge-driven approach is essential for implementing NBS effectively within broader climate adaptation efforts.

General references for this advice

Bergström et al., 2020; Climate ADAPT, 2019.

Learn more

Nature-Based Solutions Implementation Handbook: A Summary for Practitioners by the UnaLab projects provides tips on monitoring and impact assessments of NBS: https://unalab.eu/system/files/2024-01/nbs-implementation-handbook-summary-practitioners2024-01-04.pdf

Convention on biological diversity's operational guidance for application of the ecosystem approach: https://www.cbd.int/ecosystem/operational.shtml

Knowledge4Policy (K4P) is the EU Commission's platform for evidence-based policymaking. It includes knowledge on topics such as biodiversity and disaster risk management: https://knowledge4policy.ec.europa.eu/home_en

Policy integration and cross-sectoral approaches for nature-based solutions

As multifunctional solutions to the climate and nature crises, NBS need to be mainstreamed across all sectors and policies.

Advice

To combat climate and biodiversity challenges, we need to steer away from "business as usual", including traditional, grey solutions and make NBS a political priority. As nature protection and climate change adaptation should be key priorities across all governance sectors and levels, so should multifunctional and effective solutions.

Analysing policy coherence when working with policy development for NBS can reveal gaps and barriers to NBS implementation. NBS can be integrated into existing policies, and there is a need to align strategies for NBS with broader environmental and social policies.

Introducing NBS as a term in key policies on all governance levels can contribute to a focus on multi-functionality of measures that are useful to several sectors simultaneously, hence creating synergies.

Coordination between ministries and involvement of different stakeholders and sectors are needed in the policymaking process to develop policies that institutionalise NBS across sectors and ensure policy coherence.

Context

The climate and biodiversity crises are interlinked and should be addressed across all sectors, governance levels and policy areas, recognising that all human societies and economies rely on intact ecosystems and a stable climate. While the NBS term is relatively new, many of the actual solutions, such as protecting riparian zones and restoring wetlands are well-known measures. Introducing the NBS concept can emphasise the focus on multifunctionality and considerations of biodiversity and human wellbeing.

The Nordic synergy report (Engelbrecht Hansen et al., 2023) showed that in 2021, only one of the Nordic countries (Norway) had included the term NBS in national legislation. Similarly, a recent mapping from Network Nature (IEEP et al., 2024) shows that NBS was not explicitly mentioned in most global and EU policies on sustainability and the environment. While many of these policies can still promote the use of NBS, there is a need to set clear targets backed by funding in existing policies.

The Nordic NBS synergy report recommends that clear political prioritisation is needed to mainstream NBS into policy and practice (Engelbrecht Hansen et al., 2023). NBS should be considered as a main option before "grey solutions", however, they sometimes need to work in combination.

NBS often require collaboration between actors representing different disciplines and sectors in all phases from planning and financing to implementation and maintenance. This can pose a challenge, as most sectors have very specific and defined areas of expertise and responsibility. Similarly, different economic sectors are often represented by different ministries and agencies and have specific policies for their sector. To support the successful implementation of NBS, knowledge, values, and needs from different sectors must be taken into account. Cross-coordination between sectoral areas is therefore necessary to design policies that support NBS.

As NBS can solve several challenges at once they may also be the preferred option because of their potential for multifunctionality, and it may increase the likelihood of implementation several different sectors benefit. It is important to address this both through cross-sectoral collaborations and holistic approaches. It can also be useful to highlight how the different sectors can benefit from and support the use of NBS. One such example is the sectoral briefs on nature-positive solutions provided by the MERLIN project.[11]

To make NBS the default option, it is important that their multiple benefits are identified and emphasised. One way of doing this can be to apply the ecosystem services approach, as NBS clearly provides important ecosystems for humans. However, it is important to bear in mind that ecosystem services cannot account for all the benefits nature provides. The framework focuses on what nature can deliver to humans, while it is agreed that nature and all species hold intrinsic value, independent of human utility. Another principle that should be applied when working with NBS is the mitigation hierarchy, which prioritises avoiding impact before restoration and mitigation of damages. The hierarchy approach has been further developed into a more proactive version in the conservation hierarchy (Sinclair et al., n.d.).

In some Nordic countries, regional authorities can play an important role for knowledge sharing as well as coordinating with the municipalities to ensure holistic solutions and approaches in the region. Two examples are Rogaland County Authority and Møre and Romsdal County Authority in Norway, which arrange networks with seminars targeting municipalities within their county. Similar initiatives can be found in other Nordic countries as well.

There are several frameworks and ways to analyse policies looking for potential synergies or conflicting targets. An example of this is the report published by The

11. https://project-merlin.eu/mainstreaming.html

Norwegian Association of Local and Regional Authorities (KS) in 2023 which underlines the need for municipalities to work coherently and in parallel with the four topics: reduction of climate emissions; climate adaptation; protection of biodiversity; and green energy transition (Kommunesektorens interesseorganisasjon, 2023).

Useful considerations

- Integrating the use of NBS across all policy areas can increase the uptake of NBS and thereby promote synergy effects.
- As NBS are multi-functional, they should be integrated across sectors such as health, municipal planning, agriculture and transport, and not only environment and climate. This can increase awareness and make the multiple functionalities of NBS visible.
- Political prioritisation includes setting clear targets for the use of NBS and budgets both by updating existing policies and developing new strategies.
- Ensuring policy coherence is key to ensure the uptake of NBS. Some sector policies may have conflicting goals and targets or hinder the implementation of new solutions. For example, the funding systems for water management and agricultural subsidies can sometimes present such conflicts.
- Financing is important to make policies for NBS actionable. Hence, a strategy or an action plan needs to be followed up by budgeting for the activities it involves, either from the authorities' own budgets and/or by seeking external funding.

International goals and obligations

EU Adaptation Strategy: "More systemic adaptation: Supporting policy development at all levels and all relevant policy fields; including three cross-cutting priorities to integrate adaptation into: Macro-fiscal policy; Nature-based solutions; and Local adaptation actions."

Kunming-Montreal global biodiversity framework, Target 14: "Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors, in particular those with significant impacts on biodiversity,

progressively aligning all relevant public and private activities, fiscal and financial flows with the goals and targets of this framework."

SDG 13 Climate Action, Target 13.2: "Integrate climate change measures into national policies, strategies and planning."

SDG 15 Life on Land, Target 15.9: "By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts."

SDG 17, Partnerships for the Goals, Target 17.E: "Enhance policy coherence for sustainable development."

EU Adaptation Strategy: "More systemic adaptation: Supporting policy development at all levels and all relevant policy fields; including three cross-cutting priorities to integrate adaptation into: Macro-fiscal policy; Nature-based solutions; and Local adaptation actions."

General references for this advice

Davis, Cuevas & Gvein, 2024; IEEP, et al., 2024; Kommunesektorens interesseorganisasjon, 2023.

LEARN MORE

The CrossGov project is developing tools for assessing policy coherence on all governance levels. This can also be applied to assess whether policies work as intended to support NBS. https://crossgov.eu/crossgov-policy-coherence-evaluation-framework/

The OECD's recommendations on policy coherence for sustainable development. https://www.oecd.org/en/topics/policy-coherence-for-sustainable-development.html

Guidelines for Integrating Ecosystem-based Adaptation into National Adaptation Plans: Supplement to the UNFCCC NAP Technical Guidelines by the UN Environment Programme: https://wedocs.unep.org/handle/20.500.11822/36703

Taking nature-based solutions up the policy ladder: from research to policy action. A NetworkNature Knowledge Brief. https://networknature.eu/sites/default/files/uploads/networknature-nbs-knowledgebrief01.pdf

Lessons for mainstreaming. A collection of materials on how strategic intervention in the governance, financial and urban development domains can enable types of innovation to support and mainstream NBS in urban settings by the NATURVATION project: https://naturvation.eu/mainstream/lessons-mainstreaming.html

9.2 List of specific advice on policies for NBS in the online handbook

The table below provides a list of the specific advice developed in the project and presented in the handbook, including the title, introduction text and some of the highlighted examples included for each piece of advice. To read the full text, please visit the online handbook: www.nbspolicy.org/all-advice/

Table 2. Overview of the policy advice developed in the project and presented in the online handbook.

Policy advice overview
Applying assessment frameworks for NBS A robust assessment framework can ensure effective monitoring and evaluation of ecological and socio-economic outcomes, collaboration, transparency, and enables comparison across initiatives. *Some highlighted examples:* #NORWAY – Reopening of rivers and streams in Oslo #NORDIC – Sustainable city (hållbarstad.se)
Carry out cost-benefit analysis considering the Total Economic Value of NBS Analysing the Total Economic Value of NBS highlights their long-term benefits, including ecosystem services and helps policymakers and investors recognize NBS as cost-effective and scalable. *Some highlighted examples:* #DENMARK – Online portal for Climate Adaptation – OS2 Skadesøkonomi #SWEDEN – Cost-benefit analysis for urban blue-green infrastructure (BGI) in Oslo #ÅLAND – i-Tree Sweden: For strategic work with the ecosystem services of trees
Collaborate with research institutions and other knowledge-producing actors Promoting engagement and collaboration with local research institutes and other knowledge-producing actors such as NGOs can lead to better understanding of NBS impacts and wider outreach. *Some highlighted examples:* #FINLAND and #NORWAY – Collaboration with academia and research institutes within H2020 UNaLab project in Tampere (Finland) and Stavanger (Norway)
Collaborations across municipalities with common challenges To overcome challenges with lack of resources, time, or expertise to apply NBS, municipalities with common challenges should utilise existing arenas for collaboration. *Some highlighted examples:* #NORWAY – An intermunicipal plan for biodiversity (Haldenvassdraget) #DENMARK – A water management capacity plan for ten municipalities (Harrestrup å) #FAROE ISLANDS – A regional park for nature protection and economic development (Andi Snæfellsnes)

Consider no net loss or net positive impact strategies
Preserving nature is often the most resource-effective and sustainable action. A no net loss strategy can be an effective way of protecting nature and reconsidering the use of developed areas.

Some highlighted examples:
#NORWAY – No net loss as a principle for municipal planning (Nordre Follo)
#SWEDEN – "Half of Täby green" - detailed development plan for Täby municipality
#FINLAND – Biodiversity and No Net Loss in Espoo

Develop guidelines for stakeholder involvement in NBS projects
Guidelines on how to design and conduct good stakeholder involvement in NBS projects can improve and streamline these processes, and that they become a routine in NBS projects in the long-term.

Some highlighted examples:
#FINLAND – Recommendations for citizen science and public participation in approval of plans

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Earmark funds to support NBS in agriculture
Earmarking funds for NBS within financial support programmes for agriculture is one way to encourage NBS within the productive landscape.

Some highlighted examples:
#DENMARK – Grant programme to support the green transition of the food industry
#NORWAY – Using local and regional agri-environment funds for NBS

Engage schools and youth in NBS activities
Engaging youth in NBS education and activities has much potential and can benefit the youth, as well as educate them in more sustainable practices which they can apply later in their adult life.

Some highlighted examples:
#ICELAND – Introducing school children to the importance of forestry (Yrkja fund)
#DENMARK – Teaching material for Danish schoolchildren (Et grønnere klima)
#FAROE ISLANDS – Engaging students in land restoration (Lendisbati)

Establish a common NBS resource platform
Gathering knowledge and inspiration can be time-consuming. A common online NBS resource platform can support civil servants, planners and decision-makers when scoping, planning, and implementing NBS.

Some highlighted examples:
#DENMARK– A common, public portal on climate adaptation (Klimatilpasning.dk)
#SWEDEN – Sustainable city (Hållbarstad.se)
#ÅLAND – The wetland web (Våtmarkswebben)

Establish interdisciplinary networks within public administrations
Interdisciplinary networks on specific NBS-related topics such as stormwater management or natural hazards can lead to a more cohesive and effective implementation of measures.

Some highlighted examples:
#FINLAND – Climate change adaptation working group in Espoo municipality
#NORWAY – inter-agency group on climate adaptation led by the Norwegian Environment Agency

European funding opportunities for NBS-eligible projects
Several EU funding opportunities can support the implementation and execution of projects focusing on nature, climate and the environment, which have the potential to qualify as NBS.

Some highlighted examples:
#DENMARK – NBS projects in Denmark successfully implemented with EU funding (BLUE REEF Kattegat, RECONECT)
#SWEDEN – EU funding for NBS projects in Sweden (LIFE Coast Adapt)

Facilitate monitoring and documenting the effects of NBS
Systems to assess the multiple short- and long-term benefits of NBS enable improvement and scalability of NBS initiatives.

Some highlighted examples:
#FINLAND – National Biodiversity Strategy and Action Plan (NBSAP)

Facilitate private funding of nature-based solutions
Exploring innovative funding mechanisms and facilitating private funding of NBS through economic incentives can prove successful for mainstreaming and upscaling NBS.

Some highlighted examples:
#DENMARK – Tripartite agreement to transform land use
#UK – Wyre Natural Flood Management Investment Readiness Project

Financial support for integrating NBS in local policies
Allocating a dedicated budget specifically to support local efforts to prioritize NBS can significantly accelerate the adoption of NBS across municipalities.

Some highlighted examples:
#NORWAY – "Nature grants" for municipalities that work to protect biodiversity (Natursats)

Governmental grants to facilitate restoration projects
Grants directed at municipalities, NGOs and businesses can play a crucial role in mainstreaming and scaling up restoration projects, as financing remains a main barrier.

Some highlighted examples:
#SWEDEN – Local Nature Conservation Initiative (LONA)
#NORWAY – Grants for nature restoration

Guidance and strategies for plant selection in NBS
Providing guidance regarding plant selection in restoration and protection oriented NBS can underpin the protection of local biodiversity and limit spreading of harmful, invasive species.

Some highlighted examples:
#DENMARK – Guidance website on native species for Copenhagen
#NORWAY – Nature friendly gardens and guidance on local native species in Oslo
#FINLAND – Finnish open access country-wide biodiversity data

Including traditional knowledge in nature management
Integrating traditional knowledge when working with NBS can foster sustainable land management, deepen ecological insight, and strengthen biodiversity.

Some highlighted examples:
#FINLAND – Näätämö river collaborative management with Skolt Sámi indigenous peoples

Increase capacity building for key public local actors
Implementing NBS in local strategies and projects calls for capacity building for public workers across several sectors and can be especially relevant in smaller municipalities with fewer resources.

Some highlighted examples:
#NORWAY – Enhancing competence and knowledge of planners regarding nature and NBS
#DENMARK – Masterclass in nature-based climate adaptation
#SWEDEN – Building knowledge through an online course

Integrating NBS in local planning policy
Integrating NBS on the strategic level for planning in municipalities, can enable use of NBS locally, both on public and private property.

Some highlighted examples:
#ICELAND – Reykjavík's municipal master plan
#NORWAY – Stavanger's municipal master plan (land-use element) 2023–2040
#FINLAND – NBS for urban planning in provinces and municipalities

Integrating NBS in national land-use planning policy
Integrating NBS in national planning policy enables and encourages municipalities to include NBS in their municipal master plans, zoning plans and other important planning documents.

Some highlighted examples:
#NORWAY – Central government planning guideline requiring NBS to be considered
#SWEDEN – Action plan for robust environmental work in a changing climate

Integrating NBS in strategies for health and recreational areas
Recreational areas can be the first step of introducing NBS in urban and rural contexts

Some highlighted examples:
#SWEDEN – Restoration of a recreation area in Rågsved (Stockholm)
#FINLAND – National Nature Recreation Strategy 2030

Involving citizens through community programmes for NBS
Citizen engagement through community-based programmes, citizen science and NBS activities helps spreading awareness, contribute to social learning and gain confidence in NBS actions.

Some highlighted examples:
#SWEDEN – Plats för vattnet: managing stormwater on private properties
#FINLAND – Community gardening in Tampere

Land exchange – swapping properties to protect or restore important ecosystems
Land swaps are the exchange of one real estate for another. This tool can be used by public authorities to secure land for protecting or restoring important ecosystems.

Some highlighted examples:
#SWEDEN – Nämdöskärgårdens National Park
#DENMARK – Planning for multifunctional land consolidation in Assens

Look for NBL opportunities when planning infrastructure projects
To overcome challenges with lack of funding and space to apply NBS, public authorities can capitalise on large infrastructure projects by making funding or integration of NBS mandatory.

Some highlighted examples:
#SWEDEN – Flood plains to prevent flooding by the road in Vretaholm eklandskap Gränna
#NORWAY – Considering nature in the handbook for road construction

Mapping ecosystems and land-use
Getting a better overview of the land use and state of ecosystems is the first step toward better planning for NBS and nature protection.

Some highlighted examples:
#NORWAY – A regional requirement for land cover accounts (Rogaland)
#SWEDEN – Gothenburg's strategy to map and protect eel grass meadows

Promote and develop decision-making support tools
Enhancing such tools for NBS helps stakeholders effectively evaluate impacts, costs, and benefits. This can strengthen collaboration, improve decision quality, and build greater confidence in NBS.

Some highlighted examples:
#SWEDEN – Regional plans of action
#DENMARK – Interactive modelling tools in the online portal for Climate Adaptation

Promote cross-sectoral collaboration and partnerships with industry and private actors
Overcoming sectoral silos and fostering interdisciplinary efforts between municipalities/regions, industries and private sector are key for NBS policies to succeed.

Some highlighted examples:
#FINLAND – Climate Leadership Coalition
#DENMARK – The Danish Nature Fund

Provide expert guidance and relevant information on NBS
Practical implementation of NBS requires access to guidance and relevant information before and during the process – this can also enhance opportunities for meeting societal challenges.

Some highlighted examples:
#SWEDEN – Guidance on nature-based solutions (from Naturvårdsverket)
#INTERNATIONAL – NBS Management hub (IUCN)

Stormwater fees supporting NBS for stormwater management
Adopting stormwater fees, or water utility fees, can secure funding for nature-based solutions for stormwater management.

Some highlighted examples:
#DENMARK – Funding the hydraulic functions of NBS
#FINLAND – An additional stormwater fee
#SWEDEN – Separating stormwater and wastewater costs

Strengthening nature protection legislation
Protected areas are still under pressure. Focusing on enforcement of restrictions to ensure the effectiveness of nature protection is fundamental.

Some highlighted examples:
#NORWAY – Lobster reserves as a management tool
#SWEDEN – Eelgrass meadows in the Gothenburg archipelago
#DENMARK – Dune Conservation (Klitfredning)

Training programs for contractors
Including NBS in education relevant for becoming a contractor, or promoting in-service training on NBS for these professionals, can promote the appropriate use and quality of NBS in construction projects.

Some highlighted examples:
#NORWAY – In-service education and certification on NBS of actors in restoration projects
#NORDIC – The EXPERT project for machine operators in ecological restoration projects

Utilise planning tools for green and blue-green infrastructure to support NBS
Existing planning tools, such as blue-green factor and guidelines for green structure can be adapted and supplemented to integrate NBS into zoning planning.

Some highlighted examples:
#NORWAY – Blue-green factor or green norms
#SWEDEN – 3-30-300 guidelines for urban forestry
#ICELAND – Blágræn Vatnslausn (blue-green water solutions)

Zoning overhaul: Revising local zoning plans to prioritise nature
Updating or repealing old zoning plans can help municipalities in their strategy to use nature to address societal challenges and make building applications processing more efficient.

Some highlighted examples:
#NORWAY – Systematic revision of municipal plans (Planvask)



10. Key takeaways for NBS policy development in the Nordics

In this chapter we present some general conclusions based on our work with the handbook and a summary of the recommendations.

Key takeaways:

- Policies across the Nordics related to the protection, restoration and sustainable use of nature, as well as recognising nature's value can be used as a starting point for NBS mainstreaming. The policy handbook aims to illustrate both how existing policies can be adjusted or strengthened to better support NBS, and examples of new approaches.
- Different criteria and standards can be used both to develop new policy instruments and assess current frameworks. For example, the IUCN Global standard for NBS has a set of eight criteria to assess implementation of NBS that can also be applied to policy development. When developing policies for NBS it is important to consider policy coherence to assess whether regulations and incentives from other policy fields work together or contradict and create barriers for each other.
- Scalability is key for NBS, also when it comes to policies. Integrating NBS across all policies and governance levels can seem like an overwhelming task, but small changes and initiatives can create many positive effects.
- Diversifying the policy mix to target and influence different stakeholders' choice of action is important to ensure that NBS are mainstreamed across sectors. NBS should be considered and integrated across different policy domains, but it is also important to showcase how NBS can benefit each sector individually.

- Each piece of advice is quite general, while the examples provided often are more detailed and specific to the context they belong to or the societal challenges they address. While all advice and examples may inspire actors across the Nordics to do something similar, they can often also be adapted to other societal challenges. In any case, NBS and policies supporting them should always be designed with the local context in mind.

Summary of recommendations from the policy handbook:

Raise awareness and build knowledge of what NBS are, how they function and their benefits. Ecological as well as a lack of practical skills for NBS implementation have been identified as barriers. Raising awareness and building knowledge about NBS can be done in many ways, from children's education and information campaigns to capacity building among practitioners. Among the Nordic examples highlighted in the handbook, we find training and certification programs for contractors and machine operators, online resource platforms, capacity building programs for public actors, specific guidance materials for implementation, and ways to involve youth in NBS initiatives.

Work to secure long-term funding. Insufficient funding has been mentioned by informants as a barrier for implementing NBS. Funding is often perceived as short-termed, insufficient to cover the costs or reliant on municipal budgets which can be scarce in many municipalities. In some cases, existing funding schemes are skewed towards traditional and grey solutions and may be revised to also support NBS. Our advice addresses these barriers by highlighting examples from the Nordics on how to facilitate private funding, earmark governmental funds, and utilise EU funding and stormwater fees to support NBS implementation and maintenance.

NBS need to be integrated across policies. Many of the barriers mentioned by informants relate to the fact that NBS are a fairly new concept in policy and planning, which needs to be integrated into existing systems to mainstream NBS as the preferred option to address societal challenges. Our advice addresses this by suggesting how NBS can be integrated in land-use planning on a national and local level, collaborate across municipal borders on common challenges, capitalise on infrastructure projects and consider a range of policy tools and principles (e.g., mitigation hierarchy, no net loss and zoning overhauls) to ensure more NBS through land-use planning. This is exemplified with real-life cases from the Nordic countries demonstrating its use.

Evidence-based and adaptive management are key principles when working with nature and ecosystems. A barrier to choosing NBS is that it can take more time to fully unfold their effects, as compared to "grey" solutions. Therefore, policies need to support monitoring and documentation of effects and experiences with NBS to learn for future projects. Some Nordic examples are assessment frameworks for

NBS, mapping of ecosystems and land use, promoting decision-making support tools, cost-benefit analyses and inclusion of traditional knowledge.

Involving stakeholders and collaborations between different actors and sectors is central for NBS implementation to succeed. Stakeholder engagement can ensure local adaptation, acceptance and a sense of ownership. Policies can support this for example through guidelines for stakeholder involvement, NBS programmes focusing on citizens, establishing interdisciplinary networks, and promoting cross-sectoral collaborations with private actors. Evidence-based policy development is a robust way of developing policies that consider the existing local policy context, set targets for climate and environmental goals as well as integrate the interdisciplinary perspective.

Summary in English

Nature-based solutions (NBS) are a globally recognised approach to solving major societal challenges such as climate mitigation and building resilience against the impacts of climate change while at the same time reducing environmental degradation and biodiversity loss. NBS can also address other societal challenges like disaster risk and preparedness, water management, economic and social development, food security, human health and social justice. Despite substantial efforts in implementing NBS and documenting their impacts, NBS remain an underutilised concept and more can be done to encourage and enforce their use. In the A-DVICE project we have developed an online handbook featuring advice for mainstreaming the use of NBS through policies by exploring potential opportunities and examples in the Nordic countries (Denmark, Finland, Iceland, Norway, Sweden and the autonomous territories of Faroe Islands, Greenland and Åland). The project is part of the Nordic Council of Ministers programme on NBS.

The handbook and advice build on findings from previous projects in the Nordic NBS programme as well as other studies and examples of relevant policies in the Nordics and the project partners' knowledge and experience. In addition, insights on barriers and opportunities for developing NBS policies were collected via interviews and in a workshop with experts, including practitioners, researchers, NGOs and public administrations. These consultations together with experiences from previous projects show that the most common barriers towards NBS mainstreaming are low diversity of funding options, poor cross-sectoral cooperation, varying knowledge about the effects of NBS, lack of strategic vision, and administrative practices that are not adapted to the use of NBS. On the other hand, there are already many positive initiatives and opportunities in existing policies for NBS. These have been included as examples in the handbook so the Nordic countries can learn from each other.

The online handbook primarily targets decision-makers in public administration, yet the private sector and organisations working with NBS can also benefit from these insights. The advice encompasses a variety of policy instruments including regulatory approaches (such as laws and regulations), market-based and economic instruments (such as funding schemes), administrative practices (such as planning systems, strategies, action plans) as well as voluntary instruments for cooperation, knowledge and awareness-raising on all governance levels. The advice is categorised according to main societal challenge it can contribute to, type of policy instrument and governance level. While general, cross-cutting advice is provided, specific examples highlight how policies supporting NBS can be adapted to local contexts and societal challenges. The advice in the handbook covers key aspects of NBS policy development:

- **Education, capacity building and awareness raising**. Among the specific advice and Nordic examples highlighted in the handbook, we find training and certification programs for contractors and machine operators, online resource platforms, capacity building programs for public actors, specific guidance materials for implementation, and ways to involve youth in NBS initiatives.
- **Financing and economic incentives for NBS.** The handbook advice highlights examples on how to facilitate private funding, earmark governmental funds, utilise EU funding and stormwater fees to support NBS implementation and maintenance.
- **Stakeholder involvement and collaboration for NBS**. The handbook looks at examples of policies supporting guidelines for stakeholder involvement, NBS programmes focusing on citizens, interdisciplinary networks and cross-sectoral collaborations with private actors.
- **Evidence-based and adaptive management.** Some Nordic examples of this included in the handbook are assessment frameworks for NBS, mapping of ecosystems and land use, promoting decision-making support tools, cost-benefit analyses and inclusion of traditional knowledge.
- **NBS policy integration and cross-sectoral approaches.** The specific advice looks closer at how NBS can be integrated in land-use planning on a national and local level, intermunicipal collaborations, NBS in infrastructure projects and policy tools and principles for mainstreaming NBS.

Policies related to protection, restoration, and sustainable use and management of ecosystems can serve as a foundation for mainstreaming NBS in the Nordic countries. The policy handbook includes suggestions for adjusting existing policies as well as introducing new approaches to better support NBS. Using criteria and standards to develop and assess policies is useful to ensure coherence and avoid conflicting regulations. Diversifying policy instruments to influence various stakeholders and integrating NBS across different domains is essential. The Nordic countries have committed to a range of international agreements on climate and biodiversity. Policies that support the use of NBS locally can also be an important contribution toward achieving international goals and obligations.

Dansk resumé

Naturbaserede løsninger (NBL) er en internationalt anerkendt tilgang til at løse store samfundsudfordringer som ødelæggelse af naturen og tab af biologisk mangfoldighed, reducere udledninger af drivhusgasser og håndtere konsekvenserne af klimaforandringerne. NBL kan også bidrage til at løse udfordringer som naturrisici og beredskab, vandforvaltning, økonomisk og social udvikling, fødevaresikkerhed, folkesundhed og social retfærdighed.

På trods af betydelige indsatser for at teste og dokumentere effekterne af NBL, kan der gøres mere for at fremme implementeringen af sådanne løsninger. I A-DVICE-projektet har vi udviklet en online håndbog, der indeholder anbefalinger til, hvordan man kan udvikle politiske værktøjer til NBL ved at undersøge muligheder og eksempler fra de nordiske lande (Danmark, Finland, Island, Norge, Sverige og de selvstyrende områder Færøerne, Grønland og Åland). Projektet er en del af Nordisk Ministerråds program for naturbaserede løsninger.

Håndbogen og anbefalingerne bygger på resultater fra tidligere projekter i det nordiske NBL-program, andre studier og eksempler på relevante politiske tiltag i Norden samt projektpartnernes indsigter og erfaringer. Desuden blev der indsamlet viden om barrierer og muligheder for at udvikle NBL-politikker gennem interviews og en workshop med eksperter – herunder praktikere, forskere, organisationer og myndigheder. Disse konsultationer samt indsigter fra tidligere projekter peger på, at for få finansieringsmuligheder, mangel på tværsektorielt samarbejde, varierende niveau af viden om NBL's effekter, fravær af strategiske visioner og administrativ praksis, der ikke er tilpasset NBL, er blandt de mest almindelige hindringer for implementering. Omvendt findes der allerede mange positive initiativer og muligheder for NBL i eksisterende strategier og værktøjer, som er beskrevet i håndbogen, så de nordiske lande kan lære af hinanden.

Den online håndbog henvender sig primært til beslutningstagere og ansatte i offentlige myndigheder, men den kan også være nyttig for den private sektor og organisationer. Anbefalingerne omfatter en række politiske værktøjer, herunder reguleringsmæssige tiltag (som love og regler), markedsbaserede og økonomiske værktøjer (som finansieringsordninger), administrativ praksis (som planlægningssystemer, strategier og handlingsplaner) samt frivillige tiltag for samarbejde, viden og oplysning på alle styringsniveauer. Anbefalingerne er kategoriseret efter de vigtigste samfundsudfordringer, de kan løse, typen af værktøj og administrativt niveau. Samtidig gives der generelle råd på tværs af områder, mens specifikke eksempler viser, hvordan NBL kan tilpasses lokale forhold og udfordringer.

Rådene i håndbogen dækker væsentlige aspekter af NBL-politikudvikling:

- **Uddannelse, kapacitetsopbygning og oplysning.** De konkrete anbefalinger og eksempler nævnt i håndbogen omhandler blandt andert uddannelses- og certificeringsprogrammer for entreprenører og maskinførere, online ressourcer, kapacitetsopbygningsprogrammer for offentlige aktører, vejledningsmateriale til NBL og måder at inddrage unge i NBL-initiativer.
- **Finansiering og økonomiske incitamenter for NBL.** Håndbogen giver eksempler på privat finansiering, statslige midler, brug af EU-midler og afgifter til overfladevandsstyring for at støtte implementering og vedligeholdelse af NBL.
- **Involvering af interessenter og samarbejde om NBL.** Retningslinjer for interessentinddragelse, NBL-programmer med borgerfokus, tværfaglige netværk og tværsektorielt samarbejde med private aktører er nogle af de nævnte eksempler.
- **Vidensbaseret og adaptiv forvaltning.** Nordiske eksempler i håndbogen omhandler metoder for evaluering af NBL, kortlægning af økosystemer og arealanvendelse, beslutningsværktøjer, cost-benefit-analyser og integration af traditionel viden.
- **Integration af NBL i eksisterende politikker og tværsektorielle tilgange.** Rådene ser nærmere på, hvordan NBL kan indarbejdes i arealplanlægning på nationalt og lokalt niveau, samarbejder mellem kommuner, infrastrukturprojekter og politiske værktøjer og principper for NBL-integration.

Politik for bevarelse, genopretning og bæredygtig anvendelse og forvaltning af økosystemer kan være grundlaget for en større udbredelse af NBL i Norden. Håndbogen indeholder forslag til justering af eksisterende retningslinjer og introduktion af nye tiltag for at fremme NBL. Brug af kriterier og standarder er væsentligt for at udvikle og evaluere politiske værktøjer for at sikre konsistens og undgå modstridende regler. Målrettede tiltag er vigtige for at inkludere forskellige interessegrupper og integrere NBL på tværs af sektorer. De nordiske lande har forpligtet sig til en række internationale klima- og biodiversitetsaftaler. Politik, der understøtter NBL lokalt, kan derfor også bidrage til at opfylde internationale mål og forpligtelser.

Yhteenveto suomeksi

Luontopohjaiset ratkaisut ovat maailmanlaajuisesti tunnustettu lähestymistapa suurten yhteiskunnallisten haasteiden, kuten ilmastonmuutoksen hillinnän ja resilienssin lisäämisen, ratkaisemiseksi ilmastonmuutoksen vaikutuksia vastaan samalla vähentäen ympäristön tilan heikkenemistä ja biodiversiteetin vähenemistä. Luontopohjaiset ratkaisut voivat myös vastata muihin yhteiskunnallisiin haasteisiin, kuten katastrofiriskeihin ja niihin valmistautumiseen, vesienhallintaan, taloudelliseen ja sosiaaliseen kehitykseen, ruokaturvaan, ihmisten terveyteen ja sosiaaliseen oikeudenmukaisuuteen. Huolimatta merkittävistä ponnisteluista luontopohjaisten ratkaisujen toteuttamisessa ja niiden vaikutusten dokumentoinnissa, menetelmä on edelleen alihyödynnetty, ja niiden käyttöä voidaan edistää eri tavoin. A-DVICE-projektissa kirjoitettiin verkkokäsikirjan, joka sisältää neuvoja niiden käytön valtavirtaistamiseksi ohjauskeinojen kautta tutkimalla mahdollisuuksia ja esimerkkejä Pohjoismaissa (Tanska, Suomi, Islanti, Norja, Ruotsi ja autonomiset alueet Färsaaret, Grönlanti ja Ahvenanmaa). Projekti on osa Pohjoismaiden ministerineuvoston luontopohjaisten ratkaisujen ohjelmaa.

Käsikirja ja neuvot perustuvat aiempien Pohjoismaiden luontopohjaisten ratkaisujen ohjelman projektien sekä muiden tutkimusten ja esimerkkien löydöksiin Pohjoismaissa ja projektikumppaneiden näkemyksiin ja kokemuksiin. Lisäksi näkemyksiä ohjauskeinojen kehittämisen esteistä ja mahdollisuuksista kerättiin haastattelujen ja työpajan kautta asiantuntijoiden, mukaan lukien käytännön toimijat, tutkijat, kansalaisjärjestöt ja julkisen hallinnon edustajat, kanssa. Nämä konsultoinnit yhdessä aiempien projektien tulosten kanssa osoittavat, että yleisimmät esteet luontopohjaisten ratkaisujen valtavirtaistamiselle ovat rahoitusvaihtoehtojen vähäinen määrä, heikko poikkisektorinen yhteistyö, vaihteleva tieto niiden vaikutuksista, strategisen vision puute ja hallinnolliset käytännöt, jotka eivät ole mukautettuja varsinaisiin sovelluksiin. Toisaalta olemassa olevissa ohjauskeinoissa on jo monia positiivisia aloitteita ja mahdollisuuksia luontopohjaisille ratkaisuille. Nämä on sisällytetty esimerkkeinä käsikirjaan, jotta Pohjoismaat voivat oppia toisiltaan.

Verkkokäsikirja on ensisijaisesti suunnattu julkishallinnon päätöksentekijöille, mutta myös yksityinen sektori ja aiheen parissa työskentelevät organisaatiot voivat hyötyä näistä näkemyksistä. Neuvot kattavat erilaisia ohjauskeinoja, mukaan lukien sääntelyyn liittyvät lähestymistavat (kuten lait ja asetukset), markkinapohjaiset ja taloudelliset instrumentit (kuten rahoitusohjelmat), hallinnolliset käytännöt (kuten suunnittelujärjestelmät, strategiat, toimintasuunnitelmat) sekä vapaaehtoiset yhteistyön, tiedon ja tietoisuuden lisäämisen instrumentit kaikilla hallinnon tasoilla. Neuvot on luokiteltu sen mukaan, mihin yhteiskunnalliseen haasteeseen ne voivat vaikuttaa, ohjauskeinon tyyppiin ja hallinnon tasoon. Vaikka yleisiä, poikkileikkaavia

neuvoja annetaan, erityiset esimerkit korostavat, kuinka luontopohjaisia ratkaisuja voidaan mukauttaa paikallisiin konteksteihin ja yhteiskunnallisiin haasteisiin. Käsikirjan neuvot kattavat keskeiset ohjauskeinojen kehittämisen näkökohdat:

- **Koulutus, osaamiskapasiteetin rakentaminen ja tietoisuuden lisääminen.** Käsikirjassa korostetaan erityisiä neuvoja ja pohjoismaisia esimerkkejä, kuten urakoitsijoiden ja koneenkäyttäjien koulutus- ja sertifiointiohjelmia, verkkoresurssialustoja, julkisten toimijoiden kapasiteetin rakentamisohjelmia, erityisiä ohjeistuksia toteutukseen ja tapoja nuorten osallistamiseksi aloitteisiin, jotka koskevat luontopohjaisia ratkaisuja.
- **Rahoitus ja taloudelliset kannustimet.** Käsikirjan neuvot korostavat esimerkkejä siitä, kuinka helpottaa yksityistä rahoitusta, korvamerkitä valtion varoja, hyödyntää EU-rahoitusta ja hulevesimaksuja toteuttamisen ja ylläpidon tukemiseksi.
- **Sidosryhmien osallistaminen ja yhteistyö luontopohjaisten ratkaisujen parissa.** Käsikirja tarkastelee esimerkkejä ohjauskeinoista, jotka tukevat sidosryhmien osallistumista koskevia ohjeita, kansalaisiin keskittyviä ohjelmia, monitieteisiä verkostoja ja poikkisektorista yhteistyötä yksityisten toimijoiden kanssa.
- **Näyttöön perustuva ja mukautuva hallinta.** Joitakin pohjoismaisia esimerkkejä tässä käsikirjassa ovat aiheeseen liittyvät arviointikehykset, ekosysteemien ja maankäytön kartoitus, päätöksenteon tukityökalujen edistäminen, kustannus-hyötyanalyysit ja perinteisen tiedon sisällyttäminen.
- **Ohjauskeinojen integrointi ja poikkisektoriset lähestymistavat.** Käsikirjassa tarkastellaan tarkemmin, kuinka luontopohjaiset ratkaisut voidaan integroida maankäytön suunnitteluun kansallisella ja paikallisella tasolla, kuntien väliseen yhteistyöhön, sisällyttämiseen infrastruktuurihankkeisiin sekä ohjauskeinotyökaluihin ja periaatteisiin menetelmien valtavirtaistamiseksi.

Ekosysteemien suojeluun, ennallistamiseen ja kestävään käyttöön ja hallintaan liittyvät ohjauskeinot voivat toimia perustana luontopohjaisten ratkaisujen valtavirtaistamiselle Pohjoismaissa. Käsikirja sisältää ehdotuksia olemassa olevien ohjauskeinojen mukauttamiseksi sekä uusien lähestymistapojen käyttöönotoksi niiden paremman tukemisen varmistamiseksi. Ohjauskeinojen kehittämiseen ja arviointiin käytettävät kriteerit ja standardit ovat hyödyllisiä johdonmukaisuuden varmistamiseksi ja ristiriitaisten säädösten välttämiseksi. Ohjauskeinojen monipuolistaminen eri sidosryhmiin vaikuttamiseksi ja menetelmien integrointi eri aloille on olennaista. Pohjoismaat ovat sitoutuneet useisiin kansainvälisiin ilmasto- ja biodiversiteettisopimuksiin. Paikallisesti luontopohjaisten ratkaisujen käyttöä tukevat ohjauskeinot voivat olla myös tärkeä panos kansainvälisten tavoitteiden ja velvoitteiden saavuttamisessa.

Samantekt á íslensku

Náttúrumiðaðar lausnir er alþjóðlega viðurkennd nálgun til að leysa stórar samfélagslegar áskoranir, til að mynda að draga úr áhrifum loftslagsbreytinga og byggja upp seiglu gegn áhrifum þeirra. Að auki draga þær úr hnignun umhverfisins og tapi á líffræðilegri fjölbreytni. Einnig er hægt að nýta náttúrumiðaðar lausnir til að takast á við aðrar samfélagslegar áskoranir, líkt og áhættu og viðbúnað vegna náttúruhamfara, stjórnun vatnamála, efnahagslega og félagslega þróun, fæðuöryggi, heilsu og velferð sem og félagslegt réttlæti.

Náttúrumiðaðar lausnir eru enn vannýttar þrátt fyrir ítrekaðar tilraunir til að nýta þær í auknum mæli og sýna fram á jákvæð áhrif þeirra. Því er til mikils að vinna við að hvetja til og efla notkun þeirra. Í A-DVICE verkefninu höfum við þróað handbók sem er aðgengileg á netinu með ráðleggingum til að styðja við samþættingu náttúrumiðaðra lausna í gegnum stefnumótun. Þetta er gert með því að skoða möguleg tækifæri og dæmi frá Norðurlöndunum (Danmörku, Finnlandi, Íslandi, Noregi, Svíþjóð og sjálfstjórnarsvæðunum Færeyjum, Grænlandi og Álandseyjum). Verkefnið er hluti af áætlun Norrænu ráðherranefndarinnar um náttúrumiðaðar lausnir.

Handbókin og ráðleggingarnar byggja á niðurstöðum fyrri verkefna í áætlun Norrænu ráðherranefndarinnar um náttúrumiðaðar lausnir, auk annarra rannsókna og viðeigandi fordæma um stefnumótun á Norðurlöndunum. Einnig byggja þær á innsýn og reynslu samstarfsaðila verkefnisins. Með viðtölum og vinnustofu með sérfræðingum, þar með töldum fagaðilum, rannsakendum, og fulltrúum félagasamtaka og stjórnsýslu, fékkst auk þess innsýn í hindranir og tækifæri við mótun stefnu fyrir náttúrumiðaðar lausnir

Þetta samráð, ásamt innsýn úr fyrri verkefnum, sýna að algengustu hindranirnar fyrir samþættingu náttúrumiðaðra lausna eru fáir fjármögnunarvalkostir, ófullnægjandi samstarf þvert á atvinnugreinar, mismikil þekking á áhrifum náttúrumiðaðra lausna, skortur á stefnumarkandi framtíðarsýn og stjórnsýsluhættir sem falla illa að notkun náttúrumiðaðra lausna, svo dæmi séu tekin. Á hinn bóginn er töluverður uppgangur í nýtingu náttúrumiðaðra lausna og bjóða núverandi stefnur upp á mikil tækifæri. Í handbókinni eru tekin saman dæmi um þetta með það að markmiði að Norðurlöndin læri hvert af öðru.

Handbókin er fyrst og fremst ætluð aðilum sem koma að ákvarðanatöku í opinberri stjórnsýslu en einkageirinn, stofnanir og samtök sem vinna með náttúrumiðaðar lausnir geta einnig notið góðs af handbókinni. Ráðleggingarnar ná til margvíslegra stjórntækja, þar á meðal stjórnsýslunálgunar (líkt og lög og reglugerðir), markaðs- og efnahagslegra stjórntækja (svo sem fjármögnunaráætlanir) og stjórnsýsluhætti (eins og skipulagskerfi, stefnumótun og aðgerðaáætlanir). Einnig ná

ráðleggingarnar til stjórntækja sem hvetja til sjálfsprottins samstarfs, þekkingarmiðlunar og vitundarvakningar á öllum stjórnsýslustigum.

Ráðleggingarnar eru flokkaðar eftir þeim samfélagsáskorunum sem þær geta stuðlað að lausnum á, gerð stjórntækja, auk þeirra stjórnsýslustiga sem þær eiga við. Þó ráðleggingarnar séu á almennum nótum og nái þvert yfir sviðið, þá eru í handbókinni sett fram sértæk dæmi um hvernig hægt er að aðlaga stefnur sem styðja við náttúrumiðaðar lausnir að staðbundnum aðstæðum og samfélagsáskorunum. Ráðleggingarnar í handbókinni fjalla um lykilþætti í mótun stefnu fyrir náttúrumiðaðar lausnir:

- **Menntun, uppbygging þekkingar og vitundarvakning.** Meðal sérstakra ráðlegginga og dæma frá Norðurlöndum sem handbókin dregur fram eru þjálfunar- og vottunaráætlanir fyrir verktaka og stjórnendur véla, vettvangur með fræðsluefni sem aðgengilegur er á netinu og námskeið fyrir opinbera aðila til að auka þekkingu og færni. Einnig eru í handbókinni sérhæfðar leiðbeiningar fyrir innleiðingu náttúrumiðaðra lausna, sem og leiðir til að virkja ungt fólk til að sýna frumkvæði í náttúrumiðuðum lausnum.
- **Fjármögnun og efnahagslegir hvatar fyrir náttúrumiðaðar lausnir.** Í handbókinni koma fram ráðleggingar og dæmi um hvernig má auðvelda einkafjármögnun, eyrnamerkja ríkisfé, nýta ESB-styrki og gjöld vegna ofanvatns til að styðja við innleiðingu og viðhald náttúrumiðaðra lausna.
- **Þátttaka hagaðila og samstarf fyrir náttúrumiðaðar lausnir.** Í handbókinni eru dæmi um stefnur sem styðja við þátttöku hagaðila, áætlanir fyrir náttúrumiðaðar lausnir sem beinast að borgurum, þverfræðileg tengslanet og samstarf við einkaaðila þvert á atvinnugreinar.
- **Gagnreynd og aðlögunarhæf stjórnun.** Meðal norrænna dæma í handbókinni eru matsrammar fyrir náttúrumiðaðar lausnir, kortlagning vistkerfa og landnýtingar, efling stuðningstækja fyrir ákvarðanatöku, kostnaðar- og ábatagreiningar og innleiðing arf- og staðbundinnar þekkingar.
- **Samþætting náttúrumiðaðra lausna í stefnumótun og þverfagleg nálgun.** Sértækar ráðleggingar fjalla um hvernig samþætta má náttúrumiðaðar lausnir í deiliskipulagsgerð á báðum stjórnsýslustigum, samstarf sveitarfélaga, náttúrumiðaðar lausnir í innviðaverkefnum, sem og hvernig má nýta stjórntæki til að samþætta náttúrumiðaðar lausnir með stefnumótun.

Stefnur sem tengjast verndun, endurheimt og sjálfbærri nýtingu og stjórnun vistkerfa geta verið grunnur að samþættingu náttúrumiðaðra lausna á Norðurlöndum. Í þessari stefnuhandbók eru kynntar tillögur um hvernig má aðlaga núverandi stefnur og nýta nýjar nálganir til að styðja betur við náttúrumiðaðar lausnir. Til að tryggja samræmi og forðast misvísandi reglugerðir er gagnlegt að nota viðmið og staðla til að þróa og meta stefnur. Mikilvægt er að auka fjölbreytni í stjórntækjum til að hafa áhrif á ólíka hagaðila og samþætta náttúrumiðaðar lausnir á mismunandi sviðum. Norðurlöndin hafa skuldbundið sig til ýmissa

alþjóðlegra samninga um loftslag og líffræðilega fjölbreytni. Stefnur sem styðja við notkun náttúrumiðaðra lausna heima fyrir geta einnig þjónað mikilvægum tilgangi við að uppfylla alþjóðleg markmið og skuldbindingar.

Norsk sammendrag

Naturbaserte løsninger (NBL) er en internasjonalt anerkjent tilnærming til å løse store samfunnsutfordringer som å redusere klimautslipp og gjøre samfunnet mer robust mot konsekvensene av klimaendringene samtidig som de reduserer naturødeleggelser og tap av biologisk mangfold. NBL kan også bidra til å løse utfordringer som naturrisiko og beredskap, vannforvaltning, økonomisk og sosial utvikling, matsikkerhet, folkehelse og sosial rettferdighet. Til tross for en betydelig innsats i å iverksette NBL og dokumentere effektene av disse løsningene, kan det gjøres mer for å bidra til at slike løsninger blir tatt i bruk. I A-DVICE-prosjektet har vi utviklet en nettbasert håndbok som inneholder råd om hvordan man kan utvikle virkemidler for NBL ved å utforske muligheter og eksempler i de nordiske landene (Danmark, Finland, Island, Norge, Sverige og de selvstyrte områdene Færøyene, Grønland og Åland). Prosjektet er en del av Nordisk ministerråds program for naturbaserte løsninger.

Håndboken og rådene bygger på funn fra tidligere prosjekter i det nordiske NBL-programmet, andre studier og eksempler på relevante politiske virkemidler i Norden, samt prosjektpartnernes innsikt og erfaringer. I tillegg ble det samlet inn innsikt om hindringer og muligheter for å utvikle virkemidler for NBL via intervjuer og en workshop med eksperter - inkludert praktikere, forskere, organisasjoner og offentlig forvaltning. Disse konsultasjonene og innsikt fra tidligere prosjekter viser at de vanligste hindringene for å ta i bruk disse løsningene er få tilgjengelige alternativer innen finansiering, manglende samarbeid på tvers av sektorer, varierende kunnskap om effektene av NBL, mangel på strategiske visjoner og administrativ praksis som ikke er tilpasset NBL. På den andre siden finnes det allerede mange positive initiativer og muligheter for NBL i eksisterende virkemidler. Flere av disse eksemplene er beskrevet i håndboken, slik at de nordiske landene kan lære av hverandre.

Den nettbaserte håndboken retter seg først og fremst mot beslutningstakere og ansatte i offentlig forvaltning, men privat sektor og organisasjoner kan også ha nytte av den. Rådene omfatter en rekke politiske virkemidler, inkludert regulatoriske tilnærminger (som lover og forskrifter), markedsbaserte og økonomiske virkemidler (som finansieringsordninger), administrativ praksis (som planleggingssystemer, strategier, handlingsplaner), samt frivillige virkemidler for samarbeid, kunnskap og bevisstgjøring på alle styringsnivåer. Rådene er kategorisert etter de viktigste samfunnsutfordringene de kan bidra til å løse, type virkemiddel og styringsnivå. Samtidig som det gis generelle, tverrgående råd, viser spesifikke eksempler hvordan ulike virkemidler for NBL kan tilpasses lokale kontekster og andre samfunnsutfordringer. Rådene i håndboken dekker sentrale aspekter ved utvikling av politikk for NBL:

- **Utdanning, kapasitetsbygging og bevisstgjøring**. Blant de konkrete rådene og nordiske eksemplene som trekkes fram i håndboken, finner vi opplærings- og sertifiseringsprogrammer for entreprenører og maskinførere, ressursplattformer på nett, kapasitetsbyggingsprogrammer for offentlige aktører, veiledningsmateriell for NBL og måter å involvere ungdom i NBL-initiativer på.
- **Finansiering og økonomiske insentiver for NBL.** Håndboken gir eksempler på hvordan man kan legge til rette for privat finansiering, øremerke statlige midler, bruke EU-midler og overvannsgebyrer for å støtte iverksetting og vedlikehold av NBL.
- **Involvering av interessenter og samarbeid for NBL**. Håndboken tar for seg eksempler på retningslinjer for involvering av interessenter, NBL-programmer med fokus på innbyggerne, tverrfaglige nettverk og tverrsektorielt samarbeid med private aktører.
- **Kunnskapsbasert og adaptiv forvaltning.** Noen nordiske eksempler på dette i håndboken er rammeverk for evaluering av NBL, kartlegging av økosystemer og arealbruk, beslutningsverktøy, kostnads- og nytteanalyser og inkludering av tradisjonell kunnskap.
- **Integrering av NBL i eksisterende politikk og tverrsektorielle tilnærminger.** De konkrete rådene ser nærmere på hvordan NBL kan integreres i arealplanlegging på nasjonalt og lokalt nivå, interkommunale samarbeid, NBL i infrastrukturprosjekter, og politiske verktøy og prinsipper for integrering av NBL.

Politiske virkemidler for bevaring, restaurering og bærekraftig bruk og forvaltning av økosystemer kan fungere som et utgangspunkt for økt bruk av NBL i de nordiske landene. Håndboken inneholder forslag til hvordan man kan justere eksisterende retningslinjer og innføre nye tilnærminger for å støtte bruk av NBL. Det er nyttig å bruke kriterier og standarder for å utvikle og vurdere virkemidlene for å sikre sammenheng og unngå motstridende reguleringer. Det er viktig med varierte virkemidler for å påvirke ulike interessegrupper og innpasse NBL på tvers av ulike områder. De nordiske landene har forpliktet seg til en rekke internasjonale avtaler om klima og naturmangfold. Politikk som støtter bruken av NBL lokalt, kan også være et viktig bidrag til å nå internasjonale mål og forpliktelser.

Sammanfattning på svenska

Naturbaserade lösningar (NBL) är en globalt erkänd metod för att lösa stora samhällsutmaningar som klimatåtgärder och att bygga motståndskraft mot klimatförändringarnas effekter, samtidigt som de minskar miljöförstöring och förlust av biologisk mångfald. NBS kan också hantera andra samhällsutmaningar som katastrofrisk och beredskap, vattenförvaltning, ekonomisk och social utveckling, livsmedelssäkerhet, hälsa och social rättvisa. Trots betydande insatser för att implementera NBS och dokumentera dess effekter, förblir NBL ett outnyttjat koncept och mer kan göras för att uppmuntra och främja dess användning. I A-DVICE-projektet har vi utvecklat en online-handbok med råd för att integrera användningen av NBL genom policy med att utforska potentiella möjligheter och exempel i de nordiska länderna (Danmark, Finland, Island, Norge, Sverige och de autonoma territorierna Färöarna, Grönland och Åland). Projektet är en del av Nordiska ministerrådets program för NBL.

Handboken och råden bygger på resultat från tidigare projekt inom det nordiska NBL-programmet samt andra studier och exempel på relevanta policyer i Norden och projektpartnernas kunskap och erfarenhet. Dessutom insamlades kunskap om hinder och möjligheter för att utveckla NBL-policy in via intervjuer och i en workshop med experter, där bland annat utförare, forskare, NGO:er och myndigheter deltog. Dessa diskussioner tillsammans med erfarenheter från tidigare projekt visar att de vanligaste hindren för att integrera NBL är bristen av finansieringsalternativ, dålig tvärsektoriell samverkan, varierande kunskap om effekterna av NBL, brist på strategisk vision och administrativa metoder som inte är anpassade för användning av NBL. Å andra sidan finns det redan många positiva initiativ och möjligheter i befintliga policyer för NBL. Dessa har inkluderats som exempel i handboken så att de nordiska länderna kan lära av varandra.

Online-handboken riktar sig främst till beslutsfattare inom offentlig förvaltning, men även den privata sektorn och organisationer som arbetar med NBL kan dra nytta av dessa exempel på effektiva NBL lösningar. Råden omfattar en mängd olika policyinstrument inklusive reglerande tillvägagångssätt (såsom lagar och förordningar), marknadsbaserade och ekonomiska instrument (såsom finansieringsprogram), administrativa metoder (såsom planeringssystem, strategier, handlingsplaner) samt frivilliga instrument för samarbete, kunskap och medvetandegörande på alla samhällsnivåer. Råden kategoriseras enligt samhällsutmaningarna de kan bidra till, typ av policyinstrument och samhällsnivå . Även om allmänna, tvärgående råd presenteras, belyser specifika exempel hur policyer som stöder NBL kan anpassas till lokala sammanhang och samhälleliga utmaningar.

Råden i handboken täcker viktiga aspekter av utvecklingen av NBL-policyer:

- **Utbildning, kapacitetsuppbyggnad och medvetandegörande.** Bland de specifika råden och nordiska exempel som lyfts fram i handboken finns utbildnings- och certifieringsprogram för entreprenörer och maskinoperatörer, online-resursplattformar, kapacitetsbyggande program för offentliga aktörer, specifika vägledningsmaterial för genomförande och sätt att involvera ungdomar i NBL-initiativ.
- **Finansiering och ekonomiska incitament för NBL.** Handbokens ger råd och exempel på hur man kan underlätta privat finansiering, öronmärka statliga medel och utnyttja EU-finansiering för att stödja genomförandet NBL.
- **Intressenters engagemang och samarbete för NBL.** Handboken granskar exempel på policyer som stöder riktlinjer för intressentengagemang, NBL-program som fokuserar på medborgare, tvärvetenskapliga nätverk och sektorsövergripande samarbeten med privata aktörer.
- **Evidensbaserad och adaptiv förvaltning.** Några nordiska exempel på detta som ingår i handboken är bedömningsramar för NBL, kartläggning av ekosystem och markanvändning, främjande av beslutsstödsverktyg, kostnads-nyttoanalyser och inkludering av traditionell kunskap.
- **Integrering av NBL-policy och tvärsektoriella tillvägagångssätt.** Råden undersöker närmare hur NBL kan integreras i detaljplanering på nationell och lokal nivå, interkommunala samarbeten, NBL i infrastrukturprojekt samt policyverktyg och principer för att integrera NBL i samtliga verksamhetsområden.

Policyer relaterade till skydd, återställande och hållbar användning och förvaltning av ekosystem kan fungera som en grund för att integrera NBL i de nordiska länderna. Policyhandboken innehåller förslag på justeringar av befintliga policyer samt införande av nya tillvägagångssätt för att bättre stödja NBL. Att använda kriterier och standarder för att utveckla och bedöma policyer är användbart för att säkerställa sammanhang och undvika målkonflikter. Att diversifiera policyinstrument för att påverka olika intressenter och integrera NBL över olika områden är avgörande. De nordiska länderna har åtagit sig en rad internationella avtal om klimatförändringar och biologisk mångfald. Policy som stödjer användningen av NBL på lokal nivå bedöms kunna vara ett viktigt bidrag till att uppnå internationella mål och förpliktelser.

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Appendix

Methodology used to develop the NBS policy handbook

About the A-DVICE project

A-DVICE (Advice for Policy Development to Implement, Mainstream and Upscale NBS in the Nordics) is the third project commissioned by the Nordic Council of Ministers under their nature-based solutions programme. The project period was from March 2023 to November 2024. The project was led by Norwegian Institute for Water Research (NIVA), co-led by Norion Consult with VTT Technical Research Centre of Finland, Ensucon AB and University of Iceland as project partners.

The main aim of the project is to provide applicable advice and suggestions for policy development to mainstream and upscale NBS, considering aspects like promotion, incentives, planning and implementation, maintenance and monitoring of NBS at national, regional and local level in the Nordic region. This includes dissemination of examples and learning points from across the region, specifying ways of implementing recommendations from the other projects in the programme (S-ITUATION, S-UMMATION, the NordGen Crop Wild Relative project) as well as the report 'Synergies between climate and biodiversity objectives in laws, policies and management practices' (Engelbrecht Hansen et al., 2023).

The project was organised in five work packages (WPs):

- **WP1. Policy overview**. Synthesizing current knowledge on relevant policies and legislations.
- **WP2. Policy gaps, needs and enablers**. Identification and assessment of gaps, needs, enablers and success stories for NBS upscaling by consulting key stakeholders.
- **WP3. Policy advice.** Providing guidance to policy development built on existing policies and legislation, and development of the online handbook.
- **WP4. External communication and dissemination.** Information about the project work and dissemination of project results to stakeholder groups.
- **WP5. Project management.** Coordination of activities to secure alignment with objectives, other projects and communication between project partners and the NCM.

Figure 1 provides an overview of the organisation of the work packages, key deliverables and interlinkages.

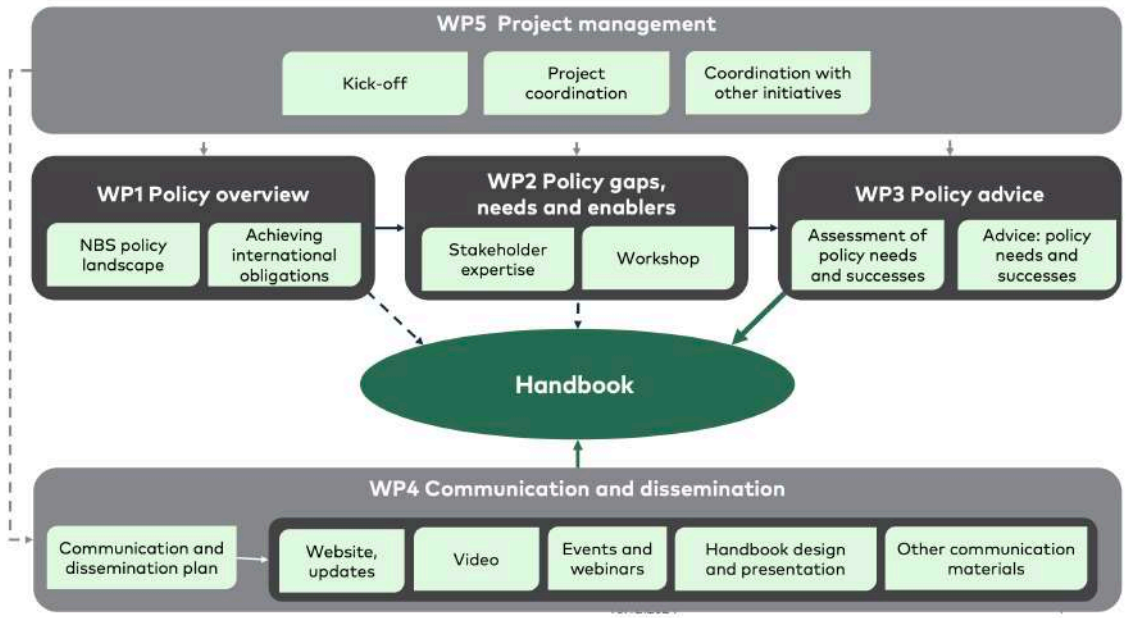


Figure 1. Illustration of the A-DVICE project work packages and organisation.

Accessing and synthesising existing knowledge and findings

The current knowledge about relevant policies and legislations related to NBS in the Nordic countries as well as international targets and obligations was synthesized. This was done by compiling knowledge from the previous projects funded by the NCM (in the NBS programme and the 'synergy report'). The A-DVICE project partners had been involved in these projects and could therefore access and build on previously gathered data and overviews. A spreadsheet was created merging data from the S-ITUATION synthesis grey literature review and overview of Nordic pilot projects as well as an overview of policies from the Synergy report. The overview was complemented with an extract of all the recommendations from the S-ITUATION, S-UMMATION and Synergy reports. The data was also supplemented by other findings and knowledge from partners' previous work and experience. The overview was used to inform the identification of gaps, needs, enablers and success stories related to NBS policy development in the Nordics. For international policies, a separate document was developed that contained an overview of key international obligations and targets categorized by key thematic areas.

Stakeholder/expert consultations and reference group

An overview of relevant experts and stakeholders was developed as a living document with inputs from all the partners. Each partner organization was responsible for contact with actors in their country. For the stakeholder

consultations, an interview guide was developed and translated in addition to a consent form for participants and a template for reporting the findings. In total, 25 interviews were conducted with NBS practitioners, researchers, project managers, representatives of NGOs and public authorities on local, regional and national levels with expertise or responsibilities related to environment, biodiversity, water management, climate mitigation and adaptation, agriculture, forestry and coastal management across the different countries. The interviews were conducted between the fall of 2023 and spring 2024. They concerned the participants' views on current gaps and barriers, needs and enablers related to policy development for NBS in their country, region or area of expertise. In addition, the participants were asked about how they access information about NBS and policies and to provide examples of NBS policies and initiatives. The findings were reported in a template and added into an overview in a separate spreadsheet where the findings were coded according to topic, country and kind of information.

The partners also contacted experts and stakeholders to be part of a project reference group. The group consisted of 18 persons representing public authorities at different governance levels in Denmark, Faroe Islands, Finland, Iceland, Norway, Sweden and a representative from the European Commission. In addition, the project leaders of parallel NCM projects GuideNBS and NordGen were part of the reference group. The group was established in August 2023 and was consulted about the content of the handbook as well as testing the structure and user interface of the online handbook.

An online workshop was held on May 7, 2024, with 39 stakeholders and experts in the Nordic countries participating. In the workshop, the project and handbook were presented, as well as preliminary findings. The participants were invited to discuss the findings and potential advice in groups. The first group discussions were based on country and participants could discuss findings related to their national context. The second group discussion was thematically divided, and participants could discuss suggestions for advice and examples of policies related to different topics that they could choose between when registering for the workshop. The topics were biodiversity, coast, restoration, urban, local governance, climate, and wetlands and streams. The findings were summarized and reported and coded into the same overview as findings from interviews.

Development of the online handbook

The structure for the online handbook and the TemaNord report was developed based on the suggestions in the project proposal. During an internal project workshop in November 2023, the partners together worked on the structure and key elements in the content of the handbook and specific advice. This was further developed into a template for developing specific advice. In December 2024, the project presented a preliminary draft for feedback from the NCM steering

committee of the TemaNord report with examples of advice as well as an illustration of the online handbook. The content of the advice in the handbook and the TemaNord report has been further developed by the project partners based on the findings from the overviews and expert consultations described above, with responsibilities for writing about different topics and countries divided between the respective partner institutions and researchers.

The online website was developed in a separate platform. The first version of the online handbook was shared with the NCM steering committee and the project reference group for beta testing in March 2024. An online survey was also sent out with specific questions about the accessibility and users' experience of the handbook. The online handbook will be updated with all text and advice entries in English, as well as translated material in Norwegian and Finnish by the end of November 2024.

Timeline

Figure 2 provides an overview of the project timeline, including key milestones and events.

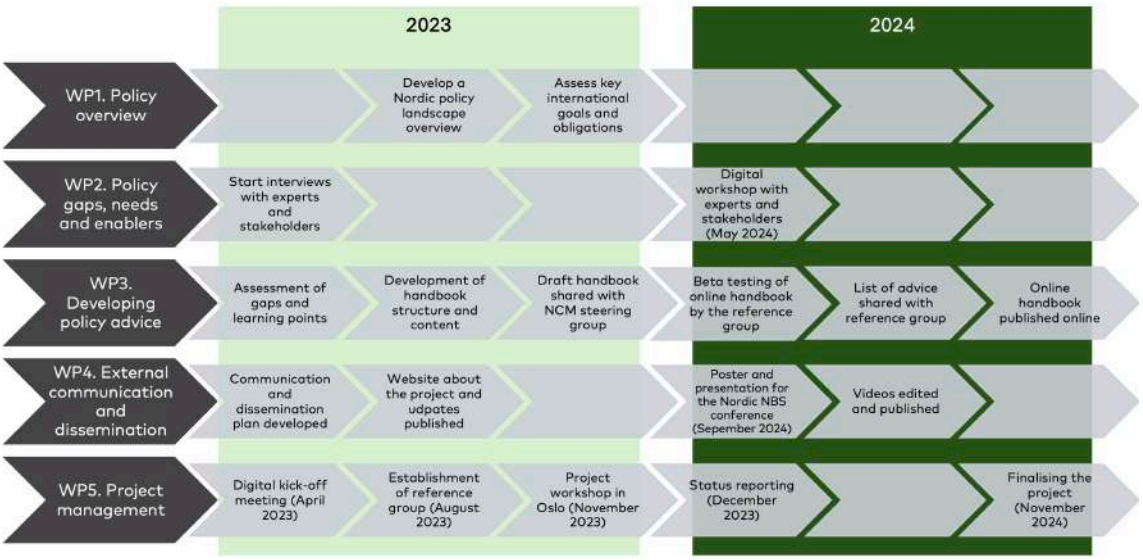


Figure 2. Overviewp of key milestones and events in the A-DVICE project.

Definitions and categories

The definition of nature-based solutions is based on the definition in the United Nations Environmental Assembly resolution (UNEP, 2022), as well as IUCN's global standard for NBS (IUCN, 2020a). When developing the categories for societal

challenges, nature types and NBS actions, the project looked to the IUCN categories as well as previous Nordic publications that the project builds on. The development of categories was aligned with the GuideNBS project so that the handbooks can easier link to each other.

Societal challenges

In the global standard published by IUCN, seven major societal challenges addressed by NBS are highlighted. Of these, climate change mitigation and adaptation, disaster risk reduction, economic and social development, human health, food security and water security were formulated within the IUCN definition of 2016, while "the seventh societal challenge, reversing ecosystem degradation and biodiversity loss, was an outcome of the second public consultation on the Standard" (IUCN, 2020a). In their work with building an evidence and knowledge base on the benefits and challenges of applying NBS, the EKLIPSE project further expanded on the list of challenges to provide a more balanced picture of policy focus areas. For example, the *economic and social development* category encompasses multiple challenge areas. The EKLIPSE report (Raymond et al., 2017) expanded and revised IUCNs list, with in total 10 categories. The EU handbook for evaluating impacts of NBS (European Commission, 2021a) revised EKLIPSE's list, with in total 12 categories. In the handbook we acknowledge this by including social justice and capacity building as an 8th category.

Ecosystems/nature types

The policy handbook does not primarily use ecosystems as a category, as policies often can apply across them. However, there is an additional tag for nature types to filter advice in the online handbook. Here, the nature types included are based on the other Nordic projects and sometimes categories are combined into: forests, mountains, urban, cultural and agriculture landscapes, coastal and marine, rivers, streams and lakes, wetlands and peatlands.

Policy types

Policy instruments are often grouped into legal, economic and voluntary/information types. For this handbook we build on several definitions, including OECD (2023) and EEA (2016) as well as the work done in Engelbrecht Hansen et al. (2023). During the project we have worked with several sub-categories, but in the handbook, we have merged them into four main categories. Table 3 below show the types of policies included in each category.

Table 3. Overview of categorisation of policies in the project policy overview.

Policy approaches	Description
Laws and regulations	Rules issued by governmental agencies
Economic instruments	Any economic measure such as funds, taxation, budgets, payment for ecosystem services, etc.
Administrative practices and strategies	• On-the-ground-management of resources such as funds, natural resources • Action plan, roadmap or the like for implementation of regulations • Measures related to planning processes including changes in municipal plans, types of stakeholder involvement, material used for decision making
Information, Guidance and other voluntary measures /Governance	• Information campaigns, public outreach, nudging, aimed behavioural change • Guidelines issued by national, regional or government aimed at increasing the implementation of NBS • Negotiated agreement between government and a private party • Any measure not included in above categories

About this publication

Teaming up with nature: Policy advice for more nature-based solutions in the Nordics

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