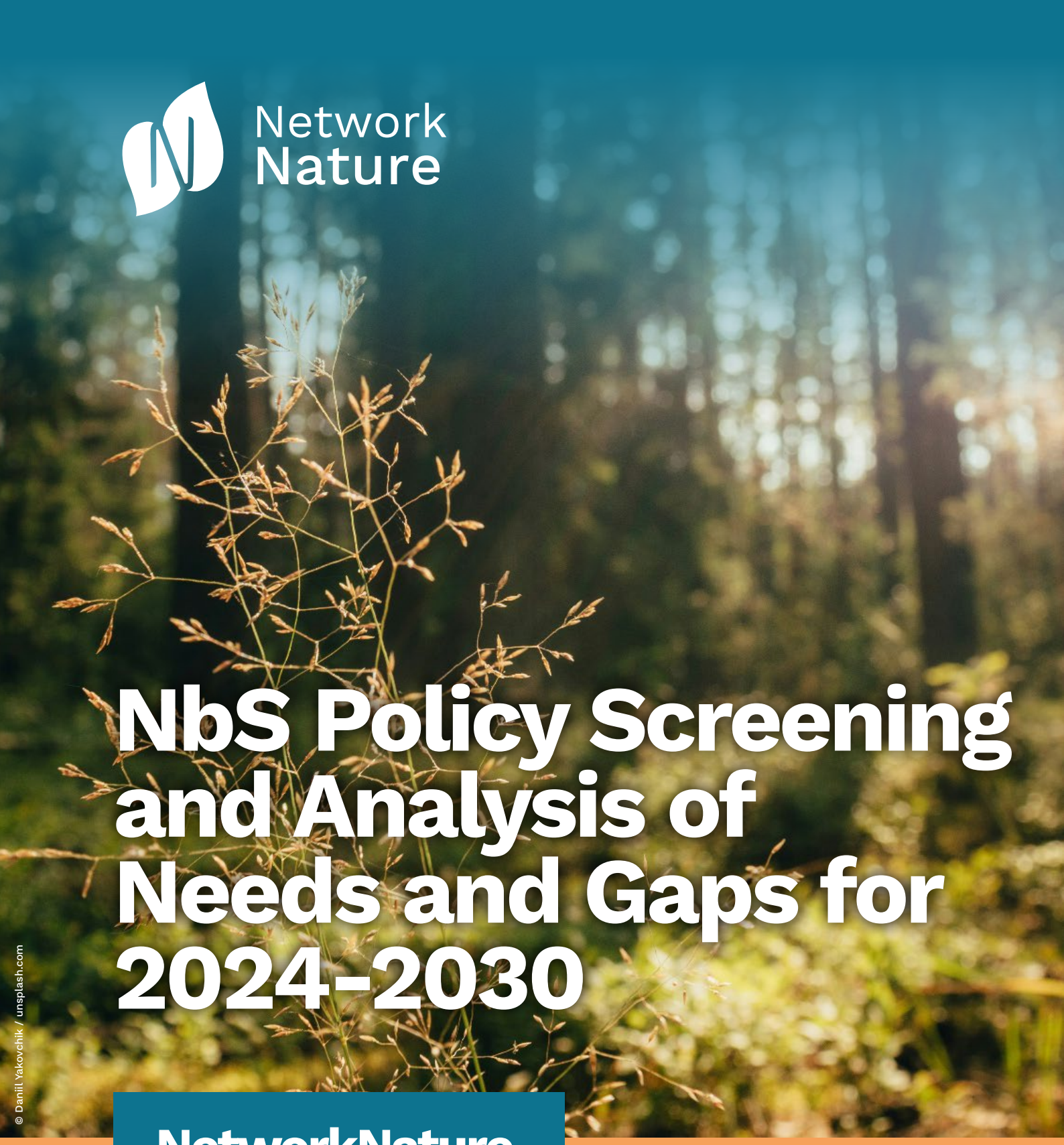

Network Nature

NbS Policy Screening and Analysis of Needs and Gaps for 2024-2030

NetworkNature

Institute for European Environmental Policy

ICLEI Local Governments for Sustainability

IUCN

biodiversa+ European Biodiversity Partnership

UN environment programme WCMC

Network Nature

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List of Abbreviations

CCA	Climate change adaptation
CF	Cohesion Fund
DRR	Disaster risk reduction
DG ENV	Directorate-General Environment (EC)
EC	European Commission
ECA	European Court of Auditors
EEA	European Environment Agency
EGD	European Green Deal
ERDF	European Regional Development Fund
ES	Ecosystem services
EU	European Union
GI	Green infrastructure
ICLEI	Local Governments for Sustainability, (originally International Council for Local Environmental Initiatives)
IEEP	Institute for European Environmental Policy
IUCN	International Union for Conservation of Nature
LBSAP	Local Biodiversity Strategies and Action Plans
LRA	Local and Regional Authorities
LULUCF	Land use, land use change and forestry
MS	Member State
NAPs	National Adaptation Plans
NbS	Nature-based Solutions
NBSAPs	National Biodiversity Strategies and Action Plans
NDCs	Nationally Determined Contributions
SAC	Special Area of Conservation (Natura 2000)
SCI	Site of Community Importance (Natura 2000)
SDG	Sustainable Development Goal under the United Nations 2030 Agenda for Sustainable Development
SME	Small or medium-sized enterprise (i.e. less than 250 staff, € 50 m annual turnover, € 43 m balance sheet)(EC, 2024c)
SPA	Special Protection Area (Natura 2000)
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNEA	United Nations Environment Assembly
UNEP-WCMC	United Nations Environment Programme – World Conservation Monitoring Centre
UNFCC	United Nations Framework Convention on Climate Change
WP	Work Package

Executive Summary

This report aims at providing an overview of the sustainability policy landscape as well as mapping policy needs and gaps in relation to the deployment of Nature-based Solutions (NbS) in the EU. The NetworkNature platform brings together the NbS community of innovators, practitioners and developers in a network of networks, with expertise in the form of the leading EU-funded NbS research projects and the participation of practitioners from cities, local authorites and businesses. NetworkNature aims to produce a policy toolkit for national, regional and local policy-makers and implementers, which will provide guidance and tools on how to promote NbS in policies and strategies, planning, public funding, and initiatives with the private sector. This report is a first step to mapping the needs and gaps that such a policy toolkit needs to address.

Target Audiences

The primary target audiences identified for the NetworkNature policy engagement are sub-national, national and EU policymakers; particularly local and regional public authorities, including public administration and urban planning departments. Whilst the policy screening in this report does not specifically cover sub-national policy, the assessment of gaps and needs addresses all levels from local to EU, and NetworkNature will engage with local and regional authorities to meet their policy needs during the project.

Six Priority Policy Themes

NetworkNature project activities on NbS are guided by 6 priority policy themes in which NbS can and do play an important role. The themes focus on different aspects of the societal and environmental challenges to which NbS are addressed, increasing human well-being whilst avoiding loss of biodiversity and ecosystem services.

Climate Adaptation, Mitigation and Resilience
Solutions offered by NbS: mitigate climate change and its impacts, reduce vulnerability, and increase ecosystem resilience. Reduce disaster risk, protect and restore carbon sinks, and avoid deforestation.

Sustainable Food Systems
Solutions offered by NbS: increase resilience of farming systems by maintaining and restoring ecosystem services and natural resources from agricultural land, ensure food security, maintain farmer livelihoods, ensure vibrant rural communities.

Zero Pollution (including human health)
Solutions offered by NbS: improve health and well-being while respecting planetary boundaries.

NbS Finance for a Just Transition to a Nature Positive Economy
Solutions offered by NbS: transition to nature-positive economic opportunities and green jobs, addressing social justice and social cohesion.

Sustainable Urban and Regional Transformation (including place regeneration)
Solutions offered by NbS: increase resilience to climate-related risks, land degradation, protect and restore biodiversity and ecosystem services, improve public health and well-being and improve quality of life.

Biodiversity Enhancement and Ecosystem Restoration
Solutions offered by NbS: enhance biodiversity and the ecosystem functions, while simultaneously providing social and economic benefits.

While sustainability and environmental policy was selected for the focus of this report due to its potential to catalyse or enable the deployment of NbS, a key aspect for NetworkNature policy engagement going forward will be how to mainstream NbS in policy domains that currently do not incorporate sustainability, e.g. health, infrastructure, employment, and industrial policy, to foster the broader uptake of NbS and help address policy silos.

Policy Screening and Expert Insights

NetworkNature partners screened ongoing and upcoming EU policies and international initiatives, identifying policies that can support the uptake of NbS or whose objectives can be better achieved through the inclusion of NbS (and covering EU 2030 policy targets, the European Green Deal, and EU Missions). Partners also undertook 26 interviews with policy experts at EU and national levels (identified in Appendix 1). and sought to determine what the experts perceive as being the main needs and policy gaps in their area of expertise, the factors that promote or hinder the uptake of NbS, and the opportunities they see for better integrating or utilising NbS in existing policies and increasing uptake. The analysis of needs and gaps was consolidated by an analysis of the literature (academic literature, grey literature, official communications, totalising more than a hundred references).

Key Findings: Policy Screening

The review of gaps associated with each policy showed that the NbS concept is not explicitly integrated into most global and EU policies. Of the 48 policies reviewed, only 17 (35%) explicitly mention NbS (see graph below). This is not a surprising explanation, as 11 of the 38 reviewed EU policies pre-date the adoption by the EU of a definition of NbS in 2015, and 31 pre-date the UNEA definition in 2022.

Some of the policies promote concepts that are considered to come under the umbrella of NbS (EEA 2021), such as the ecosystem approach, ecosystem-based disaster risk reduction, ecosystem-based adaptation, green and blue infrastructure, natural water retention measures, sustainable (urban) drainage, and regenerative agriculture or agroecology. Policy support for these concepts was also considered to be explicit support. More significantly, the evidence base to support NbS uptake in EU policy only gained ground from 2020, as results emerged from EU research investment in NbS projects. These projects had a predominantly urban focus, and this is reflected in the more explicit focus of urban policy on NbS since 2020. In relation to the lack of implementation frameworks for NbS and the clear shift from grey to green and grey-green interventions, the funding mechanisms have to be strengthened. Despite the fact that ample funding is available for NbS from the public sector, the private sector buy-in is still lacking.

Nevertheless, most EU and global policies provide scope for initiatives or measures that can promote the use of NbS over other solutions that do not work with or benefit nature. Whether or not this happens is generally determined by the implementation instruments available to national, regional or local planning authorities, fund managers, and environmental impact assessors. Targets should be set in existing policies and accompanied with budgets for reaching them. At the same time, some policies conflict with NbS by driving solutions that harm biodiversity and ecosystem services whilst solving only one challenge. For example, some climate mitigation and renewable energy solutions are causing biodiversity loss. Whilst opportunities for synergies are not being exploited.

Figure 1: *Policies and instruments explicitly mentioning NbS terms across policy themes*

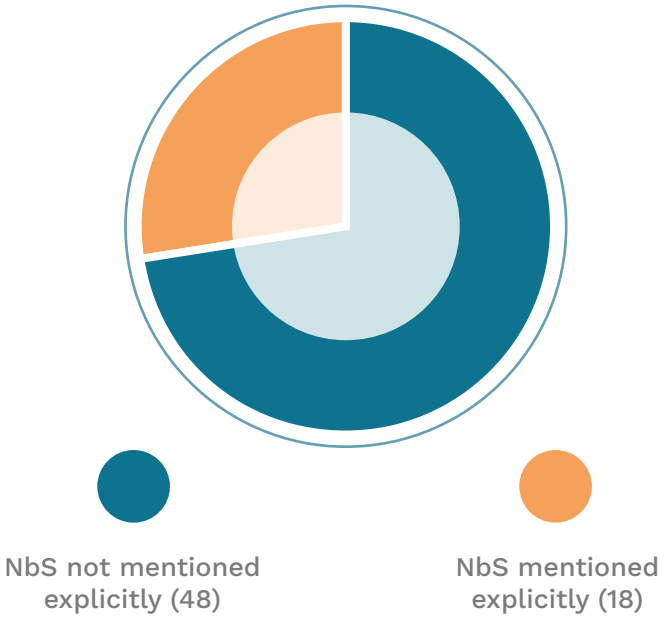


Figure 2: *Mentions of NbS across policy themes*

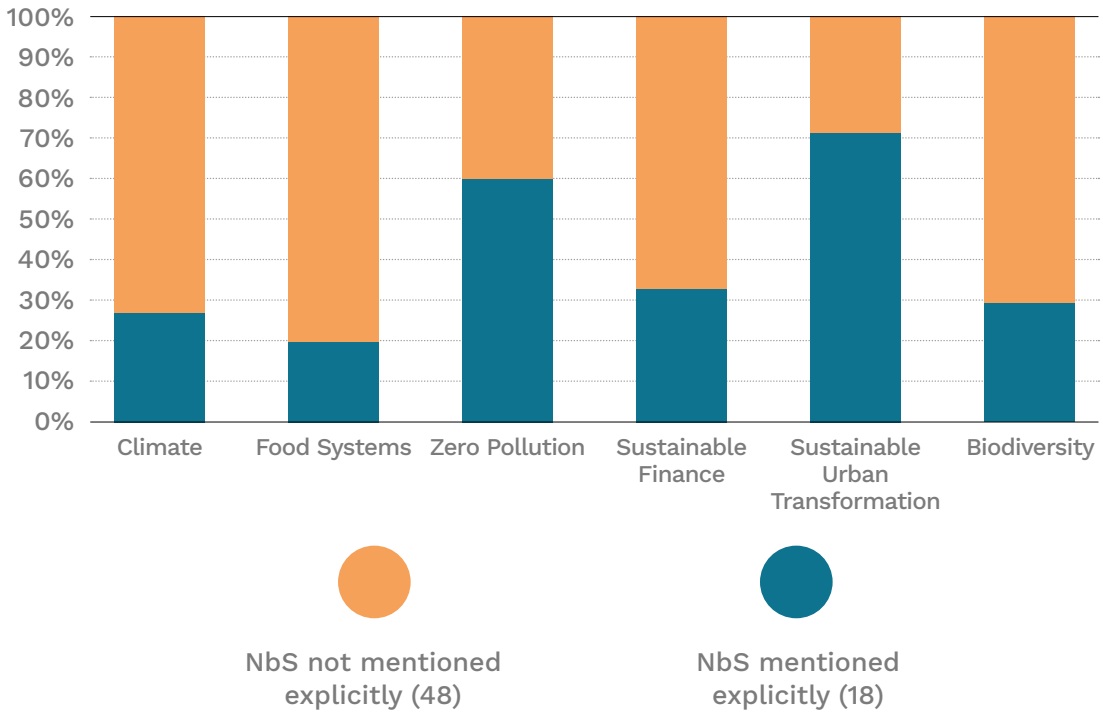


Figure 2 reflects the number of mentions of NbS (and related terms) in policies screened in this report. Water and land use policies are mainly covered by sustainable food and zero pollution themes but are cross-cutting.

Key Findings: Needs and Gaps

This report identifies gaps hindering the uptake of NbS in policy and practice under these headings:

- Lack of integration of NbS in policies, with a lack of quantitative and measurable and targets in relation to NbS deployment;
- Lack of harmonisation between policies affecting NbS adoption and insufficient exploitation of synergies between policies that have potential complementary objectives;
- Short-term political agendas and planning and risk aversion;
- Insufficient funding and financial mechanisms;
- Lack of regulatory clarity, standards, and unequal taxes;
- Lack of involvement of the business sector;
- Difficulty in evaluating NbS in non-monetary terms;
- Lack of evidence showcasing the cost-effectiveness of NbS;
- Insufficient assessments of NbS synergies and trade-offs;
- Lack of knowledge about how to integrate NbS into practice and targeted guidance for practitioners.

Strategies for Successful NbS Implementation

The report highlights some strategies and mechanisms that can enable successful implementation of NbS initiatives. The main pillars for successful implementation relate to:

- Integrating NbS into policy with specific targets, encouraging policy harmonisation;
- Developing standards supporting NbS uptake and measuring impacts;
- Assembling evidence of the effectiveness, economic benefits, and financial viability of NbS, to provide the evidence for choosing NbS above other solutions;
- Increasing targeting of public funds to NbS and increasing private financial flows;
- Promoting collaboration and participatory processes, including collaboration with business and investors;
- Upscaling research and innovation on NbS, and disseminating best practices and knowledge on NbS, through education and awareness raising, training and capacity building.

> *"I'd like to say that NbS are somehow like a red thread across many of the initiatives in the action plans of the European Green Deal, sometimes more, sometimes less, but I would think the highest integration [of NbS] is probably the Climate Adaptation Strategy next to the Biodiversity Strategy."*
>
> Karin Zaunberger, Policy Officer, DG ENV

NetworkNature Policy Engagement

Based on this analysis, the research has identified the main priorities for the NetworkNature platform to address in the development of policy relevant tools and knowledge.

Figure 3: *Network Nature potential actions in relation to the main policy needs identified in this report*

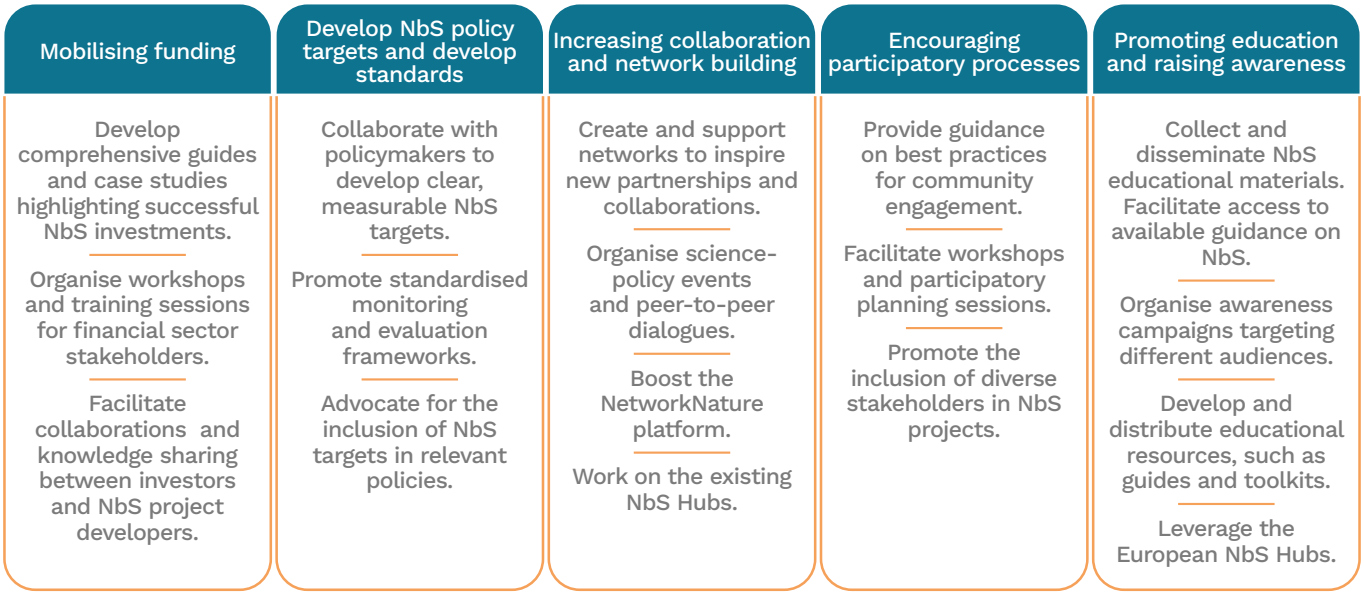


Figure 3 highlights some of the key areas of work for NetworkNature:

- integration of NbS in policy and policy tools;
- enhancing standards and harmonisation;
- mobilising funding;
- increasing collaboration and network building;
- encouraging participatory processes;
- promoting education and raising awareness.

We have highlighted throughout this report the necessity to break down sectoral siloes to foster a broad NbS community. To achieve this, there is a need for strong Europe-wide engagement of key actors and stakeholders in NbS policy, standards development, implementation and monitoring. A lack of quantitative and measurable targets relating to NbS deployment and impacts exists in EU and global policy instruments.

> *"I believe that the mainstreaming of NbS in the field of water policy relies on the following elements: national governments having genuine strong commitment to biodiversity, bringing a strong support for civic engagement and the implementation of an effective dialogue with citizens..."*
>
> Tom Wild, landscape ecologist, University of Sheffield

NetworkNature will collaborate with policymakers to develop clear, measurable NbS targets and indicators and advocate for their insertion into relevant policies. NetworkNature will produce policy toolkits including: indicators and metrics for measuring and assessing impacts of NbS, ways to set measurable or quantifiable targets and objectives for NbS, uses of cost-benefit analysis tools, economic and accounting that factors in natural capital, and social impact assessment, co-design and participatory approaches. This work will build on the Handbook for Practitioners which provides information to guide the development and implementation of NbS monitoring and evaluation and the use of NbS impact indicators. NetworkNature will also publish policy relevant information and materials on the NetworkNature platform throughout the duration of the project, also making clear for whom the information might be useful.

- NetworkNature will work towards enhancing standards and harmonisation of NbS implementation across policies and regions. This will help to build the evidence base for NbS, for NbS investors, but also for local and regional public authorities;
- Building capacity and developing skills amongst key target groups will be key to scale up and speed up NbS awareness, investment and implementation. NetworkNature will engage key actors and stakeholders across Europe in NbS policy,

research, standards development, implementation, and monitoring. NetworkNature will promote actions such as collecting NbS educational materials, providing guidance, and connecting to existing networks to inspire new partnerships and collaborations with the target audiences;
- NetworkNature will encourage participatory processes to ensure that NbS initiatives are inclusive and community-driven and promote stakeholder collaboration (through science-policy events, peer to peer dialogues, etc.). NetworNature will facilitate cross-sectoral partnerships to encourage collaboration between different sectors such as urban planning, agriculture, and water management to integrate NbS into various policy and practice areas.

Due to their ability to tackle challenges such as climate-related risks, biodiversity and ecosystem loss, public health and well-being, NbS are increasingly recognised as means for sustainable urban transformation among others. They can enhance the well-being of both people and the planet, fostering environments where human and ecological health coexist through multifunctional, biodiverse, and interconnected green and blue spaces. NbS promotes systems thinking and integrated approaches across municipal sectors such as housing, utilities, public health, urban planning, and transportation. Such interventions lend themselves to an inclusive 'whole-of-society' approach with co-creation as an integral element that brings together local and regional authorities, academia, policymakers, practitioners and civil society to create sustainable and resilient urban environments.

The EU Green Deal policies strongly support an increase in EU funding for NbS and recognise NbS as a key component in achieving the Green Deal goals. EU policies on sustainable development, disaster risk reduction, and climate and environmental issues are increasingly embedding NbS in their policy objectives, actions, and instruments. Similarly, the European Commission has driven significant efforts towards the uptake and upscaling of NbS through the EU-funded research and innovation NbS project portfolio that provides case studies and implements best practices in many different contexts. As a result, NbS are well integrated within the EC Framework Programme for Research and Innovation, Horizon 2020, Horizon Europe and EU Missions.

Decision-makers at all levels have gradually begun to recognise NbS as a more adaptive approach and a credible method to address key societal issues. While NbS are increasingly included in the policy texts of the environmental and research sectors, the uptake and recognition of NbS co-benefits appear significantly lower in other sectors. As a cross-disciplinary concept, NbS can realise its full potential only when the societal and economic benefits are recognised, alongside the environmental benefits. Further integration into related policies (e.g. economic development, health and finance) is crucial. The link to these policy areas may be less obvious and calls for further research to measure and prove the co-benefits and social economic outcomes of NbS (e.g. in terms of health benefits, job creation, business opportunities).

By aligning gaps and needs with policy themes and target audiences, NetworkNature can play a crucial role in mobilising funding, enhancing standards and harmonisation, increasing awareness, promoting collaboration, building capacity, and building the evidence base for NbS.

This report is a first step that will guide the NetworkNature policy related activities throughout the project duration from 2024 to 2027.

Network Nature

Chapter 1: Introduction

Report Objectives and Audience

The overarching goal for NetworkNature is to accelerate upscaling of Nature-based Solutions (NbS) implementation in science, business, policy and practice in line with EU ambitions to address biodiversity loss, ecosystem degradation and climate change by 2030.

The primary target audiences identified for the NetworkNature policy engagement are:

- Sub-national, national and EU policymakers;
- Local and regional public authorities, including public administration and urban planning departments in the EU.

The secondary target audiences are:

- NbS investors, (nature-based) entrepreneurs and SMEs (public and private);
- Educators, education institutions, students, and environment-oriented civil society;
- Infrastructure planners and developers;
- Natural resource managers and landowners.

NetworkNature aims to produce a policy toolkit for national, regional and local policy-makers and implementers, which will provide guidance and tools on how to promote NbS in policies and strategies, planning, public funding, and initiatives with the private sector.

This report is a first step to mapping the needs and gaps that such a policy toolkit needs to address.

Contents Overview

Chapter 1 provides an introduction which presents the report's objectives and target audience and explains the methodological approach used. It also explains the concept and definition of NbS and the types of interventions that are considered to be NbS.

Chapter 2 describes the policy screening of current EU and global policies that address the types of societal challenges that NbS can solve and assesses whether they explicitly or implicitly address or promote NbS or not. The focus of the screening was targeted towards policies that can support the uptake of NbS or whose objectives can be better achieved through the inclusion of NbS.

Chapter 3 identifies the gaps and remaining needs for NbS integration into policy and the enablers of NbS uptake and upscaling. This section describes the policy needs that impact NbS uptake at all stages of their deployment based on a review of the literature and a series of interviews with experts.

This policy needs assessment builds on the key challenges and key research needs identified by NetworkNature in the European Research and Innovation Roadmap to 2030 on Nature-based Solutions. The roadmap was co-developed with multiple researchers and stakeholders, and identified nine key challenges and twelve key research needs in four strategic action areas, including mainstreaming NbS in policy, and closing the NbS research-implementation gap.

Chapter 3 also describes enablers of NbS uptake and upscaling under these headings:

- Integration of NbS into policy and policy harmonisation;
- Standards supporting NbS uptake and monitoring;
- Evidence of effectiveness, economic benefits, and financial viability of NbS;
- Increased targeting of public funds to NbS and increasing private financial flows;
- Promoting collaboration and participatory processes, including collaboration with industry and investors;
- Upscaling research and innovation on NbS;
- Disseminating knowledge on NbS and communicating best practices;
- Education, awareness-raising, training and capacity building.

Chapter 4 draws conclusions from the policy screening, and the examination of gaps and enablers. The section then explores the resources, services and opportunities that can be mobilised and developed for increasing the mainstreaming

NbS uptake and upscaling of NbS across policy and practice.

Context Setting: What Are Nature-based Solutions?

The term NbS was first coined by the World Bank in 2008. Along with the International Union for the Conservation of Nature (IUCN), the World Bank searched for innovative solutions to work with nature to support climate change adaptation and mitigation while supporting biodiversity and improving livelihoods (Cohen-Shacham et al., 2016). In early 2010, the European Commission (EC) started promoting NbS and allocating funding to NbS research and innovation initiatives that focus on integrating NbS across various sectors, framed around the multiple benefits that NbS can potentially deliver. In 2015, the Commission published its definition of NbS and dedicated significant funding to developing NbS through the Horizon 2020 programme (European Commission Directorate-General for Research and Innovation, 2015).

In 2016, the IUCN adopted resolution 069 which defined NbS, and the IUCN Global Standard for NbS was then based on this definition in 2020, which broadened the potential of NbS to address different societal challenges, including those beyond climate (IUCN, 2020). IUCN produced a self-assessment tool, which was recently released in an online version (IUCN, 2021). The tool can be used by practitioners to support the design and verification of NbS and their delivery of desired outcomes. NbS and the challenges they are designed to address are diverse, but NbS can be characterised by the degree to which they intervene in ecosystems; ranging from protection and minimal intervention (type 1), to the implementation of management approaches for the development of sustainable and multifunctional ecosystems (type 2), to intensive management by sustainably restoring or creating new ecosystems, provided they preserve biodiversity and deliver various ecosystem services (type 3) (Eggermont et al., 2015). These NbS types can be thought of as: protect / conserve, manage / sustainably use, restore / create.

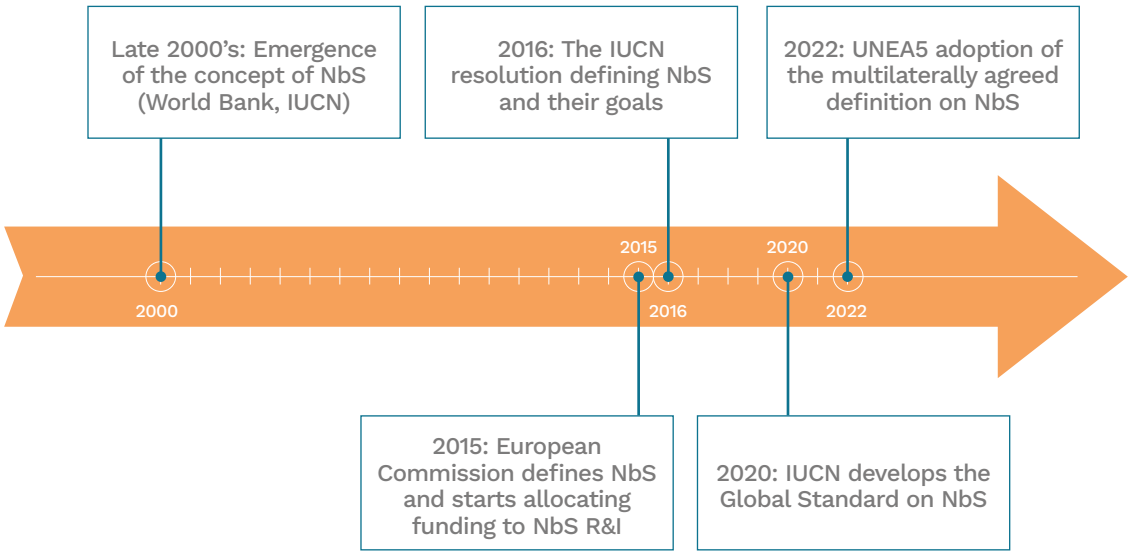
As NbS have been gaining momentum at the international level, it was becoming apparent that there was a need for a multilaterally agreed definition with operational rigour to avoid potential misinterpretation and misuse of the term (Cohen-Shacham et al, 2016), (UNEA, 2022). At the 5th United Nations Environment Assembly (UNEA) in 2022, world governments discussed and agreed to define NbS as follows:

"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 and resilience and biodiversity benefits" (UNEA, 2022).

This multilaterally-agreed definition as well as the associated UNEA resolution (UNEA Resolution 2, 2022) mark a pivotal step towards the integration of NbS in key intergovernmental agreements and is expected to increase the mainstreaming and uptake of NbS worldwide. The UNEA definition has since been referred to in decisions framed within the three Rio Conventions (UNFCCC, UNCBD and UNCCD), and is increasingly being utilised by the private sector as well as by the European Commission and the IUCN.

NetworkNature applies the UNEA definition in all its activities and products. This definition provided the framework for the identification of the needs and gaps in the policy framework for upscaling NbS implementation.

Figure 4 *Inspired by NetZeroCities Policy lab meeting and simplified from Figure 2 in (Cohen-Shacham et al., 2016)*



Nature-based Solutions Concepts and Themes

The NbS concept picks up many of the elements of earlier concepts, providing a new framing by focusing on the purpose of achieving environmental, economic and social benefits together.

The NbS concept is an umbrella concept for many related terms (EEA, 2021), including[1]:

- Green infrastructure;
- Blue infrastructure;
- Ecosystem-based disaster risk reduction;
- Ecosystem-based adaptation;
- Natural climate solutions;
- Ecological engineering;
- Natural water retention measures;
- Constructed wetlands;
- Sustainable drainage;
- Urban greening – green roof, green corridor, urban park, community garden, urban forest;
- Regenerative agriculture, agroecology.

NetworkNature project activities on NbS are guided by 6 priority themes in which NbS can and do play an important role. The themes focus on different aspects of the societal and environmental challenges that NbS address, namely climate resilience, food security and land and water management, pollution, and urban and regional transformation, including place regeneration. It also includes two transversal themes: the achievement of a benefit for biodiversity and ecosystems, and sustainable financing. Other transversal aspects are addressed in each theme, including water management and the societal and economic benefits of social justice, cohesion, employment and economic opportunities, knowledge, participatory planning and governance, and human health and well-being.

The following provides an introduction to the NetworkNature themes:

Biodiversity Enhancement and Ecosystem Restoration (as Transversal Topic)

Biodiversity loss stands as one of the triple planetary crisis humanity is facing globally, in addition to climate change and pollution (UN, 2022). Biodiversity loss is driven by human activities, changes in land and sea use, climate change, invasive alien species,

1 Such solutions are NbS when they effectively meet criteria and definition that qualify them as such.

and pollution. In response to this context, NbS are increasingly recognised as an effective approach to address the interconnected facets of this triple crisis.

Indeed, biodiversity benefits lie at the core of NbS principles, recognising its fundamental role in enhancing the resilience of ecosystems. By protecting, conserving, restoring, sustainably using and managing natural or modified terrestrial, freshwater, coastal and marine ecosystems effectively and adaptively, NbS endeavour to enhance biodiversity and the services it provides, enhancing resilience and human well-being while simultaneously providing social and economic benefits. For example, beyond serving as a buffer against erosion and storm surges, salt marshes serve as nurseries and breeding grounds and provide a haven for unique marine species. Consequently, restoring such ecosystems safeguards biodiversity while simultaneously supporting local livelihoods and reducing disaster risk.

Sustainable Food Systems (including Soil and Agriculture)

Transforming our current agricultural and food systems into a sustainable food system is necessary to address a series of societal challenges: ensuring food security whilst adapting to climate change, maintaining farmer livelihoods, and supporting vibrant rural communities, whilst protecting and restoring the ecosystem services and natural resources we get from agricultural land, such as water, biomass, and rural landscapes. Making our food systems sustainable requires various transformation journeys, each with steps and gradations. There are farming practices that are common to all or most of these farming systems or farming system transitions. Although many agricultural stakeholders recognise these transformations and the practices as NbS, they may be using other terms to designate them, including regenerative agriculture, conservation agriculture, sustainable agriculture, agroecology, and agroforestry.

Concepts mentioned in the literature that either play a role in agricultural transformation or as the desired sustainable farm system include:

- Extensification (for example, reducing livestock numbers and moving livestock from housing to open field production systems);
- Diversification (for example, more diverse crop rotations and crop diversity on farm, with associated diversification of farm outputs and markets; returning to more mixed crop and livestock farming system);
- Agroforestry (for example, introducing trees into arable fields – silvo-arable – or introducing trees on pasture – silvo-pastoral);
- Agroecology;
- Regenerative agriculture or conservation agriculture;
- Organic farming.

Organic farming is the only system or concept on this list that has a legally binding definition in the EU Organic Regulation (EU Regulation on organic production), and it is not recognised as a NbS by everyone (see policy gaps section for further discussion of this).

Zero Pollution (including Human Health)

The EU Water Framework Directive defines pollution as the '*direct or indirect introduction [...] of substances or heat into the air, water or land which may be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems [...], which result in damage to material property, or which impair or interfere with amenities and other legitimate uses of the environment*'.

For humans, pollution can cause cancer, ischaemic heart disease, obstructive pulmonary disease, strokes, mental and neurological conditions, diabetes and more. Pollution also threatens biodiversity and natural ecosystems, and is one of the five main causes of biodiversity loss along with land and sea use, overexploitation of natural resources, climate change and invasive alien species.

The complexity of interactions between such different pollutants and entire ecosystems creates the need for well-designed and careful planning. The ambition for zero pollution answers a number of cross-cutting societal challenges, including health and well-being while respecting planetary boundaries (Kopsieker et al., 2021).

NbS can be very effective at reducing pollution in different environments while also providing other benefits. NbS can reduce pollution in:

- Water: NbS can help to treat polluted water from point and non-point sources by trapping and/or containing sediments, pollutants in sediments, soils and vegetation (filtration and chemical conversion). NbS can protect groundwater from contamination by removing sediments, heavy metals and other pollutants, relieve pressure on existing water treatment infrastructure through bioretention and infiltration, and improve the quality of wastewater. NbS for water include:
    - Constructed wetlands alone or in conjunction with conventional wastewater treatment plants;
    - Retention basins, wetlands, alluvial meadows, catchment restoration measures, daylighting, riparian buffers;
    - In urban areas: sustainable urban drainage systems, green walls, rain gardens, green roofs, tree planting, wetland parks.
- Soil: NbS can reduce pollution of contaminated land through phytomanagement (phytoremediation), managing the site hydrology, re-using excavated material, and then after decontamination the conversion of brownfield sites to green spaces.
- Air: tree planting with optimum planting regimes along roads and in cities captures pollutants from the air and shading reduces heat and the formation of pollutants such as ozone.
- Noise: green corridors reduce noise in cities and along roads and railways, around industrial sites, and other noise centres (Estévez-Mauriz et al, 2023).

Climate Change Adaptation, Mitigation, and Resilience

NbS can play a crucial role in climate change mitigation and in building climate resilience for people by enhancing their capacity to adapt to climate change. Nature-based interventions such as coastal restoration, urban greening, and watershed management, can help mitigate climate change (e.g., through sequestering carbon), help reduce climate change impacts (e.g., through coastal protection), reduce vulnerability (e.g., through diversifying livelihoods), and can also increase ecosystem resilience (e.g., through increased connectivity). By integrating NbS into climate change adaptation strategies, communities can better cope with climate-related challenges (NBScomics, 2022).

Scaling up NbS will be crucial to build local resilience to climate extremes such as heatwaves, floods and wildfires. Accelerating the uptake of NbS can also deliver multiple societal benefits and contribute to nature restoration (NetworkNature, 2024).

NbS Finance for a Just Transition to a Nature-Positive Economy

Our economies are dependent on healthy and functioning ecosystems to thrive. Therefore, it is necessary to direct financing to activities such as NbS, to ensure the transition to a more sustainable economy. A just transition must also consider equitable, participatory and inclusive decision making. Additionally, it is important to promote business models, investment opportunities and forms of trade that support this transition. NbS can be financed by a combination of existing economic instruments, innovative investment and insurance schemes, and by shifting to more sustainable corporate business models (ILO, UNEP and IUCN, 2022).

Sustainable Urban and Regional Transformation

Future cities must adapt and evolve in response to the triple planetary crises of biodiversity loss, climate change, and pollution. What will these cities look like? How will they balance a growing population, urban densification and competing land uses with the well-being of people and planet? These considerations are at the centre of the concept and approach of sustainable urban and regional transformation which strives to leverage structural transformation processes to put urban development on a pathway towards sustainability, resilience and liveability.

Local and regional governments and authorities and practitioners (i.e. urban planners, landscape architects and developers) play a pivotal role in actively driving such a transition by harnessing regulatory powers (zoning, ecological compensation areas), or

adopting nature-positive planning and land management practices. They can also incentivise private actors and civil society to take action.

Methodological Approach

Approach to the Assessment of Key Policy and Legislative Instruments for NbS Uptake and Upscaling

Chapter 2 screens the EU and global policy framework under the six themes to identify the most relevant policies concerning NbS, their relevance for NbS, and the type of support they offer. This exercise allowed the identification of needs in terms of policy design and policy coherence, as well as issues related to NbS implementation and policy gaps. Each NetworkNature partner took the lead on one or more themes according to their thematic expertise: IUCN - Biodiversity enhancement and ecosystem restoration; UNEP-WCMC - Climate Adaptation, Mitigation, and Resilience and NbS Finance for a Just Transition to a Nature Positive Economy; IEEP – Sustainable food systems and Zero pollution; ICLEI - Sustainable urban and regional transformation.

Each priority theme was defined and forms the backbone of each policy screening section of the chapter. For each priority theme, key ongoing and upcoming policies were identified. The criteria for selection were:

- NbS are highly relevant for reaching the objectives and specific goals of the policy,
- The policy was identified for NbS integration in the needs and gaps assessment.

The term 'policy' refers to global treaties and agreements, legal directives and regulations, strategies, programmes, and financing instruments.

We have allocated policies according to our expertise to the most fitting theme – but bearing in mind that policies can be relevant to many of the themes. The principal EU environmental legislation on water, land and air quality and sustainable management has wide ranging implications for NbS related activities. For example, the Blue Economy Strategy be understood as falling both within biodiversity and sustainable finance: it implements the Biodiversity Strategy for 2030 as well as the other economy-focused aspects of the EU Green Deal.

Each selected policy instrument was screened and analysed according to the following attributes based on Davis et al (2018):

- **Name of policy:** Provides the full name, acronym and hyperlink to the official document, e.g. on EUR-Lex.
- **Short description of policy:** Provides the year the policy came into force, its implications and where possible, includes specific 2030 targets.
- **Policy category:** Distinguishes the policy files according to the definitions proposed by Cocklin, Mautner and Dibden (2007) into regulatory instruments, planning instruments, economic instruments or information/education-based instruments.
- **Type of instrument:** Distinguishes the policy files according to type of policy instrument as proposed by Davis et al. (2018).

Table 1: *Type of instrument*

Policy category	Type of instrument and activity
Regulatory instruments	International agreements, directives, regulations National, sub-national, and municipal laws and ordinances
Planning instruments	Action programmes/plans Strategies/roadmaps Communications
Economic instruments	Pricing, subsidies, public procurement, training, advisory services
Information/education instruments	Information campaign, labelling, stakeholder and public participation, training, advisory services

- **Type of support:** Degree of explicit policy support based on (Davis et al., 2018).

Table 2: Type of support

Strong explicit support	NbS or related terms are explicitly mentioned and strongly embedded throughout the framework, including in objectives, policy measure design and/or supported actions.
Strong implicit support	Strong framing of nature as a means to address (select) societal challenges, with multiple references to elements of NbS or NbS interventions types; no explicit mentioning of NbS or related terms.
Medium support	NbS and related terms are not a prominent feature, but deployment is supported through references to individual NbS elements and interventions.
Low support	NbS are neither a prominent feature nor relevant for/mirrored in policy measure design and supported actions.

- **Type of NbS concerned:** Along the level of enhancement of the sustainable provision of ecosystem services through NbS, addressing societal challenges effectively and adaptively while simultaneously providing human well-being and biodiversity benefits, three types of NbS are distinguished (Cohen-Shacham et al., 2016): protect and conserve, restore and create, sustainably use and manage.

Table 3: Type of NbS concerned

Protect / conserve: Solutions that involve minimal intervention in ecosystems and making better use of existing natural or protected ecosystems.
Restore / create: Solutions that involve ecosystem restoration or creating new ecosystems, provided they preserve biodiversity and deliver various ecosystem services.
Sustainably use and manage: Solutions based on developing sustainable management protocols and procedures for managed or restored ecosystem.

- **Relevance for NbS:** High, Medium or Low. This is based on the interviews with experts and scoring questions (see Chapter 3): for example, can the objectives of the policy be achieved through NbS? How important are NbS to support the achievement of the policy targets/objectives? Are there measurable criteria?

- **Societal challenge addressed**: following a typology derived from (Dumitru and Wendling, 2021b; IUCN, 2020), (El Harrak and Lemaitre, 2023):
  - Climate Resilience;
  - Water Management;
  - Food Security;
  - Social Justice and Social Cohesion;
  - New Economic Opportunities and Green Jobs;
  - Participatory Planning and Governance;
  - Natural and Climate Hazards;
  - Health and Well-being and Air Quality;
  - Land and Green Space Management;
  - Place Regeneration;
  - Knowledge, and Social Capacity Building for Sustainable Transformation;
  - Biodiversity Enhancement.

- **Funds/programmes envisaged to finance the policy**: Main financial instruments supporting the implementation of the policy.

- **Target stakeholder categories**: National and EU-level policymakers, specifically the competent authorities within each Member State and the Commission; local and subnational governments and public authorities (including agencies); natural resource managers and owners; farmers, landowners; foresters; forest owners; fishers and aquaculture producers; infrastructure planners and developers; educators, education institutions and students; NbS investors and (nature-based) entrepreneurs; NGOs; scientific institutions; society at large.

- **Gaps/barriers identified**: Main policy gaps associated with the policy.

- **Expected developments**: Expected development of the screened policies, including planned reviews, new legislative proposals, and other policy windows relevant to NbS.

Approach to the Assessment of Needs and Gaps

The assessment is based on a series of interviews and an analysis of the literature, as well as the policy screening carried out in chapter 2. The discussions held with interviewees were framed by the UNEA definition of NbS. The aim was to identify recurring needs and gaps in policy, and expert perspectives on opportunities. This assessment did not aim to deliver a comprehensive analysis of the issues around NbS uptake.

The NetworkNature partners identified policy experts within each policy theme and undertook interviews. We sought to determine what the experts perceive as being the main needs and policy gaps in their area of expertise, the factors that promote or hinder the uptake of NbS, and the opportunities they see for greater uptake. NetworkNature partners conducted **26 interviews** between January and February 2024. Each interview centred around a (cross-policy) priority theme and was conducted by one of the partners with standardised questions. The NetworkNature Hubs were also consulted, with input from NetworkNature Nordic Hub and NbS Hungary Hub. See Appendix 1 for the list of organisations consulted and see Appendix 2 for the list of questions put to the interviewees. Interviewees are not identified by name to preserve anonymity.

A review of the most recent literature on the needs and enablers and remaining gaps was used to add context to the interview findings (covering academic literature, grey literature, official communications, websites, totalising more than a hundred references). The EU-funded NbS research projects (European Commission, 2023b) were also consulted and included as examples where necessary.

Network Nature

Chapter 2: Assessment of Key Policy and Legislative Instruments for NbS Uptake

The table below groups the policy and legislative instruments screened for the assessment, following the methodology described in 1.3. These instruments have been organised according to their policy category.

Table 4: *Policy instruments reviewed*

NB: the date indicates the current version of the policy or law. The date of the original version is in brackets.

Policy instruments	Date	NbS focus area	NbS Policy Relevance	Type of Support
Treaty/ legally binding instrument (global)				
UN Framework Convention on Climate Change (UNFCCC)	1992	Climate adaptation, mitigation and resilience	High	Strong implicit
UN Convention on Biological Diversity (UNCBD)	1993	Biodiversity enhancement and ecosystem restoration	High	Strong implicit
UN Convention to Combat Desertification	1994	Climate adaptation, mitigation and resilience	High	Strong implicit
UN Framework Convention on Climate Change (UN FCCC) Paris Agreement	2015	Climate adaptation, mitigation and resilience	High	Strong implicit
Non legally binding instrument (global)				
UN 2030 Agenda for Sustainable Development with Sustainable Development Goals	2015	Climate adaptation, mitigation and resilience	High	Strong implicit
UN FCCC Reducing Emissions from Deforestation and Forest Degradation (REDD+)	2015	Climate adaptation, mitigation and resilience	High	Strong implicit
UNFCCC Global Goal on Adaptation	2015	Climate adaptation, mitigation and resilience	High	Strong implicit
UN Sendai Framework for Disaster Risk Reduction	2015	Climate adaptation, mitigation and resilience	High	Strong implicit
UN CBD Kunming-Montreal Global Biodiversity Framework	2022	Biodiversity enhancement and ecosystem restoration	High	Strong explicit
Voluntary disclosure frameworks	2023	NbS finance for a just transition to a nature positive economy	Medium	Strong implicit
EU legally binding instruments (legislation)				
Birds Directive	2009 (1979)	Biodiversity enhancement and ecosystem restoration	High	Strong Implicit
Nitrates Directive	1991	Zero pollution	High	Strong implicit
Urban Wastewater Treatment Directive	1991	Zero pollution	High	Strong explicit
Habitats Directive	1992	Biodiversity enhancement and ecosystem restoration	High	Strong Implicit
Water Framework Directive	2000	Zero pollution	High	Low implicit
Ambient Air Quality Directives	2004 and 2008	Zero pollution	High	Low implicit
Floods Directive	2007	Climate adaptation, mitigation and resilience	High	medium implicit

Marine Strategy Framework Directive	2008	Biodiversity enhancement and ecosystem restoration	High	Strong implicit
Common Fisheries Policy	2013 (1970)	Sustainable food systems	Low	Low implicit
Maritime Spatial Planning Directive	2014	Biodiversity enhancement and ecosystem restoration	High	Strong implicit
Regulation on Land Use, Land-use Change and Forestry	2018	Climate adaptation, mitigation and resilience	High	Strong explicit
Sustainable Finance Taxonomy Regulation	2020	NbS finance for a just transition to a nature positive economy	High	Strong explicit
European Climate Law	2021	Climate adaptation, mitigation and resilience	High	Strong explicit
Common Agricultural Policy	2021 (1962)	Sustainable food systems	High	Strong implicit
European Cohesion Policy	2021 (1975)	Sustainable urban and regional transformation	High	Medium implicit
Just Transition Mechanism	2021	NbS finance for a just transition to a nature positive economy	Medium	Strong implicit
Corporate Sustainability Reporting Directive and Corporate Due Diligence Directive	2022 / 2024	NbS finance for a just transition to a nature positive economy	Medium to high	Strong implicit
EU Deforestation Free Supply Chains Regulation	2023	NbS finance for a just transition to a nature positive economy	High	Strong implicit
Green Bonds Regulation	2023	NbS finance for a just transition to a nature positive economy	Medium to high	Strong explicit
Nature Restoration Law	2024	Biodiversity enhancement and ecosystem restoration	High	Strong explicit
EU proposal for legally binding instrument (legislation)				
Proposal to amend Regulation No 691/2011 on European Environmental Economic Accounts	2022	NbS finance for a just transition to a nature positive economy	High	Strong implicit
Proposal for a Directive on Soil Monitoring and Resilience	2023	Sustainable food systems	High	Medium implicit
EU policy instruments (non legislative)				
EU Strategy on Green Infrastructure	2013	Sustainable urban and regional transformation	High	Strong explicit
EU Pollinators Initiative	2018	Biodiversity enhancement and ecosystem restoration	Medium	Strong implicit
EU Bioeconomy Strategy and Action Plan	2018	Sustainable food systems	HIgh	Medium implicit
The EU Green Deal	2020	All themes	High	Strong explicit
EU Biodiversity Strategy for 2030	2020	Biodiversity enhancement and ecosystem restoration	High	Strong explicit
Urban Nature Plans under EU Biodiversity Strategy	2020	Sustainable urban and regional transformation	High	Strong explicit
Farm-to-Fork Strategy	2020	Sustainable food systems	High	Medium explicit

Green City Accord	2020	Sustainable urban and regional transformation	High	Strong explicit
EU Territorial Agenda 2030	2020	Sustainable urban and regional transformation	Medium	Medium explicit
EU Strategy on Adaptation to Climate Change	2021	Climate adaptation, mitigation and resilience	High	Strong explicit
Zero Pollution Action Plan	2021	Zero pollution	High	Medium explicit
EU Blue Economy for a Sustainable Future	2021	NbS finance for a just transition to a nature positive economy	High	Strong explicit
EU Strategy for Financing the Transition to a Sustainable Economy	2021	NbS finance for a just transition to a nature positive economy	High	Strong implicit
Forest Strategy for 2030	2021	Biodiversity enhancement and ecosystem restoration	Medium	Medium Implicit
New European Bauhaus Initiative	2021	Sustainable urban and regional transformation	Medium	Strong implicit
Urban Agenda for the EU – Greening Cities Partnership	2022	Sustainable urban and regional transformation	High	Strong explicit support

Sustainable Development

Authors: UNEP-WCMC and IEEP

This section screens the global sustainable development framework provided by the UN 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) and the EU framework provided by the EU Green Deal launched by the European Commission at the end of 2019.

Most of the post 2020 EU policies screened in this chapter are part of the EU Green Deal. The Green Deal has offered a political space for accelerating transformative change in the EU and for aligning EU policy to public demands for climate and environmental action (Tubiana, 2023).

UN 2030 Agenda for Sustainable Development and Sustainable Development Goals

Name of policy: UN 2030 Agenda for Sustainable Development Sustainable Development Goals (SDGs) (UN, 2015).

Short description of policy: The 17 Sustainable Development Goals (SGDs) are an urgent call for action by all UN countries under the UN 2030 Agenda for Sustainable Development, adopted by all UN members in 2015. The agenda recognises that ending poverty and other deprivations must go hand in hand and with strategies that improve health and education, reduce inequality, and spur economic growth, all while tackling climate change and working to preserve our oceans and forests. The SDGs are designed to provide a comprehensive framework for addressing global challenges, including climate change and biodiversity loss. The SDGs are deeply intertwined, and any action taken to achieve one may advance some others. Therefore an integrated policy approach is needed to achieve the SDGs - one that navigates the synergies and trade-offs in taking a certain line of action.

Policy category: Regulatory and planning instrument.

Type of instrument: International agreement.

Type of support: Strong implicit support; though NbS is not explicitly mentioned in the SDGs, the principles and themes associated with NbS are reflected in several SDGs and their targets (see relevance section below).

Type of NbS concerned: Protection and conservation, sustainable use and management, and ecosystem restoration/creation.

Relevance for NbS: High. NbS aligns closely with the broader goals of sustainable development, including environmental conservation, climate action, and poverty reduction. The SDGs require an integrated approach in which actions to advance one SDG must create synergies for the other SDGs and avoid trade-offs, and this approach is a feature of NbS. NbS can help advance the SDG targets by contributing to climate resilience, ecosystem restoration, and the conservation of terrestrial and aquatic ecosystems, and are particularly relevant to Goal 13 (Climate Action), Goal 14 (Life Below Water), and Goal 15 (Life on Land).

Goal 6: Clean Water and Sanitation (Target 6.6) emphasizes the protection and restoration of water-related ecosystems. NbS interventions such as the restoration of wetlands, reforestation of watersheds, and sustainable agricultural practices, can contribute to the protection and restoration of water-related ecosystems, thereby supporting the objectives of Goal 6.

Goal 13: Climate Action (Target 13.1) emphasizes the strengthening of resilience and adaptive capacity to climate-related hazards and natural disasters. NbS interventions such as reforestation, afforestation, and sustainable land management, can contribute to climate resilience and adaptive capacity, aligning with the objectives of Goal 13.

Societal challenges addressed: Climate Resilience, Biodiversity Enhancement, Climate Change Mitigation.

Funds/programmes envisaged to support the policy: All relevant programmes established under the Multiannual Financial Framework are to be used.

Target stakeholder category: National and subnational governments and public authorities, society at large, natural resource managers and landowners.

Gaps/barriers identified: Inadequate integration of NbS into national policies and regulatory frameworks can limit their mainstreaming and application in addressing specific SDG targets. Policy gaps and inconsistencies may hinder the effective implementation of NbS projects, thereby impeding their contribution to sustainable development objectives.

Expected developments: The SDGs are subject to periodic reviews, evaluations, and updates to assess progress and identify areas that need attention. These reviews typically take place at the global, regional, and national levels. Countries voluntarily present their progress on the SDGs through Voluntary National Reviews during the annual sessions of the United Nations High-Level Political Forum (HLPF). These reviews provide insights into national efforts, successes, and challenges. Future reviews may offer opportunities to highlight the role of NbS in achieving specific SDGs, especially those related to environmental sustainability, climate action, and biodiversity conservation.

The EU Green Deal

Name of policy: The EU Green Deal (ECOM(2019) 640 final).

Short description of policy: The EU Green Deal is a set of policy initiatives presented by the EU Commission in December 2019 (approved in 2020), with the overall goal of achieving climate neutrality by 2050, achieving a 55% emissions reduction by 2030 compared to a 1990 baseline, putting nature back on the path to recovery, and 'leaving no one behind'. The Green Deal encompasses the full range of the EU's main priorities: climate, energy, environment and oceans, agriculture, transport and industry, urban and regional development.

The Green Deal communication made policy proposals (including new laws or revisions to existing laws and strategies) and proposals for 2030 targets for:

- EU Climate Law, new EU Strategy on Adaptation to Climate Change;
- Fit for 55 package: strengthened and tightened EU Emissions Trading System, Carbon border adjustment mechanism, measures for clean transport, support to renewables (Renewable Energy Directive and Energy Efficiency Directive), carbon pricing and revision of energy taxation;
- Circular Economy Action Plan;

- Farm to Fork Strategy;
- EU Forest Strategy for 2030;
- EU Deforestation Regulation;
- EU Biodiversity Strategy for 2030 (which proposes an EU Nature Restoration Law);
- Zero Pollution Action Plan;
- Updated European Industrial Strategy;
- EU Chemicals Strategy for Sustainability;
- Just Transition Mechanism;
- Sustainable finance initiatives: Sustainable taxonomy, rules on green bonds, green investment;
- EU Urban Agenda.

Policy category: Planning instrument.

Type of instrument: Communication.

Type of support: Strong explicit support.

Type of NbS concerned: Protect and conserve, restore and create, sustainably use and manage.

Relevance for NbS: High relevance. The EU Green Deal has been key to introduce support to NbS through the entire policy spectrum, in close connection with the adoption of the UNEA definition in 2022. In particular, the text refers to NbS as an integral component of the EU's strategy for climate adaptation, as well as for achieving increased climate resilience of seas and oceans.

Societal challenges addressed: Climate Resilience, Water Management, Food Security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Well-being and Air Quality, Land and Green Space Management, Place Regeneration, Knowledge, and Social Capacity Building for Sustainable Transformation, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: Just Transition Fund, MFF, EU Recovery Package, CAP, and alignments in other EU funding programmes.

Target stakeholder category: National and subnational governments and public authorities, society at large, natural resource managers and landowners.

Gaps/barriers identified: Several of the EGD policy proposals have been abandoned or put on hold, including the Sustainable Food Systems Law (part of the Farm to Fork Strategy) and/or substantially modified from their original proposed objectives (e.g. the Commission's proposals for the Soil Monitoring Directive and the EU Nature Restoration Law). The EGD has been criticised for not paying enough attention to the economic and social impacts of the new environmental laws and policies, particularly with regard to the economic costs and restrictions perceived by farmers, foresters, and other primary producers (Tubiana, 2023).

Expected developments: The EU Green Deal will have a lasting legacy on the EU's social and environmental and climate ambitions, with the majority of the flagship initiatives having been adopted. However, the recent EU Parliament elections mark a switch in focus for the EU's green agenda, in a context of high inflation, farmer protests, and the widespread electoral success of right-wing parties who criticise the EU Green Deal and propose to weaken some environmental provisions (Tremblay and Underwood, 2024). There is therefore a question mark on whether the proposals that have not been adopted will muster sufficient support to be taken up again in the legislative programme (notably the sustainable use of pesticides, sustainable food systems law, and a stronger soil restoration requirement).

Biodiversity Enhancement and Ecosystem Restoration

Author: IUCN

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Within the broad theme of biodiversity enhancement and ecosystem restoration, this section describes key policies and initiatives emphasising their level of support and relevance to NbS.

The policies included in this chapter are the following:

Global policy framework: The Kunming-Montreal Global Biodiversity Framework agreed in December 2022 under the UN Convention on Biological Diversity sets out a vision, mission and goals, supported by a panel of targets, to support the conservation of biological diversity and the sustainable use of its components. The global framework explicitly recognises NbS as playing an essential role in achieving the goals of the Convention.

EU legislation: The EU Nature Directives (Habitats Directive 1992 and Bird Directive 1979/2009) establish an EU wide legal framework for the conservation, protection, enhancement and maintenance of species and natural habitats. Species and habitat conservation actions can be considered NbS and/or can be achieved though NbS.

The Marine Strategy Framework Directive adopted in 2008 sets a legal framework to achieve good environmental status in European seas, focusing on marine biodiversity and marine ecosystem conservation, restoration and sustainable management. The MSFD requires the adoption of an ecosystem based approach to the management of seas. NbS can be used to fulfil its objectives.

The Maritime Spatial Planning Directive adopted in 2014 aims to promote the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources by setting a legal framework for maritime spatial planning. By referring to ecosystem-based approaches, this instrument advances the implementation of NbS.

The Nature Restoration Regulation, adopted in June 2024, sets legally binding targets for restoration of ecologically important habitats on land and at sea, and for rivers, agricultural land, forests, pollinators, and urban areas. It explicitly recognises the importance of NbS to build resilience, fight the climate crisis, benefit biodiversity and support the delivery of a range of ecosystem services.

EU Green Deal policies: The EU Biodiversity Strategy to 2030 published in 2020 is the EU policy instrument that implements the Global Biodiversity Framework, dedicated to protecting and enhancing biodiversity in the EU. The strategy explicitly refers to NbS as nearly all of its objectives hinge upon the implementation of NbS across diverse ecosystems.

The Forest Strategy 2030 published in 2021 aims to improve the quantity and quality of EU forests by protecting and restoring forest ecosystems, which supports NbS implementation.

The EU Pollinator Initiative launched in 2018 focuses on addressing the challenges contributing to pollinator decline. The emphasis on preserving and restoring natural habitats for pollinators aligns with the principles of NbS and directly supports and restores the pollination of crops (supporting food security) and pollination of wild plants (supporting all the ecosystem services provided by vegetation).

Picture: https://unsplash.com/fr/photos/champignon-brun-sur-mousse-verte-ywIH9qJhXIU?utm_content=creditShareLink&utm_medium=referral&utm_source=unsplash

UN Convention on Biological Diversity and Global Biodiversity Framework

Name of policy: UN Convention on Biological Diversity (UNCBD) and Kunming-Montreal Global Biodiversity Framework (CBD, 2022).

Short description of policy: The Convention on Biological Diversity is dedicated to promoting sustainable development. Conceived as a practical tool for translating the principles of Agenda 21 into reality, the Convention recognises that biological diversity is about more than plants, animals and micro organisms and their ecosystems. It is about people and our need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live. The Convention was agreed and ratified in 1992.

The Kunming-Montreal Global Biodiversity Framework adopted in December 2022 has established a vision, mission, goals and new targets and strategies for biodiversity conservation and sustainable development towards 2050. It includes stronger provisions for the integration of NbS, emphasising the role of nature-based approaches in addressing biodiversity loss and ecosystem degradation.

Policy category: Regulatory and planning instrument. In the EU, the Convention objectives and targets are implemented through the EU nature directives legal framework and the EU Biodiversity Strategy to 2030.

Type of instrument: International agreement.

Type of support: Strong implicit support in the treaty. Strong explicit support in several of the global biodiversity targets to 2050. Several articles and objectives within the CBD emphasise the importance of ecosystem-based approaches, sustainable land management, and the conservation of biodiversity, all of which are central to the concept of NbS. For example CBD Article 8 (In-situ Conservation), emphasises the importance of in-situ conservation and the establishment of protected areas, reflecting the objectives of preserving ecosystems and habitats, which are central to NbS principles.

Type of NbS concerned: Protection and conservation, restoration/creation, sustainable use and management (forests).

Relevance for NbS: High. NbS have potential to contribute to the conservation and sustainable use of biodiversity, as well as the achievement of the CBD's objectives and targets. NbS can support the CBD's mission to promote the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the utilisation of genetic resources.

All the articles, goals and targets of the treaty and the Kunming-Montreal agreement are relevant, but some articles more explicitly address the role of NbS.

In the Convention on Biological Diversity (1992):

- **Article 8:** (In-situ Conservation) emphasises the importance of in-situ conservation measures, including the establishment and management of protected areas and the restoration of degraded ecosystems. NbS interventions that focus on ecosystem restoration, habitat conservation, and the protection of biodiversity hotspots align with the objectives of Article 8, contributing to the in-situ conservation of biodiversity;
- **Article 10:** (Sustainable Use of Components of Biological Diversity) highlights the need to promote the sustainable use of biological resources while ensuring the conservation of biodiversity. NbS projects that prioritise sustainable land management, sustainable forestry practices, and the sustainable utilisation of natural resources support the objectives of Article 10, promoting the sustainable use of components of biological diversity;
- **Goal A:** (Address the Underlying Causes of Biodiversity Loss) focuses on addressing the root causes of biodiversity loss, including unsustainable land use, habitat degradation, and pollution. NbS interventions that target the restoration of degraded ecosystems, the promotion of sustainable agriculture, and the enhancement of ecosystem services contribute to achieving Goal A, addressing the underlying drivers of biodiversity loss;
- **Goal C:** (Improving the Status of Biodiversity by Safeguarding Ecosystems, Species, and Genetic Diversity) emphasises the importance of safeguarding ecosystems, species, and genetic diversity through conservation and restoration measures. NbS projects that prioritise the conservation of critical habitats, the protection of endangered species, and the restoration of biodiversity-rich ecosystems contribute to achieving Goal C, promoting the improved status of biodiversity.

In the Kunming-Montreal Global Biodiversity Framework (2022):

- **Target 8:** aims to minimise the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through NbS and/or ecosystem-based approaches, while minimising negative and

fostering positive impacts of climate action on biodiversity;
- **Target 11:** aims to 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 NbS and/or ecosystem-based approaches for the benefit of all people and nature;
- **Target 12:** aims to enhance green spaces and urban planning for human well-being and biodiversity, by mainstreaming the conservation and sustainable use of biodiversity, and ensure biodiversity-inclusive urban planning, enhancing native biodiversity, ecological connectivity and integrity, and improving human health and well-being and connection to nature and contributing to inclusive and sustainable urbanisation and the provision of ecosystem functions and services.

Societal challenges addressed: Climate Resilience, Biodiversity Enhancement.

Funds/programmes: The Global Environment Facility (GEF) provides funding for NbS in line with the global targets, and promotes NbS initiatives, for example to increase investment in nature-based infrastructure that can help adapt to the impacts of climate change. In the EU, funding is provided through the EU budget (see EU Biodiversity Strategy).

Target stakeholder category: Local and subnational governments and public authorities, society at large, natural resource managers and landowners.

Gaps/barriers identified: One of the barriers is the limited implementation framework and legal power of the CBD. In August 2023, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) recommended Parties to integrate NbS and ecosystem-based approaches to climate change adaptation, mitigation and Disaster Risk Reduction (DRR) into their revised NBSAPs and ensure synergies with nationally determined contributions and national adaptation plans (Aubert and Dudley, 2023). However, as of 2023, the targets 8 and 11 that are particularly relevant to NbS appear to have received less focus and scrutiny than the other targets due to their perceived vagueness and lack of quantified and timebound objectives (Aubert and Dudley, 2023).

The integration of NbS into national biodiversity strategies often lacks clear and standardised implementation frameworks, hindering the systematic incorporation of NbS principles into biodiversity conservation and management plans. While the importance of NbS is acknowledged, limited financial resources and inadequate investment in biodiversity conservation and restoration projects can constrain the scale and scope of NbS implementation, particularly in regions with limited funding and economic resources.

In recent submissions to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), global non-government organisations called attention to the need for strong social and ecological safeguards in the implementation of NbS, including on respecting, protecting, promoting and fulfilling human rights, such as those of indigenous peoples and local communities, women and young people (SBSTTA 25 conclusions (UN, 2023)).

Expected developments: The Parties meet in October 2024 at COP16 to discuss progress on the agreement and to undertake a global analysis of their revised National Biodiversity Strategies and Action Plans (NBSAPs).

Habitats and Birds Directives

Name of policy and link to official documents:

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Council Directive 79/409/EEC; Council Directive 2009/147/EC).

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. (Council Directive 92/43/EEC).

Short description of policy: The Birds Directive and the Habitats Directive are referred to as the EU Nature Directives and form the backbone of the EU legislative framework for nature conservation. Both policies are implemented in close coordination in the form of the Natura 2000 network of protected areas.

The Birds Directive was adopted in 1979 and amended and consolidated in 2009. The Birds Directive organises the protection, conservation, exploitation, and control of native wild bird species in the EU. It sets out legal protection for all bird species, including their eggs and nests, and mandates the conservation and restoration of their habitats and biotopes. The directive contains derogations within which exploitation (i.e. hunting) of identified bird species is permitted. The Birds Directive commands the designation of Special Protection Areas (SPA) to protect and ensure the recovery of endangered bird species. These protected areas are part of the EU Natura 2000 Network together with sites designated under the Habitats Directive.

The EU Habitats Directive was enacted in 1992 (with several amendments to accommodate EU enlargements). The Directive aims to:

- Ensure that the environmental conditions of natural habitats and species of wild fauna and flora are maintained or restored to a level deemed of favourable conservation status within the EU biogeographical regions.
- Put in place a well-connected ecological network across Europe – known as Natura 2000 - which encompasses Special Areas of Conservation (SACs) and the Birds Directive sites (SPAs).
- Ensure that any plans or projects that could potentially compromise these areas are subject to thorough scrutiny regarding their environmental impact before their implementation.
- Provide strict protection for species and their habitats that are endangered or otherwise in need of protection.

The Directive defines a list of 252 habitats (such as forests, marshes, coastal formations, and reef structures), and over 1 500 species of European conservation concern that are to be given special attention to address their conservation needs. EU Member States are tasked with taking proactive measures to either maintain or enhance the conservation status of these habitats and species, including the creation of SACs designated for their protection and the prevention of their degradation or significant disruption.

The nature directives establish ecological conservation measures that impact multiple sectors including land management, agriculture, forestry, recreation, and urban planning. They are a cornerstone of the EU biodiversity policy and is a crucial regulatory instrument to achieve the EU Biodiversity Strategy for 2030's targets on protecting and restoring nature (European Commission, 2017).

Policy category: Regulatory instrument.

Type of instrument: Directive.

Type of support: Strong implicit. The nature directives do not explicitly refer to NbS as they pre-date the birth of the concept, but they implicitly support NbS interventions through the focus on conservation, protection, enhancement and maintenance of the environmental conditions of natural habitats and species of wild fauna and flora. The Habitats Directive specifies that implementation '*takes account of economic, social and cultural requirements and regional and local characteristics*'. The Birds Directive specifies that the measures correspond to *'ecological, scientific and cultural requirements, taking account of economic and recreational requirements'*. The Action Plan for nature, people and the economy adopted in 2017, in response to the 2015 Nature Directives fitness check, highlighted NbS as crucial for boosting the implementation of the directives (European Commission, 2017).

Type of NbS concerned: Protect and conserve, restore and create, sustainably manage.

Relevance for NbS: Highly relevant. The Habitats Directive is fundamentally aligned with the principles of NbS as both aim to protect biodiversity and ensure the conservation and restoration of natural habitats and species in a way that is aligned with sustainable development. The objectives of the Habitats Directive can be effectively implemented through NbS. For example, the restoration of degraded ecosystems (e.g., wetlands or forests) not only provides biodiversity benefits by supporting habitats recovery, but also provides ecosystem services and resilience benefits like flood mitigation and climate regulation, target goals of NbS actions.

The Birds Directive explicitly sets mandatory requirements for the protection, maintenance, restoration and creation of biotopes and habitats of bird species. These actions (creation of protected areas, ecosystem restoration, creation of natural spaces etc.)

are types of NbS and/or can be achieved through NbS. Article 3 has the most relevance for NbS, with the following provisions:

- For all wild bird species, Member States must preserve, maintain and re-establish birds' habitats to ensure a sufficient diversity and area of habitats;
- The preservation, maintenance and re-establishment of biotopes and habitats shall include primarily the creation of protected areas, upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones, re-establishment of destroyed biotopes, and creation of biotopes.

Societal challenge addressed: Climate Resilience, Water Management, Land and Green Space Management, Place Regeneration, Knowledge, and Social Capacity Building for Sustainable Transformation, Biodiversity Enhancement.

While the directives do not directly address issues like food security, social justice, and new economic opportunities, the conservation and sustainable use of natural habitats and species can indirectly support these areas by maintaining ecosystems that are vital for agriculture, fostering social inclusion through access to natural spaces, and potentially creating jobs in conservation and eco-tourism. Additionally, healthy ecosystems contribute to health and well-being, including air quality, by providing services such as air purification and disease regulation.

Funds/programmes envisaged to support the policy: The EU funds are committed to supporting the nature directives, as all funding programmes must take into account the national Prioritised Action Framework for Natura 2000 and Green Infrastructure (PAF). Each Member States must produce such a PAF before the programming of each EU budget cycle (the MFF). The PAF must detail the funding needs for the Natura 2000 network, habitats and species, and the green infrastructure needs outside the network that is needed to restore and maintain habitats and species to favourable conservation status, as well as the research, communication, and governance needs. The PAFs submitted by Member States for the 2021-2027 MFF prioritised these EU funds: CAP (European Agricultural Fund for Rural Development), European Regional Development Fund, Interreg and Cohesion Fund, LIFE, European Maritime and Fisheries Fund. In addition, national and regional funds remain very important.

Target stakeholder category: National and EU-level policymakers, specifically the competent authorities within each Member State and the Commission.

Gaps/barriers identified: Major funding gaps and shortages to achieve the objectives of the nature directives exist. There are barriers to accessing available EU funding, gaps in evidence of funding effectiveness and efficiency towards fulfilling the objectives of the directives (European Commission DG ENV, 2022). Making support for NbS more explicit in the implementation of the nature directive would reinforce their role in conservation strategies, ensuring that NbS are prioritised and integrated. It would also enhance access to funding, encourage stakeholder collaboration, and promote the development of specific NbS indicators for better monitoring and evaluation of conservation efforts.

Expected developments: The EU Nature Restoration Law sets legally binding time-bound targets for the restoration and recreation of the habitats and habitats of species covered by the EU nature directives, as well as targets for monitoring and filling knowledge gaps. It will therefore strengthen the implementation of the directives. The Biodiversity Strategy for 2030 sets targets to upscale delivery of the Nature Directives, in particular the completion of the Natura 2000 Network with the aim to achieve 30% protected land and 30% protected sea, with 10% of strictly protected areas, as well as more effective management of sites, and species-specific protection measures. Member States have been preparing voluntary pledges that state how they are going to meet these targets by 2030. The strategy also commits the EU and Member States to unlock at least €20 billion a year to step up finance for biodiversity conservation and restoration, including funding to achieve full enforcement of the Nature Directives. This is relevant for the mainstreaming of biodiversity in EU funds (see sections on the Common Agricultural Policy and the financing section).

Marine Strategy Framework Directive

Name of policy: Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). (Directive 2008/56/EC).

Short description of policy: The Marine Strategic Framework Directive (MSFD) was adopted in June 2008 for the conservation of marine ecosystems and biodiversity to sustain human health and social economic activities depending upon the marine environment. The MSFD sets a target of 'Good Environmental Status' which must be achieved in EU marine waters by 2020. Each Member State is required to prepare and implement one or more marine strategies for its marine waters, in cooperation with other Member States sharing the same marine region or subregion. Strategies include an assessment of the state of the marine environment, definitions of good environmental status, and monitoring and targets towards achievement of such environmental status. The Directive is implemented over six-year cycles where Member States are required to review and update the strategies and submit them to the Commission, and the Commission is required to publish evaluation reports. The second round of strategies cover the period 2018 to 2023. The Commission presented the report on the first implementation cycle in 2020 (European Commission, 2020c).

Policy category: Regulatory instrument.

Type of instrument: Directive.

Type of support: Strong implicit support. The text does not mention NbS explicitly but aims at the conservation, restoration and sustainable use of marine ecosystems to restore and maintain their good environmental status, which supports NbS. The MSFD promotes the use of an 'ecosystem-based approach,' which has been defined as *"an interdisciplinary management approach that acknowledges the complex nature of ecological systems and integrates social, ecological, and governance principles to achieve a sustainable use of natural resources in an equitable way*" (Farmer et al., 2012). The ecosystem-based approach is considered to be under the umbrella of the NbS concept.

Type of NbS concerned: Protect and conserve (e.g. marine protected areas), restore and create, sustainably use and manage.

Relevance for NbS: High relevance. The directive focuses on marine biodiversity and marine ecosystem conservation, restoration and sustainable management, hence, there is high potential to use NbS to fulfil the objectives set out in the MSFD. The conservation, restoration and sustainable management of marine ecosystems supports NbS implementation, such as increasing carbon storage through restoration of seagrass meadows, and protecting coastal settlements and infrastructure against climate change impacts through restoration of estuarine and coastal habitats.

Societal challenge addressed: Water Management (coastal), Biodiversity Enhancement, Climate Resilience, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Wellbeing and Air Quality, Food Security, Knowledge, and Social Capacity Building for Sustainable Transformation.

Funds/programmes envisaged to support the policy: LIFE+, Horizon Europe, European Structural and Investment Funds including the European Maritime and Fisheries Fund and regional funding, neighbourhood policy funding, Partnership Instrument funding, development funding.

Target stakeholder category: National and EU-level policymakers, infrastructure planners and developers, natural resource managers.

Gaps/barriers identified: The European Court of Auditors in 2020 highlighted the following gaps with regard to the MSFD and its implementation (European Court of Auditors, 2020):

- Knowledge gaps including a lack of data available on MS marine waters, and lack of important ecological dimensions in the indicators of good environmental status (for example, absence of consideration of microbial communities);
- Lack of sufficient measures (and lack of funding thereof) to attain good environmental status;

- Lack of engagement of economic and private stakeholders beyond public authorities;
- Lack of policy coherence (e.g. with the Common Fisheries Policy).

Expected developments: The third cycle of implementation of the directive started in 2024 and Member States should now be in the process of reviewing and renewing their marine strategies and programmes of measures. The Commission is currently assessing the reports received on the second MSFD implementation cycle (2018-2023). The EU Nature Restoration Law adopted in 2024 sets legally binding time bound targets for the restoration and recreation of marine habitats and habitats of species, including many of the habitats and species protected by the EU regional seas conventions and/or the EU regulation on reducing bycatch.

Maritime Spatial Planning Directive

Name of policy: Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning (MSP) (Directive 2014/89/EU).

Short description of policy: The Directive on Maritime Spatial Planning (MSP) was adopted in 2014 and establishes a framework for MSP. It is aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources. The framework provides for the establishment and implementation by Member States of maritime spatial planning that takes into account land-sea interactions and enhance cross-border cooperation, in accordance with relevant Unclos provisions. The Directive stipulates that the sustainable development of maritime sectors must be in accordance with the achievement of a good environmental status of EU seas under the MSFD. The MSP process should regulate maritime activities, resolve conflicts, and enforce management measures that support the ecosystem-based approach. The MSP should therefore be in line with the MSFD programmes of measures.

By March 31, 2021, Member States were required to submit their maritime spatial plans outlining existing human activities within their marine waters and strategising for their effective spatial development in the future. These plans should incorporate considerations of economic, social, environmental and safety aspects to support sustainable development and growth in the maritime sector, applying an ecosystem-based approach, and promoting the coexistence of relevant activities and uses (multi-use) within their marine waters.

Policy category: Regulatory instrument.

Type of instrument: Directive.

Type of NbS concerned: The sustainable management of marine ecosystems through an ecosystem-based approach, ecosystem protection, conservation and potentially restoration.

Type of support: Strong implicit support. The MSP directive does not explicitly refer to NbS but does promote the *"preservation, protection and improvement of the environment"* through the application of an ecosystem-based approach adapted to the specific ecosystems and other specificities of the marine regions. Considering that NbS is an umbrella concept that covers ecosystem-based approaches, the development and implementation of an ecosystem-based marine spatial planning advances the implementation of NbS in the maritime space. The Commission published guidance in 2021 to support the implementation of an ecosystem-based approach in MSP (European Commission et al., 2021). The guidance defines the components of the ecosystem-based approach, provides a step by step approach for implementing EbA and encourages Member States to monitor the progress towards integrating EbA in their plans.

Societal challenges addressed: Climate Resilience, Water Management (coastal), Food security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Participatory Planning and Governance, Natural and Climate Hazards, Health and Well-being and Air Quality, Knowledge, and Social Capacity Building for Sustainable Transformation, Biodiversity Enhancement.

Relevance for NbS: High. The objectives of the MSP Directive can be achieved through NbS. NbS implementation in the coastal and/or maritime

space directly contribute to the achievement of the Directive's objectives (Vassilopoulou, 2021b).

Funds/programmes envisaged to support the policy: European Structural and Investment Funds, including European Maritime, Fisheries and Aquaculture Fund (EMFAF) for capacity development and cross-border cooperation, Horizon Europe for research and innovation projects, Erasmus+ for higher education and Interreg for regional cooperation.

Target stakeholder category: National and EU-level policymakers, local and subnational governments and public authorities, educators, education institutions and students, NbS investors and entrepreneurs.

Gaps/barriers identified: According to the Commission progress report on the implementation of the MSP Directive in 2022, one of the main challenges is the collection of data and the coordination required for meeting the multiple objectives of the Directive (European Commission, 2022b). The report notes challenges in relation to implementing the ecosystem-based approach.

A recent NGO assessment of the plans concluded that none of the plans are sufficient to meet EU climate and nature restoration goals (WWF, 2024). It should however be kept in mind that accounting for climate change in marine planning is a big challenge involving dealing with considerable environmental uncertainties. Guidances and knowledge are being generated to account for it (see below) (Vassilopoulou, 2021a)

Expected developments: The 22 EU coastal Member States must review their national maritime plans by 2030 as required. Within this period, Member States have the flexibility to review their plans as they see fit. DG-MARE and IOC-UNESCO have developed guidance for Member States to incorporate climate change considerations into MSP objectives and assessments, through for example the development of guidance on climate-smart MSPs (Action XII) (Vassilopoulou, 2021).

EU Biodiversity Strategy for 2030

Name of policy and link to official document: EU Biodiversity Strategy for 2030 (COM/2020/380) (European Commission, 2020a).

Short description of policy: The EU Biodiversity Strategy for 2030 was published in May 2020, replacing the strategy adopted in 2011. It sets out the commitments of the EU and Member States to the UN Convention on Biological Diversity. This strategy is one of the flagship initiatives of the EU Green Deal. It establishes a plan for EU-level action to reverse biodiversity loss and protect Europe's nature over the decade. The strategy considers all five drivers of biodiversity loss and seeks to address the range of threats facing the EU's ecosystems and species. Biodiversity conservation and restoration is pursued in line with climate commitments, the UN Sustainable Development Goals, and with the aim to improve the resilience of ecosystems to cope with natural disasters and deliver key ecosystem services to EU citizens. The strategy contains a set of commitments and actions, including a policy framework for implementation.

The strategy includes commitments and targets to:

- Enlarge the network of protected areas to legally protect at least 30% of the EU's land area and 30% of the EU's sea area;
- Strictly protect 10% of the network in areas of very high biodiversity value or potential, including all remaining old-growth forests;
- Effectively manage all protected areas;
- Restore the EU's terrestrial and marine ecosystems with a Nature Restoration Plan with legally binding targets for restoration with the objectives to:
    - Restore large portions of degraded and carbon-rich ecosystems;
    - Ensure habitats and species show no deterioration in conservation trends and status, and a minimum of 30% reach favourable conservation status or at least show a positive trend;
    - Reverse the decline in pollinators;
    - Halve the risk and use of pesticides;
    - Achieve a minimum of 10% of agricultural area under high-diversity landscape features, a minimum of 25% of agricultural land under

organic farming, and accelerate the uptake of agro-ecological practices;
- Plant 3 billion trees in full respect of ecological principles;
- Achieve significant progress for the remediation of contaminated soil sites;
- Restore a minimum of 25,000 km of free-flowing rivers;
- Halve the number of Red List species threatened by invasive alien species;
- Halve nutrient losses from fertilisers to reduce fertilisers by at least 20%;
- Cities with over 20,000 inhabitants have an ambitious Urban Nature Plan;
- Phase out chemical pesticides in sensitive areas such as EU urban green areas;
- Substantially reduce negative impacts on sensitive species and habitats, including on the seabed through fishing and extraction activities, to achieve good environmental status;
- Eliminate or reduce by-catch of species to a suitable level for species recovery and conservation;
- Set out a new comprehensive biodiversity governance framework for transformative change.

Policy category: Planning instrument.

Type of instrument: Strategy.

Type of support: Strong explicit. There are explicit and repeated references to NbS. The strategy also explicitly refers to and supports many NbS interventions including ecosystem protection, restoration, sustainable management, etc. in application to a variety of ecosystems (forests, freshwater, marine, urban, agricultural, etc.).

Type of NbS concerned: Ecosystem protection and conservation, restoration, creation and sustainable management.

Relevance for NbS: Highly relevant. NbS are crucial tools in achieving the majority of, if not all, objectives of the strategy. Given these considerations, the EU Biodiversity Strategy for 2030 is assessed as showing strong explicit support for NbS for CCA and DRR (EEA, 2021).

Some of the most relevant developments for NbS include:

- In 2021, the Commission has issued guidance for the designation of additional protected areas in the EU. 'Nature Dialogues' are conducted with Member States for the designation of new Natura 2000 sites with a special focus on filling the gaps for marine protected areas;
- The EU Commission has set out an EU Organic Action Plan which was approved in March 2021;
- The Commission issued a proposal for an EU Forest Strategy for 2030 which was adopted in July 2021 (described in full below);
- In June 2022, the EU Commission published a proposal for an EU Nature Restoration Law. After approval by the European Parliament in February 2024, the European Council gave a final approval to the law on June 17 2024 (described in full in this chapter);
- The Commission evaluated the Directive on the sustainable use of pesticides, and, in June 2022, it proposed a new Regulation on the sustainable use of plant protection products as well as an Impact Assessment. The proposal was withdrawn by the Commission in May 2024;
- The Commission issued a proposal for a Directive on Soil Monitoring in July 2023 as part of the implementation of the EU Soil Thematic Strategy released in November 2021 (described in full below);
- An online Urban Nature Platform has been created in 2021 to support cities in preparing their Urban Nature Plans (described in full in this chapter);
- The EU Pollinators Initiative has been revised in January 2023 and it is now in the implementation phase (described in full in this chapter);
- An EU Action Plan: Protecting and Restoring Marine Ecosystems for Sustainable and Resilient Fisheries was adopted in February 2023.

One of the strategy's goals is to unlock at least EUR 20 billion a year for spending on nature, coming from, for example, InvestEU (NbS for a green recovery), 25 % of the EU budget dedicated to climate action (largely through ecosystem restoration) and public authorities (e.g. green public procurement).

Societal challenge addressed: Biodiversity Enhancement, Climate Resilience, Food Security,

Green Space Management, Water Management, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Well-being and Air Quality.

Funds/programmes envisaged to support the policy: CAP, LIFE, Horizon Europe, Cohesion Policy Fund, European Maritime and Fisheries Fund, and other EU funds.

Target stakeholder category: Local and subnational governments and public authorities, national and EU-level policymakers, natural resource managers and forest owners, NbS investors and entrepreneurs.

Gaps/barriers identified: Gaps have been identified with regard to the content and delivery of the strategy, most specifically on finance. An EU review of biodiversity finance and tracking has highlighted substantial finance gaps. While the strategy contains a commitment to unlocking EUR 20 billion a year, it was estimated that the financing needs to fulfil the objectives of the strategy amounted to nearly EUR 48 billion a year, resulting in a funding gap of EUR 19 billion a year to deliver the strategy (European Commission Directorate-General for Environment et al., 2022). Others have pointed to the lack of a binding spending target for biodiversity finance in the EU budget and gaps in commitments to phasing out biodiversity-harming subsidies (European Commission Directorate-General for Environment et al., 2022).

Expected developments: The EU Commission has set out a dashboard and an actions tracker for the implementation of EU BDS actions. Some relevant ongoing or upcoming actions:

- The Commission is working towards unlocking at least EUR 20 billion per year for biodiversity and to invest a significant proportion of the EU budget dedicated to climate action in biodiversity and NbS;
- The Commission is revising criteria and monitoring of EU Green Public Procurement to promote NbS.

In 2024, the Commission will provide a detailed assessment on progress achieved in delivering the Biodiversity Strategy.

Forest Strategy for 2030

Name of policy: EU Forest Strategy for 2030 (European Commission, 2021b).

Short description of policy: The EU Forest Strategy to 2030 was published in July 2021 by the Commission. It replaces the strategy adopted in 2013, building on its evaluation in 2018. The strategy is one of the flagship initiatives of the EU Green Deal contributing to both biodiversity and climate commitments. It connects to the EU Biodiversity Strategy for 2030. It aims to improve the quantity and quality of EU forests by protecting and restoring forest ecosystems, increasing their resilience and adaptation to climate change, ensuring their multifunctionality is preserved, and promoting their sustainable use so they continue to deliver social economic benefits. To achieve this, the strategy proposes commitments and actions to be delivered by the Commission, as well as a policy framework to deliver on these.

The strategy commits to an action to implement the pledge to plant 3 billion additional trees by 2030 in the EU.

Some of these components of the EU Forest Strategy are now legally binding targets in the new EU Nature Restoration Law (see section on NRL in this chapter). The NRL requires Member States to put in place measures to enhance biodiversity of forest ecosystems, achieve an increasing trend for the common forest bird index, and achieve an increasing trend for at least 6 of the 7 indicators selected for forest ecosystems. The law also requires commitments to contribute to the EU goal of planting at least 3 billion additional trees by 2030.

Policy category: Planning instrument.

Type of instrument: Strategy.

Type of support: Medium implicit support. The text does not refer explicitly to NbS but does mention and promote NbS components (i.e. protection, restoration, and sustainable management of forest ecosystems).

Which NbS are concerned: Forest protection and conservation, restoration and creation, and sustainable use and management.

Relevance for NbS: Medium relevance. The most NbS relevant policy measures mentioned in the strategy are the following:

- Ensure forest restoration and sustainable forest management for climate adaptation and forest resilience. The legally binding forest restoration targets under the EU Restoration Law will contribute to this (see section on nature restoration law);
- Re- and afforest biodiverse forests;
- A roadmap for planting at least 3 billion additional trees in full respect of ecological principles, as pledged under the 2030 BDS;
- Protect the EU's remaining primary and old-growth forests;
- Create financial incentives to improve forest quality and quantity;
- Enhance forest monitoring, reporting and data collection with the preparation of a proposal for a new EU Framework for Forest Monitoring and Strategic Plans;
- Develop definitions and guidelines for closer to nature forestry (Closer-to-Nature Forestry guidelines (2023)).

Societal challenge addressed: Climate Resilience, Biodiversity Enhancement, New Economic Opportunities and Green Jobs, Natural and Climate Hazards.

Funds/programmes envisaged to support the policy: LIFE, CAP, ESF+ (European Social Fund Plus), Cohesion Policy, Horizon Europe, EU cross border cooperation programs (Interreg).

Target stakeholder category: Local and subnational governments and public authorities, national and EU-level policy-makers, natural resource managers and forest owners.

Gaps identified: Difficulties regarding implementation due to the diversity of ownership structures across the landscape and diversity of stakeholders and actors involved, which makes concerted efforts challenging. The afforestation target is contested, considering the lack of scientific evidence backing massive planting and whether trees will effectively be planted in full respect of ecological principles.

There is no additional funding dedicated to the implementation of the strategy.

Expected developments: The Commission published a proposal for a regulation to improve the monitoring and health of forests in November 2023.

EU Pollinators Initiative

Name of policy: EU Pollinators Initiative: a new Deal for Pollinators (COM(2018) 395 final and COM/2023/35 final) (European Commission, 2023c).

Short description of policy: The EU Pollinator Initiative was launched by the Commission in 2018 and revised in 2023. It aims to counter the decline of wild pollinators in the EU, with three main objectives to be achieved by 2030: (I) Improving knowledge of pollinator decline, its causes and consequences, (II) Improving pollinator conservation and tackling the causes of their decline, and (III) Mobilising society and promoting strategic planning and cooperation at all levels. First, it emphasizes research and monitoring to understand the factors behind pollinator decline and assess population trends. Secondly, the initiative promotes habitat restoration by preserving natural spaces, creating urban green areas, and encouraging sustainable agricultural practices. In addressing the impact of pesticides on pollinators, the initiative advocates for the regulation and reduction of harmful pesticides while endorsing the adoption of more pollinator-friendly alternatives. Public awareness is a component, aiming to educate the public about the pivotal role of pollinators in ecosystems and food production. The initiative emphasizes collaboration among diverse stakeholders, including governments, farmers, scientists, and the public. This collaborative approach is considered essential to effectively address the complex challenges contributing to pollinator decline.

The EU Pollinator Monitoring Scheme was initiatied in 2020 and is being rolled out in Member States with the aim of establishing EU wide pollinator monitoring by 2026 (Potts et al., 2020). The initial roll out is being supported by an EU grant from the European Parliament and Horizon projects.

Policy category: Planning instrument.

Type of instrument: Set of proposals and strategies.

Type of support: Strong implicit.

Type of NbS concerned: Ecosystem protection, conservation and restoration.

Relevance for NbS: Medium. NbS is not directly mentioned, but the initiative does mention specific types of NbS such as green walls and roofs or broader terms such as agroecology that fall under the NbS umbrella concept. This leads to the assumption that NbS will play an essential role in achieving the goals of the initiative. The emphasis on preserving and restoring natural habitats for pollinators aligns with the principles of NbS. Creating green spaces and corridors (Buzz Lines) in urban areas and beyond (the revision from 2023 mentions public parks, private gardens (also in rural areas), urban farms, and green walls and green roofs) are an essential part of the initiative. Further, the initiative promotes sustainable agricultural practices, specifically mentions agroecological approaches, pollinator-friendly management and low use of pesticides, these are also potential areas where NbS could be integrated.

Societal challenge addressed: Food Security, Health and Well-being and Air Quality, Green Space Management, Place Regeneration, Biodiversity Enhancement.

Funds/programmes envisaged to finance the policy: Horizon projects (e.g. Safeguard), the CAP instruments (national apiculture programmes, eco-schemes, rural development, etc), ERDF Interreg, LIFE projects.

Target stakeholder category: All but primarily natural resource managers and landowners.

Gaps/barriers identified: The NGO feedback on the initial framework from 2018 (A Rocha et al., 2023) identified some weaknesses:

- No explicit link between integrated pest management (IPM) and NbS (Egan P et al., 2021);
- Specifics on NbS implementation are missing, despite the broad alignment with NbS;
- There is no dedicated funding for the planned actions – with the exception of EU Parliament funding for the roll out of pollinator monitoring.

Expected developments: The working group for pollinators is the main governance platform for the Pollinators Initiative under the EU Biodiversity Platform. It is setting up subgroups to work on specific objectives of the initiative, particularly on the buzzing lines action, integration with the CAP, and monitoring.

The newly adopted Nature Restoration Law Article 10 requires Member States to improve pollinator diversity and reverse the decline of pollinator populations at the latest by 2030, by putting in place appropriate and effective measures (see description of NRL in this chapter). It also commits the Commission to establishing EU pollinator monitoring and reporting.

Nature Restoration Law

Name of policy and link to official document: Regulation on Nature Restoration REGULATION (EU) 2024/1991 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 (((EU) 2024/1991)).

Short description of policy: The Nature Restoration Law constitutes the first ever legal requirement for large-scale nature restoration with the aim of ensuring no further deterioration of protected habitats and species. The law sets specific targets for the habitat types and species under the Habitats Directive, all wild birds (under the Birds Directive), marine habitats and species, pollinators, rivers, forests, agricultural land, and urban areas. In urban areas EU countries shall ensure that by 2030 there is no loss in the total national area of urban green space, and of urban tree canopy cover in urban ecosystem areas compared to 2021. After 2030 they must increase this, with progress measured every six years.

Policy category: Regulatory instrument.

Type of instrument: Regulation.

Type of support: Strong explicit. NbS are mentioned several times in the preamble articles explicitly recognising the importance of NbS to build resilience, fight the climate crisis, benefit biodiversity and support the delivery of a range of ecosystem services. Ecosystem restoration, which provides a wide range of ecosystem services, (e.g. flooding regulation, climate adaptation etc.) and benefits biodiversity, is a subset of NbS.

Type of NbS concerned: Ecosystem protection and conservation, sustainable use and management, restoration and creation.

Relevance for NbS: Hgh relevance. NbS can be an important vehicle for achieving stipulated targets, for example in urban greening.

Societal challenge addressed: Climate Resilience, Water Management, Green Space Management, Place Regeneration, Knowledge, and Social Capacity Building for Sustainable Transformation, Biodiversity Enhancement, Health and Well-being.

Funds/programmes envisaged to support the policy: European Regional Development Fund, LIFE, European Maritime Fisheries and Aquaculture Fund, Interreg, national funding by Member States. The regulation also envisages support from the Common Agricultural Policy and the Common Fisheries Policy, though it does not require Member States to revise their agricultural and fisheries funding programmes and instruments under the MFFP 2021-2027.

Target stakeholder category: National and EU-level policymakers, specifically the competent local and regional authorities within each Member State and the Commission.

Gaps identified:

- Although most of the targets are quantified, in most articles the legal implementation is measured by effort instead of results, as the legal obligation is to put in place measures to achieve the targets;
- Private sector finance/blended finance is needed to complement public funding, which is likely to not be sufficient;
- Need for whole-of government approach, including a strong role and mandate for local and regional authorities (LRA), with formalised governance structures and processes (LBSAPs as reference) for contribution/review/monitoring of National Restoration Plans;
- Requires integration and coherence with local policy, planning frameworks and instruments (e.g. Urban Nature Plans, Green Infrastructure Strategy, building codes, zoning, integration of stipulations in Master Plan);
- Limited skills/expert knowledge: guidance and support on how to prioritise actions based on physical geographies, how to address trade-offs among the different benefits for climate, biodiversity and society; technical support system should offer one-on-one support for municipalities on good practices, technical expertise (habitats, species, ecological networks, preparation of nature restoration plans;
- Lacks a strong mandate for multi-level collaboration: regional structures as a support line for co-finance in municipalities (e.g. Coordination and Regional Development Commissions), streamline priorities among municipalities.

Expected developments: The text was formally adopted by the European Parliament Plenary in February and the EU Council on 17 June 2024. The regulation was published in the EU's Official Journal and is directly applicable in all Member States from 18 August 2024. Member States will be expected to submit their nature restoration plans to the Commission by 1 September of 2026.

Sustainable Food Systems

This section describes policy areas and initiatives within the overarching theme of sustainable food systems and their relevance for NbS.

EU legislation: The Common Agricultural Policy (CAP) is the main policy instrument regulating agricultural land and practices in the EU. CAP schemes and measures have a significant potential to leverage NbS uptake in agricultural ecosystems through eco-schemes and agri-environmental measures. The degree of actual support depends on what decisions the member states have made in their national CAP strategic plans for 2023 to 2027.

The Common Fisheries Policy is the main regulatory instrument for the preservation of fish stocks in the EU, and provides opportunities for NbS deployment for the sustainable management of fish stocks.

EU Green Deal policies: The Farm to Fork Strategy (2020) is an overarching planning instrument that aims at transforming food systems in the EU at various levels, from soil health to citizen consumption.

The EU Bioeconomy Strategy (2018) is informally considered to contribute to the Green Deal through replacement of fossil fuels but it is not a formal part of it. The Strategy aims to strengthen and scale up the bio-based sector and rapidly spread bio-economies across Europe whilst keeping the bioeconomy within safe ecological limits. The scope of the bioeconomy includes most of the EU's ecosystems and nature that are potentially available to deliver NbS. It is currently going through an update.

Common Agricultural Policy

Name of policy: Common Agricultural Policy (CAP) consisting of three regulations:

Regulation 2021/2115 laying down rules for the establishment of Strategic Plans (Regulation (EU) 2024/1468).

Regulation (EU) 2021/2116 on the financing, management and monitoring of the common agricultural policy (Regulation (EU) 2024/1468).

Regulation (EU) 2021/2117 on common organisation of the markets in agricultural products, on quality schemes for agricultural products and foodstuffs, on the definition, description, presentation, labelling and the protection of geographical indications of aromatised wine products and laying down specific measures for agriculture in the outermost regions of the Union (Regulation (EU) 2021/2117).

Short description of policy: The Common Agricultural Policy is the main funding source for agriculture in the EU. The CAP takes up a large share of the EU budget and is the largest EU funding source for biodiversity conservation on farmland. The 2023-27 CAP is based on a 'new delivery model' where Member States must prepare a national CAP Strategic Plan presenting the country's needs for each of the ten specific objectives as well as the interventions they plan to implement to address these needs across both CAP funds. Support for area-based measures on agricultural land is conditional on complying with environmental regulations (statutory requirements) and Good Agricultural and Environment Conditions (GAECs), including GAEC 2 for wetlands and peatlands protection.

The new CAP focuses on performance and results while giving Member States more flexibility on how to achieve the prescribed outcomes. The strategic plans are required to make a significant contribution to the ambitions of the European Green Deal, including the Farm to Fork and Biodiversity Strategies. The main interventions for upscaling NbS in agro-ecosystems are: the new eco-schemes (Article 31), the multi-year environmental and climate-related management commitments (Article 70), and non-productive investments for restoration and habitat creation (Article 73). The GAEC 8 requirement protects landscape features, which provide ecosystem services and networks of nature on farmland.

Policy category: Regulatory instrument.

Type of instrument: Regulation (with planning instrument – CAP Strategic Plans).

Type of support: Strong implicit. There is no explicit mention of NbS but there are numerous examples of farming practices that could be considered as NbS and that are supported by CAP strategic plan interventions. However, Member States have a lot of flexibility to programme interventions towards or away from NbS.

Type of NbS concerned: Agricultural ecosystem protection and conservation, sustainable use and management, and restoration to some extent.

Relevance for NbS: The Common Agricultural Policy (CAP) is highly relevant, given the current negative impacts of agriculture on biodiversity and climate and the importance of nature and ecosystem services for supporting agricultural production and the resilience of agricultural systems in the face of climate change. The 2019 State of the Environment report from the European Environment Agency (EEA) found that agricultural intensification remains one of the main causes of biodiversity loss and ecosystem degradation in Europe (EEA, 2019). The CAP is an important support for NbS for sustainable food systems resilient to climate change. The recent European Climate Risk Assessment points out that the CAP does not address climate risks and adaptation needs adequately, whilst diversifying agricultural approaches and promoting sustainable agricultural models, such as regenerative agriculture, are crucial for increasing adaptive capacity and coping with climate extremes (EEA, 2024). At the same time, the CAP support for intensive farming systems is a continuing driver of agricultural practices that cause continued loss of nature and ecosystem services on farmland, as well as maintaining the impoverished situation of many agricutlural areas, notably through the lack of landscape features such as hedges, field margins, trees, small wetlands. This loss of nature on farmland undermines the basis for NbS and conflicts with NbS objectives.

Both eco-schemes and agri-environmental measures are highly relevant for NbS since Member States must put these schemes in place and dedicate funding envelope to environmental and climate objectives. The eco-schemes are to be fully funded by the EU and take the form of yearly payments to farmers who voluntarily enrol with the aim to reward those farmers who manage land in a nature- and climate-friendly way, and to incentivise the adoption of specific farming practices with higher environmental and animal welfare benefits. Environmental and climate-related management commitments (Article 70) shall be undertaken for a period of five to seven years. These interventions aim to incentivise farmers or other beneficiaries to change or maintain practices that contribute to inter alia climate change mitigation and adaptation, foster the sustainable and efficient management of natural resources, prevent and reverse biodiversity loss.

Result-based scheme design can also be a way to improve uptake of agricultural NbS via the CAP. This approach provides payments based on the outcomes achieved, rather than being prescriptive about the precise practices to be implemented. Such schemes can incentivise uptake as they provide land managers with the flexibility to use their experience, expertise and knowledge of their own land to determine what works best for them in terms of delivering the outcomes required, whether at the farm level or working in cooperation with other farmers at the landscape scale.

Societal challenge addressed: Climate Resilience, Water Management, Food security, Biodiversity Enhancement.

Funds/programmes envisaged to finance the policy:

The CAP funds are:

- European Agricultural Guarantee Fund (EAGF) – funds direct payments (including eco-schemes), sectoral support programmes. 25% of national EAGF budget must be allocated to the eco-schemes;
- European Agricultural Fund for Rural Development (EAFRD) – at least 35% of EAFRD funding must be dedicated to measures relevant for the environment, climate and animal welfare.

The CAP represents an opportunity to upscale investment for NbS and biodiversity in agroecosystems (EIB, 2023). These figures should be nuanced by the fact there is a lack of information on the type of action implemented in different locations, and insufficient monitoring of impacts.

Target stakeholder category: national policy makers, farmers, foresters, natural resource managers and landowners, local and subnational governments and public authorities.

Gaps and barriers identified in relation to NbS: Despite its high relevance for the NbS, and the availability of funding opportunities for NbS through the CAP, many argue that CAP funding is currently

insufficiently directed towards NbS. There is also criticism that the CAP provides environmentally harmful subsidies and negative incentives having harmful impacts on biodiversity and thus undermining NbS (EIB, 2023). The previous CAP (2013-2020) was assessed as providing only medium support for NbS for climate change adaptation and disaster risk reduction, largely because of its expenditure pattern and the limited effectiveness of the greening measures thus far (EEA, 2021). The previous CAP had weak baseline requirements and dedicated insufficient funding to increase the uptake of biodiversity-friendly farming practices (e.g. agro-ecological farming practices and agroforestry) and green infrastructure (e.g. hedgerows, buffer strips, fallow land, extensive pasture) (EEA, 2021).

Despite successive reforms aimed at improving the CAP's impact on the environment, the evidence suggests that the measurable delivery from the CAP on reducing greenhouse gas emissions, protecting biodiversity and curbing impacts on soil and water, has been limited (Bradley and Pagnon, 2023).

The success of the eco-schemes of the current CAP will depend on the attractiveness of the schemes and the payments to farmers, and how far they support a transition to sustainable and climate resilient agriculture systems. It is not yet possible to draw conclusions on the aggregated impact of this CAP. Several preliminary assessments of the CAP strategic plans indicated that many improvements could be put in place for eco-schemes to deliver for biodiversity and climate (there are issues with payment rates, lack of comprehensive set of requirements, advisory services, limited time of application, unambitious design) (EEB and BirdLife, 2022; Midler et al, 2023).

There were improvements in the mandatory environmental standards attached to all payments in this CAP period, but some of these have been weakened by derogations first allowed in 2022 and 2023 and now made permanent in a delegated act (June 2024). In the GAEC 8 standard, the requirement to leave a minimum area of arable land out of production was removed, although Member States are obliged to provide eco-scheme funding for these areas. In the GAEC 7 standard, crop diversification can be allowed instead of crop rotation. In GAEC 6 on soil cover, there is more flexibility on which soils to protect and in which season (Regulation (EU) 2024/1468).

Expected developments:

- CAP Strategic Plans can be amended by the Member States (Article 120 and 119 (2) of the CAP Regulation) and eco-schemes can be reviewed and changed every year, and there is thus scope for a stronger inclusion of NbS. However, this would need political support, sufficient incentives and longer-term commitment.
- The practices which are no longer mandatory under GAEC will require additional incentives under the ecoschemes if farmer uptake is to be maintained, potentially putting demand on increasing the ecoscheme budget by taking away budget from some other part of the CAP plans. It is not yet clear how Member States are adjusting their CAP strategic plans in response to the new regulation.

Common Fisheries Policy

Name of policy: Common fisheries policy (CFP) - Regulation (EU) No 1380/2013 & Regulation (EU) 2019/1241.

Short description of policy: The conservation of marine biological resources is an exclusive EU competence. The CFP is a set of rules for sustainably managing European fishing fleets and conserving fish stocks. The origins of the CFP date back to 1970, when the council adopted the common market organisation putting in place a structural policy for fisheries. The current CFP was adopted in December 2013, and requires fish stocks to be restored and maintained above levels capable of producing the maximum sustainable yield (MSY). The reform also introduced fleet capacity ceilings per EU country in combination with the obligation for EU countries to ensure a stable and enduring balance between fishing capacity and fishing opportunities over time. EU countries may need to develop action plans to reduce overcapacity.

The revised technical measures regulation in 2019 allows EU countries with a fisheries interest in a given sea basin to agree on regional technical measures, adapted to the specific regional circumstances,

including measures to minimise the impact of fishing on the marine ecosystems and environment.

In January 2024, a revision of the fisheries control system entered into force. It aims at improving the tracking of all fishing vessels, electronically reporting all catches, monitoring recreational fisheries, improving (digital) traceability along the supply chain and harmonising sanctions across the EU.

Policy category: Regulatory instrument.

Type of instrument: Regulation.

Type of support: Low implicit support. The regulation does not explicitly refer to NbS, but it supports to some extent the sustainable management of fish stocks since the 2013 CFP reform.

Type of NbS concerned: Sustainable use and management of fish stocks.

Relevance for NbS: Low relevance. The CFP requirement for fish stocks to be above the Maximum Sustainable Yield is the main CFP tool for the conservation of fish stocks. This reform has allowed an increase in biomass in the north-east Atlantic and adjacent seas, although fishing mortality remains high in the Mediterranean and Black Seas. Regional agreements on technical conservation measures could drive the adoption of less damaging fishing gear and fishing restrictions in sensitive areas.

Societal challenge addressed: Food Security, Biodiversity Enhancement.

Funds/programmes envisaged to finance the policy: The CFP is funded via the European Maritime, Fisheries and Aquaculture Fund (EMFAF), which has a budget of EUR 6 billion for 2021-2027.

Target stakeholder category: National authorities, fishers and aquaculture producers, NbS investors and entrepreneurs.

Gaps/barriers identified: Not addressing GHG impacts of fisheries and aquaculture, overexploitation of fishing resources in the Mediterranean and Black Seas despite 2013 reform, not addressing harmful subsidies. Lacks implementation, control and enforcement despite its potential to protect fish stocks.

Expected developments: In June 2024, the Commission announced the launch of a full evaluation of the CFP, *"based on the feedback received on the Fisheries and Oceans package and the obstacles identified by various stakeholders for the smooth transition to the energy efficiency in the sector and for the successful implementation of all CFP elements"* (European Commission COM (2024) 235 final).

Farm-to-Fork Strategy

Name of policy: A Farm to Fork Strategy (COM(2020) 381) (European Commission, 2020b).

Short description of policy: The Farm-to-Fork (F2F) Strategy, put forward in May 2020, is a key component of the European Green Deal, aiming to 'make food systems fair, healthy and environmentally friendly'. The strategy sets concrete targets to transform the EU food system, including a reduction by 50% of the use and risk of pesticides, a reduction by at least 20% of the use of fertilisers, a reduction by 50% in sales of antimicrobials used for farmed animals and aquaculture, and reaching a target of 25% of agricultural land under organic farming. It also proposes ambitious measures to ensure that the healthy option is the easiest for EU citizens, including improved labelling to better meet consumers' information needs on healthy, sustainable foods.

Policy category: Planning instrument.

Type of instrument: Strategy.

Type of support: Medium explicit support. NbS are explicitly mentioned in the strategy as a way for the food system to deliver climate and biodiversity benefits. The F2F notably encourages the implementation of sustainable agricultural practices for managing nutrients excess, recognises the value of organic farming (25% target by 2030), and encourages stronger climate and environmental commitments within the CAP and better management of fish stocks via the CFP.

Type of NbS concerned: Sustainable use and management.

Relevance for NbS: NbS are explicitly recognised for their ability to help deliver better climate and environmental results, increase climate resilience and reduce as well as optimising the use of inputs (e.g. pesticides, fertilisers). NbS are highly relevant for achieving F2F targets as they can be applied for soil health, soil moisture, carbon mitigation (through soil and forestry), downstream water quality protections, biodiversity benefits as well as agricultural production and supply chains to achieve net-zero environmental impacts while achieving food and water security (Miralles-Wilhelm, 2021).

Societal challenge addressed: Climate Resilience, Water Management, Food security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Well-being.

Funds/programmes envisaged to finance the policy: Under the Horizon Europe programme, total funding of EUR 10 billion is proposed for research and innovation on food, the bioeconomy, natural resources, agriculture, fisheries, aquaculture and the environment, as well as on the use of digital technologies and NbS for agri-food systems (El Harrak and Lemaitre, 2023).

Additionally;

- **ERDF** will invest, through smart specialisation, in innovation and collaboration along the food value chains;
- **InvestEU Fund** will foster investment in the agro-food sector by de-risking investments by European corporations and facilitating access to finance for SMEs and mid-cap companies;
- **CAP** must also increasingly facilitate investment support to improve the resilience and accelerate the green and digital transformation of farms.

Target stakeholder category: national authorities, farmers, fishers and aquaculture producers, NbS investors and entrepreneurs.

Gaps/barriers identified: Legislative framework for sustainable food systems (SFS) – Although a flagship of the EGD initially thought to legally support the Farm to Fork Strategy targets, the proposal has been shelved. The SFS is not part of the Commission's work programme for 2024.

Revision of the Sustainable Use of Pesticides Directive (SUD) – In June 2022, the Commission proposed a new Sustainable Use of Pesticides Regulation (SUR) which set legally binding targets at EU level to reduce by 50 % the use and the risk of chemical pesticides as well as the use of the more hazardous pesticides by 2030 (in line with the F2F targets). However, the Commission withdrew its proposal in March 2024 as the negotiations between Parliament and Council did not reach an agreement.

The proposal for a sustainable food systems law would have been an opportunity to more explicitly recognise agricultural NbS approaches, and provide them with an overarching legal framework.

The SUR legal proposal would have been an important legislative driver for the adoption of integrated pest management (IPM) and other low-pesticide farming approaches. IPM NbS components are host plant resistance and tolerance, habitat manipulation, biological control, semiochemical control, and the use of biopesticides; and IPM and other low-pesticide farming methods are a key component of NbS farming systems such as agroecology.

Expected developments: The prospects for re-initiating discussions on an EU legal framework for food systems and/or sustainable use of pesticides are unclear, after the elections in June 2024 changed the composition of the EU Parliament and brought in new right-wing MEPs who strongly oppose this legislation.

EU Bioeconomy Strategy and Action Plan

Name of policy: EU Bioeconomy Strategy (2018) (European Commission Directorate-General for Research and Innovation, 2018) and action plan.

Short description of policy: The 2018 revision of the previous bioeconomy strategy from 2011 was designed to refocus the actions to better support the 2030 Sustainable Development Goals (SDGs), Paris Agreement climate objectives and new EU

policy priorities. The strategy has five objectives: ensuring food and nutrition security; managing natural resources sustainably; reducing dependence on non-renewable, unsustainable resources; mitigating and adapting to climate change; and strengthening European competitiveness and creating jobs. The strategy proposes actions to support rural and coastal development, also in remote areas, to ensure a more proportionate sharing of the benefits of a competitive and sustainable bioeconomy across European territories and value chains. The strategy aims to (European Commission 2018):

Strengthen and scale-up the bio-based sector by:

- Launching a €100 million Circular Bioeconomy Thematic Investment Platform to bring bio-based innovations closer to the market and de-risk private investments;
- Facilitating the development of new sustainable biorefineries across Europe;
- Promoting and developing standards, labels and market uptake of bio-based products, such as the EU Ecolabel or green public procurement.

Rapidly spread bioeconomies across the whole of Europe via:

- A strategic deployment agenda for sustainable food and farming systems, forestry and bio-based products;
- Bioeconomy innovations with pilot actions in rural, coastal and urban areas;
- A policy support facility to help Member States and regions develop and implement their own bioeconomy strategies.

Understand the ecological limitations of the bioeconomy by:

- Implementing an EU-wide monitoring system to track progress towards a sustainable and circular bioeconomy;
- Enhancing our knowledge base and understanding of specific – and today still young – bioeconomy sectors;
- Providing guidance on how best to operate the bioeconomy within safe ecological limits.

Policy category: Planning instrument.

Type of instrument: Strategy.

Type of support: High explicit. The strategy mentions NbS several times. NbS are cited as an opportunity for "*significantly improving the potential for higher resource efficiency, decreased environmental and climate impact, increased resilience and decreased costs.*" NbS for soil pollution and NbS in the field of sustainable urban and regional transformation are also quoted.

It also indirectly supports NbS through the aim to provide guidance on how best to operate the bioeconomy within safe ecological limits, and to implement monitoring, increase knowledge, and promote standards and labels. It also aims to support social and economic development in disadvantaged regions, corresponding to the aim of NbS to address societal challenges.

Type of NbS concerned: Sustainable use and management.

Relevance for NbS: High. The scope of the bioeconomy includes most of the EU's ecosystems and nature that are potentially available to deliver NbS, notably its forests, agricultural land, coasts, and seas. However, the promotion of the bioeconomy is contributing to the rapidly increasing biomass use in the EU, which is undermining the capacity of ecosystems to provide ecosystem services (see gaps below for details).

Societal challenge addressed: Climate Resilience, Water Management, Food Security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Well-being.

Funds/programmes envisaged to finance the policy: Horizon Europe programme research and innovation on food, the bioeconomy, natural resources, agriculture, fisheries, aquaculture and the environment, as well as on the use of digital technologies and NbS for agri-food systems. Recovery and Resilience Facility funding for investments in the bioeconomy. Many other EU funds are also relevant: ERDF, Cohesion, CAP, EMFAF, EU Social Fund+, LIFE.

Target stakeholder category: National authorities, farmers, fishers and aquaculture producers, NbS investors and entrepreneurs.

Gaps/barriers identified: The strategy has been critically reviewed for its failure to achieve and support sustainable biomass use. The bioeconomy stocktaking report stated a need for more focus on achieving social economic and environmental sustainability and proposes that the strategy must provide a framework for resolving trade-offs and conflicts between different demands for biomass, which must include the valuation of ecosystem services (European Commission Directorate-General for Research and Innovation, 2022a). An assessment of the EU bioeconomy by the Joint Research Centre in 2023 concluded that while resource efficiency and energy efficiency is improving, there is a growing pressure on ecosystems from the significantly increasing biomass demand from forestry, agriculture and fisheries, and the associated use of water and energy (Mubareka et al., 2023). The strategy is failing to provide a policy coordination that tackles the multiple pressures on land from biomass demand. These pressures are undermining the capacity of ecosystems to provide ecosystem services. For example, the capacity of Europe's forests to absorb carbon and so mitigate climate change is rapidly being lost partly due to the increasing use of forest biomass. An EEA study finds a potential biomass gap of 40-70% between demand and what can be harvested in the EU sustainably by 2050 (EEA, 2023b). The biomass demands to meet the EU's net zero target by 2050 could also largely exceed the realistically available supply.

Expected developments: An update of the EU bioeconomy strategy is due to be developed during 2025[2]. A recent foresight exercise by the Joint Research Centre put forward recommendations including the need to establish coherent policies, support regional and rural development, invest in education and awareness raising, promote sustainable lifestyles, and engage consumers in the decision-making process (Borzacchiello et al., 2024). The manifesto of the BIOEAST initiative of the Central and Eastern European Member States states that the advancement of bioeconomy research and innovation is imperative for Central and Eastern Europe (BIOEAST, 2024). A revision of policy and increased investment in the bioeconomy is also a request from various stakeholders in land use, including the Special Committee on Agriculture (SCA).

2 EU Ministers called on the Commission to present an updated EU strategy & action plan for the bioeconomy sector in Council conclusions from April 2023 (*8406/23). The Commission communication on boosting biotechnology & biomanufacturing (COM (2024) 137 final) published 20 March 2024 highlights a need to adjust the Bioeconomy Strategy by the end of 2025.

Zero Pollution

Author: IEEP

EU legislation: The Nitrates Directive addresses persistent nitrate pollution from agricultural activities in water bodies, which contributes to the objective of the Water Framework Directive (WFD) to achieve good water quality.

The Water Framework Directive (WFD) adopted in 2000 aims at achieving a good qualitative and quantitative status for all water bodies and provides opportunities to promote NbS that focus on water management, particularly regarding the measures implemented by Member States in catchment management. It recognises the role of natural water retention measures.

The Urban Waste Water Treatment Directive is relevant to the use of NbS addressing wastewater pollution in urban areas.

The Ambient Air Quality Directives address and set standards for air pollution but do not refer to NbS as a pathway to improve air quality.

EU Green Deal policies: The Zero Pollution Action Plan is the overarching planning instrument setting policy targets for achieving zero pollution by 2050, for air, water and soils.

EU legislative proposal: The proposal for an EU Soil Monitoring and Resilience Directive provides a legal framework for soil monitoring. It also contains legal provisions for the management of contaminated sites (although not promoting NbS approaches) and lays out principles for sustainable soil management.

Nitrates Directive

Name of policy: Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC).

Short description of policy: The Nitrates Directive aims to reduce water pollution caused by nitrates used in agriculture. Member States are required to: monitor nitrate concentrations of water bodies and identify waters polluted by nitrates and waters that are eutrophic, designate Nitrate Vulnerable Zones (NVZ), establish codes of good agricultural practices, and implement measures to prevent and reduce water pollution from nutrients especially nitrates. In areas already polluted by nitrates, the directive prescribes maximum amounts of nitrogen to be applied through manure - a maximum 170 kg of organic nitrogen per hectare. The implementation of the Nitrates Directive contributes to achieving the WFD quality target of a nitrage concentration of less than 50 mg/l in groundwater bodies.

Policy category: Regulatory instrument.

Type of instrument: Regulation.

Type of support: Strong implicit. The codes of agricultural practices to be defined by Member States and to be implemented by farmers (voluntarily) include different types of agricultural NbS: manure management, limits for the application of fertilisers, crop rotation and cover cropping. Within the NVZ, these measures are compulsory and must be revised every four years to ensure that they are sufficient to meet the objectives.

Type of NbS concerned: Sustainable use and management.

Relevance for NbS: High relevance. Many of the key interventions to reduce nitrate pollution from farmland and other types of land are NbS or components of NbS: buffer zones and strips, vegetation planting, conservation agriculture and agroecology practices including crop rotation and cover crops and sustainable soil management practices, natural water retention measures, wetlands, and vegetation planting to reduce air pollution.

Societal challenge addressed: Water Management.

Funds/programmes envisaged to finance the policy: There is no dedicated funding for implementation at EU level. Actions can be supported through the CAP strategic plan measures and through national funds. Incentives can also be provided through the use of taxation and other financial instruments.

Target stakeholder category: National and EU-level policymakers, local and subnational governments and public authorities.

Gaps/barriers identified: Despite the legislation addressing nutrient pollution, the average nitrate (NO3) concentration in EU groundwaters did not change significantly from 2000 to 2021 (EEA, 2023). The European Court of Auditors has pointed to implementation gaps in the NVZ designation process, and a consistent lack of ambition in the good agricultural practices guidelines defined by Member States, as well as the very varying degrees of ambition of Member States' nitrates action programmes (European Court of Auditors, 2023).

Expected developments: The Commission held a public consultation on the evaluation of the Nitrates Directive in early 2024, followed by a public consultation on a proposed Commission Directive amending Annex III of the Nitrates Directive, to allow higher nitrate threshold levels linked to the use of Renure – fertiliser made from recovered nitrogen from manure. The next steps of the evaluation will assess if the directive remains fit for purpose.

Ireland and the Netherlands are seeking a prolongation of their derogation to apply more nitrate in manure than the legal threshold in 2024 and 2025, despite the Commission's position that no more derogations will be approved. Denmark, Flanders in Belgium, and two regions in northern Italy have put in place legislation with the aim to meet the threshold after their derogations have ended, but the implementation has been a subject of conflicts within the farming sector, often escalating to the political level.

The Commission's proposal for an Integrated Nutrient Management Action Plan, for which the preparatory public consultation closed in the summer of 2022, has stalled. The environmental NGOs point to the importance of the plan in transitioning the food production system to much lower nutrient inputs and increasing the circularity of nutrient use in the EU (by extracting and re-using nutrients from organic waste streams), which would also cut pollution by other agro-chemicals (pesticides and anti-microbials), and cut water use by the agricultural sector (EEB, 2023).

Water Framework Directive

Name of policy: Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

Short description of policy: The Water Framework Directive (WFD) was adopted in 2000 and came into force in 2003. It is the most important piece of water legislation in the EU. It aims to achieve a good qualitative and quantitative ecological status or potential of all water bodies (including surface waters, groundwaters, transitional and coastal waters). The directive sets the deadline of 2027 to achieve this goal. It outlines the need to protect, enhance and restore functioning ecosystems and water bodies to deliver multiple ecosystem services (Trémolet, 2019). The directive is based on the following principles:

- Integrated water management: considering all aspects of the water cycle and users of water;
- River basin management: water bodies are managed according to their natural boundaries, rather than national borders. Each river basin must have an integrated river basin management plan (RBMP) accompanied by a programme of measures (PoM), and these documents must be revised and renewed on a six yearly cycle;
- Public information and consultation: required in all stages of its implementation, from developing river basin management plans to monitoring and assessing water bodies.

Policy category: Regulatory instrument.

Type of instrument: Directive (with planning instruments RBMPs and PoMs).

Type of support: Medium implicit support.

Type of NbS concerned: Ecosystem protection and conservation, sustainable use and management.

Relevance for NbS: Very relevant. The WFD was adopted before the NbS concept was developed, but many aspects of the directive encourage NbS uptake (like natural water retention measures). Many River Basin Management Plans (RBMPs) for the river basin planning under and associated programme of measures (under MS responsibility) include NbS to

improve the ecological and chemical status of water bodies. According to the Commission review of RBMPs in 2021. 17 Member States have included natural water retention measures to deal with pollution from agriculture in their Programmes of Measures.

Societal challenge addressed: Water Management, Health and Well-being, Air Quality, Knowledge, and Social Capacity Building for Sustainable Transformation.

Funds/programmes envisaged to support the policy: National funding and EU funds. The CAP conditionality standards set minimum requirements for water for all areas receiving CAP payments. The EU water policy objectives are part of one of the CAP's three environmental strategic objectives and therefore CAP measures such as ecoschemes and agri-environment schemes must be programmed to achieve water objectives, including River Basin Management Plan measures.

Target stakeholder category: National and EU-level policymakers, infrastructure planners and developers, natural resource managers and landowners.

Gaps/barriers identified: The Fitness Check of the Water Framework Directive and the Floods Directive (Vermeulen et al, 2019) notes implementation gaps concerning the appropriate incorporation of green infrastructure in both WFD and FD plans and programmes. This implies that NbS could play a more significant role in improving the implementation of the Water Framework Directive.

The impacts of climate change are exacerbating the problems of water pollution. For example, the soil erosion and landslides caused by extreme rainfall events can release large quantities of polluted sediments. Droughts can degrade water quality by stimulating pathogen growth and increasing the concentration of pollutants in water sources (EEA 2024). The WFD and the river basin management plans are still limited in their recognition of the capacity of NbS to contribute to adaptation and disaster risk reduction goals (Vermeulen et al., 2019).

Expected developments: The third river basin management plans and their programmes of measures for the period 2022 to 2027 are essential to achieving the WFD water quality objectives for 2027. However, as of December 2023, five Member States had not yet submitted their final plans to the Commission (EC, 2024e). An evaluation of the available plans is due to be published in early 2025.

The Commission's 2023 communication and recommendation on disaster risk resilience integrates NbS as tools for disaster risk reduction, and Member States are expected to use their river basin management planning to strengthen their climate resilience (see Floods Directive in the climate section). The Commission has recently announced that it will propose an EU initiative on climate resilience addressed at the farming sector, including water resilience.

Urban Waste Water Treatment Directive

Name of policy: Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment (Council Directive 91/271/EEC).

Recast of Directive - agreed text was formally adopted by Parliament on 10 April 2024.

Short description of policy: The Urban Waste Water Treatment Directive (UWWTD), adopted in 1991, addresses pollution which in turn affects the quality of waters for human use, and the status of aquatic ecosystems. The UWWTD requires EU Member States to ensure that cities and settlements properly collect and treat wastewater. The UWWTD requires inter alia the collection and treatment of wastewater in all urban areas, secondary treatment of all discharges from urban areas above the threshold, and more advanced treatment for urban areas of more than 10,000 people in catchments with sensitive waters. It also requires the monitoring of the performance of treatment plants and receiving waters controls of sewage sludge disposal and reuse, and treated wastewater reuse whenever it is appropriate.

The revision of the Directive agreed in April 2024 calls for Member States to establish integrated wastewater management plans, The revision expands its scope to all agglomerations of at least 1,000 population equivalent (increased from the previous threshold of 2,000) and extends the obligation to set up urban wastewater collecting systems

to all agglomerations in the scope of the directive. The text also sets deadlines for member states to establish an integrated urban wastewater management plan covering all agglomerations.

Policy category: Regulation.

Type of instrument: Directive.

Type of support: High explicit support. The revised UWWTD states that Member States integrated wastewater management plans '*should [...] favour Nature-based Solutions over those that would require the establishment of grey infrastructure.*'

Type of NbS concerned: Sustainable management.

Relevance for NbS: Medium relevance. The deployment of NbS could help the achievement of the Directives' objectives. The revised scope will require additional wastewater treatment investments in smaller settlements, opening opportunities to use NbS in new wastewater installations. However, it does not address small settlements and reducing stormwater overflows, where NbS provide cost-effective solutions.

Societal challenge addressed: Sustainable water use and management.

Funds/programmes envisaged to finance the policy: The implementation of the UWWTD requires substantial and continuous investments in infrastructure. Its implementation is strongly supported by EU Cohesion Policy (EUR 38.8 billion for the wastewater sector since 2,000). To finance implementation, most Member States use a mix of water tariffs and public budget transfers.

Target stakeholder category: National and EU-level policymakers, Infrastructure planners and developers, local and subnational governments and public authorities.

Gaps/barriers identified (EC, 2019, 2020): Not designed for smaller settlements (under 1,000 inhabitants) for which NbS could provide cost-effective opportunities for wastewater treatment;

- The Directive only contains general principles regarding diffuse urban pollution and stormwater. Storm water overflows are only referred to in a footnote in the Directive. It insufficiently addresses urban runoff, which is an increasing source of pollution containing metals, plastics and microplastics. NbS offer various solutions to address stormwater overflows;
- The Directive does not adequately address pollution from chemicals: the treatment of organic matter and nutrients is required but only via bioreactors or storage as sludge, which may transfer pollution to soils and groundwater. There is also a lack of specific provisions for a number of chemicals that are not currently removed by conventional wastewater treatment;
- The Directive has no effect on the presence of other sources of pollution (in particular agriculture and livestock) in wastewater.

Expected developments: The recast of the Directive has set the following dispositions, which Member States need to implement by 2030 or 2035:

- Makes the application of secondary treatment to wastewater, before it is discharged into the environment, compulsory for all agglomerations above 1,000 inhabitants by 2035;
- Better monitoring of forever chemicals, microplastics and other public health parameters;
- Urban wastewater treatment plants will have to increase their use of energy from renewable sources (20% by 2030; 40% by 2035; 70% by 2040 and 100% by 2045);
- Introduction of the polluter pays principle to cover the costs of additional treatment for medicinal products for human use and cosmetic products found in wastewater.

This offers an opportunity to scale up the use of NbS for waste water treatment.

Ambient Air Quality Directives

Name of policy: Consolidated text: Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (2008/50/EC).

Consolidated text: Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium,

mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (2004/107/EC).

Short description of policy: The Ambient Air Quality Directives set EU air quality standards for 12 air pollutants. The Directives take into account relevant World Health Organisation standards, guidelines and programmes. The Directives also guide the assessment of air quality by establishing a representative monitoring network, with more than 4,000 air quality monitoring stations across the EU, and by exchanging information on air quality, including to a wider public.

Policy category: Regulatory instrument.

Type of instrument: Regulation.

Type of support: Low implicit. The Directives set standards for air quality and monitoring but do not refer to NbS as a pathway for reducing exposure to pollutants.

Type of NbS concerned: Protection and conservation, sustainable use and management.

Relevance for NbS: NbS have a high potential to improve air quality in urban areas, including street tree planting, creating green spaces and corridors, and greening building roofs and facades.

Societal challenge addressed: Health and Well-being and Air Quality.

Funds/programmes envisaged to finance the policy: National funding**,** Horizon Europe, Cohesion Fund, LIFE, European Regional Development Fund.

Target stakeholder category: National and EU-level policymakers, local and subnational governments and public authorities.

Gaps/barriers identified: The 2019 fitness check of the Directives ((SEC(2019) 426) and (SWD(2019) 428)) found that Member States had been responsible for substantial delays in taking appropriate and effective measures to meet the air quality standards. It also found shortcomings in the EU-wide air quality monitoring network and lack of harmonisation between member states. The fitness check revealed a substantial implementation gap, although synergies with climate, energy and transport policies have been strengthened over the past decade.

Expected developments: On 26 October 2022, the Commission proposed to revise the Ambient Air Quality Directives. The revision aligns the air quality standards more closely with the recommendations of the World Health Organisation, and proposes a requirement for Member States to establish air quality plans for areas where the levels of pollutants exceed the limit and target values set out in the directive, in which they must set out appropriate measures to keep the exceedance period as short as possible. The European Parliament adopted in April 2024 a revision to set stricter 2030 limit and target values for several pollutants, including PM2.5 and PM10, nitrogen dioxide, sulphur dioxide and ozone.

Zero Pollution Action Plan

Name of policy: Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil' (European Commission, 2021c).

Short description of policy: The zero pollution vision for 2050 is for air, water and soil pollution to be reduced to levels no longer considered harmful to health and natural ecosystems. This is translated into key 2030 targets to speed up the reduction of pollution at source. These targets include: improving air quality to reduce the number of premature deaths caused by air pollution by 55%; improving water quality by reducing waste, reducing plastic litter at sea (by 50%) and microplastics released into the environment (by 30%); improving soil quality by reducing nutrient losses and chemical pesticides' use by 50%; reducing by 25% the EU ecosystems where air pollution threatens biodiversity; reducing the share of people chronically disturbed by transport noise by 30%, and significantly reducing waste generation by 50% reduction in residual municipal waste.

Policy category: Planning instrument.

Type of instrument: Action plan.

Type of support: Medium explicit support. NbS are one of the pathways for the achievement of the Plan's targets, but are only cited once.

Type of NbS concerned: Sustainable protection and conservation, sustainable use and management, restoration and creation.

Relevance for NbS: High. The scope of this action plan encompasses a wide variety of NbS interventions, in particular sustainable soil management, or urban green spaces. The Action Plan explicitly refers to NbS as one of the pathways for achieving zero pollution by 2050, although not detailed. The Action Plan led to increased ambition of regulations in relation to air, water and soil pollution with the revision of the Ambient Air Quality Directives and the Urban Wastewater treatment Directives. NbS appear as a strong indirect element to support the ambitions of the Zero Pollution Action Plan.

With regard to air pollution from buildings, the Action plan calls for synergies with the New European Bauhaus initiatives for the recovery and reuse of construction waste. It also prioritises identification of key urban greening and innovation needs. As part of the objective to reduce pollution across regions, the Action plan calls the Commission to present a scoreboard of the EU regions' green performance. Based on this scoreboard, the Action plan lays out the basis for the award for the Green Region of the Year. This should create an incentive for the development of urban greening NbS in regions.

The Action plan also aims to support the identification and management of contaminated sites which should help the deployment of NbS for soil pollution (phytoremediation in particular).

Societal challenge addressed: Health and Well-being and Air Quality.

Funds/programmes: Horizon Europe, Cohesion Fund, LIFE, European Regional Development Fund, CAP, EMFAF

Target stakeholder category: National and EU-level policymakers, local and subnational governments and public authorities.

Gaps/barriers identified: The Action Plan led to the revision of Ambient Air Quality Directives and the Urban Wastewater treatment Directives, which potentially provides opportunities for higher NbS uptake to reach the new legal targets. However, the plan does not specifically focus on the deployment of NbS for the achievement of the targets. The support to NbS is the most evident in relation to urban greening, but could be stronger for other types of NbS (i.e. sustainable soil management in agriculture areas, water management NbS, etc). NbS could be better included as one of the 33 actions to follow on the Zero Pollution Stakeholder Platform, in the same way that green digital solutions are now featured.

Expected developments: Revised air quality targets: on 20 February 2024, the Council and the EU Parliament reached a provisional deal on a proposal to set EU air quality standards to be attained with the aim of achieving a zero-pollution objective (COM/2022/542 final). The European Parliament adopted the revised air quality standards on 24 April 2024.

Proposal for a Directive on Soil Monitoring and Resilience

Name of policy: Proposal for a Directive on Soil moninitoring and resilience proposal state in August 2024.

Short description of policy: The Directive is legally supporting some of the targets of the EU Soil Strategy, proposed in 2021. The ultimate objective of the proposed law is to have all soils in a healthy condition by 2050, in line with the EU Zero Pollution Action Plan. To achieve this, the law provides a harmonised definition of soil health, puts in place a comprehensive and coherent monitoring framework and lays down rules on sustainable soil management and remediation of contaminated sites. The Directive is directly relevant to the Sustainable Food Systems theme and the Zero Pollution theme.

Policy category: Regulatory.

Type of instrument: Directive.

Type of support: Medium implicit support.

Article 10 requires that sustainable soil management practices are to be defined by Member States. Article 11 lays out land take mitigation principles but only 'to the extent possible' and so as to minimise the impact on soil. Regarding contaminated sites, Article 12 sets an overarching obligation to take a risk-based approach to identifying and investigating potentially contaminated sites and for managing contaminated sites. Article 13 lays out the approach for identifying contaminated sites and that the sites identified as potentially contaminated are subject to investigation (Article 14). On the basis of the risk assessment, the proposal requires that competent authorities take appropriate measures to bring risks to an acceptable level for human health and the environment (Article 15), but does not suggest NbS pathways for remediation. Article 16 requires Member States to draw up a register of contaminated sites and potentially contaminated sites.

Type of NbS concerned: Sustainable use of soil and management, restoration (to some extent).

Relevance for NbS: High. Sustainable soil management practices are key to achieving soil health by 2050. The proposal requires Member States to define a set of sustainable soil practices respecting principles outlined in the proposal (Annex III), and implement soil regeneration practices based on the soil health assessment. However, there is no minimum set of practices required to be taken up by Member States and no requirement to lay out soil health plans. The proposal also lays out an approach for the designation and management of contaminated sites (see Zero Pollution chapter). NbS approaches are not incentivised by the proposal.

The proposal lays out an approach for the designation and management of contaminated sites, which offers opportunities for the implementation of NbS for contaminated land remediation like phytoremediation or conversion of contaminated sites to green spaces for example. However, biological approaches for soil remediation are only suggested in the Annex 3.

Societal challenge addressed: Climate Resilience, Biodiversity Enhancement, Pollution.

Funds/programmes: The proposal specifies that the implementation of this Directive should be supported by existing EU and national financial programmes (such as the CAP or the Horizon Europe through the EU Soil Mission).

Target stakeholder category: National and EU-level policymakers, local and subnational governments and public authorities.

Gaps/barriers identified: The proposed Directive does not include text that would encourage NbS approaches to the remediation of contaminated sites. Unlike the Commission's original proposal, the proposed directive does not set targets for priority issues such as the restoration of soil biodiversity, nor define a minimum set of sustainable soil practices to be respected. The requirement for Member States to draw up soil health plans and the obligation on Member States to achieve the quantified net land take target for 2050 and intermediate targets were also dropped. In April 2024, the Parliament voted to remove Member States' obligations to define sustainable soil management practices, regularly assess the effectiveness of the measures taken, and review and revise them if necessary. This removes an important incentive to the adoption of NbS.

Expected developments: The European Parliament's Environment Committee has agreed its position on the planned soil monitoring law. In April 2024, the Parliament adopted its first reading position on the basis of the ENVI report. The Parliament, taking office in July following the June elections, will carry the dossier forward. It is still possible that the text may be revised to more explicitly support NbS approaches, but based on the previous negotiations this is unlikely to find sufficient political support. NbS approaches could still be stimulated through policy support tools for implementation, such as guidance and best practice dissemination.

Climate Change Adaptation, Mitigation and Resilience

Author: UNEP-WCMC

This section describes policy areas and initiatives within the overarching theme of climate change, highlighting the crucial role of NbS in enhancing global and regional implementation efforts. As global policies act as drivers and contextual factors for the EU policies, both are explained here.

Global policy frameworks: UN Framework Convention on Climate Change (UNFCCC) - Paris Agreement: The Paris Agreement aims to strengthen the global response to climate change by keeping the global temperature rise well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius. The Global Stocktake (Article 14) of the Paris Agreement highlights the role of NbS in contributing to climate mitigation and adaptation efforts.

Global Goal on Adaptation: The GGA, established under the Paris Agreement, aims to enhance climate change adaptation by increasing awareness and funding for countries' adaptation needs.

REDD+ (Reducing Emissions from Deforestation and Forest Degradation): REDD+ is a framework to incentivise the reduction of greenhouse gas emissions from deforestation and forest degradation in developing countries through activities such as afforestation, reforestation, and sustainable forest management.

United Nations Convention to Combat Desertification (UNCCD): The UNCCD is a global agreement that aims to combat desertification and mitigate the effects of drought through the sustainable management of land resources, with a strong focus on the social, economic, and environmental aspects of sustainable development.

UN Sendai Framework for Disaster Risk Reduction 2015-2030: Provides a global blueprint for reducing disaster risk and building resilience to disasters. The framework recognises that NbS can assist governments in addressing climate change, biodiversity loss, increased frequency of extreme weather and natural hazards as well as other human-made environmental disasters.

EU legislations: European Climate Law (ECL): sets a legally binding objective of balancing greenhouse gas emissions and removals (net zero emissions) by 2050. It also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. The regulation highlights that Member States need to take significant actions including NbS and climate-resilient practices for reducing their social and economic vulnerablities to climate-related risks._

Regulation on Land Use, Land-use Change and Forestry (LULUCF): The LULUCF Regulation sets an EU-level land-based net removal target of 310Mt CO2e by 2030, providing a legal incentive for Member States to develop NbS at wider scale.

Floods Directive: Establishes a common approach to flooding risks by requiring Member States to assess flood risk, develop risk management plans and implement measures.

EU policies: EU Strategy on Adaptation to Climate Change: The strategy stresses the importance of resilience to climate-related risks and its impacts, highlighting the need for action at the EU, national, and local levels. The strategy *"identifies NbS for adaptation as one of the main cross-cutting priorities towards the further development and implementation of adaptation strategies and plans at all levels of governance and toward more systemic adaptation."*

UN Framework Convention on Climate Change Paris Agreement

Name of policy: UNFCCC, The Paris Agreement.

Short description of policy: Adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement aims to strengthen the global response to climate change by keeping the global temperature rise well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit temperature increase to 1.5 degrees Celsius. The Paris Agreement Article 7 establishes a goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change in the context of projected temperature rise in future. It also recognises adaptation as a major challenge for all and all nations and parties should engage in adaptation efforts including by formulating and implementing

National Adaptation Plans (NAPs) and should submit periodic updates on their adaptation priorities, needs, plans and actions. See the separate description for more details.

Policy category: Regulatory and planning instrument.

Type of instrument: International agreement.

Type of support: Strong implicit support (now, parties to the UNFCCC and CBD recognise that the climate and biodiversity emergencies are interlinked and indivisible).

Type of NbS are concerned: Restoration and conservation and ecosystem restoration/creation (reforestation), reducing deforestation and sustainable use of biodiversity resources.

Relevance for NbS: High. NbS can support the achievement of the mitigation and adaptation goals outlined in the agreement through the implementation of NbS, such as reforestation, ecosystem conservation, and ecosystem restoration.

At the UNFCCC COP27 in 2022, the ENACT PARTNERSHIP was launched by the Egyptian COP Presidency in collaboration with the Government of Germany and IUCN. ENACT provides a hub for UNFCCC Parties and non-state actors working on NbS to collaborate through a collective voice for evidence-based policy on NbS. IUCN hosts ENACT's secretariat. ENACT's NbS Goals (IUCN, 2022) are to secure up to 2.4 billion hectares of ecosystem integrity through protection of 45 million ha, sustainable management of 2 billion ha, and restoration of 350 million ha, and to significantly increase global mitigation efforts through protecting, conserving, and restoring carbon-rich terrestrial, freshwater, and marine ecosystems.

At the UNFCCC COP28 in December 2023, the Joint Statement on climate, nature and people was adopted jointly under the UNFCCC and the CBD with explicit references to NbS. The statement commits the endorsing member countries and other partners to agree to work collaboratively to:

- Ensure forest and land use legislative, policy and governance frameworks to promote integrated and sustainable land and forest management. Such actions to drive public-private partnerships and support/incentivise local communities and smallholders to manage their land sustainably;
- Foster stronger synergies, integration and alignment in the planning and implementation of national climate, biodiversity and land restoration plans and strategies at local, national and regional scales. Future policies and actions to achieve relevant GBF targets (e.g., Target 3 to conserve 30% of land, waters and seas) have the potential to strengthen synergies between the Paris Agreement and the GBF by enhancing multiple benefits including biodiversity conservation and the climate adaptation and mitigation;
- Scaling of finance and investments for climate and nature from all sources, including domestic budgets, multilateral development banks, multilateral climate and biodiversity funds, bilateral development agencies, private sectors actors, and philanthropic sources, in a synergetic, dedicated and progressive manner that ensures the promotion of co-benefits through NbS and/or ecosystem based approaches. This includes access to finance in an inclusive and equitable manner, including through direct access modalities, in particular for Indigenous Peoples, local communities, women, girls, and youth, among others. This provides a robust opportunity to promote NbS;
- Promote a whole-of-society approach in the synergetic planning and implementation of national climate, biodiversity and land restoration plans and strategies. NbS approaches should be implemented with a full consideration of biodiversity conservation, their resilience to climate change, and how Indigenous People and local communities can be able to access to equitable benefit sharing arrangement.[3]

Societal challenges addressed: Climate Change Mitigation (reducing greenhouse gas emissions), Climate Adaptation, Climate Resilience, Biodiversity Conservation/Enhancement, Equitable and Gender-responsive Actions.

3 Source: https://www.cop28.com/en/joint-statement-on-climate-nature

Funds/programmes envisaged to support the policy: All relevant programmes established under the Multiannual Financial Framework are to be used, some relevant bilateral and multilateral (such as WB and GCF) funding opportunities including grants from governments and public/private funding sources.The European Investment Bank (EIB) is one finance institution that has outlined a strategy aligning with the goals of the Paris Agreement through greater support of climate action and alignment with the agreement's principles (EIB, 2020).

Target stakeholder category: Local and subnational governments and public authorities, society at large, natural resource managers and landowners, national level governments (e.g. NDCs and NAPs)

Gaps/barriers identified: Many countries lack coherent policies and institutional frameworks that prioritise and support the implementation of NbS in climate action. Inadequate integration of NbS into national climate action plans and policies can limit their potential to contribute to the objectives of the Paris Agreement.

Limited financial resources and inadequate investment in NbS projects pose significant barriers to their effective implementation. The lack of dedicated funding mechanisms and financial incentives for NbS initiatives can hinder their scalability and impact, thereby limiting their contribution to the goals of the Paris Agreement.

Expected developments: Key aspects that can particularly drive the upscaling of NbS in the joint statement include:

- The itegration of climate and biodiversity planning at the national level, which will likely lead to more holistic approaches that favor NbS;
- The empahsis on inclusive participation, which can bring in diverse knowledge and support for NbS from various stakeholders;
- The commitment to scale up finance, especially for approaches that provide co-benefits (a hall mark for NbS).

Also see below re UNFCCC Global Goal on Adaptation.

UNFCCC Global Goal on Adaptation

Name of policy: UNFCCC Global Goal on Adaptation (UNFCCC, 2023 - Global goal on adaptation) and work programme.

Short description of policy: The Global Goal on Adaptation is a collective commitment under Article 7.1 of the Paris Agreement aimed at *"enhancing [the world's] adaptive capacity, strengthening resilience and reducing vulnerability to climate change."* Proposed by the African Group of Negotiators (AGN) in 2013 and established in 2015, the GGA is meant to serve as a unifying framework that can drive political action and finance for adaptation on the same scale as mitigation. The updated targets on the GGA include (d) Reducing climate impacts on ecosystems and biodiversity, and accelerating the use of ecosystem-based adaptation and NbS, including through their management, enhancement, restoration and conservation and the protection of terrestrial, inland water, mountain, marine and coastal ecosystems.

Policy category: Regulatory and planning instrument.

Type of instrument: International agreement.

Type of support: Strong explicit support (now, parties to the UNFCCC and CBD recognises that the climate and biodiversity emergencies are interlinked and indivisible).

Type of NbS are concerned: Protect and conserve, and ecosystem restoration and creation.

Relevance for NbS: NbS play a crucial role in supporting the objectives of the Global Goal on Adaptation by offering effective, sustainable, and holistic approaches to enhance adaptive capacity, strengthen resilience, and reduce vulnerability to climate change. Integrating NbS into adaptation strategies helps achieve the collective commitment outlined in Article 7.1 of the Paris Agreement and promotes a more comprehensive and inclusive response to the challenges posed by a changing climate. A decision adopted by the parties to the Paris Agreement (CMA) in 2023 (CoP Decision 2/CMA.5) encourages the implementation of integrated, multi-sectoral solutions, such as land use management, sustainable agriculture, resilient food systems, NbS

and ecosystem-based approaches, and protecting conserving and restoring nature and ecosystems, including forests, mountains and other terrestrial and marine and coastal ecosystems in order to reduce climate impacts on biodiversity and people.

The Friends of EbA Issues Brief for UNFCCC COP27 on NbS and GGA in 2022 (IUCN, 2024) encourages:

- Recognising and integrating the role of ecosystems for building climate resilience;
- Strengthening and creating the enabling conditions for adaptation action, including increasing overall investment on adaptation finance and specifically finance for NbS;
- Building on the existing portfolio of work on monitoring & evaluation of NbS for adaptation, with targets and indicators that align with the SDGs and the Global Biodiversity Framework under the Convention on Biological Diversity in order to create synergies and minimise national reporting burdens.[4]

Societal challenges addressed: Climate Adaptation, Climate Resilience, Biodiversity Enhancement, Climate Change Mitigation.

Funds/programmes envisaged to support the policy: All relevant programmes established under the Multiannual Financial Framework are to be used, some relevant bilateral and multilateral (such as WB and GCF) funding opportunities.

Target stakeholder category: Local and subnational governments and public authorities, society at large, natural resource managers and landowners, national level governments (e.g. NDCs and NAPs).

Gaps/barriers identified:

- Existing policies and regulations may not always support or incentivise the adoption of NbS. Addressing regulatory gaps and ensuring that policies align with the principles of NbS can facilitate their integration into broader adaptation strategies;
- Coordinating NbS with other adaptation measures and infrastructure projects may be challenging, especially if there is a lack of cross-sectoral planning and collaboration. Integrated approaches are crucial for maximising the effectiveness of adaptation strategies;
- Insufficient funding for the planning, implementation, and maintenance of NbS projects for adaptation can be a significant challenge given the adaptation funding gap. Financial mechanisms need to be developed or adapted to support NbS initiatives, considering their long-term benefits and multiple co-benefits.

Expected developments: Loss and damage: Recognition that biodiversity and ecosystems loss is a key non-economic loss is important. Species extinction is a loss and damage as it is a negative consequence arising from the unavoidable risks of climate change. To combact loss and damage, UNEP is supporting over 50 ecosystem-based adaptation projects. These projects aim to restore around 113,000 hectares and benefit around 2.5 million people worldwide (UNEP, 2024b).

More financial mechanisms for mitigation, adaptation and loss and damage are being proposed to fill the financing gaps in the Loss and Damage Fund and the adaptation funding gap. This has the potential to increase funding available for NbS intitiatives and ecosystem based adaptation which is critical to building resilience to the impacts of the climate crisis.

Climate Finance Mechanisms: Continued efforts to enhance climate finance mechanisms, including the Green Climate Fund (GCF) and other financial instruments, may result in increased funding for NbS projects. More financial support can facilitate the implementation of NbS at a larger scale.

Updates to National Climate Policies: Countries regularly review and update their climate policies and action plans. Integration of NbS into these documents can provide a clear framework for incorporating nature-based approaches into broader adaptation strategies.

4 Source: Nature-based Solutions and the Global Goal on Adaptation: Launch of Friends of EbA Issue Brief for UNFCCC COP27 – resource | IUCN

UNFCCC Reducing Emissions from Deforestation and Forest Degradation (REDD+)

Name of policy: UNFCCC REDD+ (Reducing Emissions from Deforestation and Forest Degradation) (UNFCCC, Decision booklet REDD+, 2016).

Short description of policy: REDD+ is a framework aimed at incentivising the reduction of greenhouse gas emissions from deforestation and forest degradation in developing countries.

Policy category: Regulatory and planning instrument.

Type of instrument: International agreement.

Type of support: Strong implicit support. The goals and activities associated with REDD+ implicitly align with the principles of NbS. REDD+ primarily focuses on the conservation and sustainable management of forests as well as the enhancement of forest carbon stocks. It also highlights the importance of promoting co-benefits such as biodiversity conservation and the sustainable livelihoods of local communities.

Type of NbS concerned: Restoration and creation (reforestation), sustainable forest management, and ecosystem restoration.

Relevance for NbS: NbS, including forest conservation, afforestation, and reforestation, can play a significant role in supporting the objectives of REDD+ by preserving and enhancing forest carbon stocks, promoting sustainable forest management, and conserving biodiversity.

Societal challenge addressed: Climate Resilience, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: All relevant programmes established under the Multiannual Financial Framework are to be used. Sources of finance for REDD+ can include public institutions such as the World Bank and its Forest Carbon Partnership Facility (FCPF), the Green Climate Fund, as well as private sources of funding such as the LEAF coalition.

Target stakeholder category: Local and subnational governments and public authorities, Society at large, Natural resource managers and landowners

Gaps/barriers identified: In many countries, there are unclear land tenure rights and weak governance structures which pose significant challenges to the implementation of REDD+ initiatives. The lack of clear land tenure rights can lead to land disputes, illegal encroachment, and unsustainable land-use practices, which can hamper the effective implementation of NbS projects aimed at reducing deforestation and forest degradation.

Expected developments: Legislative proposals aimed at mobilising financial resources, establishing innovative financing mechanisms, and incentivising private sector investments in sustainable forest conservation and restoration can provide critical support for the implementation of NbS within the REDD+ framework.

UN Convention to Combat Desertification

Name of policy: The United Nations Convention to Combat Desertification (UNCCD, 1994).

Short description of policy: The UNCCD is a global agreement that addresses the issues of land degradation and desertification, particularly in arid, semi-arid, and dry sub-humid areas, known as drylands. The convention aims to combat desertification and mitigate the effects of drought through the sustainable management of land resources, with a strong focus on the social, economic, and environmental aspects of sustainable development.

The UNCCD pursues its objectives through the implementation of various strategies, including sustainable land management, land restoration, and the promotion of sustainable livelihoods for communities living in dryland regions.

Policy category: Regulatory and planning instrument.

Type of instrument: International agreement.

Type of support: Strong explicit support: among the new commitments from COP28 was to *"[e]nsure greater synergies among the three Rio Conventions, including complementarities in the implementation of these treaties through NbS and target-setting at the national level"* (UNEP, 2024a).

Type of NbS concerned: Protection and conservation (reforestation), sustainable forest use and management, and ecosystem restoration, also sustainable water management.

Several articles and objectives within the UNCCD emphasize the importance of sustainable land management, ecosystem restoration, and the conservation of biodiversity, which are central to the concept of NbS, e.g., the UNCCD emphasizes the importance of sustainable land management practices, such as soil conservation, afforestation, and reforestation, to combat desertification and land degradation. These practices are central to NbS, which aims to use natural processes to address environmental challenges.

The UNCCD promotes the restoration of degraded ecosystems, emphasizing the rehabilitation of land affected by desertification and land degradation. Ecosystem restoration is a core component of NbS, aligning with its goal of using natural processes to restore and conserve ecosystems.

Relevance for NbS: NbS can play a crucial role in supporting the objectives of the UNCCD by fostering sustainable land management practices, promoting ecosystem restoration, and enhancing the resilience of communities and ecosystems in regions affected by desertification and land degradation.

Several articles within the Convention align with the principles and objectives of NbS that contribute to the sustainable management of land resources and the mitigation of desertification and land degradation

Goal 15 (Sustainable Land Management) of the UNCCD emphasizes the promotion of sustainable land management practices that contribute to the conservation of land resources, the enhancement of soil fertility, and the restoration of degraded ecosystems. NbS principles, including the restoration of natural habitats, the promotion of agroforestry, and the implementation of sustainable water management techniques, align with the objectives of Goal 15, fostering the sustainable management of dryland landscapes

Societal challenges addressed: Climate Resilience, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: All relevant programmes established under the Multiannual Financial Framework are to be used. Funding institutions supporting the UNCCD include the Global Environment Facility (GEF), the African Development Bank (AfDB), and the Land Degradation Neutrality Fund.

Target stakeholder category: Local and subnational governments and public authorities, society at large, natural resource managers and landowners

Gaps/barriers identified: Funding/policy/legal gaps/political support/awareness etc. Complexities in policy and regulatory environments related to land use and natural resource management can pose significant barriers to the effective integration of NbS principles into existing strategies for combating desertification and land degradation, requiring enhanced policy coherence and mainstreaming efforts.

Expected developments:. Efforts to enhance synergies between the UNFCCC, CBD and UNCCD - as well as the NDCs, NBSAPs and Land Degradation Neutrality Targets offer an opportunity to integrate NbS as an integrated policy and strategy to deliver against multiple objectives and ensure greater coherence among multilateral environmental agreements.

Anticipated reviews and updates to the UNCCD's 2030 Strategic Framework are expected to shape the direction of global efforts in combating desertification and land degradation. The framework's expected developments could be a good point to include stronger provisions for the integration of NbS, emphasizing the role of nature-based approaches in restoring degraded lands and promoting sustainable land management practices.

UN Sendai Framework for Disaster Risk Reduction

Name of policy: Sendai Framework for Disaster Risk Reduction 2015-2030 (UNDRR, 2021).

Short description of policy: The Sendai Framework for Disaster Risk Reduction 2015-2030 is a global blueprint for reducing disaster risk and building resilience to disasters. It was adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, in March 2015. The framework outlines seven global targets and four priority areas for action to reduce disaster risk and enhance resilience at the national, regional, and global levels.

Policy category: Regulatory and planning instrument.

Type of instrument: International agreement.

Type of support: Strong explicit support. The Sendai Framework for Disaster Risk Reduction 2015-2030 explicitly mentions the term NbS, it emphasizes the importance of ecosystem-based approaches and the integration of nature-based measures in disaster risk reduction and resilience-building efforts. The framework recognises that NbS can assist governments in addressing the challenges of climate change, biodiversity loss, increased frequency of extreme weather and natural hazards as well as other human-made environmental disasters (UNDRR, 2021). The framework recognises the role of ecosystems in reducing disaster risks, enhancing community resilience, and promoting sustainable development. Several aspects within the Sendai Framework highlight the alignment with the principles and objectives of NbS, including:

Ecosystem-based Disaster Risk Reduction: The framework acknowledges the importance of ecosystem-based approaches in reducing disaster risks and enhancing the resilience of communities. It emphasizes the need to integrate ecosystem management and restoration measures into disaster risk reduction strategies, particularly in the context of climate change and environmental degradation

Ecosystem Services and Disaster Resilience: The framework recognises the critical role of ecosystem services, such as water regulation, soil stabilisation, and biodiversity conservation, in reducing the impacts of disasters and promoting the recovery of affected communities. It emphasizes the need to safeguard and restore ecosystem services to enhance the resilience of vulnerable populations and ecosystems.

Type of NbS concerned: Protection and conservation (reforestation), sustainable forest use and management, and ecosystem restoration/creation.

Relevance for NbS: NbS plays a significant role in the context of the Sendai Framework for Disaster Risk Reduction 2015-2030, contributing to the achievement of its goals and priorities. The relevance of NbS in the Sendai Framework lies in its potential to enhance the resilience of communities and ecosystems, reduce disaster risks, and promote sustainable development. For example, NbS can contribute to the restoration and conservation of ecosystems, including forests, wetlands, and coastal areas, which play a crucial role in reducing the impacts of natural hazards and enhancing the resilience of communities to disasters.

EU Action Plan for Disaster Risk Reduction has recognised the important role of NbS/EbA approaches in addressing not only disaster risk reduction at local and regional scales but also a variety of policy goals including biodiversity conservation and climate change adaptation. The EC has been promoting research and innovation in this area and identified the the cost-effectiveness and generating multiple benefits to local people and the economy.

Societal challenge addressed: Climate Resilience, Biodiversity Enhancement, Green Growth.

Funds/programmes envisaged to support the policy: All relevant programmes established under the Multiannual Financial Framework are to be used. Disaster Risk Reduction activities are often included in countries' national disaster-related budget. Some countries have begun to fund activities with bonds. The World Bank's Global Index Insurance Facility (GIIF) also aims to deliver finance to vulnerable communities in developing countries (UNDRR, 2023).

Target stakeholder category: Local and subnational governments and public authorities, society at large, natural resource managers and landowners.

Gaps/barriers identified: Limited financial resources and inadequate investment in NbS projects can hinder their widespread implementation and scaling. The lack of dedicated funding mechanisms and financial incentives for NbS initiatives can restrict their potential contribution to achieving the disaster risk reduction objectives outlined in the Sendai Framework.

Expected developments: Regular reviews and assessments of the progress and outcomes of the Sendai Framework are critical for tracking the implementation of disaster risk reduction measures globally. Comprehensive reviews can provide valuable insights into the contributions of NbS to disaster risk reduction and resilience-building efforts, fostering the integration of nature-based approaches into future policy and planning frameworks. The UNDRR secretariat released a toolkit in July 2024 for integrating NbS into planning for disaster risk reduction and climate change adaptation (UNDRR, 2024).

European Climate Law

Name of policy: the European Climate Law (ECL) - Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999.

EU Governance of the Energy Union and Climate Action regulation - Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action (Governance Regulation, 2018).

Short description of policy: The Regulation sets a legally binding objective of balancing greenhouse gas emissions and removals (net zero emissions) by 2050. It also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. The net calculation includes expected carbon removals by carbon sinks such as forests and wetlands. It establishes an independent European Scientific Advisory Board on Climate Change. Member States must set up their own national climate advisory board and establish a multilevel climate and energy dialogue involving local authorities, the civil society, the business community, investors, other relevant stakeholders and the public. Member States must develop and submit to the Commission a long-term (30 year) strategy for reducing greenhouse gas emissions. The law requires the EU to have a climate adaptation strategy and for Member States to have a national climate adaptation strategy or plan.

The law updates the EU climate and energy governance regulation which requires Member States to produce integrated national energy and climate plans (NECPs) for 2021–2030 and update them by 30 June 2024.

Policy category: Regulatory (with regulatory planning instruments in NECPs).

Type of instrument: Regulation.

Type of support: Strong implicit support. The term NbS is used twice but not embedded throughout. NbS practices are identified as critical to climate change mitigation and adaptation through carbon capture and storage, with co-benefits for ecosystems and health. NbS are explicitly included in the ECL in Article 5, Adaptation to climate change where it is stipulated that NbS are to be promoted when taking into account the vulnerabilities of relevant sectors when adopting and implementing national adaptation plans (NAPs) and strategies. No measurable criteria or targets are defined for NbS.

Type of NbS concerned: Ecosystem protection/conservation, sustainable use and management, and restoration/creation.

Relevance for NbS: High. NbS for carbon removals include afforestation, agroforestry, restoration of soil carbon and peat formation, restoration of blue carbon. The Commission has proposed a framework to certify carbon farming, with the aim that a transparent and credible governance framework will encourage further investment in carbon removal activities (EC, 2024b).

The European Commission has established guidelines (European Commission, 2023d) for Member States' adaptation strategies and plans. The guidance recognises the restoration of ecosystems as an effort that can assist in maintaining, managing

and enhancing natural sinks, promoting biodiversity and addressing climate change. It also highlights that Member States need to take significant actions, including NbS and climate-resilient practices, to reduce their social and economic vulnerablities to climate-related risks. Member States are asked to report NbS as one of the five Key Type Measures in their voluntary adaptation measures reports to the EEA (Leitner et al, 2021).

Societal challenge addressed: Reducing carbon or GHG emissions and Climate Adaptation or Resilience; to a lesser extent also Water Management, Food security, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: All relevant programmes established under the Multiannual Financial Framework are to be used. The EU budget could be an important source of climate action as 30% of the budget for years 2021-2027 will be spent on fighting climate change (EC, 2024d; Verra, 2020).

Target stakeholder category: Local and subnational governments and public authorities, society at large.

Gaps/barriers identified: NbS could be better integrated as actions in the objectives, in the article on scientific advice, and in the intermediate Union targets. Aside from the inclusion in the adaptation article, NbS should also be included in the mitigation and disaster risk reduction aspects of the climate law.

Expected developments: The European Commission has launched the process of setting the 2040 climate targets and is expected to make a proposal to include them in the EU climate law. Member States will be expected to adjust their national energy and climate plans appropriately.

Regulation on Land Use, Land-use Change and Forestry

Name of policy: The LULUCF regulation (2014 revised 2023) (2023/839).

Short description of policy: The LULUCF regulation sets out how the land use sector contributes to the EU's climate goals. The LULUCF Regulation was revised in 2023 for the period up to 2030. The Regulation sets an EU-level land-based net removal target of 310Mt CO2e by 2030. This EU-wide target is to be implemented through ambitious, fair and binding net removal national targets for the LULUCF sector. Member State projections submitted in 2023 suggest that net removals will decrease at EU level, from an average of 314Mt CO2e per year in 1990-2020 to 226Mt CO2e in 2021-2050. Additional measures reported by Member States are expected to increase average net removals in 2021-2050. The projections show that for 2030 net removals of 240Mt CO2e are expected with existing measures and 260Mt CO2e with planned additional measures, which represents a 50-60 Mt CO2e gap.

Policy category: Regulatory instrument.

Type of instrument: Regulation.

Type of support: Strong explicit support.

Type of NbS concerned: Ecosystem protection/conservation, sustainable use and management, and restoration/creation of land.

Relevance for NbS: High relevance. The LULUCF regulation aims at increasing natural carbon sinks. NbS provide high potential to reduce disaster risk and mitigate climate-change via increased carbon storage in natural ecosystems and increased ecosystem resilience. The regulation provides a legal incentive for Member States to develop NbS at wider scale, which will be needed to reach the LULUCF target for 2030.

Societal challenge addressed: Climate Resilience, Water Management, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Participatory Planning and Governance, Natural and Climate Hazards, Health and Well-being and Air Quality, Green Space Management, Knowledge, and Social Capacity Building for Sustainable Transformation, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: There is no dedicated fund for implementation of the regulation, but EU funding programmes and

projects can be used to restore and increase natural carbon sinks. Including LIFE, CAP, ESF+ (European Social Fund Plus), Cohesion Policy, Horizon Europe, EU crossborder cooperation programs (Interreg).

Target stakeholder category: Local and subnational governments and public authorities, national and EU-level policymakers, society at large, educators, education institutions and students, infrastructure planners and developers, natural resource managers and landowners.

Gaps identified: At present, the EU is not on track to meet the 2030 net removal target of 310Mt CO2e. Stronger links should be made with the EU Biodiversity Strategy.

Expected developments:

Member States requirements that could support the upatake and upscale of NbS include:

- Ongoing or planned measures in national strategies to ensure conservation enhancement of forest sinks and reservoirs;
- Evauate synergies between climate mitigation adapatation and biodiversity in compliance reports;
- Implement systems for monitoring high carbon stock land use units, protected land use units subject to restoration, land use units with high climate risk.

Floods Directive

Name of policy: Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (Directive 2007/60/EC).

Short description of policy: The directive is a framework established for a common approach to flooding risks. It aims to reduce the negative consequences of flooding on human health, economic activities, the environment, and cultural heritage. Member States are required to assess all areas where significant floods could take place, map the flood extent and assets and humans at risk in these areas, and take adequate and coordinated measures to reduce this flood risk. Member States must produce flood hazard and risk maps and flood risk management plans. Member States and regions are expected to set flood risk reduction targets.

Policy category: Regulatory instrument.

Type of instrument: Directive.

Type of support: Medium implicit. NbS are not directly mentioned or supported. However, the EEA classifies the support as very much supported based on the *European Overview of the first Flood Risk Management Plans* (EEA, 2021).

Type of NbS concerned: Ecosystem protection and conservation, sustainable use and management, and restoration/creation.

Relevance for NbS: Very relevant. Flood risks are greatly reduced by Natural Water Retention Measures, and immediately provide important ecosystem services. NbS could be explicitly promoted in the flood risk management plans with a potential to retain flood water, such as the restoration of natural floodplains. NbS can contribute significantly to large-scale, transboundary flood management.

Societal challenge addressed: Climate Resilience, Water Management, Natural and Climate Hazards, Health and Well-being and Air Quality, Knowledge, and Social Capacity Building for Sustainable Transformation.

Funds/programmes envisaged to support the policy: INVEST EU and the multi-annual financial framework, ERDF, Cohesion Fund, EAFRD, Taxonomy Regulation, Horizon Europe, Interreg, national funding programmes.

Target stakeholder category: Local and subnational governments and public authorities, national and EU-level policymakers, natural resource managers and landowners.

Gaps/barriers identified: The European Court of Auditors pointed to a lack of guidance regarding the role of various measures in conjunction with climate change (European Court of Auditors, 2018). Furthermore, they point to deficiencies in coordination between different government levels and the lack of a specific description for how to manage

cross border flooding zones. If available, a description of measures by other involved Member States in a shared flooding zone should be included in each relevant flood risk management plan. This gap is particularly relevant for the 'solidarity principle', where no incentives are currently in place for an upstream Member State to implement measures that would benefit downstream neighbours (Wild et al, 2020). There is also a lack of awareness among stakeholders about the benefits of NbS and their integration at a landscape level. The Commission reviewed the second cycle of Flood Risk Management Plans (2016-2021) in the 6th Implementation Report in December 2021. It concluded that limited incorporation of green infrastructure or NbS into flood management plans is a barrier.

Lack of dedicated funding for large-scale river restoration and on measures ensuring synergies with Floods Directive and Habitats Directive, such as Natural Water Retention Measures, is also a barrier.

Expected developments: The third cycle of flood management planning covers 2022-2027, so plans will need to be renewed by 2027. However, increasing occurrences of devastating floods are prompting several Member States to make changes to their flood prevention and management now, and invest in restoring the flood absorption capacities of soils, rivers and floodplains. For example, two recent studies on restoration of the Thessaly floodplain in Greece show that nature-based approaches to flood management in the region, such as widening rivers and connecting them with their floodplains, creating riparian forests and removing man-made structures built to control or obstruct the flow of rivers, would be far more efficient than relying on new or rehabilitated 'grey' flood protection infrastructure, such as dykes (EIB, 2023).

The EU Nature Restoration Law now requires Member States to identify and remove artificial barriers and restore the natural functions of the river floodplains in order to contribute to restoring at least 25,000 km into free-flowing rivers by 2030 (((EU) 2024/1991)). Member States will be reporting their planned measures in their draft national restoration plans by mid 2026. This is an opportunity to significantly scale up the use of NbS for flood prevention and mitigation.

The Commission is expected to publish the 7th implementation report on WFD and FD in 2024 or 2025.

EU Strategy on Adaptation to Climate Change

Name of policy: Strategy on Adaptation to Climate Change (2021): Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions Forging A Climate-Resilient Europe - the new EU Strategy on Adaptation to Climate Change. (European Commission, 2013b).

Short description of policy: Outlines the need for a comprehensive and coordinated approach to address the challenges posed by climate change. It stresses the importance of resilience to climate-related risks and its impacts, highlighting the need for action at the EU, national, and local levels. The Communication also calls for integrating climate resilience into various policy areas, including agriculture, infrastructure, and urban planning, and emphasizes the importance of engaging stakeholders and promoting innovation and social dimensions. There are no intermediate targets set for 2030 or 2040, but the vision is to be climate-resilient society in the EU by 2050.

Key EU initiatives in support of the strategy include:

- Climate adaptation knowledge building initiatives such as Climate-ADAPT which are sharing knowledge for a climate-resilient Europe;
- The EU Mission on Adaptation to Climate Change, which is helping EU regions and cities to become climate-resilient;
- The Flagship Technical Support Project supporting Member States to prepare for the inevitable impacts of the climate crisis;
- The EU Climate Risk Assessment published in 2024 identifying key risks and the Commission Communication 'Managing climate risks' (COM/2024/91 final).

Policy category: Planning instrument.

Type of instrument: Communication.

Type of support: Strong explicit support.

Which NbS are concerned: NbS is specified in the strategy as relevant to adaptation: *"For example, protecting and restoring wetlands, peatlands, coastal and marine ecosystems; developing urban green spaces and installing green roofs and walls; promoting and sustainably managing forests and farmland will help adapt to climate change in a cost-effective way."* The strategy *"identifies NbS for adaptation as one of the main cross-cutting priorities towards the further development and implementation of adaptation strategies and plans at all levels of governance and toward more systemic adaptation."*

Type of NbS concerned: Ecosystem protection/ conservation, sustainable use and management, and restoration/creation.

Relevance for NbS: The Commission will continue to incentivise and assist Member States to roll out NbS through assessments, guidance, capacity building, and develop the financial aspects of NbS and foster the development of financial approaches and products. In the support approach for policy development, the NbS are one of three priorities.

Societal challenge addressed: Climate Resilience, Water Management, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Participatory Planning and Governance, Natural and Climate Hazards, Health and Well-being and Air Quality, Green Space Management, Knowledge, and Social Capacity Building for Sustainable Transformation, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: Focus on funding leverage, but already included: Interreg, European Structural and Investment Funds (CF and ERDF), the Common Agricultural Policy, the LIFE Programme, and the Recovery and Resilience Facility, among others.

Target stakeholder category: Local and subnational governments and public authorities, national and EU-level policymakers, society at large, educators, education institutions and students, infrastructure planners and developers, natural resource managers and landowners.

Gaps identified: Despite having some clearly defined strategic objectives, the strategy lacks concrete and time-bound targets, any strong and legally binding enforcement mechanisms, and a timeline to acheve key strategic objectives (EEB, 2021).

Expected developments: In 2023, the EU released its Disaster Resilience Goals (European Commission, 2023e) which lay out actions for facing future emergencies. NbS are mentioned as important tools for managing disaster risk. There is an expectation that resilience and adaptation to climate change will be a focus area in the new strategic agenda of the Council of the European Union for 2024-2029.

NbS Finance for a Just Transition to a Nature Positive Economy

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The policies discussed in this section include the requirements and standards set by recent legislation to direct investment and corporate activities towards sustainability, prevent greenwashing, and hold to account businesses who claim to be sustainable. Public sector policies for a just transition aim to finance the economic and social transition of areas heavily dependent on fossil fuels to a fossil fuel free economy.

EU Planning instruments: Two planning instruments set out the EU's vision of a sustainable future, which provides businesses with guidelines within which to develop new business models and steer investments towards NbS.

The renewed **EU Strategy for Financing the Transition to a Sustainable Economy** adopted in 2021 sets out measures to re-orient investments towards more sustainable technologies and businesses. Areas of action covered by the strategy are transition finance, inclusiveness, resilence and contribution of the financial system, and global ambition. The strategy provides the framework for the development of EU legislation on sustainable investment (taxonomy, green bonds, etc.).

The **EU Blue Economy for a Sustainable Future** sets out a roadmap for the required transition from 'blue growth' to a 'sustainable blue economy'. NbS can provide some of the solutions to building these sustainable bio-economies and blue economies.

EU Regulation: The **EU Taxonomy Regulation** adopted in 2020 provides companies, investors, lenders and policymakers with consistent definitions for which economic activities can be considered environmentally sustainable. It also introduces 'Do No Significant Harm' criteria.[5]

The **EU Green Bonds Regulation** adopted in 2023 applies the taxonomy requirements to the use of the label 'European green bond,' with the aim to make it easier for both investors and companies to identify environmentally sustainable investments and to guarantee their credibility.

The **EU Sustainable Finance Disclosure Regulation** introduced in 2021 aims to increase transparency in sustainable investments. It mandates selected financial actors to meet disclosure requirements at both the entity and product levels.

The **EU Corporate Sustainability Reporting Directive** adopted at the end of 2022 ensures that businesses disclose information in a clear and consistent manner to ensure comparability of sustainability information, while exceeding a minimum level of ambition in relation to sustainability performance. The **EU Corporate Due Diligence Directive** adopted in 2024 requires large companies to adopt due diligence practices for human rights and environmental risks.

The **EU Deforestation Free Supply Chain Regulation** came into effect in 2023. It aims to use trade as a lever to incentivise more sustainable production techniques in countries which import to the EU. Here there are opportunities for businesses to develop more sustainable business models, which are still profitable but create less environmental damage, and integrate NbS into them.

The **Just Transition Mechanism** adopted in 2021 is a policy framework that aims to ensure that the transition towards a climate-neutral economy happens in a fair way. The mechanism provides targeted support to help mobilise around €55 billion over the period 2021-2027 in regions that are highly dependent on carbon intensive industries or that have the most people working in fossil fuels. NbS could become part of transition plans set out by affected territories, and help deliver social benefits.

The **Proposal to amend Regulation No 691/2011 on European Environmental Economic Accounts** was adopted in 2022. It calls for the addition of new modules to the common framework for collecting, compiling, transmitting and evaluating environmental economic accounts. In particular, one module would focus on ecosystem accounts, providing consistent information on extent and condition of ecosystems and on the flows of services from these ecosystems to society.

5 The Do No Significant Harm principle states that an economic activity contributing to an environmental or social objective cannot significantly harm other environmental or social objectives outlined in the Taxonomy. This principle aims to ensure that progress towards one objective is not made at the expense of another.

Voluntary initiatives:

- Taskforce on Nature-related Financial Disclosures (TNFD);
- International Standards Sustainability Board (ISSB);
- Science Based Targets Network (SBTN).

EU Strategy for Financing the Transition to a Sustainable Economy

Name of policy: Strategy for Financing the Transition to a Sustainable Economy (2021) (European Commission, 2021d).

Short description of policy: In 2018 the EU laid the foundation for sustainable finance, by introducing the EU Taxonomy, and related disclosure regulations[6] and tools[7]. The 2021 Sustainable Finance Strategy aims to build on these foundations, supporting the European Green Deal aims, as well as an inclusive and sustainable recovery from the COVID-19 pandemic. There are four new actions included in the 2021 strategy:

- Financing the transition of the real economy towards sustainability (including financing support to certain economic activities contributing to reducing greenhouse gas emissions, and options for a possible extension of the EU Taxonomy framework to recognise transition efforts and include additional sustainable activities);
- Towards a more inclusive sustainable finance framework (including exploring how to leverage digital technologies for sustainable finance and working towards greater protection from climate and environmental risks through increasing insurance coverage);
- Improving the financial sector's resilience and contribution to sustainability by disclosing information on sustainability from both a financial and impact perspective. This 'double materiality' perspective included working towards financial reporting standards that adequately reflect sustainability risks and encourage natural capital accounting, and integrate sustainability risks in the risk management systems of banks and in the prudential framework for insurers;
- Foster global ambition (including ambitious cooperation in international forums and set a high level of ambition in the development of international sustainable finance initiatives and standards).

Policy category: Planning Instrument.

Type of instrument: Strategy.

Type of support: Strong implicit support.

Type of NbS concerned: Protect and conserve, restore and create, sustainably use and manage.

Relevance for NbS: Medium. NbS are not explicitly mentioned in the Strategy, but given its emphasis on sustainable actions, they should be captured implicitly in the kinds of actions the strategy hopes to further enable.

Societal challenge addressed: Climate Resilience; New Economic Opportunities and Green Jobs; Participatory Planning and Governance; Knowledge, and Social Capacity Building for Sustainable Transformation.

Funds/programmes envisaged to support the policy: Promotion of capital flows towards sustainable activities, through various initiatives, including further updated to the EU Taxonomy and strengthening of sustainable finance standards and labels.

Target stakeholder category: National and EU-level policymakers; local and subnational governments and public authorities; NbS investors and entrepreneurs.

Gaps identified: NbS are not explicitly mentioned or defined. For financial institutions to understand if they are investing in NbS, further guidance and definition would be needed.

Expected developments: Work has focused so far on promoting transparency, disclosure and

6 Sustainable Finance Disclosure Regulation (SFDR) applies since March 2021; Corporate Sustainability Reporting Directive (CSRD) proposed by the Commission in April 2021.

7 EU Climate Benchmarks Regulation applies since April 2020; Standard for European green bonds (EuGB), proposed by the Commission July 2021.

classification. Developments are expected on further defining and implementing transition financing and risk management across sectors.

EU Blue Economy for a Sustainable Future

Name of policy: A new approach for a sustainable blue economy in the EU - Transforming the EU's Blue Economy for a Sustainable Future (European Commission, 2021a).

Short description of policy: This communication, published in May 2021, puts forward the Commission's approach to embedding the blue economy into the European Green Deal over this decade. This document sets out an agenda for greening the blue economy across a series of themes (e.g. circular economy and preventing waste; biodiversity and investing in nature, responsible food systems, coastal resilience).

Policy category: Planning instrument.

Type of instrument: Communication.

Type of support: Explicit support. NbS are mentioned more than once, e.g. "*As an alternative to building yet more 'grey' infrastructure (dams, dikes or concrete barriers), climate adaptation should be based on natural and* ***nature-based solutions*** *[...].*"

Type of NbS concerned: NbS for ecosystem and vegetation restoration and creation, protection and conservation.

Relevance for NbS: High. The communication defines biodiversity conservation and restoration as essential to reversing biodiversity loss, contributing to climate mitigation and resilience and generating significant financial and social benefits. NbS for climate adaptation (e.g. salt marshes, seagrass fields, mangroves and dunes) are specifically mentioned in the coastal resilience section of this document as an alternative to building *"yet more grey infrastructure."*

Societal challenge addressed: Protect and conserve; restore and create; sustainably use and manage.

Funds/programmes envisaged to support the policy: The document proposes a series of actions to boost investment in research (e.g. Mission to Restore our Ocean and Waters), skills and innovation, as well as mobilising financing opportunities under the European Maritime, Fisheries and Aquaculture Fund and other EU Funds and Programmes (e.g. European Social Fund+, the InvestEU Programme and the Recovery and Resilience Facility).

Target stakeholder category: Local and subnational governments and public authorities, society at large, natural resource managers and landowners.

Gaps identified: This communication explicitly mentions integrating NbS into coastal resilience practices and hints at their potential in promoting biodiversity. However, it does not extend NbS considerations to themes beyond coastal resilience and does not mention exactly how adoption of NbS will be incentivised. Without concrete measures to mainstream NbS in areas such as coastal resilience and biodiversity conservation, stakeholders such as governments, businesses, NGOs, and local communities might lack the ability to effectively implement them.

Expected developments: Continued cooperation between the Commission and the European Investment Bank to promote initiatives that scale up investments into key priorities outlined in the communication. In particular, initiatives such as the BlueInvest platform aim to support investment readiness and access to finance for maritime and ocean start-ups and SMEs (e.g. through the EU Blue Champions scheme), while building capacities and promoting opportunities for investors (e.g. through investor reports). The platform was created in 2019 and will continue until 2026. When providing finance to foster a transition to the sustainable blue economy, the Commission and EIB Group could look to support projects that incorporate NbS (e.g. in water purification systems, coastal management and marine environment restoration and regeneration).

EU Sustainable Finance Taxonomy Regulation

Name of policy: Sustainable Finance Taxonomy Regulation (2020) Regulation (EU) 2020/852.

Climate Delegated aAt (2021), Environment Delegated Act (2023) (annexes: restoration and ecosystems, water and marine resources).

Short description of policy: The EU Taxonomy aims to provide a standardised system for defining and classifying sustainable economic activities, with the goal of promoting environmentally sustainable investments across the EU in support of the achievement of a range of sustainability objectives set out in EU policies. Besides contributing substantially to one of the six defined climate and environmental objectives, economic activities included in the Taxonomy must not significantly harm any of the objectives (DNSH principle). A level of ambition (substantial contribution) and negative criteria (do no significant harm) are attributed to each economic activity to meet the environment and climate objectives, and criteria are associated to match the ambition. The Taxonomy entered into force on 12 July 2020.

Delegated acts set technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to the climate and environmental objectives and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.

The climate delegated act adopted on 4 June 2021 sets technical criteria for significant contribution to climate change mitigation and for climate change adaption in respect of specific economic activities. The environment delegated act adopted in June 2023 sets technical criteria for substantial contributions to the sustainable use and protection of water and marine resources, to the transition to a circular economy, to pollution prevention and control, and to the protection and restoration of biodiversity and ecosystems in respect of specific economic activities. Out of the 48 economic activities and criteria sets, 2 directly target Biodiversity objectives, 6 water, 6 pollution, and the majority of the rest (21 activities) target the Circular Economy objective.

Policy category: Regulatory instrument.

Type of instrument: Regulation.

Type of support: Strong explicit support. The EU taxonomy includes disaster risk management activities that are NbS, in particular the ones listed in the water and marine resources annex: NbS for flood and drought risk prevention and protection and sustainable urban drainage systems, which explicitly includes NbS such as sustainable swales, wetlands, ponds, green roofs, bioretention areas, etc.

Type of NbS concerned: Protection and conservation (NbS for flood and drought risk prevention and protection), and sustainable use (urban drainage systems mentioned explicitly).

Relevance for NbS: Medium. Nature protection, biodiversity and NbS are crucial components of this framework. The Taxonomy provides clarity on which economic activities contribute to climate adaptation and mitigation. When major companies and investors are required to disclose how their investments align with this taxonomy, a significant increase in the direction of private sector finance towards such activities including NbS can be expected. In addition, all new adaptation activities (solutions that reduce the most important climate risks of existing and new activities) must respect the substantial contribution criteria and *"rely on nature-based solutions or rely on blue or green infrastructure to the extent possible."* This emphasis on NbS is also part of the DNSH criteria.

Societal challenge addressed: Climate Resilience, Water Management, Food Security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Well-being and Air Quality, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: Promotion of capital flows towards sustainable activities.

Target stakeholder category: National and EU-level policymakers; local and subnational governments and public authorities; NbS investors and entrepreneurs.

Gaps identified: While this taxonomy represents a significant milestone in sustainable finance, the contribution of economic activities to factors such as biodiversity remain underdeveloped. Not all areas of NbS economic activity are included in this Taxonomy, thus reducing opportunities for investment and market development (European Commission Directorate-General for Research and Innovation, 2022b). Some categories of NbS, including regenerative agriculture, wetland restoration and peatland restoration, are not included in the taxonomy (European Investment Bank et al, 2023).

Expected developments: Further Taxonomy annexes and technical screening criteria are in development, including for the agricultural sector.

Green Bonds Regulation

Name of policy: European Green Bonds Regulation (2023): REGULATION (EU) 2023/2631 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 November 2023 on European Green Bonds and optional disclosures for bonds marketed as environmentally sustainable and for sustainability-linked bonds (2023/2631).

Short description of policy:
The Green Bonds Regulation (2023) aims to make it easier for both investors and companies to identify environmentally sustainable investments and to guarantee their credibility by establishing a set of uniform requirements for the use of the label 'European green bond.' Sustainable investments are identified using the Taxonomy criteria. The proceeds of green bonds must be allocated in their entirety to an environmentally sustainable activity, and the regulation sets requirements for transparency and external review. The regulation is voluntary.

Policy category: Regulatory Instrument.

Type of instrument: Regulation.

Type of support: Strong explicit support. The EU taxonomy includes disaster risk management activities that are NbS, in particular the ones listed in the water and marine resources annex: NbS for flood and drought risk prevention and protection and sustainable urban drainage systems, which explicitly includes NbS such as sustainable swales, wetlands, ponds, green roofs, bioretention areas, etc.

Type of NbS concerned: Protection and conservation (NbS for flood and drought risk prevention and protection), and sustainable use (urban drainage systems mentioned explicitly).

Relevance for NbS: Medium. Nature protection, biodiversity and NbS are crucial components of the taxonomy framework. The taxonomy provides clarity on which economic activities contribute to climate adaptation and mitigation. When major companies and investors are required to disclose how their investments align with this taxonomy, a significant increase in the direction of private sector finance towards such activities including NbS can be expected. In addition, all new adaptation activities (solutions that reduce the most important climate risks of existing and new activities) must respect the substantial contribution criteria and *"rely on nature-based solutions or rely on blue or green infrastructure to the extent possible."* This emphasis on NbS is also part of the DNSH criteria.

Societal challenge addressed: Climate Resilience, Water Management, Food Security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Well-being and Air Quality, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: Promotion of capital flows towards sustainable activities.

Target stakeholder category: National and EU-level policymakers; local and subnational governments and public authorities; NbS investors and entrepreneurs.

Gaps identified: As mentioned in the EU Taxonomy Regulation.

Expected developments: The Green Bonds Regulation will apply from 21 December 2024.

Sustainable Finance Disclosure Regulation

Name of policy: Sustainable Finance Disclosure Regulation (2019) (2019/2088).

Short description of policy: This transparency framework sets how financial market participants and financial advisors within the EU should report on sustainability issues and comply with requirements on which financial products might be called sustainable or climate-friendly. At the entity level, disclosures revolve around sustainability risk policies, principal adverse impacts and sustainability risk remuneration. At the product level, financial actors have to disclose the sustainability profile of the financial products they produce or promote as either mainstream, having sustainable investment objective, or promoting environmental and social characteristics.

Policy category: Regulatory Instrument.

Type of instrument: Regulation.

Type of support: Strong implicit support.

Type of NbS concerned: Protect and conserve, restore and create, sustainably use and manage.

Relevance for NbS: Through mechanisms such as enhanced requirements on risk management disclosure and Principal Adverse Impact (PAI) indicators, as well as sustainability labelling at the product level, the regulation aims to incentivise investments that contribute to environmental and social objectives. NbS align with these objectives.

Societal challenge addressed: Climate Resilience, Water Management, Food Security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Well-being and Air Quality, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: Promotion of capital flows towards sustainable activities.

Target stakeholder category: NbS investors and entrepreneurs.

Gaps identified: Lack of specific guidance on NbS integration and reporting. Need for more financial products that expressly support NbS.

Expected developments: The European Commission is currently carrying out a comprehensive assessment of the framework, looking at issues such as legal certainty, usability and how the Regulation can play its part in tackling greenwashing.

Corporate Sustainability Reporting Directive and Corporate Due Diligence Directive

Name of policy: Corporate Sustainability Reporting Directive (2022) (CSRD): DIRECTIVE (EU) 2022/2464 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting.

Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU as regards sustainability reporting standards.

Corporate Sustainability Due Diligence Directive (2024) (CSDDD): Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859Text with EEA relevance.

Short description of policy: The CSRD allows organisations to disclose information in a clear and consistent manner to ensure comparability of sustainability information. Additionally, it aims to encourage companies to meet at least the minimum level of ambition on sustainability performance as set by EU legislation.

The European Sustainability Reporting Standards (ESRS) define a structured approach for companies to communicate their sustainability initiatives and impacts and ensure CSRD compliance. The delegated act adopted in June 2023 provides a first set of ESRS defining general requirements (ESRS 1), general disclosures (ESRS 2), climate change (ESRS E1), pollution (ESRS E2), water and marine resources (ESRS E3), biodiversity and ecosystems (ESRS E4), resource

use and circular economy (ESRS E5), own workforce (ESRS S1), workers in the value chain (ESRS S2), affected communities (ESRS S3), consumers and end-users (ESRS S4), business conduct (ESRS G1).

Companies within the scope of the CSDDD will need to conduct human rights and environmental due diligence in their own operations and across their chains of activities, in their risk management systems and contracts. Companies will need to effectively identify and address adverse human rights and environmental impacts, develop corrective action plans, and carry out meaningful engagement with stakeholders. Large companies will also be required to align their business strategies with the Paris Agreement goal of limiting global warming to 1.5 °C – meaning that these large companies must have a plan for reaching net zero (Schmidt and Farbstein, 2024).

Policy category: Regulatory instrument.

Type of instrument: Regulation.

Type of support: Strong implicit support. For undertakings that operate in sectors particularly reliant on natural resources, the sector-specific sustainability reporting standards require the disclosure of nature-related impacts on and risks for biodiversity and ecosystems. According to EPRS E4 on biodiversity and ecosystems, companies must provide plans to ensure that their business models and strategies are compatible with the transition to achieve no net loss of biodiversity by 2030 and assure net gain by 2050.

Type of NbS concerned: Protect and conserve, restore and create, sustainably use and manage.

Relevance for NbS: Medium to high. The 'Environment' ESRS (E1-5) incorporate five drivers of nature and biodiversity loss, so reporting on nature impacts is very important. Combined with the taxonomy, disclosure of corporate negative impact on nature could (at least in theory) drive interest and investment in NbS as a way of addressing nature-negative impacts. Combined with the due diligence requirements, it can also drive changes in business practices and investments towards prioritising NbS in the business model.

Societal challenge addressed: Climate Resilience, Water Management, Food Security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Natural and Climate Hazards, Health and Well-being and Air Quality, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: Promotion of capital flows towards sustainable activities.

Target stakeholder category: NbS investors and entrepreneurs.

Gaps identified: The directive entered into force on 24 December 2022, with the intention that sector-specific ESRS are adopted by mid-2024. However, the European Parliament and the Council made a political agreement on 8 February 2024 on a proposal to postpone the deadline for adoption of the sector-specific ESRS to mid-2026.

Expected developments: Large companies must file their CSRD reports in 2025 for the 2024 financial year, with other companies coming into scope in 2026 and 2027. From 2027, the first wave of companies — those with 5,000+ employees and 1 500 million euro turnover in the EU — must also comply with the due diligence rules.

EU Deforestation Free Supply Chains Regulation

Name of policy: EU Deforestation Free Supply Chains Regulation ((EU) 2023/1115).

Short description of policy: This regulation lays down rules regarding the placing and making available on the Union market as well as the export from the Union of relevant products, that contain, have been fed with or have been made using relevant commodities, namely cattle, cocoa, coffee, oil palm, rubber, soya and wood, with a view to:

- Minimising the Union's contribution to deforestation and forest degradation worldwide, and thereby contributing to a reduction in global deforestation;
- Reducing the Union's contribution to greenhouse gas emissions and global biodiversity loss.

The regulation aims to:

- Avoid that the listed products Europeans buy, use and consume contribute to deforestation and forest degradation in the EU and globally;
- Reduce carbon emissions caused by EU consumption and production of the relevant commodities by at least 32 million metric tonnes a year;
- Address all deforestation driven by agricultural expansion to produce the commodities in the scope of the regulation, as well as forest degradation.

Policy category: Regulatory instrument.

Type of instrument: Regulation.

Type of support: Strong implicit support.

Type of NbS concerned: NbS for ecosystem and vegetation restoration and creation, protection and conservation, and sustainable use and management.

Relevance for NbS: Although it is not focussed explicitly on NbS, the regulation responds to commitments in the European Green Deal and EU and global policies to stop deforestation, with NbS implications. Efforts to achieve the aims of the regulation can support and be supported by NbS by promoting sustainable land management, conservation, and responsible sourcing practices. NbS implementation can enhance the sustainability of some supply chains, and suppliers' efforts to comply, including through certification and traceability. This can lead to promotion and implementation of NbS that enhance the sustainable management of landscapes that products are sourced from.

Societal challenge addressed: Climate Resilience, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: The EU Commission is working with delegates from commodity producing countries that are likely to be affected by this legislation in order to help them put systems in place to be able to comply. This happens through the Multi-Stakeholder Platform on Protecting and Restoring the World's Forests. Monitoring tools for deforestation are being strengthened through the EU observatory on deforestation and forest degradation.

Target stakeholder category: Local and subnational governments and public authorities, society at large, natural resource managers and landowners.

Gaps, barriers identified: The complexity of global supply chains, involving multiple actors and stakeholders, can complicate the integration of NbS. Ensuring that nature-based approaches are applied consistently throughout the supply chain requires coordination among diverse participants. Gaps or inconsistencies in existing policies and regulations related to deforestation-free supply chains may impede the integration of NbS. Clear and supportive regulatory frameworks are essential to facilitate the adoption of NbS.

Expected developments: There is currently a strong pressure to delay implementation due to the difficulties faced by the affected companies and producers.

Periodic reviews and assessments of existing regulations may take place to evaluate their effectiveness and identify areas for improvement. Critical for NbS: A comprehensive review process could consider the role of NbS in achieving deforestation-free supply chains, providing an opportunity to refine strategies and incorporate nature-based approaches more effectively.

Just Transition Mechanism

Name of policy: Just Transition Mechanism. Regulation (EU) 2021/1056 of the European Parliament and of the Council of 24 June 2021 establishing the Just Transition Fund (EU 2021/1056).

Short description of policy: The Just Transition Mechanism provides targeted support to help mobilise around €55 billion over the period 2021-2027 in regions that are highly dependent on carbon intensive industries or with the most people working in fossil fuels. Member States can access this funding by preparing just transition plans that cover the period to 2030 and 2050, identifying the territories that should get support. The Just Transition Fund supports the economic diversification and reconversion

of the territories concerned, with up- and reskilling of workers, investments in Small and Medium-sized Enterprises, creation of new firms, research and innovation, environmental rehabilitation, clean energy, job-search assistance, and transformation of existing carbon-intensive installations. In addition, the InvestEU 'Just Transition' scheme provides a budgetary guarantee under the InvestEU programme and an InvestEU Advisory Hub acts as a central entry point for advisory support requests. It is expected to mobilise €10-15 billion in mostly private sector investments. A new Public Sector Loan Facility will combine €1.5 billion of grants financed from the EU budget with €10 billion of loans from the European Investment Bank, to mobilise €18.5 billion of public investment.

Policy category: Economic instrument.

Type of instrument: Funding mechanism.

Type of support: Weak implicit support. The regulation recital Article 8 states that green infrastructure and repurposing projects should be funded '*where necessary.*' NbS are not explicitly mentioned.

Type of NbS concerned: Protect and conserve, restore and create, sustainably use and manage.

Relevance for NbS: The plans submitted by Member States should set out ways to best address social, economic and environmental challenges specific to the affected territories and stemming from the phasing out of fossil fuel-related activities or decarbonisation of greenhouse gas-intensive processes or products. NbS could be integrated into these transition plans, and help deliver social benefits.

Societal challenge addressed: Social Justice and Social Cohesion; New Economic Opportunities and Green Jobs; Participatory Planning and Governance; Knowledge and Social Capacity Building for Sustainable Transformation.

Funds/programmes envisaged to support the policy: The Just Transition Mechanism consists of three pillars: the Just Transition Fund, the InvestEU Just Transition scheme and the Public Sector Loan Facility.

Target stakeholder category: Competent authorities within each Member State and the Commission, local and subnational governments and public authorities, society at large.

Gaps identified: NbS are not explicitly mentioned as possible solutions that can be included in territorial plans to help deliver on the environmental and social goals of the Green Deal.

Expected developments: More information on resources relevant to this policy framework can be found on the Just Transition Platform, which provides an updated overview of the opportunities, relevant regulatory developments or sector specific initiatives related to the Just Transition Mechanism.

Proposal to amend Regulation No 691/2011 on European Environmental Economic Accounts

Name of policy: Proposal for a Regulation amending Regulation (EU) No 691/2011 as regards introducing new environmental economic accounts modules (EU 2022/0210).

Short description of policy: The 2011 regulation establishes a common framework for collecting, compiling, transmitting and evaluating environmental economic accounts. The Commission proposal in 2022 adds new modules to the common framework. These are forest accounts, environmental subsidies and similar transfers accounts, and ecosystem accounts. In particular, ecosystem accounts aim to provide consistent information on the extent and condition of ecosystems and on the flows of services from these ecosystems to society. Annex I provides a list of information that should be included in these accounts. For instance, ecosystem accounts should include data on ecosystem extent, ecosystem characteristics and supply of ecosystem services. Forest accounts should include area of wooded land, volume of timber, and value of timber.

More information on nature capital accounting work done by the European Commission can be found here.

Policy category: Regulatory instrument.

Type of instrument: Proposal for a regulation.

Type of support: Strong implicit support.

Type of NbS concerned: Protect and conserve, restore and create, sustainably use and manage.

Relevance for NbS: High. NbS are not explicitly mentioned in the Proposal. However, Annex I includes 'nature-based tourism-related services' as cultural services that should be reported in ecosystem services account. More broadly, proposed modules could help in the valuation of ecosystem services and build stronger cases for investing in NbS.

Societal challenge addressed: Climate Resilience; Biodiversity Enhancement, New Economic Opportunities and Green Jobs, Land and Green Space Management.

Funds/programmes envisaged to support the policy: Promotion of capital flows towards sustainable activities.

Target stakeholder category: National and EU-level policymakers; local and subnational governments and public authorities; NbS investors and entrepreneurs.

Gaps identified: NbS are not explicitly mentioned or defined. More detailed guidance on how NbS can be financed using the European environmental economic accounts could be beneficial to investors, especially private actors.

Expected developments: The amendment proposal is currently in trilogue negotiations between EU Parliament and Council. In the meantime, the recently adopted European Strategy for Environmental Accounts (ESEA) for the period 2024-2028 sets strategic drive, direction for development of environmental accounts, level of ambition, and objectives for the European environmental accounts in the next 5 years (ESSC, 2024). This is a strategy to coordinate the producers of European environmental accounts and to inform stakeholders of the developments planned over the period 2024-2028.

Voluntary Disclosure Frameworks

There are currently a number of key voluntary disclosure frameworks developing which are likely to heavily shape upcoming regulations for financial institutions (and corporates). Even if these frameworks are not brought into national level regulations, they are already shaping the actions of leading sustainable finance institutions. The three initiatives named below are coordinating to ensure they are aligned. The TNFD and EFRAG have recently published a correspondance mapping between ESRS and TNFD metrics (EFRAG 2024).

Taskforce on Nature-related Financial Disclosures (TNFD) – the TNFD has developed a set of disclosure recommendations and guidance for financial institutions and corporations to report and act on evolving nature-related dependencies, impacts, risks and opportunities. The TNFD recommendations were published in September 2023. To develop the recommendations and guidance, the Taskforce adopted an open innovation approach to crowd in the expertise and perspectives of market participants and other interested stakeholders. Many countries are considering regulating to make it mandatory for large institutions to disclose in line with TNFD recommendations.

International Standards Sustainability Board (ISSB) - The ISSB is developing standards that will result in a high-quality, comprehensive global baseline of sustainability disclosures focused on the needs of investors and the financial markets. The ISSB builds on the work of market-led investor-focused reporting initiatives, including the Climate Disclosure Standards Board (CDSB), the Taskforce for Climate-related Financial Disclosures (TCFD), and the TNFD. IFRS S1 (published 2023) provides a set of disclosure requirements designed to enable companies to communicate to investors about the sustainability-related risks and opportunities they face over the short, medium and long term. IFRS S2 (published 2023) sets out specific climate-related disclosures and is designed to be used with IFRS S1.

Science Based Targets Network (SBTN) – SBTN has developed guidance and methods for cities and companies to set voluntary, science-based targets that reduce and improve their impact on nature and society. The targets are centred around

the key drivers of nature loss as identified by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES): land/sea use change, resource exploitation, pollution, climate change, and invasive species. SBTs for nature will help companies and cities reduce their contribution to these drivers, across all three systems, and ultimately mitigate threats to biodiversity, at the levels of species, ecosystems and nature's contributions to people (NCPs). The 2024 SBTN release describes how to set and validate targets for freshwater, land, ocean, biodiversity, and climate.

Sustainable Urban and Regional Transformation

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This section covers the following policies:

EU legislation: EU Cohesion Policy: The European Cohesion Policy consists of six EU funds and represents one third of the EU total budget, with a budget of € 392 billion. Three of the cohesion fund regulations refer to NbS and offer support for its development, mainly in urban ecosystems.

EU policies and initiatives: Urban Nature Plans under the EU Biodiversity Strategy 2030: This strategy expects cities with over 20,000 inhabitants to develop Urban Nature Plans. It aims to help local governments to better integrate existing policies related to urban greening at all governance levels and across planning departments. It strongly supports NbS mainstreaming at the local level, by putting it at the heart of its guidance and toolkit for local authorities. It is now underpinned by the EU Nature Restoration Law requirements.

Urban Agenda for the EU: Greening Cities Partnership: It focuses on green and blue infrastructure and aims at promoting cooperation at various governance levels. It strongly supports NbS within the green and blue infrastructure concept. This partnership has no legal basis and participation remains on a voluntary basis.

Green City Accord: It aims to improve the quality of life of all Europeans and accelerate the implementation of relevant EU environmental laws at the local level, by mobilising European mayors on a voluntary basis. NbS is a key element of the accord, under the Nature and Biodiversity section.

EU Strategy on Green Infrastructure: This strategy aims at enforcing ecosystems restoration activities and better connecting habitats of European Community interests via green infrastructure investements. It strongly supports the development of NbS, under the green infrastructure concept.

UNPplus: This Horizon project will build upon the existing UNP framework to support cities in creating and implementing UNPs inline with the EU BDS.

New European Bauhaus Initiative: It provides technical assistance and introduces a dedicated financial instrument leveraging both EU and private investments to deliver and support New European Bauhaus projects. Its principles and goals closely align with the NbS concept, even though it is not consistently mentioned in the documents related to this initiative.

EU Territorial Agenda 2030: This document aims to strengthen the territorial dimension of sector policies at various governance levels. It explictly refers to NbS but is lacking in quantified objectives or dedicated funding sources.

The policy screening did not cover public procurement policies as these are primarily within the scope of local and regional policies. However, it is important to note that the EU Biodiversity Strategy for 2030 committed to develop criteria and monitoring to boost NBS via legislation and guidance on green public procurement.

European Cohesion Policy

Name of policy: European Cohesion Policy 2021-2027;
Common Provisions Regulation;
European Regional Development Fund & Cohesion; Fund Regulation;
European Territorial Cooperation Goal (Interreg);
European Social Fund Plus Regulation;
Just Transition Fund Regulation (described separately in the previous section);
Cohesion Action for Refugees in Europe;
European Marine Fisheries and Aquaculture Fund.

Short description of policy: The new Cohesion Policy for 2021-2027 has set 5 top priorities: a more competitive, a greener, a more connected, a more social and a closer to citizens Europe. With a budget of €392 million, representing almost one third of the EU total budget, the projects financed under the Cohesion Policy are a significant part of the European Green Deal. The policy covers six MFF funds of which the largest are the European Regional Development Fund, including funding for the Territorial Cooperation Goal (Interreg), and the Cohesion Fund. The funds included in the Cohesion Policy are expected to contribute to achieve the target of 30% of the EU budget expenditure supporting climate objectives and to providing 7.5% of annual spending under the Multiannual Financing

Framework to biodiversity objectives in 2024 and 10% in 2026 and 2027.

Policy category: Regulatory instruments.

Type of instrument: Regulation.

Type of support: Low implicit: none of the Cohesion Policy regulations explicitly refer to NbS. The Common Provisions Regulation covers all the funds and mentions measures affiliated to NbS. As do the European Regional Development Fund & Cohesion Fund Regulation, and the Just Transition Fund (described in previous section).

Type of NbS concerned: Urban natural ecosystem protection and conservation, ecosystem restoration and creation, sustainable use and management.

Relevance for NbS: Low but with high potential. The European Regional Development and Cohesion Fund and the Just Transition Fund are relevant for NbS and make explicit references to fulfilling the biodiversity objectives of the EU Green Deal. Cohesion policy funds can help boost the implementation of NbS in urban ecosystems (NetworkNature, 2023). In the current programming period, Member States exceeded the minimum requirement of 8% national allocation of the ERDF to sustainable urban development (mostly through INTERREG projects) to reach 12% (EUR 24 billion). Indeed, NbS in urban ecosystems (both urban regeneration and the implementation of new NbS) represent the vast majority of NbS projects (more than 76%) in the EU (EIB, 2023). This reflects significant funding gaps across ecosystems.

Societal challenge addressed: Climate Resilience, Place Regeneration, Social Justice & Cohesion, New Economic Opportunities & Green Jobs, Biodiversity Enhancement.

Funds/programmes envisaged to support the policy: European Regional Development Fund, Cohesion Fund, European Social Fund Plus, Just Transition Fund.

Target stakeholder category: National & EU policymakers, local & subnational governments and authorities.

Gaps identified: The Cohesion Policy is still not enough adapted to the needs of each region. Furthermore, it lacks holistic approach in terms of social policy and only half of its package regulations provide support for NbS related measures. Additionally, it does not connect enough regions to implement sustainability related policies. The Cohesion Policy package has been impacted by important external crises, notably the Covid-19 pandemic and the war in Ukraine, which shifted funding from the original focus on driving sustainable development. This emergency use of the Cohesion Policy has affected its capacity to fulfill its original goals, while it is more and more percieved as a crisis instrument.

Expected developments: In January 2023 the Commission established the Group of High-Level Specialists on the Future of Cohesion Policy, which has issued a report to maximise the effectiveness of the Cohesion Policy. Further reflection on the Cohesion Policy has been undertaken at the 9th Cohesion Forum in April 2024. The Commission published the 9th Cohesion Report in spring 2024, calling for the policy to adapt more to regional needs and to strengthen ecosystem restoration to mitigate climate change impacts.

Urban Nature Plans under EU Biodiversity Strategy

Name of policy/strategy/instrument: EU Biodiversity Strategy for 2030.

Short description of policy: The EU Biodiversity Strategy to 2030 highlights that cities with over 20,000 inhabitants are expected to develop Urban Nature Plans, an integrated planning framework. Urban Nature Plans stand out from other greening approaches in that they help local authorities integrate existing policies, measures and strategies related to urban greening at all governance levels and across planning departments (e.g., climate, housing, mobility, utilities, and public health). They are expected to include measures to create new urban green spaces such as urban forests, public green spaces, gardens, urban farms, and green infrastructure (e.g., green roofs and walls). In addition, they should outline the policy, regulatory and financial framework needed to deliver these measures

whilst adressing the. need for coordinated bottom-up and top-down initiatives, engaging city- and community-driven efforts to complement national sustainability plans.

Policy category: Planning instrument.

Type of instrument: Strategy (one of the targets of the EUBDS 2030).

Type of support: Strong explicit support. NbS and their mainstreaming *"into all aspects of the municipal organisation"* are recognised as a core aspect of the commitment to develop urban nature plans in the official Urban Nature Plan Guidance and Toolkit.

Type of NbS concerned: NbS for ecosystem and vegetation restoration and creation, protection and conservation, as well as sustainable use and management - specifically of measures to create biodiverse and accessible urban forests, parks and gardens; urban farms; green roofs and walls; treelined streets; urban meadows; and urban hedges with a strong focus on urban and peri-urban areas.

Relevance for NbS: High relevance. Urban Nature Plans will help support the planning and implementation of NbS in urban areas. NbS should be at the core of cities' urban nature plans.

Societal challenge addressed: Green Space Management, Biodiversity Enhancement, Climate Resilience, Health and Well-being, Air Quality, Sustainable Urban Transformation, Participatory Planning and Governance.

Funds/programmes envisaged to support the policy: LIFE, CAP, ESF+ (European Social Fund Plus), Cohesion Policy, Horizon Europe, EU cross border cooperation programs (Interreg).

Target stakeholder category: Local and subnational governments and public authorities.

Gaps identified: Lack of implementation at local level, the policy tool is not mandatory, lack of dedicated funding. Despite EU support for planning, policies across governance levels fall short in addressing critical aspects of biodiversity conservation. Consequently, there is an urgent need for transformative approaches that reverse species decline and unlock the benefits that nature can provide society. Bottom-up initiatives, often overlooked and underfunded, must complement national strategies to drive meaningful change.

Expected developments: The progress on rolling out of cities' Urban Nature Plans has been hesitant up to mid 2024**.** The EU Nature Restoration Law adopted in June 2024 now sets an EU wide legally binding obligation on local authorities to map and quantify their urban green spaces and urban tree cover. They are obliged to ensure an increasing trend of urban tree canopy cover. At the national level, the government is obliged to ensure no net loss of urban green space by 2030 and an increasing trend thereafter.

The EU-funded UNPplus (UNP+) project will address the need for coordinated bottom-up and top-down initiatives, engaging city- and community-driven efforts to complement national sustainability plans. Throughout a 3-years period (2024-2027) 11 academic partners and 5 European cities will explore innovations and barriers related to Urban Nature Plans. UNP+ will harvest learnings over the course of the project to bridge gaps, foster collaboration, and propel a next-generation strategy for urban ecosystem transformation. Ultimately, the goal is for cities to have the tools and skills necessary in order to leverage the power of urban nature to achieve the goals and targets outlined by the above mentioned EU strategies and laws.

Urban Agenda for the EU – Greening Cities Partnership

Name of policy: Urban Agenda for the EU (Greening Cities Partnership) (Greening Cities Partnership, 2023).

Short description of policy: The Urban Agenda for the EU is a multi-level working agreement, for urban policy and practice, promoting cooperation between Member States, cities, the European Commission, and other stakeholders. Approved in 2022, the Greening Cities Partnership has a focus on green and blue infrastructure and has identified four priority sectors, namely urban agriculture, water management, sustainable transport and built environment. Partnerships are not official bodies, and members

are cities, regions, Member States, umbrella organisations, European institutions and other members (like universities).

Policy category: Planning instrument.

Type of instrument: Action programme.

Type of support: Strong explicit support. NbS are strongly embedded in the framework, as part of the green and blue infrastructure concept.

Type of NbS concerned: NbS for ecosystem and vegetation restoration and creation, protection and conservation, and sustainable use and management, strong focus on urban and peri-urban areas

Relevance for NbS: High relevance.

Societal challenge addressed: Green Space Management, Biodiversity Enhancement, Climate Resilience, Water Management, Food Security, Place Regeneration, Health and Well-being, Sustainable Urban Transformation.

Funds/programmes envisaged to support the policy: EU Cohesion related funds, mainly the European Regional Development Fund (ERDF), Horizon Europe and LIFE programmes as well as InvestEU programme.

Target stakeholder category: National and EU policymakers, local and subnational governments and authorities, NbS investors and entrepreneurs.

Gaps identified: As the EU Urban Agenda has no legal basis, implementation remains on a voluntary basis. Furthermore, the uptake of NbS into appropriate EU funding mechanisms is still limited, mostly due to a lack of information on how to combine different funding sources to strenghthen green infrastructure and NbS integration. Eventually, good practices connecting NbS and human health need to be scaled up. Access to knowledge is unequal and significant improvements are possible for the deployment of concrete green and blue infrastructure solutions at city level; better regulation and a strengthening of the urban dimension of upcoming EU nature policies is needed, including support for local implementation of legislation; need for new knowledge and strategies for increasing absorption of funding for GI in an integrated manner.

Expected developments: A draft action plan has been issued in April 2024. This action plan includes a set of five actions, with a timeline ending by the end of 2025. The action plan requires that by the end of 2025, a methodology to help municipalities quantify their demand for urban green infrastructure; indicators for monitoring purposes; specific guidelines; position papers on earmarking funds for green infrastructure; best practices exchanges will be developed.

Green City Accord

Name of policy: Green City Accord.

Short description of policy: The Green City Accord (GCA) is a European Commission initiative to mobilise European mayors committed to safeguarding the natural environment. It aims to improve the quality of life of all Europeans and accelerate the implementation of relevant EU environmental laws at the local level. By joining the accord, cities commit to step up their efforts in five areas - water, air, nature and biodiversity, circular economy and waste, and noise - by 2030. City authorities willing to formally join the Green City Accord are requested to go through the approval of the municipal council, followed by the signature of the GCA political commitment document by the mayor or equivalent. It was launched at EU Cities and Regions week in October 2020.

Policy category: Planning instrument.

Type of instrument: Action programme.

Type of support: Strong explicit support of NbS due to action areas of nature and biodiversity and its 3 mandatory indicators which include references to NbS .

Type of NbS concerned: NbS for ecosystem and vegetation restoration and creation, protection and conservation, and sustainable use and management, strong focus on urban and peri-urban areas.

Relevance for NbS: High relevance. Nature and Biodiversity is one of the action areas that signatories commit to dedicate their efforts to; the three mandatory indicators for measuring progress aim at increasing the protection and restoration of natural(ised) areas in cities, tree canopy cover and biodiversity (with number of bird species in urban areas as proxy).

Societal challenge addressed: Health and Wellbeing, Biodiversity Enhancement, Green Space Management, Land Regeneration, Climate Resilience, Sustainable Urban Transformation, Air Quality, Water Management.

Funds/programmes envisaged to support the policy: Funded by DG ENV and implemented by a consortium composed of Eurocities, ICLEI and the Council of European Municipalities and Regions.

Target stakeholder category: Local and subnational governments and public authorities as signatories, associations of cities, regional and national authorities, environment agencies, NGOs, scientific institutions, international organisations can become supporters of the initiative.

Gaps identified: The main identified gaps are related to the absence of binding mechanisms within the Green City Accord, which is a voluntary initiative. Signatories are responsible for the creation of the baseline report and establishing individual targets for the mandatory indicators until 2030. However, challenges arise as signatories face varying constraints in monitoring these indicators. Insufficient existing data for the baseline report hinders target setting and progress tracking, both at local and initiative level. Moreover, as the initiative covers five different areas pertaining to environmental quality across the EU, issues emerge regarding data accessibility and the ability of implemented actions to influence the indicators, due to lack of local-level mandate. Differences at the national and regional levels in governance further complicate matters, particularly concerning resource management such as water and circular economy practices. Additionally, the absence of synergies and integration among various EU-initiatives at the city level adds to the burden on municipalities, particularly in terms of monitoring and reporting.

Expected developments: Green City Accord signatories that joined the initiative until December 2022 were expected to provide their baseline report until December 2024, starting the first reporting phase of the initiative. This report will provide insights on the current status of the signatories and their individual targets until 2030, along with specific actions and strategies to achieve those targets. Additionally, this will also provide an overview on the level of engagement of the current signatories and the actual number of cities carrying out the monitoring and reporting activities of the initiative.

EU Strategy on Green Infrastructure

Name of policy: EU Strategy on Green Infrastructure (2013) (European Commission, 2013a).

Short description of policy: The EU Strategy on Green Infrastructure was adopted in May 2013 to promote investments in green infrastructure, ensure connectivity between habitats of European Community interest, and restore ecosystems. Green Infrastructure (GI) is a strategically planned network of natural and semi-natural areas designed and managed to deliver benefits to society through NbS. Natura 2000 sites form the backbone of this network and are complemented by other spaces such as parks, private gardens, landscape features on farmland, urban green features such as green roofs and walls, and ecological corridors. The review of the strategy in 2019 concluded that green infrastructure needs to be further scaled up in the EU as the strategy did not manage to deliver a truly strategic and coherent deployment of GI at the EU level. The findings of the review fed into the evaluation of the 2020 BDS and the development of the 2030 EU BDS.

The EU BDS establishes the commitment to integrate Natura 2000 sites with ecological corridors to create a trans-European Nature Network by 2030, to prevent genetic isolation, allow for species migration, and maintain and enhance healthy ecosystems.

Policy category: Planning instrument.

Type of instrument: Strategy.

Type of support: Strong implicit.

Type of NbS concerned: Urban natural ecosystem protection and conservation, sustainable use and management.

Relevance for NbS: High. The European Commission's green infrastructure communication in 2013 (COM/2013/0249 final) has no explicit reference to NbS, but the challenges addressed and the solutions sought do align with the core objectives of NbS. Green Infrastructure is referred to as *"successfully tested tool for providing ecological, economic and social benefits through natural solutions."*

Societal challenge addressed: Green Space Management, Place Regeneration, Knowledge & Social Capacity Building for Sustainable Urban Transformation, Climate Resilience, Biodiversity Enhancement, Water Management.

Funds/programmes: The Common Agricultural Policy, the Cohesion Fund, the European Regional Development Fund, Horizon 2020, the Connecting Europe Facility, the European Maritime and Fisheries Fund and the Financial Instrument for the Environment (LIFE).

Target stakeholder category: National and EU policymakers.

Gaps identified: Various gaps have been identified regarding the EU Strategy on Green Infrastructure (GI). Indeed, national government funding to further promote and develop GI is missing. Another important gap is related to the lack of understanding of the GI concept among local stakeholders. Indeed, the GI concept could be simplified, with more data consistency and a clearer definition of common standards. Providing local stakeholders with EU methodological guidance and materials, such as tools and methods could also tackle the issue related to the limited capacity and technical know-how among practitioners. Eventually, the knowledge gap around potential benefits of GI seems of great relevance, as it explains the underinvestment situation of GI across the continent.

Expected developments: The EU Biodiversity Strategy for 2030, issued in 2020, is promoting investments in green and blue infrastructure.

According to an EU Commission representative, no immediate development is currently expected regarding the EU Strategy on Green Infrastructure, which is still valid. However, there has been a revamp of the EUBP working group on green infrastructure, which now includes NbS (and has been renamed EUBP working group on Green Infrastructure and Nature-based Solutions).

New European Bauhaus Initiative

Name of policy: New European Bauhaus Initiative (COM/2021/573).

Short description of policy: Launched by the Commission in September 2021 as part of the Green Deal. The NEB expresses the *"EU's ambition of creating beautiful, sustainable, and inclusive places, products and ways of living."*

The actions most relevant to NbS include (COM2021 573 final):

- Provide technical assistance to support interested stakeholders, such as regional and local administrations, to develop and deliver New European Bauhaus projects, with a first focus on citizen engagement and interdisciplinary methods for project incubation and co-design;
- Introduce a dedicated urban development financial instrument leveraging EU and private investment to support New European Bauhaus projects in Member States. Beyond project financing, it will also grant support for training and project implementation;
- Grow the established network of 600 official partner organisations, ranging from EU-wide networks to grassroots initiatives, reaching millions and fostering collaborations across multiple sectors, including art, science, and local governance, to deliver the NEB vision;
- In alignment with the European Year of Skills, introduce the NEB Academy to offer training on sustainable construction, circularity, and biobased materials, accelerating sectoral transformation and skill development;
- Stimulate local, regional, and national actors to launch their own NEB-aligned projects, significantly enhancing the initiative's reach and impact.

EU Member States:

- Introduce the New European Bauhaus in their social economic and territorial development strategies and to reflect their commitment to support and mainstream the New European Bauhaus in the implementation of cohesion policy 2021-2027 as part of the Partnership Agreements and relevant operational programmes;
- Mobilise the relevant parts of their recovery and resilience plans (e.g. on renovation or infrastructures) on New European Bauhaus transformative projects.

Policy category: Planning instrument.

Type of instrument: Action programme.

Type of support: Strong implicit. The initiative emphasises the integration of sustainability, inclusivity, and beauty into living spaces, which inherently includes a strong connection to nature. While specific references to NbS might not be consistently highlighted in all NEB communications or documentation, the principles and goals of the NEB align closely with the concept of NbS.

Type of NbS concerned: Sustainable use and management, strong focus on urban and peri-urban areas.

Relevance for NbS: High.

Societal challenge addressed: Climate Resilience, Water Management, Food security, Social Justice and Social Cohesion, New Economic Opportunities and Green Jobs, Participatory Planning and Governance, Natural and Climate Hazards, Health and Well-being and air Quality, Green Space Management, Place Regeneration, Knowledge, and Social Capacity Building for Sustainable Transformation, Biodiversity enhancement (all 12).

Funds/programmes envisaged to support the policy: The Cohesion Funds, particularly the European Regional Development Fund (ERDF), and Recovery and Resilience Plans are integral to the European Union's strategy to incorporate NEB principles into significant funding streams. These streams aim at fostering economic, social, and territorial cohesion, and supporting Member States in their post-pandemic recovery efforts. The ERDF provides up to €50 million for innovative NEB solutions, targeting urban challenges such as circular construction, cultural heritage, affordable housing, and urban regeneration. It highlights a focused approach towards enhancing urban sustainability and revitalisation.

Horizon Europe, the Single Market Programme, Digital Europe Programme, and the LIFE Programme have contributed €106.3 million in dedicated funding for NEB projects in 2021 and 2022.

The NEB has initiated dedicated calls for projects that focus on areas of transformation, supporting the initiative's mission to catalyse change that enhances quality of life and promotes sustainability.

The collaboration with the European Investment Bank to launch the 'New European Bauhaus territorial development model' as a financial instrument represents an innovative strategy. It encourages Managing Authorities in EU Member States to set up financial tools aimed at leveraging public and private resources to support NEB projects.

Target stakeholder category: Local and Regional Administrations, EU Member States, Grassroots Initiatives and Community Groups, Artists, Designers, and Cultural Practitioners, Scientists, Researchers, and Academics, Private Sector and Investors, Educators and Students, Non-Governmental Organisations (NGOs) and Civil Society, Urban Planners and Architects, Entrepreneurs and SMEs, Environmental and Climate Advocates, General Public and Citizens.

Gaps identified: Gaps in integrating NbS within the NEB initiative are evident, notably the absence of explicit objectives for NbS, which introduces ambiguity in executing multifunctional green and blue interventions. These should enhance biodiversity, beyond merely aesthetic or 'cosmetic' improvements. Although various European programmes offer support, there is a notable lack of specified funding allocations for NbS projects, hindering targeted implementation. The initiative's impact is further limited by a dearth of direct legal frameworks, financial mechanisms, or institutional supports specifically designed for NbS. This situation is compounded by insufficient policy guidance and political

backing to drive the integration of NbS across all levels of planning and development within the NEB. Moreover, there is a gap in raising awareness about the importance and benefits of NbS, which is crucial for garnering broad-based support and understanding among stakeholders and the general public.

Expected developments: Despite the EU mission on the New European Bauhaus not advancing as initially envisioned, the European Commission acknowledges its significance and is currently working on a dedicated part of the Horizon Europe work programme 2025. Therefore, given the cross-cutting nature of the NEB and of its R&I content, the NEB will be implemented as a cross-cluster issue in the Horizon Europe work programmes for 2025-2027. This R&I component will be complemented by a roll-out component that will be delivered through synergies with other EU programmes. Together, these two components will be referred to as the 'NEB Facility' (EC, 2024a). This development underscores a continued commitment to embedding the core principles of the New European Bauhaus—sustainability, inclusivity, and beauty—within existing and forthcoming European policies and programs. There is an anticipated increase in efforts to weave these values more deeply into sectors such as urban development, environmental conservation, and social policy, leveraging ongoing European initiatives to ensure the New European Bauhaus's vision is fully realised and integrated across the EU.

EU Territorial Agenda 2030

Name of policy: Territorial Agenda 2030 (Informal Meeting of Ministers responsible for Territorial Cohesion, 2021).

Short description of policy: Adopted on 1 December 2020, this strategic framework document provides orientation for spatial planning policies and calls for reinforcing the territorial dimension of sector policies at all governance levels. By helping to achieve Sustainable Development Goals in the EU, it contributes to two key European objectives: a Green Europe to protect common livelihoods and a Just Europe to better balance territorial development and reduce inequalities across the continent. Six dedicated pilot actions have been launched to implement the Territorial Agenda 2030.

Policy category: Planning instrument.

Type of instrument: EU strategy.

Type of support: Medium explicit. The strategy explicitly mentions NbS and provides examples of actions even though it gives no concrete objectives or numbers.

Type of NbS concerned: Urban natural ecosystem protection and conservation, ecosystem restoration and creation, sustainable use and management.

Relevance for NbS: Medium explicit. The Territorial Agenda 2030 mentions supporting the development of NbS as well as green and blue infrastructure networks that link ecosystems and protected areas in spatial planning, land management and other policies, and the development of new crisis management tools to increase places' safety and resilience.

Societal challenge addressed: Climate Resilience, Place Regeneration, Social Justice and Cohesion, Natural and Climate Hazards, Biodiversity Enhancement, Food Security, Participative Planning and Governance, Green Space Management.

Funds/programmes: EU Cohesion Policy, Rural Development Policy within the Common Agricultural Policy, European Green Deal and the Sustainable Europe Investment Plan and Just Transition Mechanism, Union Recovery Programme.

Target stakeholder category: National and EU policymakers, local and subnational governments and authorities, NbS investors and entrepreneurs.

Gaps identified: First of all, it does not provide detailed or numbered objectives concerning NbS implementation in EU Member States. It only targets the European Central Banks as NbS investors and entrepreneurs and does not take into consideration other relevant stakeholders in this field. Regarding the possible funding sources, a diversity of European programmes is mentioned, though no concrete or detailed money allocation is to be found in the strategy. The European Parliament insisted on the fact that this declaration is weakened by not including any *"direct legal, financial or institutional implementation instruments."* Few local and regional authorities have implemented innovative processes

within the Territorial Agenda 2023 pilots, the majority of which having been launched by national governments.

Expected developments: A stocktaking will be conducted in 2024 including reviews of the governance system, implementation progress and relevance of the priorities. Additionally, an informal ministerial meeting shall be held in 2025, informing a decision on possible renewal of the Territorial Agenda 2030. Spatial planning with regards to the Mission A Soil Deal for Europe is also the focus of the Horizon Europe project SPADES.

Network Nature

Chapter 3: Needs and Gaps Analysis

What Are the Policy Gaps Preventing NbS Uptake?

This section describes the gaps in policy and implementation and the lack of supporting instruments to promote NbS uptake at all stages of their deployment under the following headings:

- Lack of integration of NbS in policies, with a lack of quantitative and measurable targets in relation to NbS deployment;
- Lack of harmonisation between policies and insufficient exploitation of synergies between policies that have potential complementary objectives;
- Short-term political agendas and planning and risk aversion leading to path dependency;
- Insufficient funding and financial mechanisms;
- Lack of regulatory clarity, standards, and unequal taxes;
- Lack of involvement from the business sector;
- Difficulty in evaluating NbS in non-monetary terms;
- Lack of evidence showcasing the cost-effectiveness of NbS;
- Insufficient assessments of NbS synergies and trade-offs;
- Lack of knowledge about how to integrate NbS into practice and targeted guidance for practitioners.

These headings align with the gaps identified by NetworkNature in the European Research and Innovation Roadmap to 2030 on Nature-based Solutions. The R&I roadmap identified the following key challenges related to closing the NbS research-implementation gap, mainstreaming NbS in policy, and building awareness, capacities and dialogues on NbS:

- Lack of integration and imbalance within and across sectors in science, policy, business, and civil society hinders the acceleration and effective implementation of NbS;
- At present, social, financial, political, and institutional barriers to NbS action limit mainstreaming both in public and private sectors;
- Public support and frameworks for NbS remain insufficiently coordinated across scales and sectors to consistently achieve NbS implementation.
- NbS benefits and their potential contribution to international policy objectives addressing global crises remain disputed in international fora and also pose challenges for harmonisation of national-level strategies, action plans and reporting that respond to international policy objectives;
- NbS knowledge and research outcomes are often not directly relevant or easily usable by decision-makers and stakeholders;
- Decision-makers often lack capacities and incentives to plan and implement sustainable and impactful NbS.

Lack of Integration of NbS in Policies and Quantitative and Measurable Targets

Over the last decade, there has been more attention given to NbS within the EU to increase synergies between climate change adaptation, disaster risk reduction and biodiversity. Policies are promoting climate resilience and disaster risk management, notably through the Floods Directive, the EU Climate Adaptation Strategy, the Biodiversity Strategy for 2030 and the Green Infrastructure Strategy (McVittie et al, 2018). But despite growing attention to NbS, existing policy frameworks are not yet sufficiently conducive to the uptake of NbS. The potential of NbS to answer societal and economic challenges is not being fully exploited. NbS are insufficiently integrated into economic, health and finance policies (NetworkNature, 2022). There are different layers of policy gaps: from policy shaping and development through implementation, measuring and assessing impacts, to evaluating what policy needs are not addressed and designing new policy requirements (Jaegersberg and Ure, 2017).

The policy screening reviewed 48 EU and global treaties, strategies, directives and dedicated funding instruments in relation to NbS across the six policy themes identified. The review of gaps associated with each policy revealed a lack of integration of NbS in policy texts, with the exception of the mostly non-legislative urban policies. Of the 48 policies reviewed, only 18 (35%) explicitly mention NbS or related terms. This is not a surprising result as 11 of the 38 reviewed EU policies pre-date the adoption by the EU of a definition of NbS in 2015, and 31 pre-date the adoption of the UNEA definition

in 2022. Some of the policies promote concepts that are considered to come under the umbrella of NbS (EEA 2021), such as the ecosystem approach, ecosystem-based disaster risk reduction, ecosystem-based adaptation, green and blue infrastructure, natural climate solutions, natural water retention measures, sustainable (urban) drainage, and regenerative agriculture and agroecology. Policy support for these concepts was also considered to be explicit support. The evidence base to support NbS up-take in EU policy only gained ground from 2020, as results emerged from EU R&I funding in NbS projects. Initial projects had a predominantly urban focus, and this is reflected in the more explicit focus on NbS in urban policy since 2020.

In the field of sustainable urban and regional transformation, 5 of 7 policies (71%) mention NbS explicitly. In contrast, only 1 out of 5 policies on sustainable food systems mention NbS explicitly (20%), most of these being EU laws that pre-date the NbS concept. In the biodiversity enhancement and ecosystem restoration theme, only the EU Biodiversity Strategy and the new Nature Restoration Law explicitly mention NbS.

These results contrast with a review that was undertaken in 2018 before the concept of NbS was well defined, and before the EU R&I project outcomes started to influence urban policy. The Davis et al. (2018) study review of 23 EU strategies, directives and dedicated funding instruments demonstrated a prevalence of NbS addressing societal challenges associated with biodiversity and climate (Figure 8).

Figure 5: *Mentions of NbS across policy themes – policy screen results*

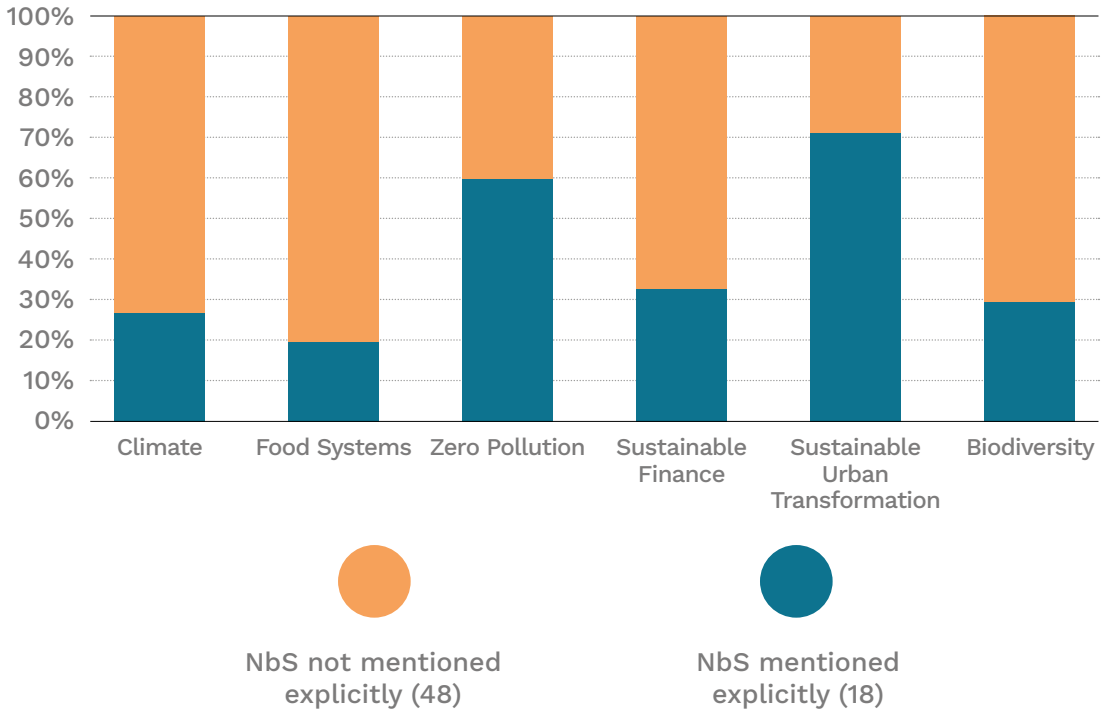


Figure 6: *Explicit mentions of NbS and related terms across reviewed policies - Results of policy screening*

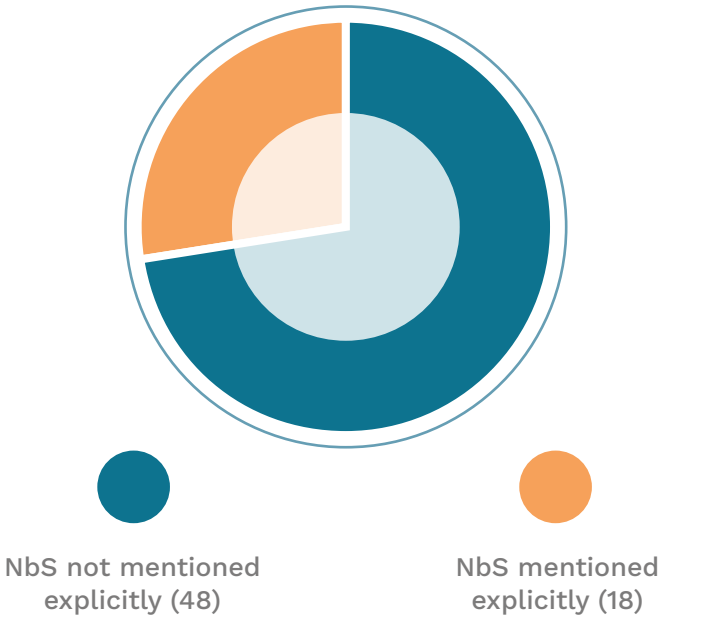
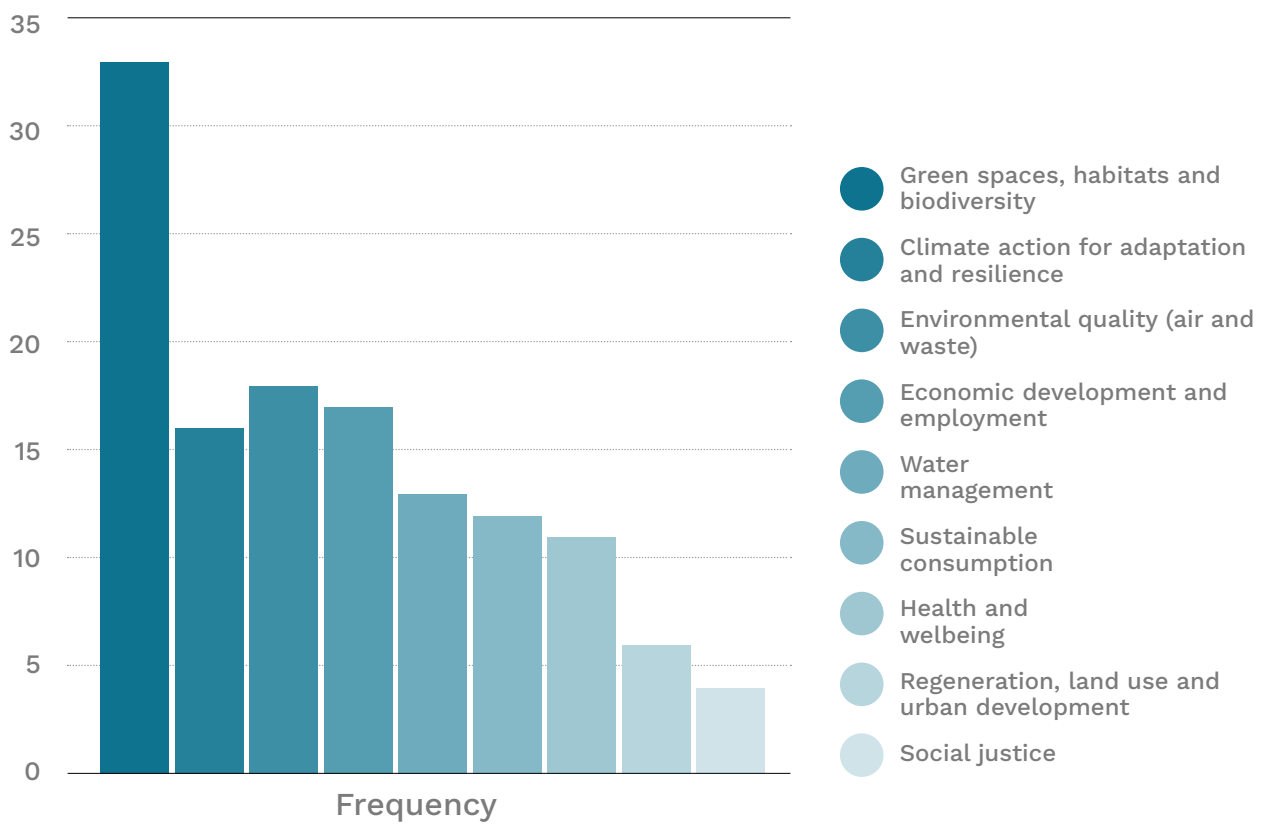


Figure 8: *Societal challenges addressed in analysed EU policies (Davis et et al., 2018)*



There is a lack of quantitative and measurable targets that incentivise NbS deployment and evaluate NbS (Davis et al., 2018). The lack of integration of the NbS concept in sectoral policies outside the urban scope means that there is very little detail or guidance on the implementation of NbS, even when explicitly refered to. Without concrete measures to mainstream NbS in areas such as coastal resilience and biodiversity conservation, stakeholders such as governments, businesses, NGOs, and local communities might lack the ability to effectively implement them. These targets should be set in existing policies and accompanied with budgets for reaching them.

The following summarises the findings of the policy screening in Chapter 2:

Biodiversity enhancement and ecosystem restoration: Policy under this theme either explicitly recognises the role of NbS or implicitly supports the use of NbS to achieve biodiversity and ecosystem objectives. The newly adopted EU Nature Restoration Law (NRL) explicitly recognizes the importance of NbS to build resilience, fight the climate crisis, benefit biodiversity and support the delivery of a range of ecosystem services, and sets binding targets for ecosystems and species including pollinators. The NRL strengthens enforcement of the species and habitat conservation measures required by the EU Nature Directives, which can be considered NbS and/or can be achieved though NbS. Marine legislation requires the adoption of an ecosystem based approach to the spatial planning and management of seas, which can advance the implementation of NbS. The global biodiversity framework agreed in 2022 explicitly recognises NbS as playing an essential role in achieving the goals of the Convention on Biological Diversity, and the EU Biodiversity Strategy to 2030 explicitly refers to NbS as nearly all of its objectives hinge upon the implementation of NbS across diverse ecosystems.

The main weakness of these policies is a shortage of dedicated funding and weaknesses in integrating policy objectives and actions with economic and social policies and interests, with weaknesses in the engagement with economic and private stakeholders under these policies.

Sustainable food systems: The dominant EU public sectoral and funding policies for agriculture, forestry, and fisheries – the CAP and the CFP – can provide opportunities for NbS support if Member States choose to do so in their national programmes. However, both policies lack explicit and binding drivers to actively promote NbS choices, whilst continuing to largely support intensive production systems and methods that undermine NbS approaches. The CAP has been assessed as providing insufficient baseline requirements and insufficient funding to increase the uptake of biodiversity-friendly farming practices (EEA, 2021). Interviewees mentioned a lack of strong (institutional) support to accelerate relevant NbS interventions in agriculture and nature restoration. The EU strategies recognise NbS and provide ambitious targets but these are not sufficiently supported by legislation or funding and their impact is criticised.

Zero pollution: There is no mention of NbS in the Zero Pollution Action Plan; despite a strong focus on actions towards eliminating and remediating, minimising and controlling as well as preventing water, air and soil pollution, the use of NbS to do so has not been highlighted. The proposal for a Soil Monitoring Directive no longer includes a minimum set of sustainable soil practices to be implemented by Member States. The existing EU legislation on water, nitrates, and air pre-dates the NbS concept and although there are opportunities to upscale NbS in the national programmes and plans (such as natural water retention measures, buffer strips and cover cropping), the policies are failing to achieve their objectives and NbS are underutilised. This reflects very much the observations from the interviewees in terms of insufficient NbS implementation within the zero-pollution theme.

Climate change mitigation, adaptation and resilience: In the EU Climate Law, there is no target for NbS integration in Member States' adaptation plans, although NbS are a key component of adaptation and Commission guidance on adaptation planning and reporting and the recent disaster risk reduction goals reflect this. NbS could be better integrated in the law as actions in the objectives, in the article on scientific advice, and in the intermediate Union targets. The newly adopted NRL requires national planning of measures for floodplain restoration, dam removal, and peatland rewetting. More EU intiatives

focussing on climate resilience are expected. There are opportunities to strengthen the role of NbS in implementation as Member States update their national energy and climate plans, national adaptation plans, and submit integrated mitigation plans for the land sector.

NbS finance for a just transition to a nature positive economy: Recent legislation sets requirements and standards to direct investment and corporate activities towards sustainability, prevent greenwashing, and hold to account businesses who claim to be sustainable. The legislation is increasingly providing businesses and financial institutions with a legal framework within which to develop new business models and steer investments towards NbS. However, for busineses and financial institutions to understand if they are investing in NbS, further guidance and definitions are needed. They also need financial products and markets that expressly support and demand NbS. In contrast, the public funding programme for just transition fails to explicitly support NbS.

Sustainable urban and regional transformation: Recent urban policies and initiatives are strongly aligned with the NbS concept and mostly explicitly support it, along with aims to increase cooperation across governance levels. Urban nature planning strongly supports NbS mainstreaming at the local level by putting it at the heart of its guidance and toolkit for local authorities. These voluntary initiatives build on the older green infrastructure concept and strategy. Urban greening is now underpinned by the EU Nature Restoration Law, which quantified and set legally binding requirements on urban green space and urban trees. The New European Bauhaus projects will benefit from a dedicated financial instrument leveraging both EU and private investments, and there are some opportunities in the cohesion policy funds.

Lack of Harmonisation Between Policies and Insufficient Exploitation of Synergies

The policy screening revealed a lack of coherence between policies. This is especially the case between climate and biodiversity policies. For example, a 2020 survey and concept note on agriculture and flood risk management in the EU revealed that despite available knowledge on the impact of floods on agriculture, there was a lack of synergies between agricultural and flood risk management policies and coordination between responsible authorities, as well as underutilisation of available EU funds (ACTeon and WOOD, 2021). According to Seddon et al .(2020), unsupportive, conflicting policies hinder the uptake of NbS, and the voluntary nature of policies supporting NbS makes it challenging to integrate NbS in policymaking. The interviews highlighted the problem of competing regulations and policies,[8] where stakeholders may have to meet standards that potentially exclude NbS. For example, engineering standards or building codes do not specifically include NbS or inadvertently exclude them. There are conflicting technical requirements between the international, the EU and national levels and a lack of coherence between EU policies, which requires better harmonisation and better cross-sectoral collaboration (EEA, 2021; Somarakis, Stagakis and Chrysoulakis, 2019).

In urban policy, Kabisch et al (2016) relate the lack of NbS uptake to the traditional structures of city departments which create 'sectoral silos.' These silos have different 'sectoral languages' due to differences in educational and professional backgrounds as well as diverse sectoral objectives. The multifaceted definition of NbS is not easily translated within the defined and restricted responsibilities of local or regional sectoral departments. For instance, the urban greening department might not have the same objectives or the same understanding of NbS as the mobility department. This is reflected in divergent policies on urban green spaces versus transport and mobility issues within a city. NbS policy integration needs to take into account the need to create bridges between decision-making and permitting structures at local and regional levels (Davies et al., 2015).

8 Mentioned by both NbS Hubs and Green Finance Institute.

The Case of Forest and Water Management: A siloed Approach to Climate and Biodiversity Challenges Tackled by NbS

The compartmentalised approach to environmental policy is often cited as one of the main aspects preventing the uptake of NbS. Although NbS have the potential to answer multiple societal challenges simultaneously, the deployment of NbS in practice tends to focus on specific challenges to the detriment of others, and some actions result in losses of biodiversity and ecosystem services instead of gains.

The planting and restoration of forests and curbing deforestation are often mentioned as NbS for GHG mitigation and carbon sequestration. An interview with an investment company noted that the "*most viable NbS investments are now linked to carbon sequestration.*" However, there are cases where this can lead to investments in monocultures and low-diversity plantations that present negative impacts on biodiversity and reduce resilience to droughts (Seddon et al., 2020). These risks associated with focusing mainly on the carbon sequestration potential of NbS reveal confusion around the concept and broader application of NbS. It also points to the need to work with investment companies to think beyond financial returns on investment to how NbS approaches align with multiple benefits and returns.

The interviews revealed that in NbS for water management, projects tend to focus on NbS for managing climate-related risks (e.g. flood risk reduction) without considering biodiversity and health benefits, e.g. for improving water quality. At the same time, projects that primarily aim to restore ecosystems from a biodiversity standpoint may need to pay more attention to the fact that they can also contribute to achieving climate objectives and respond to social and economic challenges. Interviewees stated that there is insufficient evaluation of the effect of NbS measures at a landscape and/or catchment/river basin scale and there is a lack of quantified evidence of NbS impacts and benefits.

Challenges associated with identifying the additionality, attribution, and permanence of NbS outcomes have been pointed out as contributors to the 'greenwashing' of practices as NbS (Seddon, 2022). This demonstrates a need for a more comprehensive and standardised assessment of NbS at an international level. The IUCN Global Standard agreed upon in 2020 and currently under revision (2024-2025) provides a very good basis for identifying the multiple benefits of NbS. In terms of research, climate resilience and natural and climate hazards were the most studied challenges in the EU database of NbS Research and Innovation implementation projects (43% of projects) (El Harrak and Lemaitre, 2023). However, there is a need for more evaluation of the combined benefits of NbS, e.g. for flood risk reduction, drought risk reduction, and biodiversity (Penning et al., 2023).

Short-term Political Agendas and Short-term Planning

Frequent changes in administrations can impede long-term planning and do not create the sustained political will required for NbS implementation, as was stated in the interviews with representatives of the Committee of the Regions and the NetworkNature Nordic Hub. The literature highlights a lack of alignment between short-term political timelines and the long-term delivery of benefits from NbS. In urban planning, city planners still prefer to develop actions with well-known costs and outcomes rather than taking the risk of implementing NbS that may involve uncertain long-term consequences, especially in the case of significant challenges like storm-water management (Sarabi et al., 2020). Local policymakers may also prefer to focus on short-term outcomes because they are working to a short-term electoral agenda (Sarabi et al., 2020).

The NbS research and implementation gap is highlighted in the NetworkNature Research and Innovation Roadmap, which underlines the need to integrate research and demonstration and operationalise NbS in business contexts and policymaking. Kabisch et al. (2016) point to the disconnection between policy receptiveness and ready-to-apply scientific innovations. They explain that "*scientifically validated options and knowledge are often not available when the policy windows are receptive to new ideas.*" The NbS research and implementation gap is highlighted in the NetworkNature Research and Innovation Roadmap, which underlines the need to integrate research and demonstration and operationalise NbS in business contexts and policymaking (El Harrak and Lemaitre, 2023).

Sarabi et al. (2020) argue that low NbS uptake might be explained by policymakers' *"lack of sense of urgency"* regarding the use of NbS to address

policy challenges. Kabisch et al (2016) refer to a 'fear of the unknown' to characterise the (lack of) implementation of NbS within an administration. This fear encompasses both the uncertainties and risks of implementing NbS and the resulting changes this may induce in city planning. This may be compounded by a lack of understanding and a potential lack of willingness to engage with NbS outside the conservation community. Interviewees in the sustainable urban and regional transformation theme mentioned the urban agenda partnerships and Urban Nature Plans as the main enablers for NbS integration in urban planning. However, since these do not include binding rules and regulations, there are no direct consequences in neglecting the recommendations for implementing NbS and thus they are not so effective.

Risk Aversion Leading to Path Dependency

The knowledge gap among policymakers and practitioners about the effectiveness of NbS policies/practices and their ability to deliver co-benefits means that NbS are still often perceived as a financial burden and costly rather than a known profitable investment and solution. The interview with the EU Urban Agenda 'Greening Cities' Partnership confirmed this aversion to risk and the importance of changing mindsets. It proves challenging overall to implement transformative and integrated policy solutions in a public and private finance landscape that is locked into short-term horizons and privileges finances over social and environmental returns on investment.

Organisations from the private sector also tend to favour traditional 'grey' infrastructure over NbS due to fear of potential short-term financial losses (Davies and Lafortezza, 2019). Professionals from the investment sector make a distinction between their philanthropic investments in nature and natural capital and mainstream investments aimed at a return on investment in their core business. This suggests that there is not sufficient confidence to invest in NbS as part of the core business strategy, and may also reflect a lack of awareness of the risks and dependencies of business on nature and biodiversity.

Path dependency refers to "*a concept where active memory conditioned by past decisions has a controlling influence on decision-making*" (Davies and Lafortezza, 2019). Decision-makers tend to implement familiar solutions. Path dependency can be reinforced by decisions driven by power relations, whereby the choice of infrastructure is influenced by interests connected to property and appropriation regimes which do not support NbS (Seddon et al., 2020). According to Davies and Lafortezza (2019), path dependence can be disrupted through a combination of policy reforms to create more familiarity with NbS and thus greater adoption. The authors consider the reform of institutions and their cultures as an important transition path for the adoption of NbS. According to the authors, breaking path dependence would require the appointment of new 'transformational leaders' that would reshape institutions from within. Although this may be difficult in practice, it underlines the importance of bringing in fresh insights and the necessity of challenging the status quo. Encouraging education and awareness on the topics of NbS should contribute to changing leaders' mindsets.

The Case of Sustainable Food Systems: Uncertainties about What the Transition Should Look Like

Concerning the theme of sustainable food systems, there is recognition that system transitions are needed towards lower intensity and more resilient farming systems, such as regenerative agriculture, agroecology, organic farming, and agroforestry. There is also high tension around the choice of pathway and the trade-offs that need to be made for a just transition that enables all farmers to transition towards more sustainable forms of farming and leaves no-one behind. There are many challenges to the transition from a farming system that maximises the production of a small set of crops and products to a system that manages the agroecosystem to provide a range of ecosystem services (e.g. Dhyani et al., 2021). There is a tension between the goal of maintaining yield (associated with economic demands and concerns for food security) and the need for a transition to lower-intensity practices (Boix-Fayos and de Vente, 2023).

The transition towards mainstreaming agricultural NbS further relies on a series of larger changes. These include modification of diets (lower demand for animal products and decreased food waste), adequate land management (managing increasing demand for other human activities, reallocating land uses for livestock towards agriculture for human consumption) and shifting away from harmful subsidies to payments to support environmental management.

The EU Agricultural Outlook for 2023-2035 (European Commission, 2023a) examines the environmental and economic effects of wider adoption of soil management practices promoting carbon sequestration and reducing soil greenhouse gas (GHG) emissions (including NbS such as peatland restoration and sustainable soil management practices). It shows how adopting such practices can decrease GHG emissions with moderate adverse effects on farm income. These future projection exercises help decrease some of the uncertainties associated with the adoption of different pathways. However, the farmer protests in the winter of 2023-2024 have underlined the necessity to engage and support farmers and the farming sector in the transition and engage them in the definition of the desired pathway.

NbS in agriculture includes both sustainable agricultural practices and complete shifts to sustainable agriculture systems such as agroecology, conservation agriculture, and agroforestry, but the concept can also hide conflicts and differences in understanding, which highlights the need for just transition principles. Organic farming is the only system or concept mentioned as an NbS that has a legally binding definition in the EU (EU Regulation on organic production), and it is not recognised as NbS by everyone. In fact, there are fears that promoting this as an NbS could create confusion, and possibly even conflict with the objective of increasing the uptake of organic farming[9]. There is also concern that promoting NbS through the CAP could create further confusion exacerbated by low receptivity among the farming community in the current political context (Euronews, 2024). The transition towards sustainable food systems will likely result in systems changes in sectors and will result in trade-offs that need to be identified, negotiated and remedied for a just transition to occur.

Insufficient Funding and Financial Mechanisms for NbS

The scientific literature highlights the lack of funding and financing available for NbS: "*NbS are deplorably undercapitalised and this lack of finance is widely recognised as one of the main barriers to the implementation and monitoring of NbS across the globe*" (Seddon et al., 2020). Recent reviews show that most funding for NbS comes from the EU or national public sector budgets; philanthropic funds contribute a small amount and a limited amount is financed by the private sector (European Investment Bank et al., 2023; UNEP, 2023b).

The EU-funded grants from the Horizon Europe, LIFE, and Interreg programmes are the dominant source of funding identified as going to NbS explicitly (European Investment Bank et al., 2023). EU funding of NbS projects increased from 25 to more than 100 million euros per year from 2011 to 2017 and was at just above 100 million euros per year between 2017 and 2020 (El Harrak and Lemaitre, 2023). National research funding via the Biodiversa+ partnership has also increasingly gone to NbS projects.

Private financial instruments for NbS include loans (market-rate and concessional loans) and equity, but they are still rarely used. Only 3% of the 1364 NbS

9 Based on statements from interviews.

projects identified by the European Investment Bank have private-sector financing that covers more than 50% of a project's total cost (European Investment Bank et al, 2023).

The financial barriers to implementing NbS were highlighted in a WWF-UK report based on interviews with experts in the NbS finance community (WWF, 2022). The main barrier identified was the lack of information on NbS return on investment and impacts. The report identified a lack of transparent and public data on the performance and return on investment of NbS projects, a lack of universal metrics on NbS impacts and effectiveness, weak data monitoring at the local level, and challenges associated with identifying the additionality, attribution, and permanence of NbS outcomes. Most NbS projects are small-scale, which creates higher transaction costs. The WWF report also highlights that NbS project developers tend to underestimate their financial viability, which results in weak perceived bankability.

Interviews under the Finance and Just Transition for Nature-Positive theme highlighted the need for policies that provide clear incentives to invest in NbS through the creation of well-designed nature markets (e.g. payment for ecosystem services or green subsidies). Ensuring that future policies address the tax implications of investing in NbS and enable consistent financial valuation and accounting of nature investments were also flagged as necessary actions to unlock more investment, as were defining clear roles and allocating sufficient resources to regulating bodies.

For Davies and Lafortezza (2019), one of the main transition paths for the adoption of NbS is the development of *"a new approach to public and private sector procurement"*: "*Policymakers can intervene at various administrative levels to encourage finance and business models for innovations with nature-based solutions, for example through changing accounting frameworks, adjusting procurement rules and providing risk guarantees.*" Accounting rules should incorporate non-monetary values related to nature and procurement rules need to be adjusted to capture the benefits of NbS, such as improved air quality.

Lack of Regulatory Clarity, Standards, and Unequal Taxes

The interviews and literature point to the lack of standards dedicated to NbS on planning, designing, implementing, and monitoring, such as the research conducted by CLEVER Cities. Further knowledge brokerage on the standardisation offers is necessary to bring NbS research results closer to the market and to practitioners.

Professionals from the finance sector noted the need for transparent market infrastructures in the EU, considering the current lack of established valuation standards for NbS projects and insufficient funding earmarked for NbS investments. The business sector regrets the general lack of capacity and direction on what different entities can and should do regarding NbS investments. The Triodos Bank underlined the lack of regulatory clarity on the type of carbon credit projects eligible for corporate sustainability reporting compliance. They also ask for more clarity on the permanence of NbS for carbon credits.

Several investors also flagged the tax burden when it came to investments in NbS as opposed to grey infrastructure. For example, in both the UK and some EU countries, some NbS solutions incur a 20% VAT burden, whilst their equivalent traditional investment or grey infrastructure alternatives do not. The tax situation also varies country by country, and so additional costs are incurred by understanding the country context in each new investment area.

Unknowns relating to accounting standards were also highlighted. For such 'non-traditional' investments in NbS, it is still unclear where they can be reflected in the balance sheet and what sort of investment they are, and so it is hard for investors to integrate them into investment strategies. Increased cooperation between banks could help create sufficient scale of evidence to accelerate the adoption of new asset classes (EIB, 2023).

Lack of Involvement of the Business Sector in NbS

Nature-based Enterprises (NBEs) is a term that refers to businesses and individuals who are aligned

with NbS delivery on the ground, ranging from regenerative farmers to many other types of business such as aquaculture, green building developers, water management and ecosystem restoration companies. These NbEs face many common barriers which have been well documented (European Commission Directorate-General for Research and Innovation, 2022b). One of the most frequent challenges for NbS financing are low levels of awareness and support for NbS among the general public and business sectors and in the wider political and public sector environment. Small businesses also experience a lack of practical, cost-effective methodologies and tools to measure the effectiveness of NbS. The variation in quality standards and codes of good practice across sectors increases risk for investors as well as the lack of market research data and support from business innovation ecosystems for market development. There are still skill gaps - both technical and related to 'soft skills' (such as business development). Lastly, many NBEs are SMEs and therefore share the challenges of small business.

Experts in the business sector (incl. GFI, TNC interviews) regret the lack of policy incentives from the demand and supply side, such as accounting standards, valuation standards, tax policy, land opportunity costs, landowners buy-in, and payments for ecosystem services. Comments were that *"there are no natural capital compliance markets in the EU"* (unlike the UK) or regulations around natural capital.

The EU market for NbS faces significant challenges. Lack of information on the performance of NbS and difficulties related to measuring the polluting and extraction impacts of economic activities as well as gaps in skills and knowledge slow down the NbS market (EIB, 2023). NbS can create multiple benefits for society, but projects usually require coordination between multiple agencies and stakeholders, which might be more challenging. Analysis of market failures for NbS also point out high transaction costs in combination with the relative small scale of projects, as well as higher investment risks compared to grey approaches, and longer time frames for expected financial returns (ibid.)

Interviews (EC DG ENV, EU Urban Agenda Partnership) repeat that that cooperation between the private sector and the public sector is necessary, the cost-effectiveness of NbS needs to be proven, and a comparison needs to be made between traditional methods being more expensive under the polluter pays principle. The lack of private financing streams for NbS in the EU should motivate regulatory interventions to change market structures and provide direct incentives for private entities to deploy NbS (EIB, 2023). In line with this, Toxopeus and Polzin (2017) argue for business models where i) NbS are financed by a diverse group of (public and private) financiers and ii) innovation in accounting and valuation allows NbS to be presented to the decision-making processes of governments, businesses, investors and citizens as beneficial (i.e. natural capital accounting).

Difficulty in Evaluating NbS in Non-monetary Terms

Interviewees across all categories of stakeholders recognise that although NbS might offer the best value in the long term, their perceived high upfront cost compared with grey infrastructure creates a significant barrier to their uptake. The interviews also note that NbS tend to provide slow returns that are difficult to quantify in financial or monetary terms (El Harrak and Lemaitre, 2023). Interviewees in the financial sector consider that most NbS are not commercially viable. Many of the benefits associated with NbS cannot be capitalised. Benefits, as well as potential negative externalities associated with NbS, often impact groups who are not invested in the development, so it is difficult or impossible to convert the benefits into financial returns or integrate the risks into the traditional financial approach.

Kabisch et al. (2016) highlight that the difficulty in evaluating NbS in non-monetary terms is also related to the lack of understanding and project participation of 'financial providers' (financial institutions and markets) compared to the 'users of finance' (business and individual borrowers). The WWF further highlights this in a recent report, where the capacity of the finance sector is considered the second most significant barrier to NbS financing: "*There is a lack of skills and tools within global financial institutions with which to assess risk and returns in NbS projects and structure investments appropriately*" (WWF, 2022). The report underlines the limited availability of training and knowledge for

finance sector professionals and the limited opportunity for knowledge exchange between them.

According to Chausson et al. (2020), the complexity of leveraging NbS uptake is related to the fact that policies relevant to climate adaptation "*rely heavily on economic appraisal frameworks tailored to conventional, engineered interventions.*" These frameworks do not capture the many non-material benefits NbS can deliver, which can result in undervaluing NbS. Authors suggest adopting integrated approaches to valuation, which include ways of capturing multiple values and benefits of nature.

Some interviewees attributed challenges for NbS uptake to the current economic system, focusing on short-term economic gain, growth and exploitation of natural resources. This is in clear opposition to the vision of transformative change needed for NbS mainstreaming. The IPBES (2019) underlined this aspect as well as Seddon et al. (2020): "*Growth-based economies, with entrenched policy and market conditions favouring industrialised and extractive land-uses, present a serious barrier to upscaling sustainable landscape interventions. Focusing on economic growth and short-term profits can reduce options considered by private or government sector actors who may not see NbS projects as bankable, particularly when faced with severe budget constraints.*" This underscores the notion that policy and economic transformative changes are needed to allow the full uptake of NbS. The vision of a nature positive economy is described in a recent report published by the European Commission's DG RTD (European Commission Directorate-General for Research and Innovation, 2022b) as:

- An economy that puts nature and people at its heart;
- An economy that is aligned with nature and climate goals, including through incentive structures, fiscal and budgetary policies;
- An economy with more holistic objectives and measures of progress that look beyond economic growth and GDP.

An economy integrating these conditions would likely create opportunities for *"viable, large-scale NbS across various sectors, while creating a win-win for nature, climate, and the people"* (ibid.)

Lack of Evidence Showcasing the Cost-effectiveness of NbS

Interviewees across all policy themes underlined the lack of evidence supporting the cost-effectiveness of NbS as a barrier to its uptake. This is confirmed by the literature, as in Seddon et al., 2020: "*The potential of NbS to provide the intended benefits has not been rigorously assessed. There are concerns over their reliability and cost-effectiveness compared to engineered alternatives, and their resilience to climate change.*" The economic motivations that would favour NbS in urban and regional development need clear specifications on what NbS are and how they compare to conventional 'grey' approaches. If cost-effective, this would justify their implementation in municipalities with limited resources.

Despite general efforts to synthesise NbS evidence, existing evidence on the cost-effectiveness of NbS is scattered or difficult to evaluate across disciplines and sectors and is not easily accessible to policymakers (Chausson et al., 2020). This was commented on in the Zero Pollution interview with DG ENV, where it was made explicit that the green or NbS options would be better integrated if the evidence for their cost-effectiveness was clear and compared favourably to grey or traditional solutions. There are efforts to synthetise NbS benefits[10], but it would require more targeted evidence.

There is growing evidence that NbS can be cost-effective compared to grey infrastructure, for instance, in the field of disaster risk reduction (Seddon et al., 2020; Chausson et al., 2020; Reguero et al., 2018), to prevent floods along coasts (Morris et al., 2018) and in river catchments (Collentine and Futter, 2018). Liquete et al. (2016) highlight that "*green infrastructure (constructed wetlands and parks) performs equal or even better than the grey alternative for water purification and flood protection, and it has a similar cost.*" The literature also shows that the combination of grey and green infrastructure can be efficient for adaptation and be cost-effective: "*The optimum solutions for adaptation are unlikely*

10 including via online tools such as the online tool of the Nature-based Solutions Initiative

to be exclusively green or grey, but rather a diverse portfolio of options including green (e.g., wetland or dune restoration), grey (e.g. seawalls, and breakwaters) and policy (e.g., land use zoning) measures [...]." Liquete et al. (2016) highlight that "*green infrastructure (constructed wetlands and parks) performs equal or even better than the grey alternative for water purification and flood protection, and it has a similar cost.*" The literature also shows that the combination of grey and green infrastructure can be efficient for adaptation and be cost-effective: "*The optimum solutions for adaptation are unlikely to be exclusively green or grey, but rather a diverse portfolio of options including green (e.g., wetland or dune restoration), grey (e.g. seawalls, and breakwaters) and policy (e.g., land use zoning) measures [...]*" (Reguero et al., 2018). Seddon et al. (2020) also argue that the focus should be on finding synergies among different solutions, rather than framing NbS as an alternative to engineered approaches.

Insufficient Assessments of NbS Synergies and Trade-offs

Chausson et al. (2020) highlight that existing reviews are often limited to empirical studies and omit scenario modelling, which can demonstrate how the effectiveness of NbS depends on future conditions, such as the extent of global warming. Studies also often overlook the combined benefits or impacts of NbS (i.e. social or economic), which calls for more integrated assessments of interventions to showcase synergies and potential trade-offs (ibid. and El Harrak and Lemaitre, 2023). Stakeholder groups may experience the costs and benefits of NbS differently, and the provision of ecosystem services might change over time, especially with climate change, which is rarely accounted for (Seddon et al., 2020). The response of ecosystems to threats is more difficult to assess and predict than grey infrastructure (ibid.)

Discrepancies between the Availability of Funding and Practical Modalities to Access It and Need for Evidence of Effectiveness

The case of funding for sustainable agricultural practices

The Common Agricultural Policy (CAP) programmes have the scope to finance NbS for sustainable agricultural practices, as pointed out by the European Investment Bank (EIB). The EIB notes, however, that significant questions remain about the efficiency and effectiveness of current expenditure for NbS from this funding source (European Investment Bank et al, 2023). This was also mentioned by stakeholders working actively with the farming community. There are discrepancies between modalities of access to funding via the CAP and the economic realities of agricultural holdings. The capacity of farmers to invest time (administration) and effort in NbS is often limited by their low cash flow availability. The deployment of NbS requires substantial financial capital in the first stages, which does not match the timeline for CAP payments (farmers are paid once the measures have been implemented). This entails a notion of risk and uncertainty for farmers (who are generally risk-averse) to perceived risks of reduced yield and income loss (at least in the short and medium term).

This illustrates the importance of demonstrating the economic viability of agricultural NbS to farmers. There is a high demand for quantitative and qualitative evidence about the cost-effectiveness of NbS in the agricultural sector. This is related to the need for evidence on the potential for NbS to deliver co-benefits to agricultural holdings in terms of flood and drought prevention, increased resilience to extreme weather events, etc. (Boix-Fayos and de Vente, 2023).

Access to funding in municipalities

Cities often face challenges in accessing EU funding, even if this is recognised as a valuable complement to national and local budgets for NbS. EU funding usually includes restrictions on eligibility and specific requirements, which are a barrier for many municipalities suffering from a lack of human and financial capacities to apply for EU funding (Knoblauch et al., 2019). In addition, Knoblauch et al. (2019) underline that most EU funds "*do not address the precursory actions necessary for developing city-wide management strategies or plans. [...] Aspects such as standardisation and mainstreaming, which are necessary for creating dedicated NbS strategies, are not typically supported as part of H2020 projects.*" There is guidance available for cities to explore funding opportunities (see for example NetworkNature (2023)).

Lack of Knowledge about How to Integrate NbS into Practice and Targeted Guidance for Practitioners

According to multiple interviewees, there is a lack of knowledge about how to practically integrate NbS at all levels, and policies are considered too complex for practitioners to implement. Practitioners interviewed declared being aware of the main policies supporting NbS at EU level as well as key official reports on NbS. However, they highlighted that despite some awareness of their effectiveness, NbS were still insufficiently implemented in practice, for example across all aspects of reducing pollution.

Despite existing standards such as the IUCN Global Standard for Nature-based Solutions (IUCN, 2020), the uptake of NbS is hindered by the lack of standardised practices and, due to their complexity and inadequate utilisation of available standards, as indicated in the interviews and the R&I Roadmap (El Harrak and Lemaitre, 2023). However, and since the adoption of the UNEA definition and associated resolution in 2022, UNEP intergovernmental consultations on NbS have produced outputs for practitioners on NbS implementation (UNEP, 2023a).

The Difficulty for Practitioners to Explain and Recognise NbS

The interviews highlighted several challenges concerning the definition of NbS. Interviews with experts on this thematic area revealed that local and regional authorities have different levels of understanding on what NbS are and what measures could count towards NbS implementation.

Indeed, the interview with the EU Urban Agenda Greening Cities Partnership and the European Committee of the Regions representatives highlighted the fact that this difference of knowledge – resulting in a difference of interpretation – around NbS is not limited to local and regional bodies but is also found in national and central authorities as well. Furthermore, the interview with the NetworkNature Nordic Hub underlines the existing confusion among local governments about NbS, resulting, in some cases, in the implementation of mixed grey and green infrastructure under the NbS banner.

The IUCN Global Standard for NbS was frequently identified as having provided clarity, i.e. what criteria and actions need to be met to be considered NbS. However, it was noted by multiple interviewees that it can be quite complex to determine if something is indeed a NbS.

There is evidence that NbS are being used for greenwashing, as Seddon (2022) notes that "*many of the biggest emitters (such as fossil fuel companies and the wealthy nations that subsidise them) are investing in activities labelled as Nature-based Solutions without also investing in robust actions to rapidly decarbonise their operations.*" (see also, for example Waldron et al. (2017))

In the field of urban policy, some projects claimed as 'green infrastructure' fail to meet the criteria for NbS and are considered greenwashing. In a review of 73 green infrastructure projects by 25 developers in the city of Poznań (Poland), it was "*verified that most of the marketing strategies of selected developers in Poznań should be considered as greenwashing, and only a few estates exhibited NbS characteristics.*" (Gałecka-Drozda et al., 2021)

On the other hand, the interview with the European Committee of the Regions representative shed light on the mismatch between the use of the concept on the ground and its use in the research sphere. It seems that most people working with local and regional authorities do not name and recognise their actions as NbS, believing that NbS is only a research concept. As such, many NbS are currently being implemented without referencing the concept.

Another important element, underlined in the interview, is the misalignment occurring between the European and national levels when it comes to the visible support of NbS. Indeed, some EU Member States seem to hesitate to use the NbS concept internally, or instead use a local language term with similar concepts, while the EU is pushing forward with all societal challenges included (EESC, 2024).

According to Seddon et al. (2020), the difficulty in identifying appropriate indicators and metrics for the effectiveness of NbS is related to the influence of many interacting and context-specific factors fluctuating over time: socioeconomic (like the institutional capacity to respond to an impact), biophysical

(frequency and intensity of natural hazards), and ecological (variation in the delivery of ecosystem services). Metrics should instead be context-specific to account for these challenges (ibid.)

Implementation in varying geographies and across different authorities and local rules requires guidance to be country-specific and translated into local languages. An easily accessible metric for evaluating NbS effectiveness (Kumar et al., 2021) could help in selecting a NbS. To address these challenges, there is a need for *"more accessible and easy-to-use standards, metrics and guidelines"* tailored to different contexts (Kooijman et al., 2021). The Hungarian and NordicNbS Hubs mention uncertainty about what standard or guidance to use when there is no translation or transmission to the local or even national context. In the Sustainable urban and regional transformation interviews, the existence of guidance was acknowledged (incl. the IUCN Global Standard, Dumitru and Wendling, 2021b), and Dumitru and Wendling, 2021a). Still, the need to target different audiences, i.e., the city level, was highlighted.

The Climate-ADAPT portal, mentioned during the interviews, has been mandated under the EU Adaptation Strategy to promote better-informed decision-making in adapting to climate change, its guidance (on NbS) at the local scale is however not complete. The interviewee of the Covenant of Mayors (CoM) mentions a policy support facility focussing on local perspectives of climate adaptation (in addition to regional and national). The Policy Support Facility, under the Covenant of Mayors Europe, was launched by the European Commission to help local and regional authorities develop and implement climate adaptation measures, with an emphasis on moving from planning into implementation (Beijneveld and Arbau, 2022). The issue of scale comes into play in implementing NbS, and smaller cities have less budget and fewer resources, which means that adjustable tools are needed to make the economic arguments for NbS.

A key gap in both the UK and EU is the lack of accounting standards, fundamentals, and valuation standards (i.e., balance sheet implications from natural capital accounting are undefined, and not standardised). In the theme of NbS Finance for a Just Transition to a Nature Positive Economy, there is a lack of clear, concrete guidelines on the mechanics of how NbS implementation should work and their implications for tax policy (e.g. carbon credits, different VAT implications).

Another consideration relates to understanding the site-specific aspects of each NbS investment. The GFI interview underlined the complexity of determining which social indicators should be addressed by the NbS projects they are funding, to optimise for all the outcomes featured in the NbS definition.

Various interviewees mentioned a lack of common tools and standards for understanding NbS among local and national public authorities. This leads to difficulties in measuring the benefits and demonstrating the value of NbS approaches. More clarity in choosing NbS standards and guidance for a municipality in implementing NbS should lead to better decision-making at higher levels of governance.

It may be difficult for a city to implement NbS to serve multiple purposes as they might be facing knowledge gaps in relation to the complexity of multifunctional urban planning (Kabisch et al., 2016). Moreover, urban administrations may be lacking information about legal instruments and requirements needed to implement NbS (ibid.)

Farmers' Difficulty Accessing Training on Sustainable Farming Practices within the CAP Framework

The path towards increased uptake of sustainable agricultural practices requires adequate training and support for farmers. Interviews revealed that this support is chronically lacking and/or inadequate, and varies between Member States. Interviewees pointed out the failure of the CAP farm advisory service to support and advise farmers in the sustainable transition of agricultural holdings.

Findings from Canessa et al. (2024) have shown that one of the barriers to the uptake of biodiversity-friendly farming practices relates to the lack of knowledge and/or advice and information sharing. Although many farmers recognise the need to transition to farming systems that are more resilient and nature-based, they are hampered by not knowing how to implement the changes required. One of the issues is that farm advice is still being delivered predominantly by organisations and individuals with little biodiversity expertise and/or little motivation or mandate to deliver such knowledge (e.g. agriculture chambers, pesticide and fertiliser organisations, agronomy professionals). Interviewees further expressed concerns about the impartiality and independence of advisory services, with risks of having advisory content delivered from private sales representatives of inputs, equipment or machinery. In addition, biodiversity advice is not delivered in a way that makes it easy for farmers to integrate changes into their farm operations (Canessa et al., 2024).

Farm advisory services (FAS), and Agricultural Knowledge and Innovation Systems (AKIS), are important components of the Common Agricultural Policy (2023–2027). They aim to promote a faster transition of European agriculture towards a more sustainable model, through the fostering and sharing of knowledge, and through supporting innovation. Yet, research has shown that the implementation of CAP's advisory measures has been rather limited, with only a few farmers reached overall (Labarthe and Beck, 2022). In addition, an interview with the Soil Heroes Foundation, which accompanies farmers in the transition towards regenerative agriculture practices, revealed that farmers may often be unable to attend training because of funding or timing issues (not aligned with the farming calendar).

The EU CAP Network[11] and the Member State European Agriculture Innovation Partnership operational groups play an important role to promote exchanges between scientists, farmers, stakeholders and other relevant actors to develop innovative solutions to the challenges being faced. They have driven research on environmental and climate questions, which improve the knowledge base and capacity to deliver (Alliance Environnement, 2019).

In general, there is still limited information on the target beneficiary groups of advisory policies, as well as a lack of monitoring on the current beneficiaries (Labarthe and Beck, 2022). NbS approaches are knowledge-intensive and tailored approaches – not a 'one size fits all' approach, which requires increased opportunities for targeted training and knowledge sharing.

How NbS Can Compete with or Complement the Grey Infrastructure - the Case of Sustainable Urban Drainage Systems (SuDS)

In the field of urban drainage solutions, traditional approaches like piped drainage systems, are gradually showing incapacity to withstand increasing urbanisation and stormwater rates impacted by climate change and soil sealing which can lead to increased run-off and a higher risk of urban flooding (Davis, Krüger and Hinzmann, 2015; EEA, 2012). Sustainable urban drainage systems (SuDS), on the contrary, present a sustainable and cost-effective alternative or addition, creating many other benefits besides flood protection: carbon capture, public health, biodiversity safeguards, as well as recreational opportunities (Davis and Naumann, 2017). Elements of SuDS include for example, permeable surfaces, filter and infiltration trenches, green roofs, detention basins, underground storage, wetlands and/or ponds.

11 The network is a forum set up by the EU Commission through which National CAP Networks, organisations, administrations, researchers, entrepreneurs and practitioners can share knowledge and information (e.g. via peer-to-peer learning and good practices) about agriculture and rural policy.

SuDs are seen as a promising approach to prevent or reduce hazard exposure and vulnerability to disasters, in the framework of the Sendai Framework for Disaster Risk Reduction. The Urban Agenda for the EU and the EU Strategy on Green Infrastructure support the critical role of green infrastructure in urban areas for flood prevention, and the Urban Nature Plans should encourage the planning of NbS for water management.

The Water Framework Directive (WFD) and the Floods Directive (FD) request Member States to develop river basin management plans (RBMPs) and flood risk management plans (FRMPs) to ensure good quality of EU water and set up risk management plans to mitigate flood risks.

SuDs should meet the objectives of the EU FD and WFD Directives. NbS are not explicitly mentioned or encouraged, but the value of natural water retention measures (NWRMs) is recognised by the WFD and the FD (de Luca et al., 2021).

Despite the benefits NbS offer for urban stormwater management, several gaps are preventing their wider uptake by city administrations. Stormwater management remained an unaddressed topic until the mid-1990s when the increase of impervious surfaces with urban sprawl added pressure to implement urban flood management schemes (Gimenez-Maranges, Breuste and Hof, 2020). The prevailing logic has been shaped by highly centralised and top-down governance structures, in which scientific, technical, and linear solutions were developed with close to no public participation (ibid.)

First, there is a lack of specific funding schemes supporting the implementation of NbS at the national or EU level, which means NbS have to compete with conventional approaches for funding. As detailed earlier (i.e. in Path dependency), decision-making processes fail to effectively and comprehensively evaluate and understand the multiple benefits that SuDS can offer besides flood protection although their cost-efficiency materialises over a longer timespan than grey solutions. As stated in (Davis, Krüger and Hinzmann, 2015): *"Public authorities tend to choose those options for flood protection, which have the lowest implementation costs, without considering the value of other benefits, such as recreation or environmental protection."*

Second, the implementation and maintenance of SuDS requires a distribution of responsibilities across various actors, city departments and agencies – which means that obligations for funding are not necessarily clear (Gimenez-Maranges, Breuste and Hof, 2020). Moreover, while city agencies are responsible for stormwater from private properties, they have no authority over its proper management in these spaces. That can create conflicts in terms of maintenance in the long term. In particular, governance arrangements for water provision in Europe are very fragmented: In France alone, there are 36,600 municipalities and approximately 15,000 water service providers, thanks to successive grouping processes (Trémolet et al., 2019). Therefore, if cross-departmental collaboration and co-financing is not exercised, it might become a significant barrier.

Third, SuDS (and NbS in general) are site-specific, which means that a technical 'one size fits all' solution is excluded (Davis, Krüger and Hinzmann, 2015). The city of Malmö (Sweden) started **introducing SuDs** in the 1990s to respond to frequent flooding episodes. The system integrates multiple solutions tailored to the city's needs and architecture, with canals, water channels, retention ponds, green roofs and wetlands all contributing to stormwater management.

Fourth, there are capacity gaps for the maintenance of SuDS in relation to a lack of systematic testing, monitoring and reporting for measuring performance, costs and benefits of SuDS on the long term.

The EU Interreg project **Water Resilient Cities** (2016-2020) which sought to increase urban resilience to climate change through improved stormwater management, aimed to address some of the gaps highlighted above. The project focused on policy, legal and practical measures to support SuDS deployment in five cities: Bruges, Mechelen, Middelburg, Plymouth and Wimereux. This included: multi-stakeholder maintenance agreements; co-financing models; tools to value societal benefits and spatial policies to create a more favourable environment for implementation. One of the project's outputs was the creation of an easy-to-use guide to retrofitting sustainable drainage systems into urban areas.

What Enabling Factors can Help Mainstream NbS in Policies?

Considering the needs and gaps identified, this section looks at what solutions might be appropriate, drawing from engagement strategies, learning methods, and incentives and leverages earlier evidence from research and innovation (El Harrak and Lemaitre, 2023). By delving into the available resources for NbS, through interviews and desk research, this section highlights the strategies and mechanisms that can enable successful implementation of NbS initiatives.

Integration of NbS into Policy and Encouraging Policy Harmonisation

The policy screening revealed the gradual integration of NbS into the EU policy framework. Overall, NbS are either explicitly or implicitly (i.e. via use of other related terms) supported primarily by policies in the EU environmental and climate change legislative framework. However, greater efforts are needed for full coherence between EU sectoral policies in terms of NbS integration (NetworkNature, 2022). The existing environmental and sustainability policies should set targets for NbS integration policies and accompany these with budgets for reaching them. NbS could be better exploited to explore the full potential for synergies, such as: natural water retention measures for the Floods Directive and the Habitats Directive; NbS for carbon sinks for the LULUCF legislation and the EU Biodiversity Strategy.

Policy integration can drive the implementation of NbS across sectors. For example, combining the use of NbS in policy narratives with a health and well-being perspective can provide funding opportunities and raise awareness of health benefits of investing in nature (and related healthcare savings), with better delivery of the societal benefits of NbS in the long term. According to Kauark-Fontes, Marchetti and Salbitano (2023), the integration of NbS in sustainable urban and regional transformation should be supported by the dissemination and recognition of the cultural, human health and financial benefits that NbS can bring, with better delivery of the societal benefits of NbS in the long term.

At the global level, the links between the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (UNCBD), and the recognition of how NbS can help contribute to multiple goals (Seddon et al., 2019), were identified as a useful enabler for policy uptake and greater integration of NbS at the regional and national level, e.g. through the National Biodiversity Strategies and Action Plans (NBSAPs), Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). Developments at the global level, such as the implementation of the Global Biodiversity Framework and discussions on a Global Goal on Adaptation provide an opportunity to consider how nature, and NbS in particular, can be better incorporated into policy at various levels. NbS are increasingly being integrated into climate mitigation strategies, but there is still greater opportunity for their contribution to climate adaptation (for example through National Adaptation Plans, NAPs). Similarly, discussions on a Global Goal on Adaptation within the United Nations Framework Convention on Climate Change (UNFCCC) highlight the crucial role of NbS in building climate resilience. NbS, such as reforestation, wetland restoration, and sustainable agriculture, are recognized as effective strategies for climate adaptation. These strategies not only mitigate the impacts of climate change but also provide co-benefits for biodiversity, water management, and human well-being. NAPs are critical tools for countries to assess their vulnerabilities to climate change and outline strategies to enhance resilience. Incorporating NbS into NAPs can help countries achieve multiple objectives, such as reducing disaster risk, improving water security, and enhancing food production.

At the EU level, interviewees underlined the importance of harnessing the power of new regulations as well as interpreting existing legal frameworks (Nature Directives, Water Framework Directive, etc) in a way that includes and promotes NbS. Existing EU regulations and directives (explicitly those under the EU Green Deal) are recognised as being supportive of NbS. Still, their implementation in different sectors remains a challenge, e.g. the Common Agricultural Policy was named as having particular potential to encourage NbS if concrete, cost-effective NbS can be fully integrated into it (see chapter 2 of this report). EU strategies provide the direction of travel for Member States, which in turn

set the direction of travel for municipal and regional strategies and plans, often with corresponding financing. Consequently these EU and Member State plans and associated guidance documents can and should be used to create or maintain the ambition for regional and local implementation.

National, regional and local commitments to NbS programmes and funding play a key role. Some Member States are formally committing their national policies and funding to support NbS. For example, the Nordic Ministers declaration on NbS shows the commitment of the Nordic countries (with Denmark abstaining due to political situation) to adopting NbS, urging "*actors in the Nordic countries to make use of the information and reports produced by the Nordic programme for nature-based solutions and apply nature-based solutions actively in the green transition*" (Nordic Council of Ministers, 2022). In Germany, the government coalition agreed on the development of a Federal Action Plan on Nature-based Solutions for Climate and Biodiversity (BMU, 2022).

Better coherence between national and sub-national governments could strengthen the policy implementation of NbS. Policy harmonisation could be fostered at the local and regional level via increased coordination (mechanisms) across departmental silos, which was underlined in an interview with the Covenant of Mayors. Examples in Wamsler et al. (2020) include the establishment of intersectoral working groups at the municipal level and intersectoral learning through joint site visits in the city of Lomma (Sweden) that contributed to breaking silo effects between the municipality's departments. This point is also underlined in Kauark-Fontes, Marchetti and Salbitano (2023), who insist on the incorporation of different departments that "*do not usually have a direct responsibility on matters concerning the environment and nature (i.e., communication, transportation, education, health).*" More co-creative decision-making and policy-making approaches could help, including more citizen and practitioner engagement in participatory policy processes (EEA, 2023a) (see section below on promoting collaboration and participatory processes).

Two types of policy and legislative instruments are required to incentivise transition finance: those that drive positive change, and those that hold organizations accountable and prevent greenwashing. Voluntary initiatives such as the Taskforce on Nature-related Financial Disclosure and the Science Based Targets Network also play a key role in shaping financial institutions' actions regarding NbS investments. Additionally, many countries have indicated that alignment with these initiatives may become mandatory.

With regard to urban nature planning, the recent adoption of the binding Nature Restoration Law is key: cities now have a legal obligation to plan urban green space and urban tree planting to meet the legal targets within the context of national restoration plans, including rigorous monitoring and reporting, which should in turn trigger more robust urban nature planning.

Additionally, the Cities Mission, the Adaptation, Ocean and Water and Soil Missions are suggested as areas where support is needed and a policy impact can be made.

Standards Supporting NbS Uptake and Measuring Impacts

Developing and establishing clear, standardised guidelines and best practices for planning, designing, implementing, and monitoring NbS projects will bring consistency and quality across different initiatives. Beyond the establishment of standards, the need for assistance on navigating existing standards on NbS might be required to ensure effective implementation. The NbS project CLEVER Cities together with the Sector Forum on European Standardisation for Sustainable Cities (CEN/CENELEC-ETSI SF SSCC) is integrating research results and knowledge in technical committees by inviting projects to share their expertise and knowledge in working groups. NetworkNature established a liaison with the technical committee for Sustainable Cities and Communities (CEN/TC 465). The committee is working on a protocol for assessing the effectiveness of various NbS and decision support (including cost-benefit comparability considerations). It is also defining a monitoring and evaluation strategy for NbS which could be a strategic enabler.

Monitoring, evaluation and learning are key components of NbS deployment that needs to occur

at every stage of the NbS process, in the build-up of long-term goals for NbS (Raymond et al., 2017). Monitoring can be a very effective learning tool (including lessons from failure) to help improve NbS design and future implementation. Insights from effective monitoring can be used as convincing arguments for decision-makers, in urban administrations for example (Kabisch et al., 2016). Only via monitoring and evaluation can project developers assess if the benefits of NbS have been achieved and if potential trade-offs persist. There are methods available to support monitoring and evaluation, e.g. under EKLIPSE (Raymond et al., 2017) or from Evaluating the Impact of Nature-Based Solutions: A Handbook for Practitioners (Dumitru and Wendling, 2021b).

This handbook is one of the main outcomes of the NbS Task Forces (Dumitru and Wendling, 2021b) and provides information to guide the development and implementation of NbS monitoring and evaluation and the use of NbS impact indicators. At this stage, NetworkNature judges the probability of this product being considered for entering the standardisation pipeline as highly probable.

Evidence of Effectiveness, Economic Benefits, and Financial Viability of NbS

To break the perceived notion that NbS are more costly, more evidence on the costs and benefits of NbS is needed, but also more mainstream messaging of outcomes of such studies (see for example communication from the World Economic Forum on NbS effectiveness: *"NbS for infrastructure are 50% cheaper than 'grey', man-made alternatives [...]"* (WEF, 2022)). The Research and Innovation Roadmap (El Harrak and Lemaitre, 2023) specifically identifies knowledge gaps in this regard, *"[f]urther developing non-monetary and monetary valuation of NbS benefits and cost."* Several Horizon projects are contributing to this enabling factor. Horizon project SELINA, CircHIVE or A-TRACK are developing tools to support EU decision makers from various business, policy and societal sectors in the integration of natural capital accounting approaches. The Commission adopted a proposal in 2022 to amend Regulation (EU) 691/2011 on European environmental economic accounts adding ecosysem accounts (COM/2022/329). They include ecosystem extent accounts (for 12 broad types of ecosystems), ecosystem services accounts in physical terms for 7 ecosystem services, and ecosystem condition accounts for five types of ecosystems and using 8 condition indicators in total.

Increased Targeting of Public Funds to NbS and Increasing Private Financial Flows

Increased financial flows towards NbS can be mobilised through a variety of fiscal and financial instruments and tools, such as environmental taxes, price-based instruments, carbon trading schemes, biodiversity offsets, certification schemes, payments for ecosystem services, fiscal benefits, and blended finance arrangements. The option of financial sanctions could also be explored in cases where NbS are not appropriately realised. Implementing a combination of such tools is also an option (Somarakis, Stagakis and Chrysoulakis, 2019).

Three key enabling factors to mobliise greater NbS finanacing materialised through these interviews:

- Scaling up innovative financial instruments that are tailored to the specific investment profile of NbS projects;
  - For instance, policy levers could enable the increased deployment of public catalytic financing, guarantees and concessional loans to NbS interventions, to allow for risk reduction and crowd in private investments. Setting up policies that incentivize technical assistance in developing landscape-level projects would also strengthen the case for investing in NbS;
  - The EU Budget targets that commit 10% of the whole budget to benefit biodiversity in the budget years 2026 and 2027 (and 7.5% in 2024) are instrumental in terms of mobilizing more nature-positive investments through the use of EU funds.
- One of the interviewees suggested that more financing could be channelled to NbS if governments took steps to include them in overarching national restoration plans, similar to what has been done in climate policy;
- Both Triodos Bank and the NGO TNC mention the need for an analytical framework of metrics

to compare the outcomes of investing in NbS projects;
- Policy frameworks could support the harmonisation of performance data, also driving collection and accessibility requirements. Such intervention could enable providers of public and private finance, as well as project developers, with better opportunities to raise finance for NbS projects.

Some examples of potential solutions to these issues developed by EU projects are listed below:

To address the need for well-designed nature markets, the Invest4Nature project aims to contribute to the creation of a market for NbS, and the 15 partners from 11 European countries are evaluating NbS benefits and economic performance.

The NATURVATION project has investigated financing urban sustainable nature-based innovations and provided a model catalogue on private-public financing (Toxopeus, 2019).

The EU Business & Biodiversity Platform provides a unique forum for dialogue and policy interface to discuss the links between business and biodiversity at EU level.

The ThinkNature Nature-based Solutions Handbook has an entire chapter dedicated to the financing aspects of NbS (Elgar et al., 2019). The section explores some of the nuances, opportunities, and tools to help practitioners make the case for investment in a proposed NbS.

Market-based Tools for NbS

Interviews with experts from the business sector (among others) underlined that good market signals and the existence of financial incentives for NbS are fundamental enablers, as already pointed out by Ershad Sarabi et al. (2019). Interviews with experts from the business sector (among others) underlined that good market signals and the existence of financial incentives for NbS are fundamental enablers, as already pointed out by Ershad Sarabi et al. (2019).

Market tools can take many forms, from payments for ecosystem services to public procurement and certification schemes for NbS. Droste et al (2017) introduce three types of economic instruments: price-based instruments, quantity instruments, and fiscal instruments. Price-based and quantity instruments focus on private actors, with the former changing the fees and charges of using ecosystem services and the latter limiting those activities that negatively affect nature. On the other hand, fiscal instruments focus on the decision-makers in the public sector by creating incentives for developing green infrastructures and NbS by including ecological criteria in fiscal transfer processes.

As another example of an enabling market tool, certification schemes can provide credibility to NbS solutions while reinforcing trust between investors and practitioners deploying NbS. This need was highlighted during the interviews on Sustainable food systems and the challenge of creating value for farmers working with regenerative agriculture.

A recent EIB report (European Investment Bank et al., 2023) reviews the outcomes of the Natural Capital Financing Facility, an example of a market-based instrument for investing in NbS that ran from 2015 to 2022. The report also highlights other market-based tools to incentivise NbS solutions (e.g. German cities offering subsidies for installing green roofs, Rewilding Europe Capital).

Promoting Collaboration and Participatory Processes

The partnership among stakeholders has been one of the most frequently identified socio-institutional enablers of NbS (Ershad Sarabi et al., 2019): this includes partnerships among stakeholders and organisations both in terms of vertical and horizontal collaboration. NbS projects should pay particular attention to the inclusion of citizen participation in the process to ensure a shared understanding of NbS and its benefits, as well as potential trade-offs. As Sarabi et al. (2020) reported, "*lack of public awareness and support is a key barrier for NbS uptake.*" Therefore, citizens, as well as local business representatives, should be included in the policy-making process, also to include their local knowledge (Kabisch et al., 2016; Ershad Sarabi et al., 2019).

Bringing together sectors and actors, especially those that have not been connected before despite having similar goals, for dialogues and exchanges (e.g. policymakers, implementers, and experts) was regarded as an important aspect of successful NbS planning and implementation by interviewees. Following Termeer, Dewulf and Lieshout (2010), the societal challenges addressed by NbS have the specificity to cut across traditional jurisdictions and thus require new forms of governance which in turn require coordination between governance levels (EU, national, sub-national, regions or cities, civil society). According to Mahmoud and Morello (2021), multi-level governance approach might be ideal to ensure the longevity of NbS actions on the ground. An inclusive shared governance approach would contribute to the societal awareness and acceptance of NbS as measures to tackle societal challenges.

Although including stakeholders in a co-creation process is a key element of success for NbS projects, interviews revealed that it can require more time and effort than traditional approaches (in most cases, limited to informing or consulting). However, according to Mahmoud and Morello (2021) a critical lesson learnt through the CLEVER Cities project was that "*the use of innovative tools for co-creation, such as co-design by immersion, personas simulation and digital participation tools) can facilitate and speed up the implementation of complex large-scale NbS with limited timespan and flexibility.*" The project developed a city-centred approach, in which urban regeneration challenges were addressed through careful co-creation planning ('Clever Action Labs') (Cantergiani et al., 2019). In Milan, Hamburg and London Clever Action Labs contributed to strengthen community ties and create tailored approaches to urban regeneration with strong public appropriation (ibid.)

In this regard, R&I has a pivotal role to play in developing participatory approaches, methods for co-production, governance systems and open innovation processes to enable transdisciplinary dialogue and ensure the active participation of all stakeholders across sectors (El Harrak and Lemaitre, 2023).

There are other examples of NbS projects such as AQUACROSS, PEGASUS, GoGreenRoutes, or the European Territorial Cooperation programme URBACT which tested and demonstrated innovative and iterative collaborative processes in NbS design leading to better and more socially acceptable outcomes with a promise of long-term sustainability of impacts of the project.

Using Innovative and Diverse Co-creation Tools and Methods – Tallinn Case Study (Gäckle et al., 2023)

To ensure the co-creation and co-design process planned in the city of Tallinn before NbS intervention of developing the Vormsi Park, several innovative and diverse tools and channels were used under GoGreenRoutes.

First of all, before the participatory 'seedbed intervention' event, the city of Tallinn announced the event on social media and the city's official website, via press releases and posters in cafes and restaurants (as well as at educational facilities such as schools and kindergartens). Communication with locally engaged citizens of the neighbourhood as well as a means of targeted announcement ensured their participation in the event to co-plan and co-design NbS.

Secondly, during the event and to provide multiple avenues for the participants to engage, there were flyers with information about the project handed out, surveys to gauge their opinions were circulated as well and a canvas was installed with questions for the participants to answer about what they would like to see in their area where the NbS was being planned. Furthermore, the photovoice method was used which was quite popular with all ages to interact with the site and explain their wishes with regards to the NbS development. And lastly, guided tours in both local languages (Estonian and Russian) were offered.

The outcomes of these activities were recorded and the NbS planning and design was carried out in consideration of potential contrasting interests. Although this case study involves only one pilot and is ongoing (which does not necessarily mean that engagement will be sustained over the long-term), there is a large group of locally active stakeholders in Tallinn. Innovative, diverse and frequent communications ensure that varied co-creation tools and methods are applied. These methods should be replicated in future NbS interventions.

Wamsler et al. (2020) detailed targeted strategies from cities for overcoming barriers and establishing better collaboration, which sums up the different elements of stakeholder and citizen engagment for NbS deployment:

I. **Targeted stakeholder collaboration:** involvement of the private sector, academia and/or other local authorities to support single activities and increase policy support for NbS;
II. **Strategic citizen involvement:** involvement activities aimed to increase public awareness and avoid contestation/protest;
III. **The alteration of internal working structures:** changes to internal cooperation, working structures and capacities that aim to ensure the integration of NbS based on more intersectoral work;
IV. **Outsourcing:** offering information and advisory services to other stakeholders in order to support their implementation of NbS;
V. **Concealed science-policy integration:** systematic science policy integration that aims to progressively mainstream NbS into planning regulations and mechanisms.

These strategies should contribute to mainstreaming NbS and climate change adaptation and mitigation into daily planning regulations, practices, and governance mechanisms/tools.

Living-Labs

Living Labs are "*user-centered, open innovation ecosystems based on a systematic user co-creation approach integrating research and innovation processes in real life communities and settings*" (Lupp et al., 2020).

A growing number of cities have been adopting [Urban] Living Labs to co-create and test NbS. Interviews (CoR, NetworkNature Nordic Hub, CSIC-CEBAS) revealed that the most successful examples of NbS uptake relied on effective collaboration between practitioners, researchers, policymakers and citizens. The concept of Living Labs was cited as a powerful tool to leverage public participation in the design of NbS.

Living Labs have gained the attention of the European Commission, which led to their introduction in several Horizon research projects, for example, Unalab, Invest4nature, urbinat, proGIreg. The European Network of Living Labs (ENoLL) has been fostering the integration of Living Labs initiatives across the EU.

In the analysis of the Unalab project, Sarabi et al. (2021) signal a number of barriers to the adoption and well-functioning of living labs in Tampere, Eindhoven and Genoa: organisational and structural barriers; cognitive and behavioural barriers; knowledge and process barriers; and ethical barriers. Therefore, and knowing these limitations, administrations should implement a supportive political and institutional setting for the adoption of Living Labs.

Collaboration with Business and Investors

Collaboration with private sector and industry could be an important enabler to facilitate the uptake of NbS. Not only can the private sector contribute to the financial resources of an NbS project, but is also essential to support NbS implementation. The collaboration with investors could also drive increased understanding of the financial risks associated with biodiversity loss (European et al., 2024).

In the sphere of urban planning, Public Private Partnerships (PPP) are considered as particularly pertinent as they combine "*the top-down regulation of the government sector with the flexibility of the private sector*" (Ershad Sarabi et al., 2019). According to Seddon et al. (2020), the creation of multilateral consortia of close partnerships between companies, communities, local governments, national governments, non-governmental organisations, local financial institutions, and national and international financial institutions is key to providing large-scale and long-term investments for ecosystems.

There are significant opportunities for NbS related to the built environment through the New European Bauhaus (NEB) initiative. The New NEB Facility, supporting the New European Bauhaus from 2025 to 2027, aims to combine sustainability, inclusivity, and aesthetics in built environment projects. This initiative provides a unique opportunity to incorporate

NbS into urban planning and development, promoting greener and more resilient cities.

Kooijman et al. (2021) have proposed a typology for organisations delivering NbS and a categorisation of their economic activities. The most common organisation type found was that of 'nature-based enterprises.' Having a clear typology to follow and propose to private industry helps in selecting a pathway with similar examples.

Private Sector Financing Nature Restoration - Findings from the University of Cambridge Institute for Sustainability Leadership (CISL)

A report from the CISL (2023) highlights examples of companies that have partnered with a range of stakeholders to invest in nature restoration projects. For instance, energy company EDF Energy partnered with the French National Forest Office and the National Alpine Botanical Conservatory to restore riverbanks with local plant species around their Romanche-Gavet facility. In particular, this collaboration allowed EDF to collect seeds and plants from the local area and include local plant species in the technical specifications of its project. Other examples mentioned in the CISL report include Cemex's restoration of a Pastor clay quarry in collaboration with the University of Barcelona and Salesforce's commitment to investing and forging partnerships in nature protection and restoration through the founding of 1t.org and the creation of an Ecosystem Restoration and Climate Justice Fund.

These examples should be recognised as encouraging efforts from companies to support the adoption of NbS, especially when these efforts are part of a wider company strategy to support climate and nature protection targets. However, as the WWF underlined it, "*support for nature-based solutions can't be an excuse for business as usual*" (WWF, 2020). The support to NbS should not overlook the potential harmful impacts of the companies' activities on the environment.

Upscaling Research and Innovation

A close integration with Research and Innovation (R&I) is crucial in developing a robust policy roadmap to support NbS initiatives. Across various fronts, R&I plays a critical role in guiding policy implementation, helping to foster conducive conditions and legal frameworks, and supporting advocacy for an ambitious global NbS agenda (El Harrak and Lemaitre, 2023).

In advancing policy implementation across EU sectors and scales, R&I and the development of NbS knowledge could help finetune or uncover impactful and novel levers for NbS policy implementation from the EU to local levels. Recognizing in many policies the absence of quantitative and measurable targets that hinder widespread NbS adoption, R&I emerges as a key determinant in establishing coherent and co-developed priorities for biodiversity, ecosystem services, and NbS across administrative tiers. Moreover, it provides science-based guidance and tools for realising EU policy objectives, such as outlined in the EU Biodiversity Strategy to 2030. Additionally, transdisciplinary R&I supports the integration of NbS across sectors through dialogue and participative approaches, thereby facilitating cross-policy collaboration and augmenting NbS uptake across environmental, social, and economic realms.

R&I also has a pivotal role in cultivating supportive conditions and legal frameworks vital for NbS implementation. By identifying and assessing legal frameworks for NbS innovation and deployment at different scales, R&I can help guide the alignment of policy instruments with meaningful and coherent NbS deployment. Other concrete examples of R&I support include addressing knowledge gaps regarding policy and financial incentives for NbS implementation, as well as helping identify and assess instruments to stimulate NbS demand. Importantly, participatory approaches developed in NbS R&I encourage the development of collaborative governance systems in order to engage relevant stakeholders in the effective delivery of multiple NbS benefits, thereby promoting co-development processes and more cross-sectorial and democratic approaches, essential for effective implementation of NbS.

At the global level, EU R&I efforts can help support an ambitious NbS policy agenda, driving the development of a vibrant NbS knowledge-based economy. This endeavour encompasses establishing

standardised frameworks for evaluating NbS performance and advocating for NbS integration into international policy agendas, such as the Sustainable Development Goals and the Global Biodiversity Framework. Concurrently, ongoing efforts to recognise the diversity of NbS values and benefits (i.e., monetary and non-monetary) in the design, implementation, and assessment phases are essential to promote inclusive, equitable, and just policy frameworks. To ensure widespread adherence to the NbS concept and achieve ambitious global NbS goals, it is imperative to close the current research-implementation gap, notably by leveraging R&I contributions to pertinent policy initiatives, such as the UN Decade in Ecosystem Restoration.

Knowledge Dissemination and Communicating Best Practices

In general, from the interviews and the desk study, it became apparent that access to relevant information and resources to decision-makers on NbS at all levels was an important enabler for their implementation (Seddon et al., 2021).

To shift NbS from an academic concept to a commonly used and understood concept that can mobilise citizens, good examples of successful NbS projects need to be highlighted to demonstrate their effectiveness and encourage wider adoption. Developing strong communities of practice has been shown as a strong enabler for wider NbS uptake (Ershad Sarabi et al., 2019). These are instrumental in sharing successful NbS project experiences and best practices that can then encourage wider adoption. In the field of urban planning, demonstration projects have proved to be successful at inspiring new opportunities, as well as learning lessons from less successful projects (Kabisch et al., 2016). One example worth exploring might be the emergence of People's Plan for Nature as a way to envision what nature means to ordinary people.

Another success factor for NbS uptake is effective peer-to-peer exchange. Interviewees (incl. European Commission, IUCN, University of Sheffield) have noticed that project site visits, in-person meetings, and study talks for instance were powerful methods for disseminating NbS and for creating networking opportunities between policymakers and practitioners. In the interviews with experts on food systems, the effectiveness of peer-to-peer exchange for disseminating sustainable agricultural practices was underlined.

There are many sources of information, best practices, and policy tools on NbS available online, but it is scattered and it is difficult for practitioners to know where to go. At the EU level, the Knowledge Center for Biodiversity serves as a hub for evidence-based policy making and information sharing on biodiversity (where Nature-based Solutions is a key topic). The Oppla platform provides a hub for information sharing on ecosystem services.

Education and Awareness-raising

Beyond collaboration amongst stakeholders, there is a need to integrate NbS in formal and non-formal education for all levels -primary, secondary, higher, and adult learning. At the primary to higher education levels, this would ensure capacity building and skills development for future generations preparing them for jobs requiring NbS knowledge (in technical and people skills). The EU has launched a GreenComp reference framework to allow educators and education institutions to evaluate their courses and curriculum to integrate varied essential principles which support the youth in engaging and learning about environmental practices including NbS. The Horizon project NBS EduWORLD is actively indexing relevant NbS education resources.

The Council of the European Union (EU) adopted a Recommendation on learning for the green transition and sustainable development in June 2022. The Recommendation is a key policy statement highlighting the crucial role of education and training in working towards the goals of the European Green Deal. Moreover, vocational training and Continuous Professional Development can help prepare practitioners to incorporate transdisciplinary knowledge to support the implementation of NbS and learn about on-the-ground applications of NbS. To break away from path dependencies and business-as-usual approaches when it comes to urban planning, local administration staff could undergo capacity building to acquire the knowledge and skills to better incorporate NbS into the urban fabric.

Davies and Lafortezza (2019) describe the necessity to develop 'ecosystem literacy' at the community level to boost the implementation of NbS. Authors underline the role of 'ecosystem-aware community workers' – individuals who can work at the local level, who understand the grey-green spectrum/ continuum and hybrid approaches that sit between, and know how to make NbS work at the community level, 'with' rather than 'for' local people.

Training and Capacity Building

The need for education of infrastructure professionals to break their path dependency not only applies to new students but to existing in-career professionals as well (Davies and Lafortezza, 2019; Ugolini et al., 2018), with capacity development being delivered through continuing professional development programmes. "*Tutors may need to be retrained and a variety of under-represented disciplines recruited into departments with non-typical backgrounds. Indeed, there is a case for infrastructure education being taught in transdisciplinary teaching schools. Costs are to be met in respect of these changes, exemplified by the need to prepare new curricula and teaching materials*" (Davies and Lafortezza, 2019).

Other examples to fill this need are the courses on NbS for professionals by IUCN and UN agencies via the IUCN Academy and Learning for Nature. These usually take a few weeks to complete and are designed to train individuals from all sectors interested in gaining expertise from the field and applying this knowledge to develop sustainable deevlopment projects, including NbS.

In addition, the UrbanByNature programme plays a key role in capacity building by helping practitioners integrate NbS into planning. Through thematic modules, webinars, and workshops, UrbanByNature addresses knowledge gaps and practical challenges, fostering international collaboration and innovation in sustainable development.

Network Nature

Chapter 4: Findings and Conclusions

This chapter brings together the findings of the policy screening and the needs and gaps analysis, draws conclusions, and identifies the key policy needs that the NetworkNature project can address during the project lifetime to 2027.

Priority Areas of Work for NetworkNature in Relation to Policy

NetworkNature has identified several strategic priority areas that will drive our efforts to integrate NbS more effectively across policies and sectors. These areas focus on mobilising resources, enhancing standards, fostering collaboration, and raising awareness, ensuring that our initiatives create a lasting impact. While the specific areas of work have been clearly defined and separated for easier understanding and organisation, the initiatives and outputs from NetworkNature are designed to be versatile and may simultaneously address multiple gaps or needs identified in the analysis.

Policymakers will need further guidance on how to make the case for NbS in their respective fields, as well as for stakeholders developing, implementing and investing in policies and interventions on the ground (i.e. affected communities and rightsholders local and regional authorities, planners, financial sector etc.). In particular, NbS have the potential to break the 'environmental policy silo' if they are framed around the multiple benefits that NbS can deliver.

Table 6 below connects the main policy needs identified in this report to NetworkNature activities, to best suit the needs of the project's target audiences. The table highlights some of the key areas of work for NetworkNature:

- integration of NbS in policy and policy tools;
- enhancing standards and harmonisation;
- mobilising funding;
- increasing collaboration and network building;
- encouraging participatory processes;
- promoting education and raising awareness.

Table 6: *Summary of identified needs and gaps and their relation to potential NetworkNature products and actions*

Identified gaps	Enabling factors	Needs	NN products and actions	NN Target audiences
Lack of integration and harmonisation between policies	Policy integration, legislative change Education Capacity building	Long-term and holistic planning with cross-sectoral and multilevel dialogues with wide stakeholder engagement	Guidance documents, tools, best practices and recommendations for policy integration for sub-national, national and EU policymakers Knowledge sharing and exchange between policymakers to share good practices in integrated policymaking for NbS	Local and subnational governments and public authorities (+ NbS Hubs) National and EU-level policy-makers Educators, education institutions and students
Lack of political will Lack of awareness about NbS and resistance to change Lack of sense of urgency Science and policy timelines not aligned Path dependency	Legislative change and policies within EU Member States encouraging NbS uptake Increased collaboration and transdisciplinary considerations for planning and implementation. Using identified windows of opportunity	Need for a more transdisciplinary approach Consolidate evidence and knowledge to support targeted NbS policies Integration of NbS in societal challenges of different policies	Communicating research outcomes efficiently (more accessible) Reaching new audiences to promote transdisciplinary work Creating opportunities for peer-to-peer dialogue with NbS Hubs Finding strategic entry points for target audiences Science-policy workshops Demonstrate, where NbS can have an impact in achieving policy objectives	Local and subnational governments and public authorities (+ NbS Hubs) National and EU-level policy-makers Infrastructure planners and developers
Lack of targeted guidance for stakeholder training	Capacity building, knowledge dissemination Providing context-specific and tailored resources Standards supporting NbS uptake Dissemination of best practices Participatory approaches (in design, governance, etc.)	Need for references on NbS methods and tools for NbS monitoring and evaluation – targeted to specific sectors. Assessment of existing standards	NbS Task Forces Peer-to-peer events and capacity building activities Dissemination of dedicated tools, guidance and best practices Development of guidance documents to develop actions for NbS integration into business decision-making processes	NbS investors and (nature-based) entrepreneurs Local and subnational governments and public authorities Infrastructure planners and developers
Financing: lack of involvement from the private sector	Capacity building Market-based tools Increasing collaboration (i.e.. private-public partnerships) Guidance and standards for NbS operationalisation in business	Need for increased understanding of NbS and their co-benefits, costs, monetary and non-monetary values and effectiveness Need for reduced risk and perception of threat and conflict between actors; Need for more evidence on valuing and comparing NbS benefits using natural capital approaches to inform decision-making	Extension and creation of peer- and cross-sector networks Mainstreaming of natural capital approaches Creating opportunities for peer-to-peer dialogue with NbS Hubs Finding strategic entry points for target audiences	Financial sector, NbS potential investors Local and regional public authorities
Funding and financing: Lack of evidence showcasing cost-effectiveness	Providing context-specific and tailored resources Providing evidence – sharing best practices Further developing monetary valuation of NbS benefits and costs		Short curriculum and capacity building for different stakeholders on what NbS financing schemes are, the potential risks, and principles for design. Dialogues and briefings with policy-makers and public authorities Case studies of successful financing of NbS projects	NbS investors and (nature-based) entrepreneurs Local and subnational governments and public authorities

Integration of NbS in Policy and Policy Tools

We have highlighted throughout this report the necessity to break down sectoral siloes to foster a broad NbS community. To achieve this, there is a need for strong Europe-wide engagement of key actors and stakeholders in NbS policy, standards development, implementation and monitoring.

A lack of quantitative and measurable targets relating to NbS deployment and impacts exists in EU and global policy instruments. NetworkNature will collaborate with policymakers to develop clear, measurable NbS targets and indicators and advocate for their insertion into relevant policies.

NetworkNature will produce policy toolkits including: indicators and metrics for measuring and assessing impacts of NbS, ways to set measurable or quantifiable targets and objectives for NbS, uses of cost-benefit analysis tools, economic and accounting that factors in natural capital, and social impact assessment, co-design and participatory approaches. This work will build on the Handbook for Practitioners (Dumitru and Wendling, 2021b) which provides information to guide the development and implementation of NbS monitoring and evaluation and the use of NbS impact indicators.

NetworkNature will also publish policy relevant information and materials on the NetworkNature platform throughout the duration of the project.

Some areas of focus:

Sectoral policies outside traditional 'green' sectors: Drawing on the analysis of Zero Polution policies, NbS are still often less present in industrial sectoral policies such as transportation or waste management. Recognising how NbS could also support EU goals in these sectors (for example if / how NbS could help increase the resilience of transport or energy infrastructure) could prove useful and effective. NetworkNature will align with the New European Bauhaus facility to support innovative projects that showcase how NbS can enhance the quality of life, foster cultural and social inclusion, and contribute to the EU climate goals.

The European Commission has made a policy proposal to develop natural capital accounting in the EU (European Commission, 2022a). NetworkNature will actively collaborate with and support established partnerships, platforms and initiatives for mainstreaming natural capital in policy and practice.

NetworkNature will take action to:

> Collaborate with policymakers to develop clear, measurable NbS targets, accompanied by appropriate budget measures and funding incentives.
>
> Promote standardised monitoring and evaluation frameworks.
>
> Advocate for the inclusion of NbS targets in relevant policies.

Mobilising Funding and Finance

One of the main needs identified is the increased investment to scale up NbS implementation. Financial and business sectors lack knowledge of the benefits of investing in NbS, existing financial mechanisms, and financing models for investors and enterprises. The evidence for the cost-effectiveness of NbS is scattered and predominantly refers to small-scale investments. Addressing this gap involves providing guidance, case studies, and capacity building for potential NbS investors and SMEs and nature-based enterprises (NbEs). Enhancing the understanding and attractiveness of NbS for investors by facilitating collaborations and showcasing successful financing models is crucial.

Areas of focus will include:

- **Finance and insurance**: The European Investment Bank and others have identified lack of access to finance, or options for financing NbS, as being a key barrier to greater uptake. A lack of options to insure NbS can also be a barrier. Reviewing and considering how finance and insurance for NbS could be better integrated into existing frameworks could help overcome some of these barriers;
- **Joint Work for a Nature-Positive Economy and Just Transition**: NetworkNature will emphasise

the importance of a Just Transition, ensuring that the shift towards a nature-positive economy is inclusive and equitable. This involves collaborating with various stakeholders, including financial institutions, businesses, civil society organisations, trade unions and communities, to integrate NbS into their practices and policies;
- **Procurement policies and budgets**: ensuring that policies on public procurement are able to facilitate measures like co-financing (identified in the EIB report as a key potential lever for greater uptake of NbS) could help support greater uptake of NbS. Conversely, ensuring the policies do not inadvertently exclude NbS from procurement processes (for example by specifying that certain grey infrastructure processes or standards have to be met, meaning that NbS cannot be considered and reviewed alongside engineered approaches) may also be helpful in some contexts.

This will draw on the massive body of work being undertaken by many EU projects in this space (Invest4Nature, Naturance, Waterlands & sister projects, GoNaturePositive!, BioFin, A-Track and many more).

NetworkNature will take action to:

Develop comprehensive guides and case studies highlighting successful NbS investments.

Organise workshops and training sessions for financial sector stakeholders.

Facilitate collaborations and knowledge sharing between investors and NbS project developers and between investors and NbEs seeking investment.

Setting Targets and Budgets for NbS Implementation in Different Policy Areas

NetworkNature will work towards enhancing standards and harmonisation of NbS implementation across policies and regions. This will help to build the evidence base for NbS, for NbS investors, but also for local and regional public authorities.

NetworkNature applied for the service provided by the HS Booster which will particularly target the outputs of the NetworkNature Nature-based Solutions Task Forces, which are judged to be of sufficiently high maturity and are based on wide stakeholder engagement. Task Forces are facilitated by NetworkNature and are meant to facilitate collaboration between EU Horizon Projects on NbS (but not only). The first webinars in 2024 were supported by a series of hands-on workshops to inform the experts about the opportunity and offers to turn their work into standards.

Increasing Collaboration and Network Building

Breaking down sectoral silos is essential to fostering a broad NbS community. Building capacity and developing skills amongst key target groups will be key to scale up and speed up NbS awareness, investment and implementation.

NetworkNature will engage key actors and stakeholders across Europe in NbS policy, research, standards development, implementation, and monitoring. NetworkNature will promote actions such as collecting NbS educational materials, providing guidance, and connecting to existing networks to inspire new partnerships and collaborations with the target audiences. Examples of this are the memorandum of understanding with the EU Mission for 100 Climate-Neutral and Smart Cities (also known as the Cities Mission) and collaborations with the EU Mission on Adaptation to Climate Change. These partnerships aim to integrate NbS into broader policy frameworks and enhance NbS planning and implementation across various sectors.

NetworkNature will take action to:

Create and support networks to inspire new partnerships and collaborations.

Organise science-policy events and peer-to-peer dialogues to promote stakeholder collaboration.

Boost the NetworkNature platform for sharing best practices and experiences, improving connectivity with the Connecting Nature

Enterprise Platform to reach practitioner communities.

Build on the existing NbS Hubs at the Member State and regional level and the establishment of new ones to facilitate localised NbS collaboration, knowledge exchange, and implementation support. These hubs will act as focal points for national and regional stakeholders, enhancing the capacity to integrate NbS into local policies and projects.

Encouraging Participatory Processes

Involving local communities and stakeholders, including practitioners, in NbS projects is vital for their success. NetworkNature will encourage participatory processes to ensure that NbS initiatives are inclusive and community-driven and promote stakeholder collaboration (through science-policy events, peer to peer dialogues, etc.). NetworNature will facilitate cross-sectoral partnerships to encourage collaboration between different sectors such as urban planning, agriculture, and water management to integrate NbS into various policy and practice areas.

NetworkNature will take action to:

Provide guidance on best practices for community engagement.

Facilitate interactive workshops and participatory planning sessions that bring together policymakers, practitioners, and researchers to discuss and share best practices and innovative NbS approaches.

Promote the inclusion of diverse stakeholders in NbS projects.

Promoting Education and Raising Awareness

Increasing awareness about NbS – across all target audiences - and breaking path dependency towards 'grey' solutions is crucial. The challenges associated with breaking path dependency are manifold and require ways to reach new target audiences and demonstrate how NbS can answer a variety of societal challenges.

NetworkNature will focus on promoting NbS through education and awareness-raising activities tailored to all target audiences identified in this report. NetworkNature is already a strong community of practice sharing successful NbS project experiences and best practices that can then encourage wider adoption through the NetworkNature platform, but also the Oppla repository. This web platform provides context-specific and tailored resources to the specific needs of target audiences identified, through an accessible one-stop-shop. This includes: guides, best practices, experiences from other cities and regions. Links are made with the Connecting Nature Enterprise platform and the ThinkNature platform.

NetworkNature is a partner in The Nature of Cities Festival (TNOC) which showcases the power of peer-to-peer exchange in disseminating NbS best practices. In June 2024, the Festival, based in Berlin, gathered NbS practitioners and enthusiasts for a week around a series of diverse and enriching activities connected to urban NbS (conferences, site visits, gardening, workshops, etc).

NetworkNature will take action to:

Collect and disseminate NbS educational materials, produce additional case studies and success stories that document and share successful NbS implementations to illustrate their effectiveness and encourage adoption.

Continue curating comprehensive collections of NbS-related documents, toolkits, and research papers accessible through the one-stop-shop.

Organise awareness campaigns targeting different audiences, create campaigns aimed at educating the public and specific sectors about the benefits of NbS over traditional grey infrastructure solutions.

Develop and distribute educational resources, such as guides and toolkits; leverage the European NbS Hubs to disseminate educational materials and conduct training sessions

in local languages. These hubs will serve as NbS platforms for community engagement, providing tailored NbS resources and guidance to local practitioners and policymakers.

Leverage Digital Platforms: Connect NetworkNature to other online platforms such as OPPLA and social media to disseminate information and engage with a broader audience, making NbS more accessible to diverse stakeholders.

Conclusions

This report has provided an overview of the policy landscape for sustainability and environmental objectives, and mapped the policy needs and gaps in relation to the deployment of NbS in the EU. The NetworkNature platform has been bringing together the NbS community of innovators, practitioners, and developers in a network of networks, with expertise from leading EU-funded NbS research projects and the participation of practitioners from cities, local authorities, and businesses. This report serves as a first step in guiding NetworkNature policy-related activities from 2024 to 2027. Based on this analysis, the main priorities for the NetworkNature platform are identified, addressing the development of policy-relevant tools and knowledge. By aligning gaps and needs with policy themes and target audiences, NetworkNature plays a crucial role in mobilising funding, enhancing standards and harmonisation, increasing awareness, promoting collaboration, and building capacity.

Additionally, the need to ensure a just transition towards a world where NbS are designed and delivered with justice and equity at its core should not be neglected. Governments should recognise this, implementing policies that ensure that the jobs provided by NbS offer decent work and are equitably accessed and distributed across society. Training and education will likely be necessary to prepare people to take on jobs provided by NbS and retrain out of professions that do not contribute to a sustainable economy (ILO, UNEP and IUCN, 2022).

NetworkNature plans to monitor and report on the implementation of the suggested actions through the annual general meetings and other events, and through regular reports and articles on the NetworkNature webplatform, including the newsletter, policy briefs, briefs of the science-policy events, and more. By implementing the strategies suggested in this document, NetworkNature aims to play a pivotal role in fostering a robust NbS community, driving policy integration, and accelerating the transition towards NbS planning and implementation. This holistic approach ensures that NbS becomes a cornerstone in addressing environmental and societal challenges, paving the way for sustainable and resilient future.

Network Nature

Annexes

Appendix 1: Organisations consulted

	Theme	Consulted organisation	Partner responsible	Name and Surname	NbS type (if applicable)
1	Zero Pollution	EC - DG ENV	IEEP	Joachim D'Eugenio	Soil, water, air, noise
2	Zero Pollution	University of Amsterdam	IEEP	Matteo Fermeglia	Phytoremediation
3	Zero Pollution	University of Sheffield	IEEP	Tom Wild	Water quality
4	Sustainable food systems	ELO	IEEP	Ana Rocha	Sustainable agriculture
5	Sustainable food systems	CEBAS-CSIC	IEEP	Joris de Vente	Regenerative, sustainable land management practices, agroecology
6	Sustainable food systems	Soil Heroes Foundation	IEEP	Annabelle Williams	Regenerative agriculture
7	Sustainable food systems	Organics Europe	IEEP	Hanna Winkler	Organic agriculture
8	Sustainable food systems	EC - DG AGRI	IEEP	Alia Atitar de la Fuente and Emmanuel Petel	
9	Sustainable urban and regional transformation	Formas	ICLEI	Björn Wallsten	
10	Sustainable urban and regional transformation	Committee of the Regions	ICLEI	Marta Canovas Mansanet	
11	Sustainable urban and regional transformation	NbS Hub Hungary	ICLEI	Monika Nemeth	
12	Sustainable urban and regional transformation	NetworkNature Nordic Hub	ICLEI	Jona Olavsdottir and Leonard Sandin	
13	Sustainable urban and regional transformation	Covenant of Mayors	ICLEI	Luca Arbau and Alison de Luise	
14	Sustainable urban and regional transformation	Coop4CBD, UNEP-WCMC	ICLEI	Claire Brown	

15	Sustainable urban and regional transformation	EU Urban Agenda Partnership	ICLEI	Liviu Bailesteanu	
16	NbS finance for a just transition to a nature positive economy	Green Finance Institute	UNEP-WCMC	Helen Avery	
17	NbS finance for a just transition to a nature positive economy	Anonymised	UNEP-WCMC	Anonymised	
18	NbS finance for a just transition to a nature positive economy	Triodos Bank	UNEP-WCMC	Simon Scholl	
19	NbS finance for a just transition to a nature positive economy	The Nature Conservancy	UNEP-WCMC	Rob Cunningham	Water quality
20	Climate adaptation, mitigation and resilience	WCS	UNEP-WCMC	Anonymised	Various
21	Climate adaptation, mitigation and resilience	SEI	UNEP-WCMC	Anonymised	Various - focus on Agri
22	Biodiversity enhancement and ecosystem restoration	European Commission	IUCN	Anonymised	Soil
23	Biodiversity enhancement and ecosystem restoration	European Commission	IUCN	Anonymised	Forest
24	Biodiversity enhancement and ecosystem restoration	European Commission	IUCN	Karin Zaunberger	Various
25	Biodiversity enhancement and ecosystem restoration	Nature Conservation NGO	IUCN	Anonymised	Various
26	Biodiversity enhancement and ecosystem restoration	European Commission	IUCN	Anonymised	Coastal and maritime environments
27	Biodiversity enhancement and ecosystem restoration	Butterfly Conservation Europe	IUCN	Aidan Whitfield	Pollinators and biodiversity

Appendix 2: Interview Template

1. **What are the most relevant tools and standards currently supporting NbS in your policy sector?**
   Why?

2. **From 0 to 3, to what extent do you consider that this policy tool adequately supports NbS? Why?** (0 none, 1 minimal support, 2 equate support, 3 maximum support)

3. **What are the main barriers preventing the uptake of NbS in your sector?**

4. **What are the policy areas where you identify the lowest NbS uptake?**

   (rate them 0-3; 0 none, 1 minimal, 2 adequate uptake, 3 maximum uptake)

   Biodiversity enhancement and ecosystem restoration (IUCN)/ Sustainable food systems (IEEP) /Climate adaptation, mitigation and resilience (UNEP-WCMC)/ NbS Finance for a Just Transition to a Nature Positive Economy (UNEP-WCMC) / Sustainable urban and regional transformation (ICLEI) /Zero Pollution (IEEP)

5. **Can you elaborate on the factors contributing to the successful uptake of NbS in some thematic areas?**

   To what extent do you consider this transferable to your policy area? (e.g: successful uptake of the NbS concept in sustainable urban transformation with urban greening approaches being mainstreamed)

6. **What would help mainstream NbS in your policy area?**

   Do you have a specific idea in mind in terms of enablers?

7. **Which identified barriers in your policy sector could NN+ help address?**

8. **Which target audience would benefit most from tools or support from NN+ in your sector?**

   - Local and sub-national governments and their public authorities
   - NbS investors and entrepreneurs
   - Subnational, national and EU policy-makers
   - Educators, education institutions and students
   - Natural resources managers and landowners
   - Infrastructure planners and developers

9. **What would you like to see NN+ create or publish over the next 4 years?**

10. **What kind of policy impact could you expect from the project?**

References

A Rocha, BatLife Europe, BirdLife Europe and Central Asia, Buglife-The Invertebrate Conservation Trust, Butterfly Conservation Europe, CEEweb for Biodiversity, Client Earth, European Natural Heritage Foundation (Euronatur), EUROPARC Federation, European Environmental Bureau (EEB), Eurosite, Friends of the Earth Europe, International Mire Conservation Group (IMCG), Rewilding Europe, Societas Europaea Herpetologica, Society for Ecological Restoration (SER), Association, W I-E and EPO), W E P O W (2023) *Position paper regarding the EU Pollinator initiative*. https://www.bund.net/fileadmin/user_upload_bund/publikationen/naturschutz/naturschutz_eu_pollinator_initiative_englisch.pdf

ACTeon and WOOD (2021) *Strengthening the synergies between agriculture and flood risk management in the European Union*. Final draft report, European Commission DG Environment, circabc. https://drmkc.jrc.ec.europa.eu/events-news/all-news#news/432/details/21184/strengthening-the-synergies-between-agriculture-and-flood-risk-management-in-the-european-union

Aubert, G and Dudley, N (2023) *Progress on implementing the Kunming-Montreal Global Biodiversity Framework*. PE 754.196, European Parliament - Policy Department for Economic, Scientific and Quality of Life Policies, Brussels. https://ieep.eu/publications/progress-on-implementing-the-kunming-montreal-global-biodiversity-framework/

Beijneveld, M and Arbau, L (2022) *Policy Support Facility: A tailored programme to help local authorities move from planning to implementation of adaptation action*. Covenant of Mayors for climate and energy https://eu-mayors.ec.europa.eu/system/files/2023-01/2022.11.08_PSF%20one%20page%20brief.pdf

BIOEAST (2024) *Manifesto: Sustainable supply chains and strengthened local processing of bioresources in Central and Eastern Europe* https://bioeast.eu/wp-content/uploads/2024/05/MANIFESTO-1.pdf

BMU (2022) *Federal Action Plan on Nature-based Solutions for Climate and Biodiversity*. https://www.bmuv.de/en/download/federal-action-plan-on-nature-based-solutions-for-climate-and-biodiversity

Boix-Fayos, C and de Vente, J (2023) Challenges and potential pathways towards sustainable agriculture within the European Green Deal. *Agricultural Systems* No 207, 103634. https://doi.org/10.1016/j.agsy.2023.103634

Borzacchiello, M T, Magnolfi, V, Sanchez Lopez, J, Barbero Vignola, G, Avraamides, M, Ní Choncubhair, Ó, Mayorga Duarte, L, Sinkko, T and Camia, A (2024) *Exploring foresight scenarios for the EU bioeconomy*. JRC. https://publications.jrc.ec.europa.eu/repository/handle/JRC135536

Bradley, H and Pagnon, J (2023) *EU budget review – is the CAP delivering the 'transition towards a more sustainable agriculture'?* Institute for European Enviornmental Policy. https://ieep.eu/wp-content/uploads/2023/06/EU-budget-review-mobilising-nature-and-climate-funding-IEEP-2023.pdf

Canessa, C, Ait-Sidhoum, A, Wunder, S and Sauer, J (2024) What matters most in determining European farmers' participation in agri-environmental measures? A systematic review of the quantitative literature. *Land Use Policy* No 140, 107094. https://doi.org/10.1016/j.landusepol.2024.107094

Cantergiani, C, Herranz, K, MurphyEvans, N, Bradley, S, Pastoors, J, Menny, M, Robert, J, Casagrande, S, Barone, E, Berrini, M and Bono, L (2019) *Clever Cities: Co-Creation Plan and Co-Design of Solutions in CLEVER Action Laboratories* https://clevercities.eu/fileadmin/user_upload/Resources/D2.2_Co-creation.pdf

CBD (2022) *Kunming-Montreal Global Biodiversity Framework*. CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY Fifteenth meeting – Part II, CBD/COP/15/L.25, Convention on Biological Diversity, Montreal, Canada. https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf

Chausson, A, Turner, B, Seddon, D, Chabaneix, N, Girardin, C A J, Kapos, V, Key, I, Roe, D, Smith, A, Woroniecki, S and Seddon, N (2020) Mapping the effectiveness of nature-based solutions for climate change adaptation. *Global Change Biology* No 26 (11), 6134-6155. https://doi.org/10.1111/gcb.15310

CISL (2023) *From Risk to Resilience: The Business Imperative of Nature Restoration*. University of Cambridge Institute for Sustainability Leadership (CISL), Cambridge, UK. https://www.corporateleadersgroup.com/files/cisl_from_risk_to_resilience_report_2023_v2.pdf

Cocklin, C, Mautner, N and Dibden, J (2007) Public policy, private landholders: perspectives on policy mechanisms for sustainable land management. *Journal of Environmental Management* No 85 (4), 986-998.Cohen-Shacham, E, Walters, G, Janzen, C and Maginnis, S (2016) Nature-based solutions to address global societal challenges. *IUCN: Gland, Switzerland* No 97, 2016-2036.Collentine, D and Futter, M N (2018) Realising the potential of natural water retention measures in catchment flood management: trade-offs and matching interests. *Journal of Flood Risk Management* No 11 (1), 76-84. https://doi.org/10.1111/jfr3.12269

COMMISSION STAFF WORKING DOCUMENT FITNESS CHECK of the Ambient Air Quality Directives: Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air and Directive 2008/50/EC on ambient air quality and cleaner air for Europe. EC. 2019. https://circabc.europa.eu/ui/group/cd69a4b9-1a68-4d6c-9c48-77c0399f225d/library/d53fbb73-6144-4e48-8c41-e464f7b54b99/details

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Green Infrastructure (GI) — Enhancing Europe's Natural Capital. Official Journal of the European Union. 2013. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52013DC0249

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS New European Bauhaus Beautiful, Sustainable, Together. Official Journal of the European Union 2021. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2021%3A573%3AFIN

Conference of the Parties serving as the meeting of the Parties to the Paris Agreement 5 agenda item 8(a) Matters relating to adaptation Glasgow–Sharm el-Sheikh work programme on the global goal on adaptation referred to in decision 7/CMA.3 2023. https://unfccc.int/sites/default/files/resource/Global_goal_on_adaptation_1.pdf

Consolidated text: Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. Official Journal of the European Union. 2004. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02004L0107-20150918

Consolidated text: Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. Official Journal of the European Union. 2008. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0050-20150918

Consolidated text: Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (Text with EEA relevance)Text with EEA relevance. Official Journal of the European Union. 2019. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02019R2088-20240109

Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds. Official Journal of the European Communities L103, pp1-18. 4/25/1979. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31979L0409:EN:HTML

Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment. Official Journal of the European Union L 135, pp40-52. 30.5.1991. http://eur-lex.europa.eu/legal-content/EN/NOT/?uri=CELEX:31991L0271

http://ec.europa.eu/environment/water/water-urbanwaste/index_en.html

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Official Journal of the European Union L206, pp1-48. 1992. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1992L0043:19920610:EN:PDF

Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (codification of Birds Directive). Official Journal of the European Union L 20, pp1-25. 2009. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF

Davies, C, Hansen, R, Rall, E, Pauleit, S, Lafortezza, R, Bellis, Y, Santos, A and Tosics, I (2015) *Green Infrastructure Planning and Implementation - The status of European green space planning and implementation based on an analysis of selected European city-regions*. GREEN SURGE Deliverable 5.1.Davies, C and Lafortezza, R (2019) Transitional path to the adoption of nature-based solutions. *Land Use Policy* No 80, 406-409. https://doi.org/10.1016/j.landusepol.2018.09.020

Davis, M, Abhold, K, Mederake, L and Knoblauch, D (2018) *Nature-based solutions in European and national policy frameworks*. Deliverable 1.5, NATURVATION. Horizon Europe Grant Agreement No 730243, European Commission. https://networknature.eu/product/22758

Davis, M, Krüger, I and Hinzmann, M (2015) *Coastal protection and SuDS - Nature-based Solutions*. RECREATE, Ecologic Institute. https://www.ecologic.eu/sites/default/files/publication/2017/2723-recreate-pb-nature-based-solutions.pdf

Davis, M and Naumann, S (2017) Making the Case for Sustainable Urban Drainage Systems as a Nature-Based Solution to Urban Flooding, in Kabisch, N, Korn, H, Stadler, J, Bonn, A (eds), *Nature-based solutions to climate change adaptation in urban areas: linkages between science, policy and practice*, pp123-137. Springer International Publishing, Cham. https://doi.org/10.1007/978-3-319-56091-5_8

de Luca, C, Naumann, S, Davis, M and Tondelli, S (2021) Nature-Based Solutions and Sustainable Urban Planning in the European Environmental Policy Framework: Analysis of the State of the Art and Recommendations for Future Development. *Sustainability* No 13 (9), 5021.Dhyani, S, Murthy, I K, Kadaverugu, R, Dasgupta, R, Kumar, M and Adesh Gadpayle, K (2021) Agroforestry to achieve global climate adaptation and mitigation targets: Are South Asian countries sufficiently prepared? *Forests* No 12 (3), 303.Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks. Official Journal of the European Union. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0060&from=EN

Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). Official Journal of the European Union L 164, pp19-40. 6/17/2008. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:164:0019:0040:EN:PDF

Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning. Official Journal of the European Union L 257, pp135-145. 7/23/2014. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.257.01.0135.01.ENG

Droste, N, Schröter-Schlaack, C, Hansjürgens, B and Zimmermann, H (2017) Implementing nature-based solutions in urban areas: financing and governance aspects. *Nature-based solutions to climate change adaptation in urban areas: linkages between science, policy and practice* No https://doi.org/10.1007/978-3-319-56091-5_18, 307-321.Dumitru, A and Wendling, L (2021a) *Evaluating the impact of nature-based solutions – Appendix of methods*. European Commission, Directorate-General for Research and Innovation, Publications Office of the European Union.Dumitru, A and Wendling, L (eds) (2021b) *Evaluating the Impact of Nature-based Solutions: A Handbook for Practitioners*. Publications Office of the European Union, Luxembourg.EC (2019) *Commission Staff working document: EXECUTIVE SUMMARY OF THE EVALUATION of the Council Directive 91/271/EEC of 21 May 1991, concerning urban waste-water treatment*. EU Commission. https://circabc.europa.eu/ui/group/1c566741-ee2f-41e7-a915-7bd88bae7c03/library/2c7a6568-a624-4b0d-8a88-65f69083f518/details

EC (2020) Nature-based solutions improving water quality & waterbody conditions: Analysis of EU-funded projects No. https://op.europa.eu/en/publication-detail/-/publication/d6efaeeb-d530-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-219289052

EC (2024a) *Horizon Europe strategic plan 2025-2027 for research and innovation to underpin journey to a green, digital and resilient future*. https://ec.europa.eu/commission/presscorner/detail/en/IP_24_1572 AccessedEC (2024b) *Land use sector*. https://climate.ec.europa.eu/eu-action/land-use-sector_en#eu-rules-on-land-use-land-use-change-and-forestry-lulucf AccessedEC (2024c) *SME definition*. https://single-market-economy.ec.europa.eu/smes/sme-fundamentals/sme-definition_en AccessedEC (2024d) *Supporting climate action in the EU budget*. https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/supporting-climate-action-through-eu-budget_en AccessedEC (2024e) *Webage: Water Framework Directive*. https://environment.ec.europa.eu/topics/water/water-framework-directive_en#state-of-play-of-3rd-rbmp-adoption-in-eu-27 AccessedEEA (2012) *Urban adaptation to climate change in Europe - Challenges and opportunities for cities together with supportive national and European policies*. Luxembourg. https://www.eea.europa.eu/publications/urban-adaptation-to-climate-change

EEA (2024) Drought and water scarcity. European Climate and Health Observatory and Climate Adapt. Available at: https://climate-adapt.eea.europa.eu/en/observatory/evidence/health-effects/drought-and-water-scarcity

EEA (2019) *The European environment — state and outlook 2020: knowledge for transition to a sustainable Europe*. European Environment Agency, Copenhagen. https://www.eea.europa.eu/soer

EEA (2021) *Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction*. EEA Report No 1/2021, European Environment Agency, Luxembourg: Publications Office of the European Union. https://www.eea.europa.eu/publications/nature-based-solutions-in-europe/

EEA (2023a) *The case for public participation in sustainability transitions*. Briefing no. 18/2023, European Environment Agency, Publications Office of the European Union.EEA (2023b) *The European biomass puzzle – Challenges, opportunities and trade-offs around biomass production and use in the EU*. EEA Report No 8/2023, European Environment Agency, Copenhagen. https://www.eea.europa.eu/en/newsroom/news/biomass-in-europe

EEA (2024) *European climate risk assessment*. EEA Report No 1/2024, European Environment Agency, Denmark. https://www.eea.europa.eu/publications/european-climate-risk-assessment

EEB (2021) *First assessment of the EU's 2021 Adaptation Strategy* https://eeb.org/library/first-assessment-of-the-eus-2021-adaptation-strategy-eeb/

EEB (2023) *Letter to European Commission Executive Vice-President for the European Green Deal Maroš Šefčovič. Re: Completing the European Green Deal: The Commission's initiative for an Integrated Nutrients Management Action Plan.* . https://eeb.org/wp-content/uploads/2023/09/Letter-to-COM-re-INMAP_Sept-2023-FINAL.pdf

EEB and BirdLife (2022) *CAP Strategic Plans - are they likely to deliver on given promises?* European Environment Bureau and Birdlife International, Brussels. https://eeb.org/library/cap-strategic-plans-are-they-likely-to-deliver-on-given-promises/

EESC (2024) *A comprehensive strategy for biodiversity at COP16: bringing all sectors together for a common goal*.Egan P, Chikoye D, Green KK, Tamò M, Feit B, Kumar PL, Bandyopadhyay R, Tepa-Yotto G, Ortega-Beltran A, Sæthre M-G, Coyne DL, Legg JP and M, J (2021) *Harnessing nature-based solutions for smallholder plant health in a changing climate*. Swedish University of Agricultural Sciences; International Institute of Tropical Agriculture,

Norwegian Institute of Bioeconomy Research. https://cgspace.cgiar.org/items/c04cc4ca-c9bc-4ccc-88f1-c23be1423f50

Eggermont, H, Balian, E, Azevedo, J M N, Beumer, V, Brodin, T, Claudet, J, Fady, B, Grube, M, Keune, H, Lamarque, P, Reuter, K, Smith, M, van Ham, C, Weisser, W W and Le Roux, X (2015) Nature-based Solutions: New Influence for Environmental Management and Research in Europe. *GAIA - Ecological Perspectives for Science and Society* No 24 (4), 243-248. https://www.ingentaconnect.com/content/oekom/gaia/2015/00000024/00000004/art00010

EIB (2020) The EIB Group Climate Bank Roadmap 2021-2025. No. https://www.eib.org/en/publications/the-eib-group-climate-bank-roadmap

EIB (2023) *Working with nature, not against it*. https://www.eib.org/en/stories/nature-based-solutions-flood-greece AccessedEl Harrak, M and Lemaitre, F (2023) *European Roadmap to 2030 for Research and Innovation on Nature-based Solutions*. NetworkNature. https://networknature.eu/product/29557

Elgar, H, Coles, N, Jurik, J, Mortimer, N and Banwart, S (2019) Financing & Business, in Somarakis, G, Stagakis, S, Chrysoulakis, N (eds), *ThinkNature Nature-Based Solutions Handbook*, pp123-147.Ershad Sarabi, S, Han, Q, L. Romme, A G, de Vries, B and Wendling, L (2019) Key enablers of and barriers to the uptake and implementation of nature-based solutions in urban settings: A review. *Resources* No 8 (3), 121. https://doi.org/10.3390/resources8030121

ESSC (2024) *55th Meeting of the European Statistical System Committee*. European Statistical System Committee. https://ec.europa.eu/eurostat/documents/1798247/6191525/European+Strategy+for+Environmental+Accounts/

Estévez-Mauriz, L, Riaño, J C, de Barrios Carro, M and de Barrios Carro, M Á (2023) *The Zero Pollution Ambition. European Main Cities Urban Sound Environment Analysis*. Springer International Publishing, Cham.The EU Green Deal. European Commission. 2019. https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52019DC0640

Euronews (2024) EU to revise Agricultural Policy in response to farmers protests. *Euronews*. https://www.euronews.com/2024/03/16/eu-to-revise-agricultural-policy-in-response-to-farmers-protests

European, Commission, Directorate-General for Financial Stability, F S, Capital Markets, U, Cziesielski, M, Dekker-Hufler, C, Pal, T, Nicholls, G, Petsinaris, F, Korteweg, L, Obersteiner, M and Khabarov, N (2024) *Study for a methodological framework and assessment of potential financial risks associated with biodiversity loss and ecosystem degradation – Final report*. pp.European Commission (2013a) *COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Green Infrastructure (GI) — Enhancing Europe's Natural Capital* https://eur-lex.europa.eu/resource.html?uri=cellar:d41348f2-01d5-4abe-b817-4c73e6f1b2df.0014.03/DOC_1&format=PDF

European Commission (2013b) *An EU Strategy on Adaptation to Climate Change*. Communication from the Commission to the European Parliament and the Council, COM(2013) 216, European Commission, Brussels. https://ec.europa.eu/clima/sites/clima/files/docs/eu_strategy_en.pdf

https://ec.europa.eu/clima/policies/adaptation/what_en

European Commission (2017) *An Action Plan for nature, people and the economy*. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2017) 198 final, European Commission, Brussels. http://ec.europa.eu/environment/nature/legislation/fitness_check/action_plan/index_en.htm

European Commission (2020a) *EU Biodiversity Strategy for 2030*. COM(2020) 380 final, European Commission, Brussels. https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1590574123338&uri=CELEX:52020DC0380

European Commission (2020b) *A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system*. COM(2020) 381 final, European Commission, Brussels. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0381

European Commission (2020c) *On the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC)*. REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL, COM(2020) 259 final, European Commission, Brussels. https://ec.europa.eu/info/sites/info/files/com2020_259_final_en.pdf

European Commission (2021a) *COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on a new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future*. COM/2021/240, European Commission. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:240:FIN

European Commission (2021b) *New EU Forest Strategy for 2030*. COM(2021) 572 final, European Commission, Brussels. European Commission (2021c) *Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'*. COM/2021/400 final, European Commission, Brussels. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0400&qid=1623311742827European Commission (2021d) *Strategy for financing the transition to a sustainable economy*. SWD(2021) 180, European Commission. https://eur-lex.europa.eu/resource.html?uri=cellar:9f5e7e95-df06-11eb-895a-01aa75ed71a1.0001.02/DOC_1&format=PDF

European Commission (2022a) *Natural capital accounting*. https://environment.ec.europa.eu/topics/nature-and-biodiversity/natural-capital-accounting_en#reports Accessed 30-05-2024European Commission (2022b) *REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL outlining the progress made in implementing Directive 2014/89/EU establishing a framework for maritime spatial planning*. COM/2022/185 final, European Commission, Brussels. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022DC0185

European Commission (2023a) *EU agricultural outlook for markets, 2023-2035*. European Commission, DG Agriculture and Rural Development, Brussels.European Commission (2023b) *Nature-based solutions – EU-funded NbS research projects tackle the climate and biodiversity crisis*. Factsheet, European Commission, European Research Executive Agency, Publications Office of the European Union. https://op.europa.eu/en/publication-detail/-/publication/edab5ab8-94b7-11ee-b164-01aa75ed71a1/language-en/format-PDF/source-310486665

European Commission (2023c) *Revision of the EU Pollinators Initiative: A new deal for pollinators*. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM/2023/35 final, European Commission, Brussels. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2023:35:FIN

European Commission (2023d) *Guidelines on Member States' adaptation strategies and plans*. Commission Notice, (2023/C 264/01), European Commission. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52023XC0727(01)

European Commission (2023e) *European Union Disaster Resilience Goals: Acting together to deal with future emergencies*. COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, COM/2023/61 final, European Commission, Brussels. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023DC0061

European Commission, European Climate Infrastructure and Environment Executive Agency, Ruskule, A, Oulès, L, Zamparutti, T and et al. (2021) *Guidelines for implementing an ecosystem-based approach in maritime spatial planning - Including a method for the evaluation, monitoring and review of EBA in MSP*. Publications Office of the European Union, https://data.europa.eu/doi/10.2926/84261. https://op.europa.eu/en/publication-detail/-/publication/a8ee2988-4693-11ec-89db-01aa75ed71a1

European Commission DG ENV (2022) *Financing Natura 2000: EU funding opportunities in 2021-2027*. revised report May 2022, European Commission Directorate-General for Environment, https://data.europa.eu/doi/10.2779/724345. https://op.europa.eu/en/publication-detail/-/publication/686e40b8-e089-11ec-a534-01aa75ed71a1/language-en/format-PDF/source-259034635

European Commission Directorate-General for Environment, Nesbit, M, Whiteoak, K, Underwood, E, Rayment, M, Hart, K, Aubert, G, Kollenda, E, Lóránt, A, Kopsieker, L, Cziesielski, M, Petsinaris, F, Gerritsen, E, Beznea, A, Cihlarova, P, Frapaise, L, Finesso, A, Forestier, O and Nicholls, G (2022) *Biodiversity financing and tracking : final report*. pp. https://op.europa.eu/en/publication-detail/-/publication/793eb6ec-dbd6-11ec-a534-01aa75ed71a1/language-en/format-PDF/source-259505877

European Commission Directorate-General for Research and Innovation (2015) *The EU and nature-based solutions*. https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions_en Accessed 30-05-2024European Commission Directorate-General for Research and Innovation (2018) *A sustainable bioeconomy for Europe : strengthening the connection between economy, society and the environment: updated bioeconomy strategy*. Publications Office of the European Union, https://data.europa.eu/doi/10.2777/792130. https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/

European Commission Directorate-General for Research and Innovation (2022a) *European bioeconomy policy : stocktaking and future developments*. Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Bioeconomy Policy progress report, Publications Office of the European Union, https://data.europa.eu/doi/10.2777/997651. https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/adoption-bioeconomy-strategy-progress-report-2022-06-09_en

European Commission Directorate-General for Research and Innovation (2022b) *The vital role of nature-based solutions in a nature positive economy*. Publications Office of the European Union, https://data.europa.eu/doi/10.2777/307761. https://networknature.eu/product/25930

European Court of Auditors (2018) *Floods Directive: progress in assessing risks, while planning and implementation need to improve*. Special Report No 25/2018, European Court of Auditors. https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=47211

European Court of Auditors (2020) *Marine environment: EU protection is wide but not deep*. Special Report 26/2020, European Court of Auditors, Luxembourg. https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=57066

European Court of Auditors (2023) *EU efforts for sustainable soil management – Unambitious standards and limited targeting*. Special report 19/2023, European Court of Auditors, https://www.eca.europa.eu/en/publications/SR-2023-19. https://www.eca.europa.eu/en/publications/SR-2023-19

European Investment Bank, Hudson, G, Hart, S and Verbeek, A (2023) *Investing in nature-based solutions – State-of-play and way forward for public and private financial measures in Europe*. European Investment Bank. https://data.europa.eu/doi/10.2867/031133

Farmer, A, Mee, L, Langmead, O, Cooper, P, Kannen, A, Kershaw, P and Cherrier, V (2012) *The Ecosystem Approach in Marine Management*. EU FP7 KNOWSEAS Project. http://www.ieep.eu/assets/876/The_Ecosystem_Approach_in_Marine_Management.pdf

Gäckle, J and al., e (2023) *Seedbed Intervention: Tallinn*. Report 3.5, GOGREENROUTES. https://gogreenroutes.eu/publication?t=Seedbed%20Intervention:%20Tallinn

Gałecka-Drozda, A, Wilkaniec, A, Szczepańska, M and Świerk, D (2021) Potential nature-based solutions and greenwashing to generate green spaces: Developers' claims versus reality in new housing offers. *Urban Forestry & Urban Greening* No 65, 127345. https://www.sciencedirect.com/science/article/pii/S1618866721003721

Gimenez-Maranges, M, Breuste, J and Hof, A (2020) Sustainable Drainage Systems for transitioning to sustainable urban flood management in the European Union: A review. *Journal of Cleaner Production* No 255, 120191. https://www.sciencedirect.com/science/article/pii/S0959652620302389

Greening Cities Partnership (2023) *ORIENTATION PAPER of the URBAN AGENDA FOR THE EU GREENING CITIES PARTNERSHIP* https://www.urbanagenda.urban-initiative.eu/sites/default/files/2023-06/Greening%20Cities%20Partnership_Orientation%20Paper.pdf

Guidelines on Closer-to-Nature forest management. Publications Office of the European Union. 2023. https://op.europa.eu/en/publication-detail/-/publication/2d1a6e8f-8cda-11ee-8aa6-01aa75ed71a1

ILO, UNEP and IUCN (2022) Decent Work in Nature-based Solutions. No. https://www.unep.org/resources/report/decent-work-nature-based-solutions

Informal Meeting of Ministers responsible for Territorial Cohesion (2021) *Territorial Agenda 2030 - A future for all places*. https://territorialagenda.eu/wp-content/uploads/TA2030_jun2021_en.pdf

IPBES (2019) *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. IPBES Secretariat, Bonn, Germany. https://doi.org/10.5281/zenodo.3553579

IUCN (2020) *Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS*. First edition edition. IUCN, Gland, Switzerland, pp. https://portals.iucn.org/library/node/49070

IUCN (2021) *IUCN Global Standard for Nature-based Solutions self-assessment tool*. online tool. https://nbs-sat.iucn.org/ Accessed 28/7/2024IUCN (2022) *ENACT: Enhancing Nature-based Solutions for an Accelerated Climate Transformation*. https://iucn.org/our-work/topic/nature-based-solutions-climate/our-work/enact-enhancing-nature-based-solutions AccessedIUCN (2024) *Nature-based Solutions and the Global Goal on Adaptation: Launch of Friends of EbA Issue Brief for UNFCCC COP27*. https://iucn.org/resources/information-brief/nature-based-solutions-and-global-goal-adaptation-launch-friends-eba

Jaegersberg, G and Ure, J (2017) Policy-Related Barriers, *Renewable Energy Clusters. Innovation, Technology, and Knowledge Management*, pp195-224. Springer, Cham.https://doi.org/10.1007/978-3-319-50365-3_11

Kabisch, N, Frantzeskaki, N, Pauleit, S, Naumann, S, Davis, M, Artmann, M, Haase, D, Knapp, S, Korn, H and Stadler, J (2016) Nature-based solutions to climate change mitigation and adaptation in urban areas: perspectives on indicators, knowledge gaps, barriers, and opportunities for action. *Ecology and Society* No 21 (2), 39. http://dx.doi.org/10.5751/ES-08373-210239

Kauark-Fontes, B, Marchetti, L and Salbitano, F (2023) Integration of nature-based solutions (NBS) in local policy and planning toward transformative change. Evidence from Barcelona, Lisbon, and Turin. *Ecology and Society* No 28 (2). https://www.ecologyandsociety.org/vol28/iss2/art25/

Key decisions relevant for reducing emissions from deforestation and forest degradation in developing countries (REDD+). Framework convention on climate change. 2016. https://unfccc.int/files/land_use_and_climate_change/redd/application/pdf/compilation_redd_decision_booklet_v1.2.pdf

Knoblauch, D, Naumann, S, Mederake, L and Sosa, A C A (2019) *Multi-level policy framework for sustainable urban development and nature-based solutions -- Status quo, gaps and opportunities*. Deliverable 1.2, CLEVER Cities, H2020 grant no. 776604. https://www.ecologic.eu/sites/default/files/publication/2019/clever_d1.2_policy_framework_for_sud_and_nbs_0.pdf

Kooijman, E D, McQuaid, S, Rhodes, M-L, Collier, M J and Pilla, F (2021) Innovating with nature: From nature-based solutions to nature-based enterprises. *Sustainability* No 13 (3), 1263. https://doi.org/10.3390/su13031263

Kopsieker, L, Gerritsen, E, Stainforth, T, Lucic, A, Costa Domingo, G, Naumann, S, Röschel, L and Davis, M (2021) *Nature-based solutions and their socio-economic benefits for Europe's recovery*. IEEP and Ecologic Institute, Brussels. https://ieep.eu/wp-content/uploads/2022/12/Nature-based-solutions-and-their-socio-economic-benefits-for-Europes-recovery-IEEP-2021-WEB.pdf

Kumar, P, Debele, S E, Sahani, J, Rawat, N, Marti-Cardona, B, Alfieri, S M, Basu, B, Basu, A S, Bowyer, P, Charizopoulos, N, Gallotti, G, Jaakko, J, Leo, L S, Loupis, M, Menenti, M, Mickovski, S B, Mun, S-J, Gonzalez-Ollauri, A, Pfeiffer, J, Pilla, F, Pröll, J, Rutzinger, M, Santo, M A, Sannigrahi, S, Spyrou, C, Tuomenvirta, H and Zieher, T (2021) Nature-based solutions efficiency evaluation against natural hazards: Modelling methods, advantages and limitations. *Science of The Total Environment* No 784, 147058. https://doi.org/10.1016/j.scitotenv.2021.147058

Labarthe, P and Beck, M (2022) CAP and Advisory Services: From Farm Advisory Systems to Innovation Support. *EuroChoices* No 21 (1), 5-14. https://doi.org/10.1111/1746-692X.12354

Leitner, M, Dworak, T, Johnson, K, Capela Lourenço, T, Lexer, W, Vanneuville, W, Tamasova, A and Prutsch, A (2021) *Using Key Type Measures to report climate adaptation action in the EEA member countries*. Technical Paper 2021/1, European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA)

Liquete, C, Udias, A, Conte, G, Grizzetti, B and Masi, F (2016) Integrated valuation of a nature-based solution for water pollution control. Highlighting hidden benefits. *Ecosystem Services* No 22, 392-401. https://doi.org/10.1016/j.ecoser.2016.09.011

Lupp, G, Zingraff-Hamed, A, Huang, J J, Oen, A and Pauleit, S (2020) Living labs—a concept for co-designing nature-based solutions. *Sustainability* No 13 (1), 188. https://doi.org/10.3390/su13010188

Mahmoud, I and Morello, E (2021) *Co-creation Pathway for Urban Nature-Based Solutions: Testing a Shared-Governance Approach in Three Cities and Nine Action Labs*. Springer International Publishing, Cham.McVittie, A, Cole, L, Wreford, A, Sgobbi, A and Yordi, B (2018) Ecosystem-based solutions for disaster risk reduction: Lessons from European applications of ecosystem-based adaptation measures. *International Journal of Disaster Risk Reduction* No 32, 42-54. https://www.sciencedirect.com/science/article/pii/S2212420917302741

Midler, E, Pagnon, J, Nadeu, E and Scheid, A (2023) *Environmental and climate assessments of CAP Strategic Plans: Summary of impact based on four key Member States*. Institute for European Environmental Policy (IEEP), Brussels. https://ieep.eu/wp-content/uploads/2023/04/Environmental-and-climate-assessements-of-CAP-Strategic-Plans_IEEP-2023.pdf

Miralles-Wilhelm, F (2021) *Nature-based solutions in agriculture: Sustainable management and conservation of land, water and biodiversity*. FAO & The Nature Conservancy. https://openknowledge.fao.org/items/e47d61b7-ba86-4aec-921a-26b5bc18da2c

Morris, R L, Konlechner, T M, Ghisalberti, M and Swearer, Stephen E (2018) From grey to green: Efficacy of eco-engineering solutions for nature-based coastal defence. *Global Change Biology* No 24 (5), 1827-1842. https://doi.org/10.1111/gcb.14063

Mubareka, S, Giuntoli, J, Sanchez Lopez, J, Lasarte Lopez, J, M`barek, R, Ronzon, T, Renner, A and Avraamides, M (2023) *Trends in the EU bioeconomy*. EUR 31434 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-68-00295-7, doi:10.2760/835046, JRC132639.NBScomics (2022) *NbS and Resilience*. https://nbscomics.com/tag/resilience/ AccessedNetworkNature (2022) *Taking naturebased solutions up the policy ladder: from research to policy action*. Knowledge Brief 1, NetworkNature Horizon project, Brussels. https://networknature.eu/sites/default/files/uploads/networknature-nbs-knowledgebrief01.pdf

NetworkNature (2023) *Financing nature-based solutions in cities: Exploring opportunities from municipal funding*. https://networknature.eu/product/29745

NetworkNature (2024) *Climate Adaptation, Mitigation and Resilience*. https://networknature.eu/themes/climate-adaptation-mitigation-and-resilience AccessedNordic Council of Ministers (2022) *Nordic Ministerial Declaration on nature-based solutions*. Nordic Council of Ministers for the Environment and Climate, Helsinki. https://www.norden.org/en/declaration/nordic-ministerial-declaration-nature-based-solutions

Penning, E, Peñailillo Burgos, R, Mens, M, Dahm, R and de Bruijn, K (2023) Nature-based solutions for floods AND droughts AND biodiversity: Do we have sufficient proof of their functioning? *Cambridge Prisms: Water* No 1, e11. https://www.cambridge.org/core/product/B59AE69B92DA10CD73324C8B74B6CCCC

Potts, S G, Dauber, J, Hochkirch, A, Oteman, B, Roy, D, Ahnre, K, Biesmeijer, K, Breeze, T, Carvell, C, Ferreira, C, Fitzpatrick, Ú, Isaac, N, Kuussaari, M, Ljubomirov, T, Maes, J, Ngo, H, Pardo, A, Polce, C, Quaranta, M, Settele, J, Sorg, M, Stefanescu, C and Vujic, A (2020) *Proposal for an EU Pollinator Monitoring Scheme*. EUR 30416 EN, Publications Office of the European Union, Luxembourg. ISBN 978-92-76-23859-1, doi:10.2760/881843, JRC122225. https://ec.europa.eu/jrc/en/publication/proposal-eu-pollinator-monitoring-scheme

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 691/2011 as regards introducing new environmental economic accounts modules. Official Journal of the European Union. 2022. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022PC0329

Raymond, C M, Frantzeskaki, N, Kabisch, N, Berry, P, Breil, M, Nita, M R, Geneletti, D and Calfapietra, C (2017) A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas. *Environmental Science & Policy* No 77, 15-24. Reguero, B G, Beck, M W, Bresch, D N, Calil, J and Meliane, I (2018) Comparing the cost effectiveness of nature-based and coastal adaptation: A case study from the Gulf Coast of the United States. *PLoS ONE* No 13 (4), e0192132. https://doi.org/10.1371/journal.pone.0192132

Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007. Official Journal of the European Union. 2018. https://eur-lex.europa.eu/eli/reg/2018/848/oj

REGULATION (EU) 2018/1999 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1999&from=ENRegulation (EU) 2021/1056 of the European Parliament and of the Council of 24 June 2021 establishing the Just Transition Fund. 2021. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1056

REGULATION (EU) 2023/839 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 April 2023 amending Regulation (EU) 2018/841 as regards the scope, simplifying the reporting and compliance rules, and setting out the targets of the Member States for 2030, and Regulation (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review Official Journal of the European Union. 2023. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R0839

Regulation (EU) 2023/1115 of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010 (Text with EEA relevance). Official Journal of the European Union. 2023. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1115&qid=1687867231461

REGULATION (EU) 2023/2631 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 November 2023 on European Green Bonds and optional disclosures for bonds marketed as environmentally sustainable and for sustainability-linked bonds. Official Journal of the European Union. 2023. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302631

Regulation (EU) 2024/1468 of the European Parliament and of the Council of 14 May 2024 amending Regulations (EU) 2021/2115 and (EU) 2021/2116 as regards good agricultural and environmental condition standards, schemes for climate, environment and animal welfare, amendment of the CAP Strategic Plans, review of the CAP Strategic Plans and exemptions from controls and penalties. Official Journal of the European Union. 2024. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1468

Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 (Text with EEA relevance). Official Journal of the European Union. 2024. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202401991

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 691/2011 as regards introducing new environmental economic accounts modules Official Journal of the European Union. https://eur-lex.europa.eu/resource.html?uri=cellar:ddb7c711-010b-11ed-acce-01aa75ed71a1.0010.02/DOC_1&format=PDF

Resolution adopted by the United Nations Environment Assembly on 2 March 2022 United Nations: Environment Assembly of the United Nations Environment Programme. 2022 https://wedocs.unep.org/bitstream/handle/20.500.11822/39864/NATURE-BASED%20SOLUTIONS%20FOR%20SUPPORTING%20SUSTAINABLE%20DEVELOPMENT.%20English.pdf?sequence=1&isAllowed=y

Sarabi, S, Han, Q, L. Romme, A G, de Vries, B, Valkenburg, R, den Ouden, E, Zalokar, S and Wendling, L (2021) Barriers to the adoption of urban living labs for NBS implementation: a systemic perspective. *Sustainability* No 13 (23), 13276.Sarabi, S, Han, Q, Romme, A G L, De Vries, B, Valkenburg, R and Den Ouden, E (2020) Uptake and implementation of nature-based solutions: an analysis of barriers using interpretive structural modeling. *Journal of Environmental Management* No 270, 110749. https://www.sciencedirect.com/science/article/pii/S0301479720306812?via%3Dihub

Schmidt, A and Farbstein, E (2024) *CSDDD, explained: the Corporate Sustainability Due Diligence Directive*. https://normative.io/insight/csddd/ AccessedSeddon, N (2022) Harnessing the potential of nature-based solutions for mitigating and adapting to climate change. *Science* No 376 (6600), 1410-1416. https://doi.org/10.1126/science.abn9668

Seddon, N, Chausson, A, Berry, P, Girardin, C A J, Smith, A and Turner, B (2020) Understanding the value and limits of nature-based solutions to climate change and other global challenges. *Philosophical Transactions of the Royal Society B: Biological Sciences* No 375 (1794), 20190120. https://royalsocietypublishing.org/doi/full/10.1098/rstb.2019.0120

Seddon, N, Daniels, E, Davis, R, Harris, R, Hou-Jones, X, Huq, S, Kapos, V, Mace, G M, Rizvi, A R and Reid, H (2019) Global recognition of the importance of nature-based solutions to climate change impacts. No.Seddon, N, Smith, A, Smith, P, Key, I, Chausson, A, Girardin, C, House, J, Srivastava, S and Turner, B (2021) Getting the message right on nature-based solutions to climate change. *Global Change Biology* No 27 (8), 1518-1546. https://doi.org/10.1111/gcb.15513

Somarakis, G, Stagakis, S and Chrysoulakis, N (2019) *ThinkNature Nature-Based Solutions Handbook*. pp.Sustainable fishing in the EU: state of play and orientations for 2025 2024. https://oceans-and-fisheries.ec.europa.eu/document/download/eb3bec4b-2362-4382-b2cb-17db1f049771_en?filename=COM-2024-235_en.pdf

Termeer, C J A M, Dewulf, A and Lieshout, M (2010) Disentangling Scale Approaches in Governance Research: Comparing Monocentric, Multilevel, and Adaptive Governance. *Ecology and Society 15 (2010) 4* No 15.Toxopeus, H (2019) *Taking Action for Urban Nature: Business Model Catalogue, NATURVATION Guide*. https://naturvation.eu/sites/default/files/results/content/files/business_model_catalogue.pdf

Toxopeus, H and Polzin, F (2017) *Characterizing nature-based solutions from a business model and financing perspective*. Naturvation. https://www.naturvation.eu/sites/default/files/news/files/naturvation_characterizing_nature-based_solutions_from_a_business_model_and_financing_perspective.pdf

Tremblay, L-L and Underwood, E (2024) *Policy brief: Making adaptation and resilience a priority in nature*. IEEP. https://think2030.eu/think-timeline/uploads/2024/06/Think2030-2024-brief-Adaptation-in-nature-restoration-plans.pdf

Trémolet, S, Kampa, E, Lago, M, Anzaldúa, G, Vidaurre, R, Tarpey, J, Favero, A, Karres, N, Toledo, M, Makropoulos, C, Lykou, A, Hanania, S, Rebollo, V and Anton, B (2019) *Investing in Nature for Europe Water Security*. The Nature Conservancy, ICLEI and Ecologic. https://www.nature.org/content/dam/tnc/nature/en/documents/Investing_in_Nature_for_European_Water_Security_02.pdf

Tubiana, L (2023) Le Green Deal est le nouveau contrat social. *GREEN* No 3 (1), 26-36. https://www.cairn.info/revue-green-2023-1-page-26.htm

https://www.cairn.info/load_pdf.php?ID_ARTICLE=GREEN_003_0026

Ugolini, F, Sanesi, G, Steidle, A and Pearlmutter, D (2018) Speaking "Green": A worldwide survey on collaboration among stakeholders in urban park design and management. *Forests* No 9 (8), 458.UN (2015) *UN 2030 Agenda for Sustainable Development Sustainable Development Goals*. https://sdgs.un.org/goals AccessedUN (2022) *What is the Triple Planetary Crisis?* https://unfccc.int/news/what-is-the-triple-planetary-crisis AccessedUN (2023) *Subsidiary Body on Scientific, Technical and Technological Advice Twenty-fifth meeting*. https://www.cbd.int/doc/c/1da1/0146/e66fee7acf1443a44d258f7c/sbstta-25-12-en.pdf

UNDRR (2021) *WORDS INTO ACTION: Engaging for resilience in support of the Sendai Framework for Disaster Risk Reduction 2015-2030*. https://www.undrr.org/words-action-nature-based-solutions-disaster-risk-reduction

UNDRR (2023) INFFs for Disaster Risk Reduction (DRR) No. https://inff.org/assets/DESA_deep_dives/inff-and-drr.pdf

UNDRR (2024) *Nature-based solutions for comprehensive disaster and climate risk management: Toolkit for integrated planning and implementation of disaster risk reduction and climate change adaptation*. https://www.undrr.org/publication/nature-based-solutions-comprehensive-disaster-and-climate-risk-management-toolkit

UNEA (2022) *Nature-based Solutions for supporting sustainable development*. (UNEP/EA5/L9/REV.1), United Nations Environment Assembly. https://wedocs.unep.org/bitstream/handle/20.500.11822/39864/NATURE-BASED%20SOLUTIONS%20FOR%20SUPPORTING%20SUSTAINABLE%20DEVELOPMENT.%20English.pdf?sequence=1&isAllowed=y

UNEP (2023a) *Resource Guide for Nature-based Solutions: An output from the Intergovernmental Consultations on Nature-based Solutions* https://wedocs.unep.org/bitstream/handle/20.500.11822/44254/AP2_CCS_NbS_ResourceGuide.pdf?sequence=1&isAllowed=y

UNEP (2023b) *State of Finance for Nature 2023: The Big Nature Turnaround - Repurposing $7 Trillion to Combat Nature Loss*. United Nations Environment Programme. https://wedocs.unep.org/20.500.11822/44278

UNEP (2024a) *United global call to act on land degradation and drought concludes major UN meeting in Côte d'Ivoire*. https://www.unccd.int/news-stories/press-releases/united-global-call-act-land-degradation-and-drought-concludes-major-un AccessedUNEP (2024b) *What you need to know about the COP27 Loss and Damage Fund*. https://www.unep.org/news-and-stories/story/what-you-need-know-about-cop27-loss-and-damage-fund AccessedUnited Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa. 1994. https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-10&chapter=27&clang=_en#1

Vassilopoulou, V (2021a) *Climate change and marine spatial planning: policy brief*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000375721

Vassilopoulou, V (2021b) *Climate change and maritime spatial planning*. Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000375721/PDF/375721eng.pdf.multi

Vermeulen, J, Whiteoak, K, Nicholls, G, Gerber, F, McAndrew, K, Cherrier, V, Cunningham, E, Kirhensteine, I, Wolters, H, Verweij, W and Schipper, P (2019) *Fitness Check Evaluation of the Water Framework Directive and the Floods Directive*. European Commission-DG Environment Service request under framework contract ENV.F.l/FRA/2014/0063 (Ref. Ares(2017)6170183), European Commission. https://ec.europa.eu/environment/water/fitness_check_of_the_eu_water_legislation/documents/Study%20report%20FC%20WFD%20and%20FD_Final%20report_TRI%20_TEC6327EU.pdf

Verra (2020) *ICAO Council Expands Eligibility for Nature-Based Solutions under CORSIA*. https://verra.org/icao-council-expands-eligibility-for-nature-based-solutions-under-corsia/ AccessedWaldron, A, Garrity, D, Malhi, Y, Girardin, C, Miller, D C and Seddon, N (2017) Agroforestry Can Enhance Food Security While Meeting Other Sustainable Development Goals. *Tropical Conservation Science* No 10, 1940082917720667. https://journals.sagepub.com/doi/abs/10.1177/1940082917720667

Wamsler, C, Wickenberg, B, Hanson, H, Olsson, J A, Stålhammar, S, Björn, H, Falck, H, Gerell, D, Oskarsson, T and Simonsson, E (2020) Environmental and climate policy integration: Targeted strategies for overcoming barriers to nature-based solutions and climate change adaptation. *Journal of Cleaner Production* No 247, 119154.WEF (2022) *BiodiverCities by 2030: Transforming Cities' Relationship with Nature*. World Economic Forum. https://www3.weforum.org/docs/WEF_Biodivercities_by_2030_Insight_Report_Key_Messages.pdf

Wild, T, Bulkeley, H, Naumann, S, Vojinovic, Z, Calfapietra, C and Whiteoak, K (2020) *Nature-based Solutions: state of the art in EU-funded projects*. Report for the European Commission, Publications Office of the European Union, Luxembourg. https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/nature-based-solutions-state-art-eu-funded-projects_en

WWF (2020) *Nature-based Solutions: An Opportunity for Business Unusual*. https://wwf.panda.org/wwf_news/?362565/Nature-based-Solutions AccessedWWF (2022) *Nature Based Solutions – a review of current financing barriers and how to overcome these*. Terranomics. https://www.wwf.org.uk/sites/default/files/2022-06/WWF-NBS-Public-Report-Final-270622.pdf

WWF (2024) *The EU is not on track for a sustainable blue future*. https://www.wwf.eu/?7932966/The-EU-is-not-on-track-for-a-sustainable-blue-future

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