

Nature-Based Solutions (NBS): Definitions, Concept, Criteria

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NBS – DEFINITIONS (I)

- **IUCN (2016, 2023):** Nature-based Solutions are actions to **protect, sustainably manage, and restore** natural and modified **ecosystems** that **address societal challenges** effectively and adaptively, simultaneously **benefiting people (human well-being) and nature (biodiversity)**.

Nature-based Solutions are underpinned by **benefits that flow from healthy ecosystems**. They target **major challenges** like **climate change, disaster risk reduction, food and water security, biodiversity loss and human health**, and are critical to **sustainable economic development**.

- **EC (2020), EU (2021):** Solutions to societal challenges that are **inspired and supported by nature**, which are **cost-effective**, simultaneously provide **environmental, social and economic benefits** and help **build resilience**. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions. Nature-based solutions **must benefit biodiversity** and support the **delivery of a range of ecosystem services**.

NBS – DEFINITIONS (II)

- IPCC AR6 WGI + WGII glossaries (2022):
 - NBS: *cites the IUCN (2016) definition*
 - **Ecosystem-based adaptation (EBA):** The use of ecosystem management activities to increase the resilience and reduce the vulnerability of people and ecosystems to climate change. *See also Nature-based solution (NBS)*
- **EEA (2021):** Nature-based solutions for *climate change adaptation* and *disaster risk reduction* are actions that **work with and enhance nature** to restore and protect ecosystems and to help society **adapt to the impacts of climate change and slow further warming**, while providing **multiple additional benefits** (environmental, social and economic).
- **PLANALP – Natural Hazards WG of the Alpine Convention (2022):** NBS are actions that work with and enhance nature to restore or create a **protective function for society from the impacts of natural hazards**. NBS are based on and use the power of nature as infrastructure to provide natural services, to benefit society and environment. Such interventions must be designed to mitigate identified real or anticipated social and environmental challenges, for instance natural hazards that are exacerbated by climate change. At the same time, **NBS can have many co-benefits** for instance for **local biodiversity** or increasing the **capacity to store carbon**.

NBS IN THE CONTEXT OF CCA + DRR

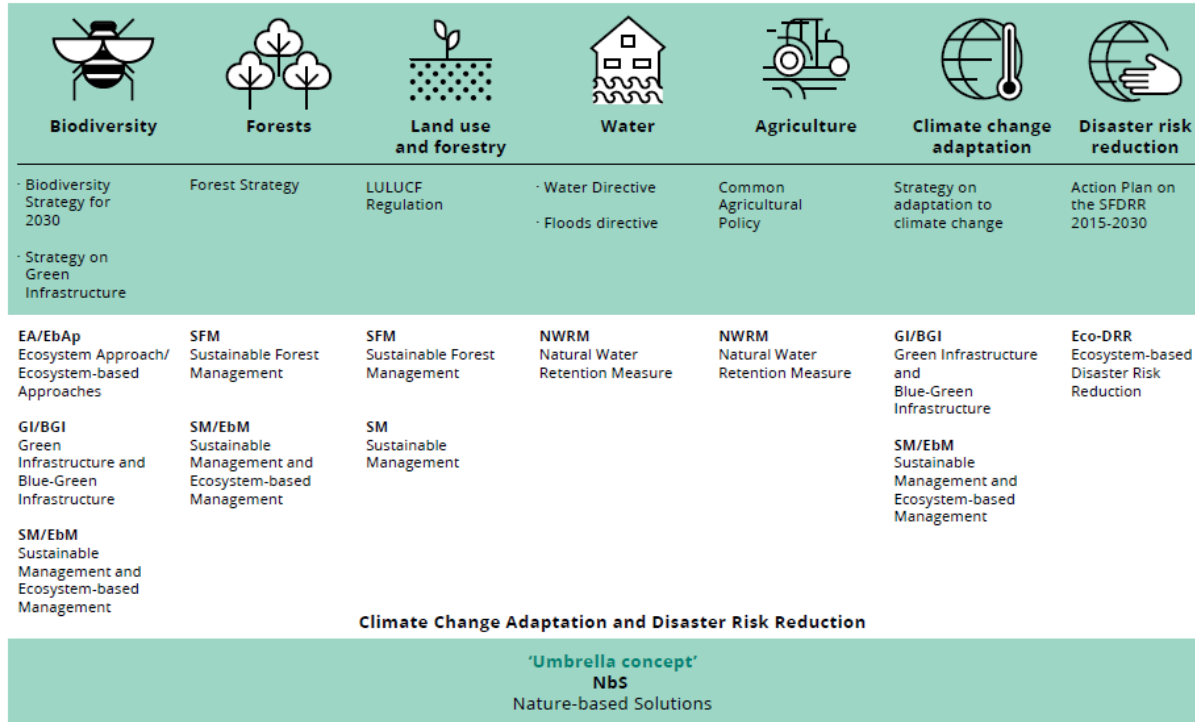
Key messages from EEA Report 01/2021

- Nature-based solutions are **multifunctional**, providing many **environmental, socio-economic and cultural benefits**. In addition to increasing resilience to climate change, they support **biodiversity conservation, human health and well-being, climate change mitigation, recreation and tourism, and job creation**.
- Nature-based solutions for climate change adaptation and disaster risk reduction is an **'umbrella concept'** encompassing other established approaches, e.g. the ecosystem approach and ecosystem-based approaches, sustainable management, ecosystem-based management, sustainable forest management, green infrastructure and blue-green infrastructure, ecosystem-based adaptation, natural water retention measures and ecosystem-based disaster risk reduction.



NBS IN THE CONTEXT OF CCA + DRR

Nature-based approaches in EU policy sectors



NBS IN THE CONTEXT OF CCA + DRR

Key messages from EEA Report 01/2021

- Nature-based solutions for climate change adaptation and disaster risk reduction involve **various levels of intervention**: (1) conservation and restoration of ecosystems; (2) sustainable management and climate-proofing of ecosystems; and (3) creation of new, engineered ecosystems for reducing the impacts of climate change.
- **Stakeholder involvement, dialogue and co-design** of tools and measures are key to increase awareness, to tackle potential stakeholders' conflicts more effectively and to create **social acceptance** and demand for nature-based solutions. About half of the European cases analysed strongly emphasise stakeholder involvement.
- Well-designed nature-based solutions [...] can be **more cost-effective than grey solutions** for reducing the impacts of climate change.

NBS IN THE THE CONTEXT OF CLIMATE CHANGE MITIGATION

- **Natural climate solutions (NCS)** refer explicitly to conservation and management actions that **reduce greenhouse gas emissions from ecosystems** and harness their potential to **store carbon** (Griscom et al., 2017). In a follow-up study it is clarified that natural climate solutions are also referred to as nature-based solutions (Griscom et al., 2020).
- **Mitigation benefits of NBS:**
 - ❑ Avoid GHG emissions from grey (technical, structural) measures (construction, operation, maintenance) or deliver comparative net-gains in GHG emission reduction
 - ❑ Conserve and/or increase natural carbon storage (vegetation, soil, wetlands)
 - ❑ Reduce GHG emissions from ecosystems / land use

IUCN (2020) GLOBAL STANDARD FOR NBS

- Facilitative framework for designing and verifying NBS
- Guidance for implementation on the ground and for systematic learning
- Quality assurance and success factors
- Set of 8 criteria and 28 indicators



IUCN Global Standard for Nature-based Solutions

A user-friendly framework for the verification, design and scaling up of NbS

First edition



INTERNATIONAL UNION FOR CONSERVATION OF NATURE



IUCN GLOBAL STANDARD FOR NBS

CRITERIA

- 1) NbS effectively address societal challenges
- 2) Design of NbS is informed by scale
- 3) NbS result in a net gain to biodiversity and ecosystem integrity
- 4) NbS are economically viable
- 5) NbS are based on inclusive, transparent and empowering governance processes
- 6) NbS equitably balance trade-offs between achievement of their primary goal(s) and the continued provision of multiple benefits
- 7) NbS are managed adaptively, based on evidence
- 8) NbS are sustainable and mainstreamed within an appropriate jurisdictional context

SUMMARY: KEY CHARACTERISTICS OF NBS

- **Work with nature, use ecosystem services**
- **Address societal challenges** (in particular joint tackling of the climate and biodiversity crisis)
- **Multifunctionality:** simultaneous delivery of multiple benefits (mitigation, adaptation, environmental, social, economic)
- **Protects, strengthens and enhances ecosystems and biodiversity**
- **Proven effectiveness**
→ e.g., IPCC AR6: *Ecosystem-based adaptation approaches such as urban greening, restoration of wetlands and upstream forest ecosystems have been effective in reducing flood risks and urban heat (high confidence).*
- **Cost-effectiveness:** cost advantages compared to 'standard' / technical solutions, lower life-cycle cost (maintenance, operation, de-construction), better cost-benefit ratio
- **Multi-stakeholder engagement:** planning and implementation should be based on participation, co-design and inclusiveness to realize and optimize benefits and avoid trade-offs
- Often **higher public acceptance** than technical measures

LIMITATIONS

- As nature-based solutions depend on healthy ecosystems, which are vulnerable to climate change, their potential to address climate change adaptation and disaster risk reduction may be reduced in the future. [EEA 2021]
- Climate change impacts may reach a magnitude that exceeds ecosystems' capacity to adapt, causing ecosystem degradation and reducing the potential of nature-based solutions to address climate change adaptation and disaster risk reduction. [EEA 2021]
- The effectiveness of adaptation, including ecosystem-based and most water-related options, will decrease with increasing warming. [IPCC AR6 Synthesis Report SPM 2023]

RESOURCES

- IUCN - International Union for Conservation of Nature: About Nature-based solutions.
<https://www.iucn.org/our-work/nature-based-solutions>
- IUCN - International Union for Conservation of Nature: Global Standard for Nature-based solutions
<https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf>
- EEA Report 01/2021: Nature-based solutions in Europe. Policy, knowledge and practice for climate change adaptation and disaster risk reduction
<https://www.eea.europa.eu/publications/nature-based-solutions-in-europe>
- Alpine Convention -PLANALP: Nature-based solutions in the context of natural hazards – Policy Brief (2022)
https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/PLANALP/PLANALP_NbS_policybrief_fin.pdf
- Climate-ADAPT: Case Studies (74 ecosystem-based adaptation measures)
<https://climate-adapt.eea.europa.eu/en/knowledge/tools/case-studies-climate-adapt/>
- Nature-Based Solutions Initiative
<https://www.naturebasedsolutionsinitiative.org/what-are-nature-based-solutions/>

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