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FARCLIMATE

DELIVERABLE D5.1
NbS Guidelines for the Elaboration of Projects

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List of acronyms

CNS	Close-to-Nature Silviculture
EU	European Union
GGG	Green Growth Generation
IUCN	International Union for Conservation of Nature
LL	Living lab
NbS	Nature-based solution
OSAT	Online self-assessment tool
WP	work package

The acronyms of the participating partners are set in the table 2 - List of Participants.

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Project information

Project full title: Moving ForwARd to achieving CLIMATE-resilient and sustainable European regional economic systems - FARCLIMATE

Acronym: FARCLIMATE

Call: HORIZON-MISS-2022-CLIMA-01

Topic: HORIZON-MISS-2022-CLIMA-01-04 - Transformation of regional economic systems for climate resilience and sustainability

Start date: October 1st, 2023

Duration: 48 months

List of participants:

Partner No.	Organisation Name | Acronym
1 (Coord.)	UNIVERSIDAD DE VIGO | UVIGO
2	CONTACTICA S.L. | CTA
3	C4G - CONSULTING AND TRAINING NETWORK, LDA | C4G
4	INVIABLE LIFE CYCLE THINKING S.L. | INV
5	MUNICIPIO DO FUNDAO | FUNDAO
6	GREEN GROWTH GENERATION | GGG
8	FUNDACION CENTRO DE SERVICIOS Y PROMOCION FORESTAL Y DE SU INDUSTRIA DE CASTILLA Y LEON | CESEFOR
9	UNIVERSIDADE NOVA DE LISBOA | UNL
10	FUNDACION PARA LA PESCA Y MARISQUEO FUNDAMAR | FUNDAMAR
11	INTERNATIONAL UNION FOR CONSERVATION OF NATURE | IUCN
12	EUROPEAN NETWORK OF LIVING LABS | ENOLL
12.1	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS | CERTH
12.2	LAUREA UNIVERSITY OF APPLIED SCIENCES | LAUREA
13	UNIVERSITY OF GHENT | UGENT

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Deliverable details

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Period:	PR2
WP:	WP5
Task:	T5.1
Authors:	Helena Clavero Sousa, Simon Julien (IUCN) Jose Carlos Porto (CESEFOR; Appendix III)
Abstract:	Task T5.1 focuses on promoting nature-based solutions (NbS), using the IUCN Global Standard for NbS, in the technical solutions that will be developed in the FARCLIMATE project case studies. This deliverable 5.1 presents guidelines for designing, identifying and applying these nature-based solutions in the different technical solutions to be implemented in the various case studies. It is tailored to the scope of the project and target sectors. It also presents a preliminary review of the technical solutions already defined or foreseen, if applicable, in the living labs.

Version	Date	Description
Version_V1.0	28/11/2025	First submitted version
Draft_2.0	18/09/2026	First draft of revised version
Version_V2.1	30/09/2026	Second version (revised after RP2 review)

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Executive summary

Climate change poses severe risks to food security, rural livelihoods, and ecosystem integrity across Europe and beyond. Agriculture, forestry, and fisheries are among the most vulnerable sectors, facing increasing droughts, floods, soil degradation, and biodiversity loss. The FARCLIMATE project aims to accelerate climate adaptation through Nature-based Solutions (NbS) and Close-to Nature silviculture, leveraging ecosystems to build resilience while delivering co-benefits for biodiversity and communities. The Deliverable D5.1 is focused on providing practical guidelines for the design, implementation, and evaluation of Nature-based Solutions (NbS) within the FARCLIMATE project, using the IUCN Global Standard (a globally recognised tool, developed by IUCN independently of FARCLIMATE, where its use is promoted and tested). Overall, the deliverable serves as a practical guide for FARCLIMATE partners and case study managers to design and implement interventions, innovations or actions that are scientifically robust, socially inclusive, and economically viable, while ensuring scalability and alignment with international standards.

The **Introduction** explains the purpose and context of the deliverable within the project. NbS as a key approach for climate adaptation and mitigation are highlighted, giving a first overview of what they are with its definition and principles (according to the IUCN framework) and their relevance in the context of climate adaptation. NbS are defined as actions that protect, manage, and restore ecosystems to address societal challenges while delivering benefits for both people and biodiversity. Their relevance lies in reducing climate risks, enhancing resilience, and providing cost-effective solutions compared to traditional infrastructure. The section also clarifies the distinction between NbS, nature-derived solutions, nature-inspired solutions, and green infrastructure.

Section 2 introduces the IUCN Global Standard for Nature-based Solutions™, which consists of eight criteria and 27 indicators designed to ensure that NbS are effective, sustainable, and scalable. These criteria cover aspects such as addressing societal challenges, maintaining biodiversity, ensuring economic viability, inclusive governance, managing trade-offs, adaptive management, and mainstreaming into policy frameworks. This sections also explains how the Standard can be used for project design, verification, and scaling, and highlights the availability of the NbS Online Self-Assessment Tool (OSAT) to evaluate alignment with the Standard. It also mentions the forthcoming sector-specific interpretation for agriculture and provides examples of NbS applications in forestry, agriculture, and fisheries drawn from global case studies.

Following a more theoretical presentation of the IUCN's NbS framework, **Section 3** offers more practical recommendations for integrating this framework into FARCLIMATE's 'Living Lab' methodology; it is therefore aimed specifically at practitioners and case study managers (i.e. NbS planners). The recommendations include applying the Standard from the earliest stages of design and throughout the entire project lifecycle, using the OSAT for assessments, and incorporating NbS indicators into monitoring and evaluation plans. The integration process is described across the phases of the 'Living Lab': exploration, co-creation, experimentation, evaluation and scaling up. This approach aims to ensure that solutions are participatory, evidence-based and aligned with global sustainability goals. To facilitate the application of the guidelines set out in this deliverable, this section specifically includes a Quick guide for practitioners on designing Nature-based Solutions. Considerations regarding economic feasibility and cost-benefit analysis are also included.

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Section 4 outlines the methodology followed for promoting NbS within FARCLIMATE case studies. Activities include training sessions for partners and stakeholders, development of resources, and direct support for applying the NbS Standard in selected pilot sites. Preliminary assessments have started, using OSAT to identify gaps and improve design of the interventions. Further evaluations are planned for other case studies. That is why it is important for those managing the case studies to have these guidelines and to understand how to design interventions that are aligned with the NbS framework, where possible and relevant.

Finally, **Appendix I** lists key resources (publications, tools, and online courses) related to NbS and climate adaptation, mainly developed by IUCN. **Appendix II** presents the results of the preliminary NbS assessment (at the initial stage of the intervention) for one of the case studies, working on urban agriculture, and some recommendations for a better alignment with the IUCN NbS Standard. **Appendix III** (developed by CESEFOR) describes the Close-to-Nature Silviculture (CNS) demonstrative stands, which complement NbS in the forestry sector. It explains the methodology for establishing CNS Labs, monitoring protocols, and data-sharing mechanisms through open-access platforms.

The primary audience of these guidelines comprises FARCLIMATE Living Lab coordinators, local and regional authorities, land managers, technical experts, project partners and other practitioners involved in the planning, implementation and evaluation of climate adaptation interventions in the forestry, agriculture and fisheries sectors (particularly Section 3, together with Section 4 for a more in-depth exploration of the NbS framework and its criteria, and the Appendix I for further resources; also Appendix III for those working in the forestry sector who are interested in learning about the promotion of more sustainable innovative practices and their scientific analysis within the FARCLIMATE project).

1. Introduction

The FARCLIMATE project is a four-year EU-funded initiative aimed at addressing the complex challenges of climate change by fostering sustainable, climate-resilient regional economic systems across Europe. Through a multidisciplinary, multi-sectoral approach, the project seeks to support critical sectors such as forestry, fisheries, and agriculture, which are particularly vulnerable to climate change impacts. One of the approaches that the FARCLIMATE project aims to support is the development of nature-based solutions (NbS), promoting their adoption by living labs (LLs) and case studies and stakeholders and their scalability, through capacity building, community engagement, dissemination of good examples and the promotion of relevant tools. FARCLIMATE provides a good framework for inclusive, evidence-based, and scalable NbS implementation.

Support for the design and implementation of NbS in the LLs is provided throughout the project by the partner International Union for Conservation of Nature (IUCN), through actions in several work packages (WP), but mainly in WPs 5 and also 6. This deliverable is part of **WP5 - Innovation solutions in the specific sectors** (led by CESEFOR), **Task 5.1. Nature-based Solutions** (led by IUCN), which focuses on promoting NbS using the ***IUCN Global Standard for Nature-based Solutions™*** (available at https://inbs.iucn.org/) in the technical solutions that will be developed in the FARCLIMATE project case studies.

To facilitate this, **Deliverable 5.1** (D5.1) presents guidelines for promoting, designing, applying and evaluating Nature-based Solutions in the different technical solutions to be tested and

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implemented in the various case studies. It is tailored to the scope of the project and target sectors. It also briefly presents the methodology for the preliminary review of the technical solutions already defined or foreseen, if applicable, in the living labs.

It is also included the description of "Close-To-Nature silviculture demonstrative stands" in Appendix III (**Milestone 7**), which is part of the **Task 5.3. Close-to-Nature Silviculture Management**. This task focuses on the development and improvement of Close-to-Nature Silviculture (CNS) practices in the forestry sector.

The two working methodologies, CNS and NbS, complement each other in FARCLIMATE to maximise the social and environmental benefits of the solutions and innovations implemented in the case studies.

1.1. Objectives

The **main objectives** are:

- To explain and clarify the concept and framework of NbS, in accordance with the IUCN approach.
- To serve as a simple guide for the design, implementation and assessment of NbS, based on the IUCN framework and tools for NbS, for Living Labs and for FARCLIMATE partners to provide their support in an effective and coordinated manner.
- To serve as a basis for IUCN's working strategy with case studies to promote solutions that are better aligned with the Standard and provide recommendations to improve the suggested actions.
- To compile available tools and materials and present some good examples of NbS for the three sectors (forestry, fisheries, agriculture).
- To increasing the capabilities of the stakeholders of FARCLIMATE and help ensure that the solutions to be implemented are as scalable as possible to other cases and regions.
- To present a methodology for the promotion of NbS and assessment of the technical solutions being designed and implemented in the LLs.
- To describe the 'Close-To-Nature silviculture demonstrative stands' and Close-to-Nature Silviculture practices.
- To facilitate the coordination of NbS and CNS frameworks with the Living Labs methodology.

These guidelines are intended for FARCLIMATE case study managers, Living Lab coordinators, local and regional authorities, land managers, technical experts and other roles involved in designing, planning implementing and evaluating climate change adaptation interventions and solutions within the project, primarily in the forestry, agriculture and fisheries sectors. They are also intended for project partners, especially those who support the cases (internal focal points), to promote a coordinated approach to the design of actions and practices. These guidelines may also be useful in supporting the development of NbS within the framework of other European projects similar in scope to FARCLIMATE.

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1.2. What are NbS and their relevance in the context of climate change adaptation

Nature can provide solutions to many societal challenges, such as delivering clean water or defending against coastal erosion, floods and other natural disasters. On the other hand, addressing the climate emergency and meeting the necessary emissions reduction will require, in addition to massive and rapid decarbonisation, a significant contribution from land-based options. Nature-based Solutions offer the best way to implement these land-based options, through the protection, restoration and sustainable management of natural carbon sinks and reservoirs (UNEP and IUCN, 2021). It is particularly in the primary productive sectors where, on the one hand, there is a more urgent need for adaptation, due to their more direct dependence on environmental factors, and on the other hand, they have great potential to reduce emissions and implement NbS and sustainable practices. Indeed, the relevance of Nbs for agriculture, forestry, and fisheries is significant because these sectors are highly vulnerable to climate impacts like droughts, floods, soil degradation, and biodiversity loss.

This contribution from NbS requires compliance with strict **social and environmental safeguards to prevent damage** such as indirect negative impacts. Nature-based Solutions, when properly designed and developed, should deliver several benefits, including for climate change adaptation and biodiversity conservation (Figure 1). They should therefore be adequately planned, conceived and implemented so as to deliver those benefits. Tools such as the IUCN Global Standard for NbS serve to formulate and guarantee these safeguards and positive results.

Nature-based Solutions were defined by IUCN as **"actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits"** (IUCN, 2016 WCC-2016-Res-069).

They must therefore address societal challenges through actions in ecosystems benefiting people and nature at the same time. They target major challenges like climate change, disaster risk reduction, food and water security, biodiversity loss and human health, and are critical to sustainable development.

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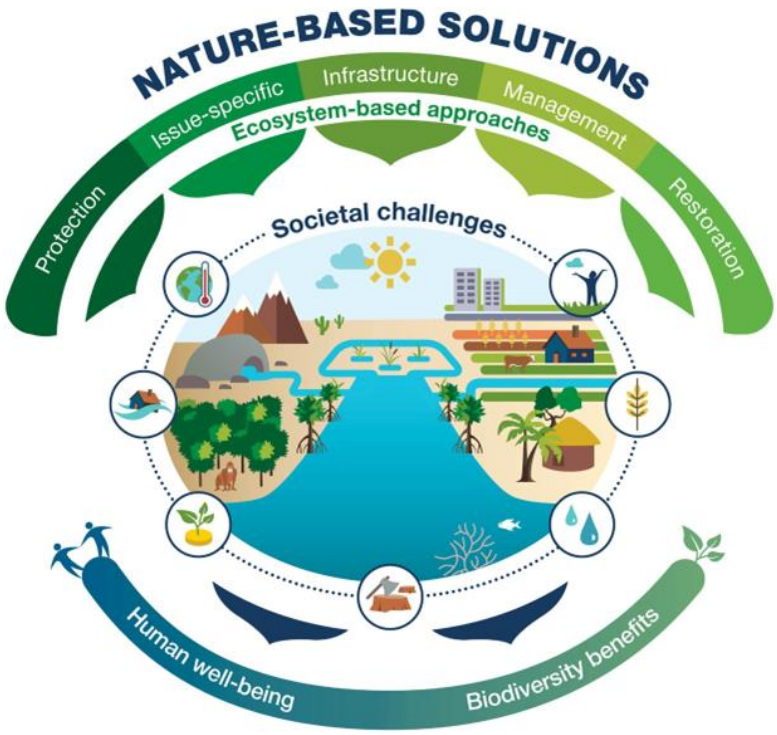


Figure 1 - NbS simultaneously support human well-being needs and biodiversity benefits through actions of protection, restoration and sustainable management. © IUCN.

Conceptually, NbS have been considered a general and umbrella concept, incorporating a whole range of ecosystem-based and ecosystem related approaches, which all use natural or modified ecosystems to address one or multiple societal challenges, and always benefit biodiversity and human well-being (Cohen-Shacham et al., 2016), as already mentioned. To elaborate in greater detail what NbS were about, and avoid any misunderstanding of its terminology, the **NbS definition can be completed with eight principles** (IUCN, 2016). Nature-based Solutions:

1. Embrace nature conservation norms (and principles);
2. Can be implemented alone or in an integrated manner with other solutions to societal challenges (e.g. technological and engineering solutions);
3. Are determined by site-specific natural and cultural contexts that include traditional, local and scientific knowledge;
4. Produce societal benefits in a fair and equitable way, in a manner that promotes transparency and broad participation;
5. Maintain biological and cultural diversity and the ability of ecosystems to evolve over time;
6. Are applied at a landscape scale;
7. Recognise and address the trade-offs between the production of a few immediate economic benefits for development, and future options for the production of the full range of ecosystems services;
8. Are an integral part of the overall design of policies, and measures or actions, to address a specific challenge.

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Along with the definition of NbS and those principles, **some few additional terms and approaches can be identified**, that would be particularly relevant and essential during the planning and implementation of NbS interventions, such as (Cohen-Shacham et al., 2016):

- Ensuring that adaptive management and governance are taken into account while implementing NbS;
- Considering the effectiveness of NbS and the uncertainties linked to the development of NbS;
- The need for ensuring multi-stakeholders' participation in NbS; and
- Considering the temporal scale and long-term stability of the intervention.

All these concepts and principles are incorporated and form the basis of the IUCN framework for NbS, which is embodied in the IUCN Global Standard (developed in Section 2).

Once the concept and principles of NbS have been developed in greater depth in accordance with the IUCN framework, **their relevance for climate adaptation** that benefit both society and nature becomes clear, and can be summarised as follows:

- NbS reduce climate risks by leveraging ecosystem services —such as water regulation, carbon sequestration, and soil fertility— rather than relying solely on engineered solutions (Integrated approach).
- They often provide long-term resilience at lower costs compared to hard infrastructure (Cost-effectiveness).
- NbS address major societal challenges such as food security, biodiversity conservation, and livelihoods (Co-benefits).

On the other hand, it should be noted that NbS can often be used **in conjunction with other types of interventions**. Food security challenges, for example, are best addressed using a combination of measures including NbS (e.g. introducing agroforestry systems, restoring wetlands) as well as more conventional solutions such as improving access to food and making trade policy more supportive of local food supply (Cohen-Shacham et al., 2016).

Some of these other types of interventions are also closely linked to or directly inspired by the workings of nature, but there are differences that are worth noting so as not to confuse terms and to avoid errors and prevent them from being indistinctly used or mixed with the concept of NbS.

All NbS interventions are solutions that are based on nature —or functioning biological ecosystems— that benefit people and nature simultaneously, and do not cover actions that derive from or are inspired by nature. They use the power of functioning ecosystems as "infrastructure" to provide natural services that benefit society and the environment.

Nature-derived and nature inspired solutions, which are also needed to achieve a low-carbon and sustainable future, are different:

Nature-derived solutions relate to physical or chemical processes occurring in nature, which come from a natural source but are not directly based on functioning ecosystems. They include for example wind, wave or solar energy, all of which are derived from nature and help fulfil low carbon energy needs through production methods deriving from natural sources (WBCSD,

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2020). In agriculture, the practice of soil solarisation could be considered a type of nature-derived solution, as it is a disinfection process that uses ultraviolet light from the sun.

Nature-inspired solutions are based on biological processes and inspired by nature for the design and production of original materials, structures and systems. These designs take inspiration from nature however they are not based on functioning and 'living' ecosystems neither. Biomimicry is an example. Another example: in nature, tree roots play a crucial role in preventing soil erosion. A nature-inspired solution for soil health could involve designing erosion control methods that mimic tree root systems. Innovative soil stabilisation mats or biodegradable geotextiles could be engineered to replicate the structure and binding properties of tree roots.

There is also **green infrastructure**, "a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, they can be developed in rural and urban settings." (European Commission, 2013). Some examples are well-designed urban green spaces, (parks, gardens, green roofs and facades, allotments, sidewalks...), green hubs and corridors, biodiversity buffer strips in agricultural areas, swales and ponds, etc. The concept of green infrastructure, depending on how these actions are designed and implemented, can fall under the umbrella of NbS.

To meet today's challenges, synergies between conventional solutions and NbS, nature-derived solutions, etc. should be sought.

2. The IUCN NbS Global Standard and related tools

The design, implementation, and evaluation of NbS are supported, as already mentioned, by the ***IUCN Global Standard for Nature-based Solutions™*** (IUCN, 2025). The NbS Global Standard was developed with the aim of setting a common basis of understanding for NbS, and providing a robust framework to design, implement, assess, adapt and improve NbS. The Standard helps users design, implement and scale up NbS in a way that allows nature to deliver its valuable ecosystem services, and it helps them shape their solutions and make them effective. It also sets clear benchmarks to measure the progress of NbS. It guides the user on what has been achieved and where to take actions on the gaps and shortfalls.

Use of External IUCN Frameworks within FARCLIMATE

The FARCLIMATE project does not develop its own Nature-based Solutions (NbS) standard. Instead, it applies the IUCN Global Standard for Nature-based Solutions™ and the associated Online Self-Assessment Tool (OSAT), developed by the International Union for Conservation of Nature (IUCN), as internationally recognised reference frameworks for the design, implementation and evaluation of NbS.

Within FARCLIMATE, these tools are promoted and used to guide Living Labs and case studies in assessing the degree of alignment of proposed interventions with recognised NbS principles and good practices. The methodology, criteria, indicators and online assessment tool remain external IUCN resources and are not outputs of the FARCLIMATE project.

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The IUCN NbS Standard was developed over a period of several years through public consultation with over 800 practitioners and experts from more than 100 countries. It was first launched in 2020 (with the publication of the document "IUCN, 2020a") and an update has been released in October 2025 (through the "**iNbS platform"** https://inbs.iucn.org/; Figure 2). The update of the Standard has made it possible to better define and formulate the criteria and indicators, following a process of review, after several years of experience in its use. We recommend using the new version of the Standard, available through the "iNbS platform", although the 2020 publication remain a robust tool for understanding the framework, its structure and application of the Standard.

On the other hand, some reports have also been developed by IUCN in the framework of several other projects that collect **examples of successful NbS applications**, which may be useful and illustrative for applying the NbS framework in the FARCLIMATE case studies. For example, the document "Applying the IUCN Global Standard for Nature-based Solutions™. 21 case studies from around the globe" (Cohen-Shacham et al., 2025), presents 21 case studies of NbS from around the world, ranging from protecting coastal areas from climate change impacts to restoring landscapes and promoting agroecology that foster biodiversity and water security (see Section 2.4).

An **NbS online self-assessment tool** (OSAT) is also available, aiming at facilitating the assessment process of an intervention. It proposes a series of guiding questions to determine whether an intervention is an NbS (as understood by the IUCN framework), identifying its strengths and weaknesses, and ultimately helping improve it (see Section 2.2). The tool is integrated into the "iNbS platform" (Nature-based Solutions Self-Assessment | INBS).

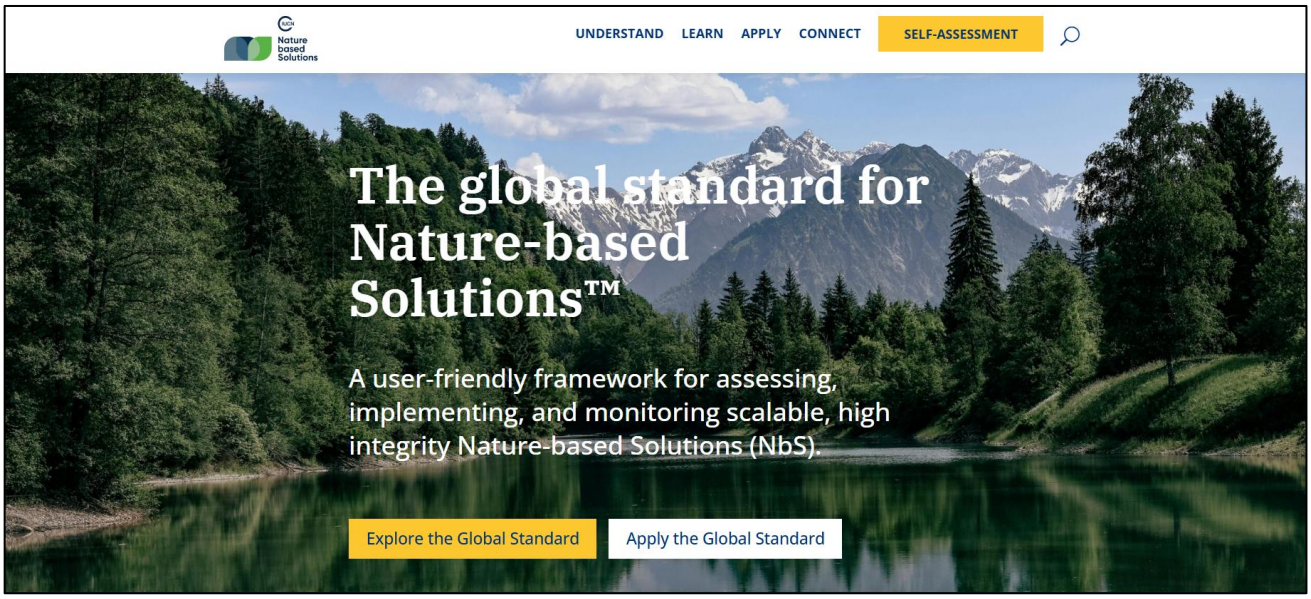


Figure 2 – View of the iNbS platform, with the available sections. © IUCN. Note: The IUCN Global Standard and OSAT are external reference tools used by FARCLIMATE for NbS assessment.

The new version of the Standard and of the online self-assessment tool are now available through the "iNbS platform" https://inbs.iucn.org/.

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See Appendix I for a summary of the relevant available resources.

2.1. What is the Standard and how to use it

It is a framework of **eight criteria and 27 indicators** (26 + 1 optional indicator) for designing, verifying, and scaling up projects or interventions, to ensure NbS are applied effectively and sustainably, maximising benefits for both people and nature.

Among others, the following applications of the Standard are noteworthy:

- Designing of a solution.
- Supporting decision-making for investment and financing.
- Informing the scaling up of impact and results of the action.

Its main **functions** are to:

- Guide project design: Helps users identify and address societal challenges in the most effective and sustainable way.
- Upscale pilot projects: Identifies gaps in existing projects and provides a pathway for improvement and expansion.
- Verify projects: Offers a credible self-assessment process for evaluating past projects and future proposals against a global benchmark.
- Enhance credibility: Adds credibility for investors, donors, and other stakeholders by demonstrating adherence to robust, internationally recognised best practices.

The criteria and indicators

For information purposes and to better understand the structure of the NbS Global Standard, the criteria and their indicators are detailed below. Their application and further details on what each one refers to and how to assess whether our intervention complies with each indicator to a greater or lesser extent can be easily obtained through the online self-assessment tool.

The eight criteria focus on the major elements that are critical to consider for successful NbS. They represent the essential elements needed for NbS design and implementation to be environmentally appropriate, socially beneficial and economically viable. There is no hierarchy among the criteria: they share equal status, validity and authority. **Each criterion addresses the following topics**:

1. **Effectively addresses societal challenges**: The project must identify and define a specific challenge, such as climate change, disaster risk, or food security, through an inclusive consultation process.
2. **Designed by scale:** The project design must consider the appropriate geographic, economic, social, and ecosystem-based scales to address the challenge effectively.
3. **Results in a net gain to biodiversity and ecosystem integrity:** The project should positively impact biodiversity and ecosystem health, with indicators ensuring ecological integrity is maintained or improved.
4. **Economically viable and feasibility:** The solution must be financially sustainable over the long term, preventing projects from being short-lived interventions.

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5. **Inclusive and equitable governance:** The process must involve inclusive and participatory governance that respects the rights of Indigenous Peoples and local communities.
6. **Trade-offs equitably balanced**: The project must identify and balance any potential trade-offs to ensure multiple co-benefits are achieved fairly.
7. **Managed adaptively and based on evidence**: The project must be based on the best available science and knowledge, including traditional knowledge, with a framework for adaptive management.
8. **Mainstreamed and integrated**: The solution should be integrated into relevant jurisdictional contexts, such as national policies and strategies.

The indicators offer specific means of assessing whether each criterion is fulfilled. They should not be interpreted as performance metrics or monitoring indicators in themselves. Rather, they constitute an assessment framework designed by IUCN to evaluate whether all key dimensions of an NbS intervention have been adequately considered during design, implementation and governance. Some indicators assess qualitative aspects, such as governance arrangements, stakeholder participation, adaptive management processes or assumptions regarding system dynamics, which cannot always be expressed through a single quantitative metric. Their purpose is to help practitioners identify strengths, weaknesses and gaps requiring further attention.

The **list of the 27 indicators, per criteria**, is (see also Figures 3 and 4):

Criterion 1. NbS effectively address societal challenges

1.1 The societal challenges addressed are clearly identified, understood, and documented
1.2 The most pressing societal challenges for stakeholders and rights-holders are prioritised
1.3 NbS outcomes for people and nature are identified, benchmarked and periodically assessed

Criterion 2. NbS incorporate an ecological, economic, social and cultural systems perspective

2.1 NbS recognise and respond to interactions between the economy, society, ecosystems and cultural norms
2.2 NbS seek synergies across sectors and with complementary interventions
2.3 NbS incorporate risk identification and management

Criterion 3. NbS result in positive change in the state of biodiversity and enhanced ecosystem integrity, including connectivity

3.1 The state of the ecosystems and the drivers of ecosystem degradation and biodiversity loss are identified, assessed and documented
3.2 Opportunities to enhance ecosystem integrity, including connectivity, are identified, assessed and documented
3.3 Measurable biodiversity outcomes are identified, benchmarked, periodically assessed and reviewed according to evidence-based assessments
3.4 Unintended consequences on nature arising from the NbS are periodically assessed and addressed

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Criterion 4. NbS are financially feasible and economically justified

4.1 The distribution of financial and societal costs and benefits is understood and documented to ensure distributional equity
4.2 NbS are economically and financially justifiable against alternative solutions
4.3 Financial mechanisms are identified and secured to ensure NbS long-term viability

Criterion 5. NbS are based on inclusive, transparent and empowering governance processes

5.1 Stakeholders, rights-holders and Indigenous Peoples who are directly and indirectly affected by the NbS have been identified and are invited to fully and effectively participate in all processes
5.2 A defined and fully agreed upon grievance and conflict resolution mechanism is available, accessible and implemented.
5.3 NbS are based on inclusive participation, mutual respect and equality, regardless of gender, age, ethnicity or social status
5.4 Decision-making processes document and respond to the rights and interests of affected stakeholders, rights- holders and IPLCs
5.5 (OPTIONAL) Where the scale of the NbS extends beyond jurisdictional boundaries, mechanisms are established to enable joint decision making among stakeholders and rights-holders in the affected jurisdictions

Criterion 6. NbS seek to equitably reconcile the achievement of their primary goal(s) with any intended and unintended impacts on the continued provision of multiple benefits

6.1 Safeguards and associated corrective actions are established through a transparent, inclusive and participatory process to address the intended and unintended negative social or environmental impacts of the NbS
6.2 Safeguards and corrective actions are documented, available, accessible to affected stakeholders and rights-holders, and implemented
6.3 Safeguards and corrective actions are periodically reviewed to ensure that they have been fully implemented, proactively address conflicts and remain relevant

Criterion 7. NbS are managed adaptively, based on evidence

7.1 Assumptions on how desired NbS outcomes are achieved under dynamic social, economic and ecological conditions are defined and made explicit
7.2 The validity of the assumptions is periodically tested through monitoring and evaluation as part of an ongoing learning process
7.3 Necessary changes to the management of the NbS are defined and implemented through an inclusive and participatory approach

NOTE: Indicator 7.1 seeks to ensure that the assumptions underpinning the intervention are explicitly documented. For example:

- restoration of riparian vegetation is expected to reduce flood impacts;
- selective forest management is expected to increase climate resilience;
- wetland restoration is expected to improve water retention.

These assumptions should subsequently be tested through monitoring and evaluation under Indicator 7.2. The purpose of the indicator is therefore to strengthen adaptive management rather than to prescribe specific quantitative targets.

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Criterion 8. NbS contribute to the enhancement of the enabling conditions for their implementation, sustainability and mainstreaming

8.1 Lessons learnt from NbS design and implementation, including barriers and enabling conditions, are captured and documented
8.2 NbS inform and enhance the policy, finance and regulatory frameworks enabling their mainstreaming
8.3 NbS contribute to relevant jurisdictional environmental, economic, and social targets and frameworks

A very useful resource on the iNbS platform is a **glossary of terminology** used in this framework: Glossary | INBS.

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Figure 3 *- Criteria 1-4 of the IUCN NbS Global Standard and their indicators. © IUCN/https://inbs.iucn.org/*

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Figure 4 (continuation) *- Criteria 5-8 of the IUCN NbS Global Standard and their indicators. © IUCN/https://inbs.iucn.org/.*
Note: The IUCN Global Standard and OSAT are external reference tools used by FARCLIMATE for NbS assessment.

2.2. The online self-assessment tool

A key resource for implementing the Standard is, as already mentioned, the NbS online self-assessment tool (OSAT), which allows users to evaluate their projects or interventions against the Standard and assess their adherence (Figure 5). The tool compares a project against good

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practices, offering a percentage match and a "traffic light" system to highlight areas for improvement (Figure 6).

This tool can be used to:

- Assess a project's quality and alignment with the eight global NbS criteria;
- Help design new NbS;
- Identify gaps in already existing NbS;
- Upscale pilots by identifying gaps;
- Self-assess past projects and future proposals.

It is designed to facilitate self-assessment of the alignment of a solution or intervention with the IUCN Standard.

The tool guides users to self-assess their intervention and find out how well they may meet the requirements of the Global Standard. The outcome is a report with the results of the self-assessment. The tool is available to all and has no limits for usage.

Link to the self-assessment tool: Nature-based Solutions Self-Assessment | INBS, to assess the alignment of each specific solution or intervention with the NbS Global Standard

To carry out an assessment using the OSAT, it is not necessary to register on the platform. Once an assessment has been started, it is not necessary to complete it in one go, as the results of the responses to the indicators are saved on the platform for 30 days (using the 'Save and Continue later' button), so it can be completed in several stages. We will receive a link in the email we provide to return to the assessment we started. More information about this tool can be found on the Self-assessment section of the "iNbS platform".

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Figure 5 – The IUCN NbS self-assessment tool. Example of self-assessment for indicator 1.1. ©IUCN. Note: The IUCN Global Standard and OSAT are external reference tools used by FARCLIMATE for NbS assessment.

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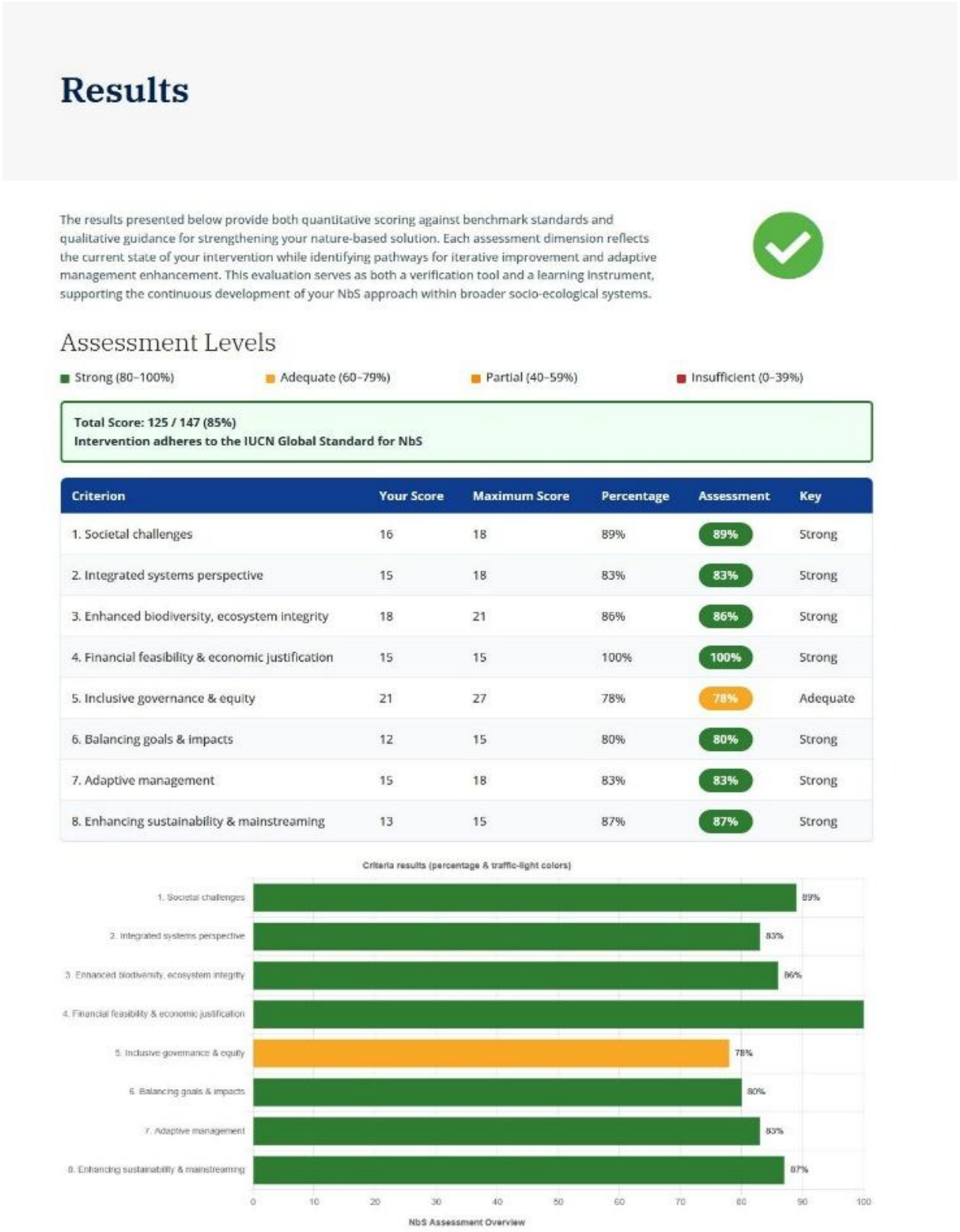


Figure 6 – *The IUCN NbS self-assessment tool. Example of results obtained after completing an assessment, indicating the percentage of adherence of the intervention/solution/project assessed to the Standard. ©IUCN.*
Note: The IUCN Global Standard and OSAT are external reference tools used by FARCLIMATE for NbS assessment.

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As can be seen in Figure 5, for each indicator of each criterion, several questions are presented to help respond more specifically to the components of that criterion and indicator. There are always four possible answers, ranging from more or less aligned with what would be an optimal NbS according to the IUCN Standard. After completing an assessment, a report is generated Figure 6, with the results presented in a highly visual manner, making it easy to see the percentage of alignment of our intervention with each criterion and identify the strongest and weakest points, as well as opportunities for improvement and reinforcement.

It is important to note that this is a self-assessment and that it is up to the assessment team for each solution, intervention or action to accurately answer the indicator assessment questions and interpret the results in order to integrate them into an improvement of the NbS or for its scalability. The assessment team should consist of personnel who are familiar with the design and implementation process of the solution.

2.3. Nature-based Solutions in the context of agriculture

A **sector-specific interpretation of the IUCN NbS Global Standard for agriculture** is **currently being finalised** and will complement the use of the Standard in the FARCLIMATE project. While the Global Standard provides the overarching criteria and indicators applicable to all contexts, the forthcoming agricultural sectoral interpretation explains how these requirements should be understood and applied when interventions take place within, or in relation to, agricultural landscapes.

This document has been developed to support practitioners, project managers, and public and private investors in planning, assessing, and improving agricultural interventions through the NbS lens. Its purpose is to provide practical guidance that translates each of the eight criteria and indicators of the Global Standard into the specific realities of agricultural production systems. It will also help align project-level work with wider policy commitments, including the targets of the Kunming-Montreal Global Biodiversity Framework on protected areas, sustainable management, pollution reduction, and harmful subsidies.

The sectoral interpretation builds on —and is designed to complement— the IUCN publication ***Sustainable Agriculture and Nature-based Solutions*** (Demozzi et al.,2024), which situates the NbS concept within the broader landscape of sustainable agriculture and examines how diverse agricultural approaches align with, or diverge from, the criteria of the IUCN Global Standard for NbS.

This publication, rather than providing operational guidance, offers a conceptual, analytical, and policy-oriented foundation for **understanding how sustainable agriculture practices relate to the NbS** framework. In particular, it maps 14 sustainable agriculture approaches (including agroecology, conservation agriculture, regenerative agriculture, organic farming, climate-smart agriculture and high nature value farming) against the eight criteria of the Global Standard, identifying their natural synergies with NbS principles as well as areas where safeguards or complementary measures may be needed.

While the publication presented above examines how different sustainable agriculture approaches relate to the NbS framework, **the sectoral interpretation under preparation focuses on *practical implementation***: what each criterion requires in agricultural contexts,

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what types of evidence are needed, and which methods or tools can support a robust assessment.

In agricultural systems, interventions often serve multiple societal challenges at once — including food and nutrition security, rural livelihoods, ecosystem degradation, pollution, climate adaptation, and biodiversity loss. The sectoral interpretation therefore pays particular attention to ensuring that agricultural NbS:

- Maintain or improve biodiversity and ecosystem integrity;
- Rehabilitate or restore ecosystem services essential for production;
- Contribute to food and nutrition security;
- Help preserve or improve human and animal health;
- Deliver positive economic outcomes for farmers, including income, autonomy and resilience;
- Uphold the rights of farmers and Indigenous Peoples, with full attention to gender and age;
- Are economically viable and scalable; and
- Strengthen policy support for mainstreaming sustainable agriculture practices.

Once published, the sectoral interpretation will also introduce practical tools and approaches relevant for agricultural NbS assessments, as well as a few case studies illustrating how the Standard has been applied in real agricultural landscapes. These examples will assist FARCLIMATE Living Labs in interpreting the Standard more precisely and in designing interventions that respond to the agricultural sector's unique socio-ecological dynamics.

While still undergoing revision at the present time to align with the updated 2025 version of the Global Standard, the forthcoming sectoral interpretation will offer a clear indication of how agricultural interventions can be made more consistent with NbS principles. Its content will therefore provide useful orientation for FARCLIMATE partners in the design, assessment, and improvement of agricultural solutions throughout the project.

2.4. Some examples of Nature-based Solutions and practices

To illustrate how the IUCN Global Standard for NbS has been applied in real contexts, these guidelines draw on the recent IUCN publication ***Applying the IUCN Global Standard for Nature-based Solutions: 21 case studies from around the globe*** (Cohen-Shacham et al., 2025; developed outside the FARCLIMATE project). This publication compiles **NbS interventions from multiple regions and biomes**, all of which were thoroughly assessed against the eight criteria and 28 indicators of the Global Standard before its latest update. Each case study includes: a description of the societal challenges addressed, the NbS interventions implemented, the ecological and socio-economic outcomes achieved, and the results of the NbS Self-Assessment Tool. Together, these examples provide a reliable evidence base for understanding what well-designed and well-implemented NbS look like in practice.

For the forestry sector, the NbS methodology is also complemented by the promotion of Close-to-Nature Silviculture (CNS) practices (see Appendix III) within FARCLIMATE.

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For FARCLIMATE, which focuses on agriculture, forestry and fisheries across European regions, several of the assessed case studies offer particularly relevant insights. Among the European cases included in the publication (six in total), some of the most applicable to the project's thematic focus include:

Forestry/Landscape Restoration

- **Case Study 7 — Co-designing Atlantic landscapes management to address societal challenges, Paiva River watershed, Portugal**
  A comprehensive forest–landscape management initiative addressing wildfire risk, erosion, biodiversity loss and rural development in a Mediterranean-Atlantic context. It integrates participatory planning, restoration measures and ecosystem-based management across a mosaic of forests and agricultural areas, making it especially relevant for FARCLIMATE's work on resilient forestry and integrated landscape governance.

Agriculture/Extensive grazing and land management

- **Case Study 14 — Extensive livestock for vegetation control, La Rioja, Spain**
  A Mediterranean agricultural landscape intervention using extensive livestock systems to manage vegetation, reduce wildfire risk, maintain open habitats and support local livelihoods. It demonstrates how sustainable grazing can serve as an NbS when aligned with ecosystem integrity, governance and socio-economic co-benefits.

Fisheries/Coastal & estuarine management

- **Case Study 3 — Adaptive management of the lagoons and marshes of the former Camargue saltworks, France**
  A large-scale coastal wetland restoration initiative that reconnects hydrological systems, restores lagoon ecosystems, sustains artisanal fisheries and integrates climate adaptation measures. It provides a strong example of NbS relevant to marine–terrestrial interfaces and productive coastal landscapes.

These cases demonstrate diverse pathways for designing NbS in productive landscapes and seascapes, and they illustrate how NbS can respond to many of the same societal challenges addressed by FARCLIMATE case studies—such as climate adaptation, biodiversity loss, water management, and sustainable economic development.

Beyond Europe, the publication includes additional examples of agricultural NbS (e.g., dryland grazing in Argentina; small-scale agriculture adaptation in Ecuador), comprehensive forestry restoration initiatives (e.g., in New Caledonia), and coastal/marine fisheries NbS (e.g., mangrove restoration in Indonesia). While outside the geographic scope of FARCLIMATE, these cases provide useful inspiration for practitioners seeking to design robust, Standard-aligned NbS in complex socio-ecological settings.

Taken together, the 21 assessed case studies offer a valuable reference point for FARCLIMATE partners as they design and evaluate their own interventions. They demonstrate how the Global Standard can be applied in practice, what kinds of evidence strengthen NbS assessments, and

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how to anticipate the strengths, weaknesses and trade-offs inherent in real NbS implementation.

3. Recommendations for the design, implementation, and evaluation of NbS within the framework of FARCLIMATE

The Global Standard for NbS is a context-dependent, process-oriented operational framework, which is precise in defining what needs to be assessed, as well as being adaptable to various geographic and ecological contexts, and addressing different societal challenges. It can therefore be applied and adapted to the different contexts and regions of the FARCLIMATE project case studies, as well as other projects working on adaptation or mitigation of the impacts of climate change. It is a very **useful framework for helping to design and implement actions, interventions or solutions that respond to the climate challenge while maximising social and environmental benefits**, and helping to identify and reduce potential unwanted adverse effects.

We therefore recommend using this framework in the **early stages of designing** the LL or case study solution, so that the design can be adapted according to the results of the assessment. The assessment of alignment with the NbS Global Standard can be repeated in later phases (implementation, or even closure) to apply adaptive management or a learning and scalability approach for other interventions. The NbS online self-assessment tool (Section 2.2) is the easiest, simplest and most effective way to assess alignment with the NbS Global Standard and check how well the case study intervention(s) meet the eight criteria and 27 indicators.

The IUCN NbS framework can be integrated into and complement the Living Lab methodological approach used for the FARCLIMATE project case studies development, and implemented by the FARCLIMATE regions and communities (see DELIVERABLE 2.1 Methodological approach for FARCLIMATE, developed by the project partner ENoLL; available through the FARCLIMATE project website/ Resources/ Deliverables section; https://farclimate-project.eu/wp-content/uploads/2024/10/Fairclimate_D2.1-Methodological-Approach-for-FARCLIMATE.pdf, also published in the open-access repository Zenodo https://zenodo.org/communities/farclimate-project/, after registration and sign-up), and below is a brief analysis of their mutual integration and some recommendations.

3.1. Integration of the LL methodology and the NbS framework

Integrating the IUCN NbS Global Standard into the FARCLIMATE Living Lab methodology is a good way to ensure that innovation processes for climate adaptation are both ecosystem-based and participatory, and with benefits for nature and people. The IUCN NbS framework and the ENoLL Living Lab methodology can complement each other in several ways:

To begin with, some **shared principles** can be identified:

- Co-creation and stakeholder engagement: both frameworks emphasise inclusive participation. The IUCN NbS Standard requires equitable governance and stakeholder involvement, while Living Labs are built on multi-actor collaboration (citizens, academia, industry, government) to co-design climate adaptation solutions.

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- Systemic approach: NbS are applied at landscape scale and consider ecological, social, and economic dimensions. Living Labs similarly operate as ecosystems of innovation, integrating diverse knowledge systems and iterative learning.

Furthermore, the IUCN **NbS framework can contribute to the establishment of LL in several ways**, notably:

- Guidance for design and scaling: LL often start as pilots, as it is promoted by the FARCLIMATE project. The NbS Standard offers the self-assessment tool to identify gaps and improve design before upscaling, aligning with Living Lab phases of experimentation and replication.
- Alignment with global policy goals: using the NbS framework within LL ensures projects contribute to SDGs, climate adaptation, and biodiversity targets, strengthening legitimacy and funding opportunities.
- Quality assurance and impact measurement: the IUCN Standard criteria and indicators for assessing NbS effectiveness (e.g., biodiversity benefits, socio-economic co-benefits, adaptive management) can be embedded in LL evaluation phases to ensure solutions are robust and scalable.

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The application of the NbS Global Standard, integrated into the FARCLIMATE Living Lab methodology, can be carried out as follows, as a suggestion:

- **Exploration phase**: Use the NbS framework to define the challenge(s) and preliminary desired outcomes and/or scenarios. Explore the Standard and take a look at the 8 Nbs criteria, as defined in the iNbS platform INBS |, and ensure you understand what each one is aiming for and how they are evaluated based on their indicators. Make sure that the societal challenge(s) addressed are clearly identified, understood, and documented., through the Criterion 1 specially.

- **Co-creation phase**: Apply the NbS principles in participatory design. Use NbS criteria as design checkpoints during stakeholder meetings. Ensure societal challenges and biodiversity goals are explicitly defined in the LL roadmap. A quick assessment of the different solutions or interventions proposed, using the OSAT (Nature-based Solutions Self-Assessment | INBS), will help in this initial phase to choose the one that best responds to the challenge(s), maximising social and environmental benefits and helping to identify the most sustainable, feasible and scalable option.

  We recommend that this assessment using the OSAT be carried out by a small number of people (3 or 4 maximum) who are familiar with the case study and its context, and that the results be subsequently presented to all stakeholders to help decide which solution is most appropriate and feasible for the specific challenge and according to the context of that case. The OSAT can also be used when a solution has already been chosen and there is a desire to improve its implementation or certain parts of its design.

- **Experimentation phase**: Monitor NbS indicators (see a list in Section 2.1 of this document, and their explanation in detail in each criterion section, on the iNbS platform https://inbs.iucn.org/understand/global-standard-for-nature-based-solutions/) alongside other innovation metrics and embed NbS indicators into the Living Lab monitoring plan (e.g., biodiversity metrics, governance inclusivity). Apply the real-life testing to validate NbS effectiveness under local conditions and within the context of each FARCLIMATE region. To explore examples of NbS and the application of the Standard, please refer to the various publications developed by IUCN, which compile good examples (see Appendix I).

- **Evaluation phase**: Conduct a final and more detailed NbS self-assessment (using the OSAT, link above) to validate the ecological and social outcomes and the performance of the solution/intervention. The assessment of NbS indicators should also be integrated into an overall LL evaluation plan.

- **Scaling phase**: The results of the NbS assessment (the report that is produced after conducting an assessment using the OSAT) can be used to give more weight to the project and its results, and to attract investment and policy support. Document lessons for replicability and scalability, aligning with both NbS and LL methodologies. If the solution has been well aligned with the NbS Global Standard, replicability and scalability will have been integrated into the LL lifecycle.

Before starting an NbS assessment, it is important to define the geographical scope of the solution/project/intervention to be evaluated, as this will facilitate the application of the criteria.

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The IUCN NbS framework provides scientific rigor, measurable indicators, and global alignment, while Living Labs offer real-world co-creation environments. Combining them ensures that innovations and interventions, where possible, are NbS, and that they are participatory, equitable, sustainable, evidence-based, and scalable, maximising social and ecological benefits.

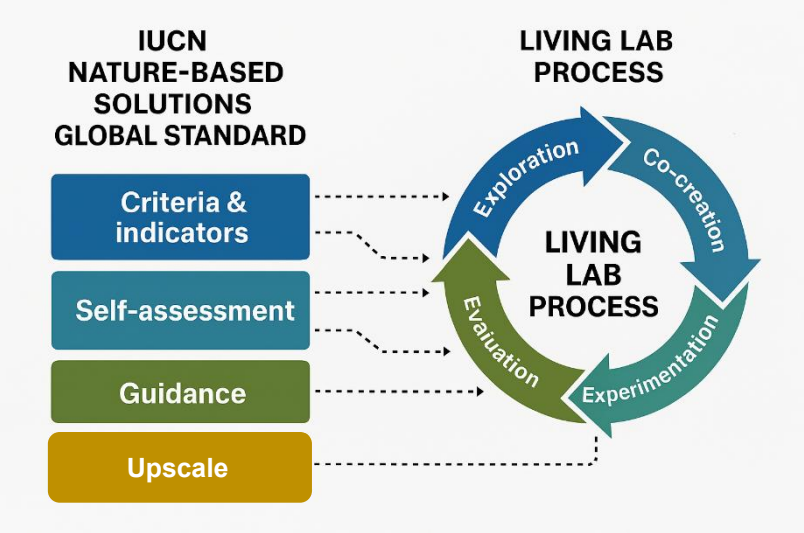


Figure 7 – Integration diagram showing how the IUCN NbS Global Standard can align with the Living Lab process. Source: Own work.

3.2. Quick guide for practitioners: from climate risk to Nature-based Solutions

A pathway for local and regional authorities, Living Labs and land managers

Nature-based Solutions (NbS) should not simply begin with the selection of a measure such as planting trees, restoring wetlands, or introducing agroforestry. They should start with a clear understanding of the climate challenge to be addressed, and the benefits expected for people and nature. The following seven-step approach provides a practical pathway for designing, implementing and monitoring NbS in line with the IUCN Global Standard and the Living Lab approach promoted within FARCLIMATE. This guidance is intended to support decision-makers and practitioners particularly in the field of climate change adaptation in the in agriculture, forestry and fisheries sectors.

Step 1. Define the challenge

Start by identifying the main climate risk affecting the territory, and above all its people (the societal challenge(s)).

Key questions

- What is or are the primary climate hazard(s) to be addressed?
- Who is affected?
- What impacts are already being observed?

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- What adaptation objective is sought?

Examples:

Climate hazard	Possible impacts	Adaptation objective
Drought	Water shortages, declining crop yields	Increase water retention
Extreme rainfall	Flooding, erosion	Slow runoff and increase infiltration
Wildfires	Forest degradation, economic losses	Improve ecosystem resilience
Coastal storms	Erosion, habitat loss, decline in fish stocks	Stabilise coastal ecosystems
Biodiversity decline	Reduced ecosystem resilience	Restore ecosystem functions

➡ **Practical advice:** Focus on the problem first and the solution afterwards. Successful NbS projects are problem-driven rather than intervention-driven.

Step 2. Define and understand the landscape and ecosystem and how it functions

NbS work best when they build upon ecological processes already present in the landscape.

Key questions:

- What ecosystem is involved?
- What are the main ecological pressures?
- What ecosystem services should be improved?

Assess:

- ✅ ecosystem condition
- ✅ biodiversity values
- ✅ land-use patterns
- ✅ socio-economic conditions
- ✅ current and future climate pressures

Key output
A simple baseline describing:

- the ecosystem;
- its main degradation drivers;
- ecosystem services that should be strengthened.

Step 3. Engage stakeholders early in the process

Local ownership is often a key factor in success.

- Identify affected and key stakeholders.
- Ensure participation of authorities, land managers, businesses and community representatives.
- Consider vulnerable groups.

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Minimum stakeholder groups

- Local and regional authorities
- Landowners and land managers
- Farmers, foresters or fishers
- Research institutions
- Environmental organisations
- Community representatives
- Vulnerable and underrepresented groups
- Key industries or companies (e.g. due to their impact or innovation)

What stakeholders help identify

- local needs and priorities;
- potential conflicts and trade-offs;
- implementation barriers;
- opportunities for long-term sustainability.

➡ **Practical advice:** Establish a small stakeholder working group before the solution is selected.

Step 4. Identify potential NbS options and select the most appropriate one

The selected intervention should simultaneously contribute to climate adaptation, biodiversity conservation and human well-being. Some examples of practices or interventions which are, in principle, sustainable, relevant to FARCLIMATE:

Forestry

- Close-to-Nature Silviculture
- Riparian buffers
- Sustainable grazing systems
- Mixed-species forest restoration

Agriculture

- Agroforestry systems
- Cover crops
- Hedgerow restoration
- Sustainable grazing systems
- Wetland restoration

Fisheries and coastal systems

- Saltmarsh restoration
- Dune restoration
- Seagrass recovery
- Estuarine habitat management

Screening checklist

Before choosing a solution, ask:

- Does it address the identified climate challenge?
- Does it improve biodiversity and ecosystem integrity?
- Is it technically feasible?
- Is it socially accepted?
- Is it economically viable?

Can it be maintained over time? Once the intervention/solution/action has been clearly identified, it can be assessed against the IUCN Standard to check whether it complies with it. To put the intervention to be assessed into the right context and prepare the assessment, it is advisable to use this short questionnaire, which will help to narrow down the focus:

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Information about the intervention

Intervention name:

Location:

Geographical scope (mark "X"): Local / Regional / National / Multinational

Timeframe (dd/mm/yy)

Start date:
Targeted end date:

Status of the intervention:

At which of the following stage is your intervention? You may choose more than one option (mark "X").

Being designed: *the intervention is at the design stage*.

Under implementation: *the intervention is being implemented and monitored according to design*.

Outcomes realised: *the intervention is having its intended impact*.

Description of the intervention:

Describe the initial need/problem statement. Specify the needs:

Describe what the solution to the need/problem is. How to propose the specific interventions:

What are the main societal challenge(s) this intervention plans to address?

Select at least one societal challenge from the list. If you select "Environmental degradation and biodiversity loss", please select an additional challenge in the list (mark "X").

Climate change mitigation and adaptation
Disaster risk reduction
Economic and social development
Human health
Food security
Water Security
Environmental degradation and biodiversity loss

Describe what are intended results:

In which sector(s) is the intervention operating? You may choose more than one option (mark "X").

Agriculture
Forestry

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Fisheries
Mining and quarrying
Manufacturing
Electricity, gas, steam and air conditioning supply
Water supply; sewerage, waste management and remediation activities
Construction
Wholesale and retail trade; repair of motor vehicles and motorcycles
Transportation and storage
Accommodation and food services activities
Information and communication
Financial and insurance activities
Real estate activities
Professional, scientific and technical activities
Administrative and support services activities
Public administration and defence; compulsory social security
Education
Human health and social work activities
Arts, entertainment, and recreation
Other services activities
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
Activities of extraterritorial organisations and bodies
Natural resource management
Sustainable development
Conservation
Other: Community based urban governance

Organisations/groups/actors leading the intervention (insert other organisations/institutions that are part of the management of the space/community):

Step 5. Check alignment with the IUCN Standard

Use the NbS Online Self-Assessment Tool (OSAT; https://inbs.iucn.org/apply/nature-based-solutions-self-assessment/) as early as possible, to verify:

✓ biodiversity benefits
✓ social benefits
✓ economic feasibility
✓ monitoring framework
✓ long-term sustainability
✓ governance arrangements

Particular attention should be given to:

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IUCN Criterion	Practitioner question
Criterion 1	Is the climate challenge clearly defined?
Criterion 2	Are links between ecosystems, people, and economic activities understood? How will the solution affect and be affected by the wider system?
Criterion 3	Will biodiversity improve?
Criterion 4	Is the solution economically justified?
Criterion 5	Are stakeholders meaningfully involved?
Criterion 6	Have trade-offs been identified?
Criterion 7	Is adaptive management planned?
Criterion 8	Can results influence policy and scale-up?

☞ The objective is not necessarily to achieve full compliance with the NbS Standard (see section 2) at the beginning, but to identify areas requiring improvement before implementation starts. Analyse those criteria that have the lowest scores for alignment with the Standard and improve the design or implementation in line with those results, paying attention to the specific indicators and questions set out in the OSAT for that criterion. It is a continuous process of learning and improvement, and to this end it is useful to apply the Standard at different stages of design, development and evaluation.

Step 6. Establish a monitoring framework, defining monitoring indicators

Monitoring should measure both adaptation outcomes and environmental performance. Include:

- Environmental and biodiversity indicators (e.g. Habitat condition, Species diversity, Vegetation cover, Water quality)
- Climate resilience indicators (e.g. Soil moisture, Erosion rates, Flood retention capacity, Wildfire risk indicators)
- Social indicators (e.g. Stakeholder participation, Satisfaction levels, Inclusion of local knowledge)
- Economic indicators (Costs and benefits, Avoided damages, Livelihood improvements, Productivity gains).

➡ **Practical advice**: Select a small number of indicators that can realistically be measured over time (SMART).

Step 7. Learn from the results and document lessons learnt. Apply adaptive management. Scale it up.

NbS should be managed as learning processes. Regularly review monitoring results, revise actions where necessary and ask, for example:

- Is the solution delivering expected results?
- Is this learning being properly monitored and documented?
- Are additional measures required?
- Are there unforeseen impacts?

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- Have stakeholder needs changed?
- Can the solution or the lessons learnt be incorporated into any policy, regulation or official process, to help ensure its replicability and sustainability?

☞ Adapt interventions accordingly and document lessons learned to facilitate future replication and scaling. One of the key mechanisms through which an NbS, a successful intervention or innovation can achieve long-term sustainability, scaling, and systemic impact - rather than remaining isolated pilot projects - is policy uptake.

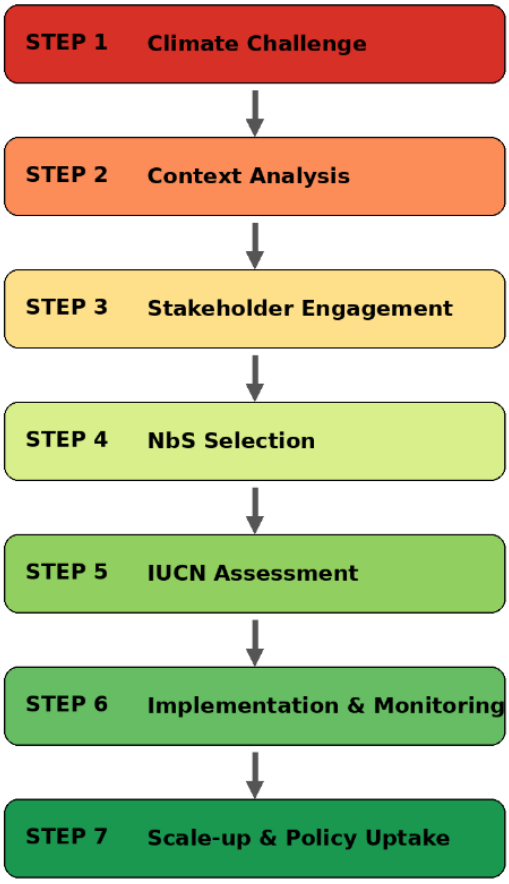


Figure 8 – Practitioner pathway for designing and implementing Nature-based Solutions (NbS). The process begins with the identification of the climate challenge, followed by context analysis, stakeholder engagement, selection of appropriate NbS options, assessment against the IUCN Global Standard, implementation and monitoring, and finally scaling-up and policy uptake. Own work.

Some further considerations

➢ **Common pitfalls to avoid**

❌ Selecting a solution before understanding the climate and social challenge
❌ Focusing only on infrastructure or engineering outcomes
❌ Neglecting biodiversity objectives
❌ Insufficient stakeholder engagement

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- ❌ Lack of long-term funding or maintenance planning
- ❌ Absence of measurable monitoring indicators
- ❌ Assuming that NbS will automatically generate benefits without active management

➢ **Economic feasibility and cost-benefit considerations**

In line with Criterion 4 of the IUCN Global Standard, FARCLIMATE Living Labs should progressively assess the economic feasibility of proposed NbS interventions as project implementation advances. In this regard, project activities should seek to document:

- implementation costs;
- operation and maintenance costs;
- avoided costs associated with climate impacts;
- ecosystem service benefits;
- social and economic co-benefits;
- potential funding mechanisms.

Comparative analyses between NbS and alternative intervention options should be carried out where feasible to support decision-making and scalability.

In this regard, Criterion 8 (which emphasises creating enabling conditions for the long-term viability of NbS) is also important to be considered here. Policy uptake is critical within the IUCN NbS Standard because it enables the mainstreaming, replication, and long-term sustainability of NbS; by embedding NbS principles into policies, regulations, and planning processes, successful interventions can be scaled beyond individual projects, attract sustained investment, support national and international environmental commitments, and generate transformative change for both biodiversity conservation and human well-being. Projects often depend on temporary donor funding. When NbS principles are incorporated into laws, policies, national adaptation plans, biodiversity strategies, land-use planning, or infrastructure regulations, their implementation can continue after project resources end.

4. Promoting NbS and preliminary assessments within the FARCLIMATE case studies

NbS have been integrated as a methodology to be promoted in climate change adaptation within the framework of the FARCLIMATE project. IUCN is the partner responsible for promoting its framework and the global NbS Standard that embodies it. The working methodology followed for the promotion of NbS and support for the evaluation of solutions in case studies is summarised below.

4.1. Methodology

To promote NbS and their integration into FARCLIMATE actions, especially in the development of case studies and the co-creation of living labs, work is mainly carried out in three areas:

1. Direct training and capacity building.
2. Development of specific resources for the FARCLIMATE project.

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3. Support to case studies in the application of the NbS Standard for the assessment of their solutions.

1. Direct training and capacity building

Several training sessions on NbS and the Global Standard have been organised by IUCN, both for partners providing technical support to case studies and for case study representatives (Wave 1 and Wave 2), to help them design solutions that are more aligned with NbS. The sessions have been organised in either face-to-face or virtual format.



Figure 9 – One of the training sessions on NbS organised for the FARCLIMATE case studies.

These training sessions address the concept of NbS, what the Global Standard is, and its structure, criteria and indicators. Some examples of NbS projects, mainly in the fields of agriculture, forestry and/or fisheries, to make them more relevant to participants, are also presented, and any query that may arise is answered.

It is planned to organise some additional sessions throughout the project to strengthen this training and capacity building among the case studies and to help disseminate and integrate this Deliverable 5.1. Likewise, IUCN is available to any case study or project partner that organises workshops where the NbS approach is relevant or that requires additional support for the application of the Global Standard.

2. Development of specific resources for the FARCLIMATE project

Some resources have been developed to disseminate the NbS framework, mainly online training courses, offered on the FARCLIMATE website, in the Training section. More training courses in this format will follow.

This Deliverable 5.1 is the main written document providing guidelines for NbS in the project.

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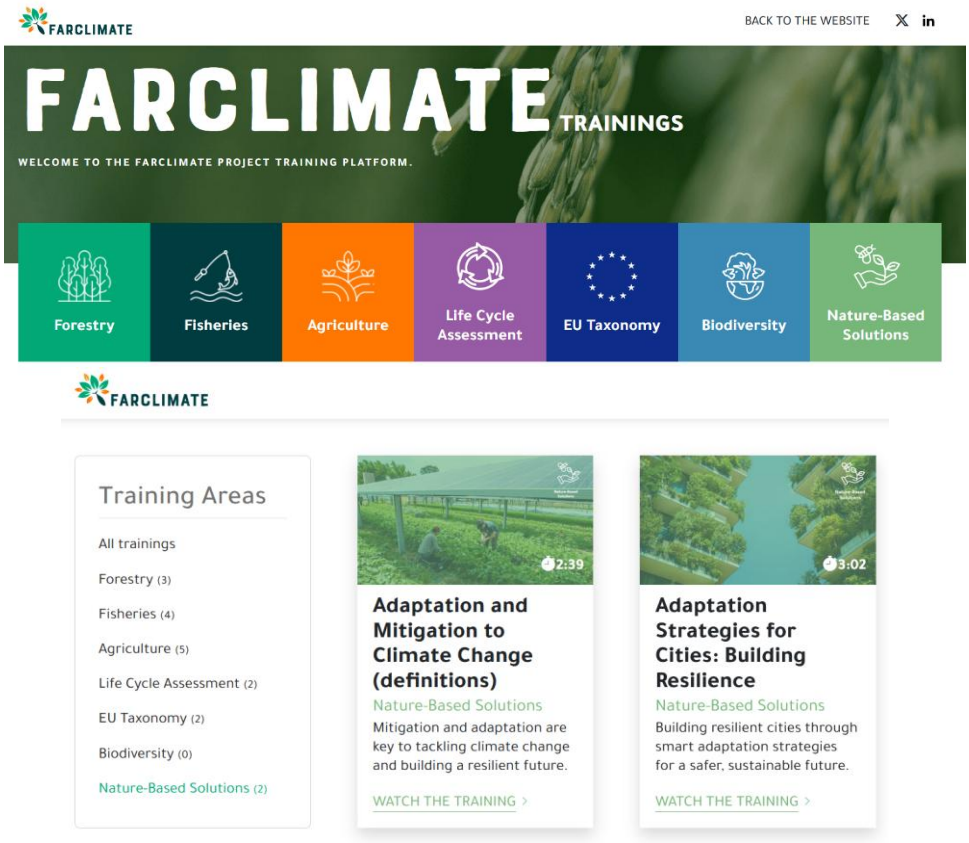


Figure 10 – Training courses offered on the FARCLIMATE website https://training.farclimate-project.eu/

3. Support to case studies in the application of the NbS Standard for the assessment of their solutions

To assist in the initial application of the NbS framework, it was decided that preliminary solutions could be evaluated in the demonstrative case studies that form part of the FARCLIMATE Consortium, which are more closely supported by project partners who could help in the task. IUCN first informed and discussed the task with the partner in question at each pilot site (internal focal points) to coordinate contact with the external representative of the case study (external focal points) and the request for information.

The first NbS assessment begun with the Rebollo case study, in the forestry sector, specifically with the plot in the province of Salamanca (Spain), as sufficient information was available to conduct an initial assessment. This assessment served as a pilot application of the methodology in the framework of FARCLIMATE.

A meeting was held (together with CESEFOR) to present the analysis, needs and expected results and to agree on a work plan. The evaluation for this case study was carried out by the living lab representative with direct support from IUCN and CESEFOR through regular weekly meetings. At these meetings, the NbS OSAT has been used to score compliance of the intervention with the Global Standard, applying the indicators for each criterion, and deciding on the most appropriate response after justification. Each one-hour session evaluated one or two of the eight criteria. At this stage of the Rebollo case study, it is hoped that this NbS assessment will serve to identify gaps and areas for improvement in the design. An overview of the results for the Rebollo LL preliminary assessment is included in the following section 4.2.

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Figure 11 – NbS assessment session for one of the case studies (Rebollo) (above) and example of one of the indicators scored, using the NbS OSAT (below).

At the same time, work also began on carrying out an NbS assessment for case study related to urban agriculture, for the Turin case study, in collaboration with Green Growth Generation (GGG). This enabled the partner GGG, responsible for the Turin case study, to carry out the self-assessment using the IUCN NbS OSAT, with support from IUCN following a preparatory online meeting to familiarise GGG with the tool. The results of this assessment, together with some recommendations for improvement from IUCN, are included in Appendix II.

IUCN, together with project partners (mainly the "internal focal points") is already supporting the design of NbS and the application of the Standard in the other LL of the FARCLIMATE Consortium and subsequently in other case studies of the project that are interested in a more in-depth evaluation of their solutions with this framework.

In the case of the Galician *rías* – to continue with a fisheries case study – several virtual meetings have been held both with external representatives involved in the cases, to explain the NbS framework to them in greater detail, and with the internal focal point (Fundamar), to

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discuss the solutions currently under consideration, carry out a very preliminary assessment (without using the OSAT for the time being), and to assess their potential for greater or lesser alignment with the Standard, with a view to a forthcoming comprehensive evaluation.

This and other full NbS assessments will be progressively carried out for other FARCLIMATE case studies as their interventions advance and additional technical, environmental and socio-economic information becomes available. The results will be presented in the deliverable D6.4 - NbS alignment analysis of the solutions applied.

4.2. Overview of the NbS assessment results for one of the case studies: forestry

This section briefly presents the results of the first preliminary NbS assessment carried out; in this instance, the assessment for Rebollo, as an illustrative example.

For the start of the assessment of the Rebollo-Salamanca solution, the LL and the intervention to be evaluated were contextualised, identifying the following points more precisely, to answer the questions raised in the NbS OSAT, since the appropriate course of action in these cases is to carry out the assessment for a specific intervention and geographical location:

The initial need:

The oak forests (*rebollares*; *Quercus pyrenaica*) of Castilla y León region, covering over 800,000 hectares, are at a turning point. Traditionally undervalued and managed primarily for firewood, these ecosystems face challenges such as low productivity, lack of knowledge on their full potential, limited stakeholder coordination, and minimal local economic return. The Rebollo Living Lab will test and implement solutions primarily in the province of Salamanca, where high-potential forest areas coexist with a motivated and diverse network of actors. This territory presents ideal conditions to explore selective silviculture models that are climate-resilient, ecologically sound, and economically viable.

A key strength in Salamanca is the presence of engaged stakeholders from the quadruple helix—industry, firewood producers, local governments, regional authorities, researchers, political figures, innovation centres, and environmental groups. While some already had established relationships, others came together for the first time through this initiative, reinforcing a dynamic and collaborative network.

However, stakeholder engagement still faces several barriers, including lack of awareness about the potential of *rebollares*, resistance to change from traditional forest users, limited access to market opportunities for new products, and insufficient coordination between local actors. Overcoming these challenges is central to the mission of the Living Lab.

Main societal challenges this intervention plans to address (according to the list of challenges in the Standard):

- Climate change mitigation and adaptation.
- Economic and social development.
- Environmental degradation and biodiversity loss.

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The solution:

To stablish a selective silviculture model, one that is more conscious and aligned with the forest's natural processes. The LL will act as a core hub for innovation, dialogue, and territorial action, promoting the rebollo oak as more than just a forest resource — as a key ecological, social, and economic asset. In the long term, it aims to spark a local value-added industry rooted in the forest, strengthening climate resilience, rural sustainability, and circular economy principles.

Identified lines of work:

- Changes in traditional forestry in the forests of Castilla y León, placing greater value on traditional products.
- Promoting other related sectors like mycological production.
- Promoting the circular economy.

Intended results:

To revitalise the local economy in Salamanca by unlocking the value of the rebollo forests through innovative, sustainable, and climate-resilient forest management. The LL is a pioneering alliance that brings together knowledge and action to explore new ways of caring for the forest — proving that a different, and more profitable, model is possible.

Create a network of stakeholders who feel represented.

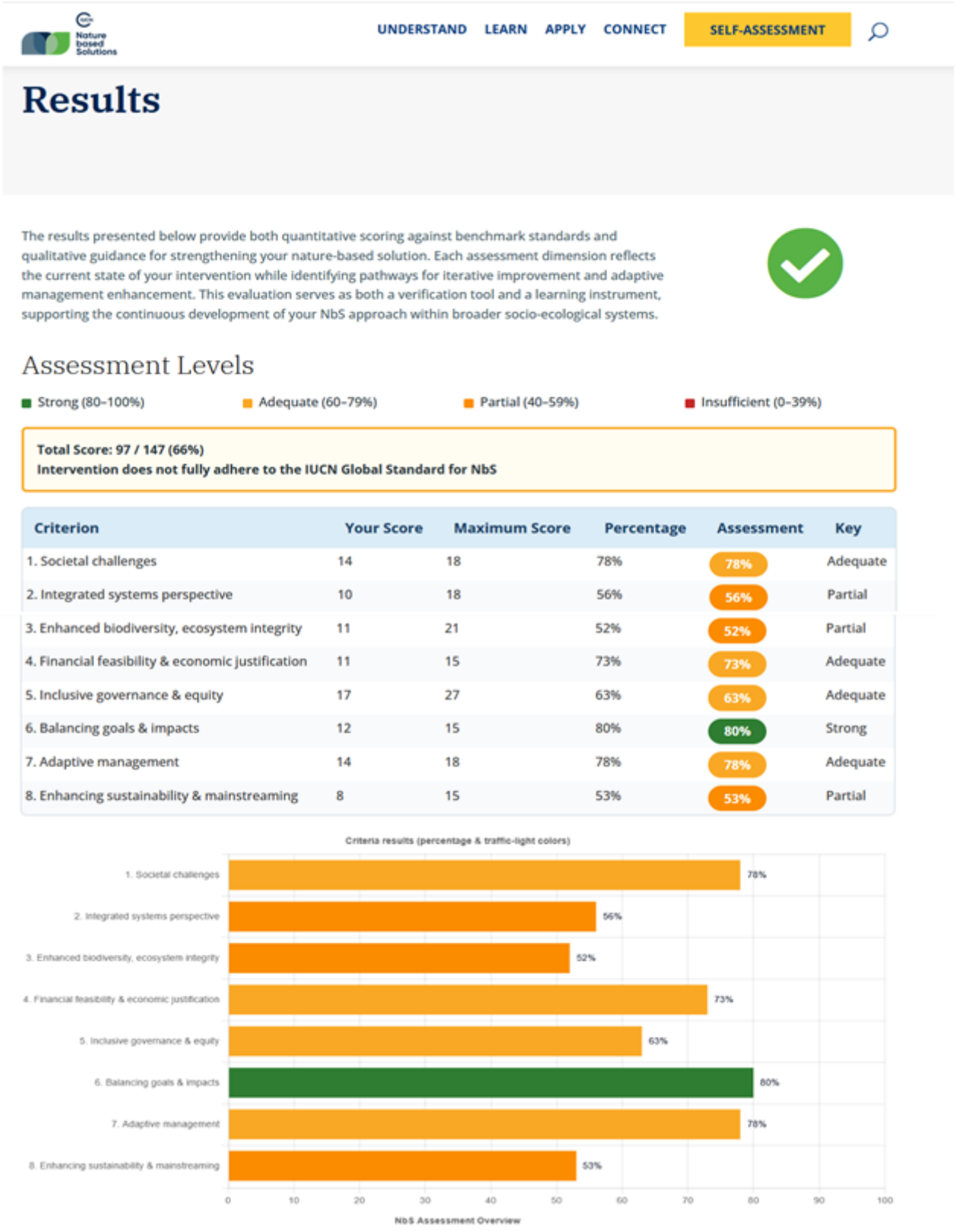
Include changes in forestry practices to make tree stands more resilient to climate change: with a focus on improving the technological quality of products, but also on enhancing biodiversity and adapting to climate change.

Main sector(s) in which is the intervention is/will be operating:

Forestry; Natural resource management; Sustainable development; Conservation

After completing the first assessment of the Rebollo-Salamanca LL intervention using the NbS OSAT to verify the degree of alignment of the solution with the Global NbS Standard, the results generated are shown below:

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Criterion	Your Score	Maximum Score	Percentage	Assessment	Key
1. Societal challenges	14	18	78%	78%	Adequate
2. Integrated systems perspective	10	18	56%	56%	Partial
3. Enhanced biodiversity, ecosystem integrity	11	21	52%	52%	Partial
4. Financial feasibility & economic justification	11	15	73%	73%	Adequate
5. Inclusive governance & equity	17	27	63%	63%	Adequate
6. Balancing goals & impacts	12	15	80%	80%	Strong
7. Adaptive management	14	18	78%	78%	Adequate
8. Enhancing sustainability & mainstreaming	8	15	53%	53%	Partial

Figure 12 – Results after completing the first assessment of the Rebollo-Salamanca LL intervention using the NbS OSAT to verify the degree of alignment of the solution with the Global NbS Standard.

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Figure 13 – Radar chart of the Rebollo-Salamanca LL intervention evaluating its alignment with the Global NbS Standard through the first NbS assessment using OSAT.

The first thing the tool indicates is the **total score**, in this case 97/147, 66% alignment and a "grade" on compliance with the Standard, in this case "not fully compliant". This is an adequate score for an initial assessment at the beginning of the intervention, as there are indicators that cannot yet be adequately verified at this early stage because the actions that would lead to compliance have not yet been initiated. However, it is still very appropriate to carry out this assessment at this early stage, as it will help us to improve the design of the intervention, and there is still room for improvement throughout the following stages.

As can be seen in these graphs, NbS OSAT displays the results in several ways, all of which are highly visual. First, the tool provides a **table with a breakdown for each criterion**, showing the score for that assessment, the maximum score that the Standard would give, and the percentage of alignment for each criterion according to that maximum score, measuring the degree to which the intervention complies with the Standard. In addition, there is a colour-coded "traffic light" system for the percentages to make interpretation easier. The second graph shows the same results by criterion but in **bar format**, using the same colour coding.

The third graph shows the results in a **'spider web' format**, also showing which criteria are closer or further away from the ideal 100% compliance.

As can be seen, all criteria achieved scores equal to or higher than the partial adherence percentage. There is one criterion that strongly adheres to the Standard (criterion 6-Balancing goal and impacts), four that adequately adhere, and three that partially adhere, with the latter having the most room for improvement. Indeed, LL Rebollo has a strong balance between the

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potential negative impacts it may cause and the social and environmental benefits. The trade-offs seem to be adequately identified at this stage and are expected to be properly monitored.

As for the criteria with the lowest scores, criterion 3 currently has the lowest level of adherence, mainly due to the lack of identified SMART results that respond to an improvement or recovery of key biodiversity or ecosystem values. It would also be necessary to design a system for tracking, monitoring and evaluating results and impacts, identifying measurable indicators and objectives.

Criterion 8 also has considerable room for improvement in the future, but it is normal that it is only partially met at present because it refers to how NbS results can be integrated and mainstreamed at levels beyond the project, such as policies or regulatory frameworks. For the time being, it has been noted that it would be necessary to improve the system for compiling and documenting results and lessons learned and to begin identifying regional frameworks in which lessons learned can be integrated and provide valuable information to inform policy.

Criterion 2 “Integrated system perspective” also indicates that there is still room for improvement in certain areas relating to understanding the interconnections and interactions between the ecological, economic, social and cultural systems within which the NbS is designed and implemented, mainly in terms of establishing a monitoring system and identifying and managing risks associated with these interactions.

It should be noted, in any case, that this type of assessment serves to identify areas of the intervention where there is most room for improvement, and that there will always be room for improvement.

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Appendices

Appendix I: Relevant resources on NbS and climate mitigation/adaptation

All materials are available openly and free of charge online (except for the professional certification course at the IUCN Academy) and the access link is provided for each case.

TITLE	TYPE OF MATERIAL	AVAILABLE AT
Global Standard for Nature-based Solutions™ (2025)	Standard	https://inbs.iucn.org/understand/global-standard-for-nature-based-solutions/
Applying the IUCN Global Standard for Nature-based Solutions™ 21 case studies from around the globe (2025)	Report/Compilation of case studies	https://doi.org/10.2305/RFTD6180
Sustainable agriculture and Nature-based Solutions (2024)	Report	https://portals.iucn.org/library/node/52103
Aquaculture and Nature-based Solutions: identifying synergies between sustainable development of coastal communities, aquaculture, and marine and coastal conservation (2022)	Report	https://doi.org/10.2305/IUCN.CH.2022.02.en
Nature-based Solutions to address global societal challenges (2016)	Report	https://portals.iucn.org/library/node/46191
Nature-based solutions for climate change mitigation (2021)	Report	https://portals.iucn.org/library/node/49781
Nature-based solutions to address climate change (2016)	Report	https://portals.iucn.org/library/node/46343
Nature-based Solutions for corporate climate targets (2023)	Report	https://doi.org/10.2305/ELGL1056
Integrating Nature-based Solutions into policies for climate change adaptation and disaster risk reduction (2022)	Report	https://portals.iucn.org/library/node/49992
Planning and delivering Nature-based Solutions in Mediterranean cities: First assessment of the IUCN NbS Global Standard in Mediterranean urban areas	Report/Assessment	https://portals.iucn.org/library/node/49779

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TITLE	TYPE OF MATERIAL	AVAILABLE AT
(2021)		
Towards Nature-based Solutions in the Mediterranean (2022)	Report/Compilation of case studies	https://iucn.org/sites/default/files/2022-07/towards_nature-based_solutions_in_the_mediterranean.pdf
Nature-based solutions to climate change adaptation in urban areas (2017)	Report	https://portals.iucn.org/library/node/47907
Enhancing Nature-based Solutions in Albania (2025)	Report	https://portals.iucn.org/library/node/52624
Towards Nature-based Solutions at scale: 10 case studies from China (2023)	Report/Compilation of case studies	https://portals.iucn.org/library/node/50761
Ecosystem based adaptation: knowledge gaps in making an economic case for investing in nature based solutions for climate change (2015)	Report	https://portals.iucn.org/library/node/45156
Climate mitigation and biodiversity conservation (2024)	Report/Review	https://doi.org/10.2305/WGZI5482
Nature-based Solutions Self-Assessment Tool | iNbS platform	Self-assessment form	https://inbs.iucn.org/apply/nature-based-solutions-self-assessment/tool/
Diseño de proyectos de recuperación de ecosistemas degradados. Guía suplementaria para la utilización del estándar global de las Soluciones basadas en la Naturaleza de la UICN (2024)	Guidelines	https://iucn.org/sites/default/files/2024-12/uicn-guia-a4_online_compressed.pdf
Professional Certificate on NbS Online course	Online course	IUCN Academy

You can consult these and other publications in the IUCN virtual Library https://portals.iucn.org/library/.

Other useful resource on the topic is:

Castellari, S., Zandersen, M., Davis, M., Veerkamp, C., Förster, J., Marttunen, M., Mysiak, J., Vandewalle, M., Medri, S. & Picatoste, J.R. (2021): *Nature-based solutions in Europe: policy, knowledge and practice for climate change adaptation and disaster risk reduction.* EEA Report 01/2021. Office for Official Publications of the European Communities, Luxembourg, https://doi.org/10.2800/919315

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Appendix II: Results of the first Nature-based Solutions (NbS) assessment of the Turin case study and IUCN Feedback

February 2026

This document presents the results of the evaluation of the intervention being implemented as part of the FARCLIMATE project in the Turin case study, using the IUCN Global Standard for Nature-based Solutions™ to assess its alignment with this Standard. The following are recommendations from IUCN for improving those criteria which, at the time of assessment, showed the least alignment with the Standard, with a view to sharing it with the case study and enhancing the design and implementation of the intervention using a NbS approach.

The assessment was carried out by the partner Green Growth Generation, responsible for the Turin case study, using the IUCN NbS online self-assessment tool (OSAT; https://inbs.iucn.org/apply/nature-based-solutions-self-assessment/), with support from IUCN following a virtual meeting to familiarise GGG with the tool.

Preparatoy questionnaire shared by IUCN to help contextualise the assessment:

Preparing the NbS assessment (through the online self-assessment tool)

Information about the intervention

Intervention name: Il Verde che Vorrei – Parella Community

Location: Turin, Italy (Parella Neighbour)

Geographical scope (mark "X"): Local / Regional / National / Multinational

Timeframe (dd/mm/yy)
Start date: August 2025
Targeted end date: ongoing/October 2027 (?)

Status of the intervention:

At which of the following stage is your intervention? You may choose more than one option (mark "X").

X Being designed: *the intervention is at the design stage.*

X Under implementation: *the intervention is being implemented and monitored according to design.*

Outcomes realised: *the intervention is having its intended impact.*

Description of the intervention

Describe the initial need/problem statement. Specify the needs.

Parella neighbourhoods in Turin face increasing climate-related challenges, including heat stress, limited access to green spaces, and fragmented community governance of urban nature. These challenges are compounded by social inequalities and limited opportunities for citizens to actively participate in climate adaptation and nature-based solutions.

Describe what the solution to the need/problem is. How to propose the specific interventions.

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The GGG Living Lab supports communities in the co-design, testing, and stewardship of nature-based solutions, such as community-managed urban gardens and green spaces. Through participatory processes, facilitation, and iterative learning, we enable locally adapted solutions that combine environmental improvement with social inclusion and collaborative governance.

What are the main societal challenge(s) this intervention plans to address?

Select at least one societal challenge from the list. If you select "Environmental degradation and biodiversity loss", please select an additional challenge in the list (mark "X").

X Climate change mitigation and adaptation
Disaster risk reduction
X Economic and social development
Human health
Food security
Water Security
X Environmental degradation and biodiversity loss

Describe what are intended results.

- Improved quality and resilience of urban green spaces
- Increased community capacity to co-manage and steward nature-based solutions
- Enhanced local awareness of climate adaptation and biodiversity
- Shared action plans for sustainable urban green space development
- Transferable lessons for future urban NbS initiatives

In which sector(s) is the intervention operating? You may choose more than one option (mark "X").

X Agriculture
Forestry
Fisheries
Mining and quarrying
Manufacturing
Electricity, gas, steam and air conditioning supply
Water supply; sewerage, waste management and remediation activities
Construction
Wholesale and retail trade; repair of motor vehicles and motorcycles
Transportation and storage
Accommodation and food services activities
Information and communication
Financial and insurance activities
Real estate activities
X Professional, scientific and technical activities
Administrative and support services activities
Public administration and defence; compulsory social security

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X Education

Human health and social work activities

X Arts, entertainment, and recreation

X Other services activities

Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

Activities of extraterritorial organisations and bodies

Natural resource management

X Sustainable development

Conservation

X Other: Community based urban governance

Organisations/groups/actors leading the intervention: N/A

Assessment results provided by the OSAT:

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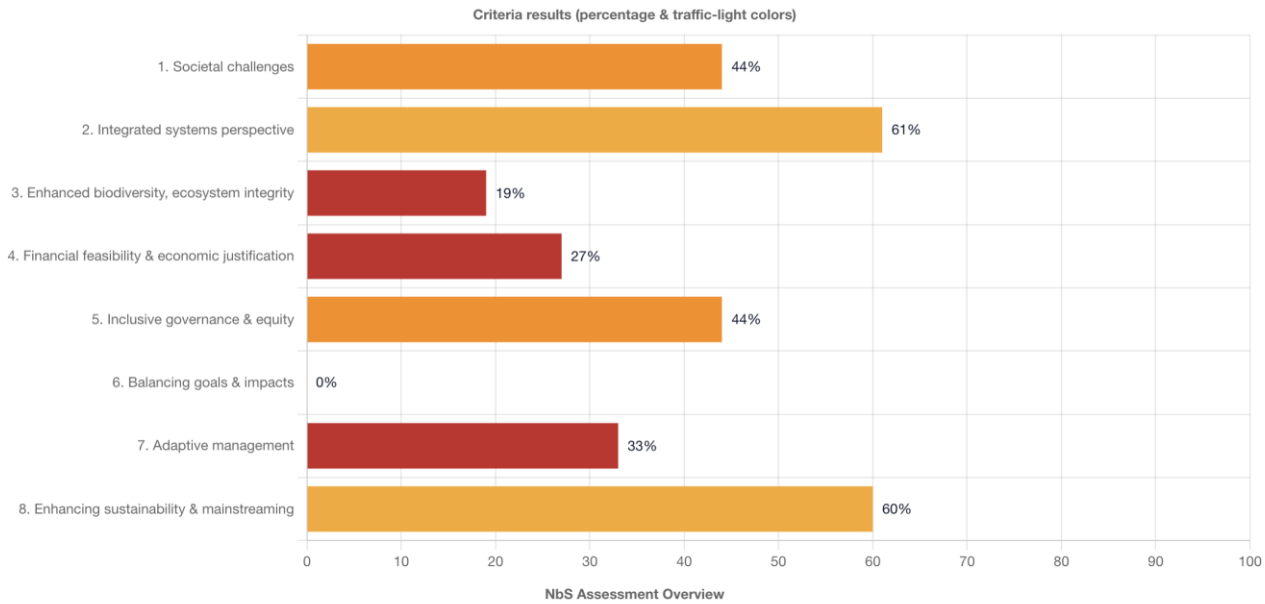
The results presented below provide both quantitative scoring against benchmark standards and qualitative guidance for strengthening your nature-based solution. Each assessment dimension reflects the current state of your intervention while identifying pathways for iterative improvement and adaptive management enhancement. This evaluation serves as both a verification tool and a learning instrument, supporting the continuous development of your NbS approach within broader socio-ecological systems.

Assessment Levels

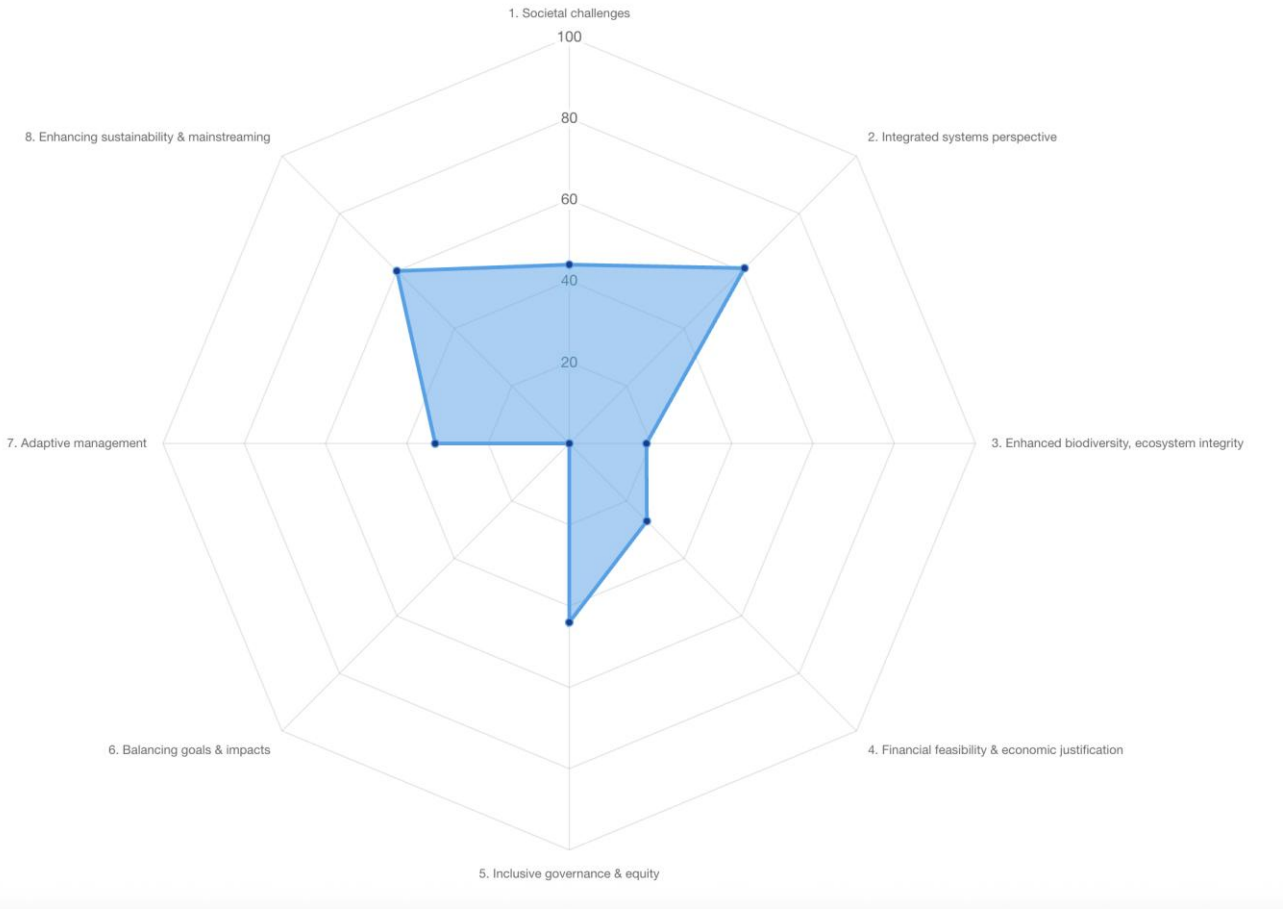
Strong (80–100%) Adequate (60–79%) Partial (40–59%) Insufficient (0–39%)

Total Score: 54 / 147 (37%)
Intervention does not fully adhere to the IUCN Global Standard for NbS

Criterion	Your Score	Maximum Score	Percentage	Assessment	Key
1. Societal challenges	8	18	44%	44%	Partial
2. Integrated systems perspective	11	18	61%	61%	Adequate
3. Enhanced biodiversity, ecosystem integrity	4	21	19%	19%	Insufficient
4. Financial feasibility & economic justification	4	15	27%	27%	Insufficient
5. Inclusive governance & equity	12	27	44%	44%	Partial
6. Balancing goals & impacts	0	15	0%	0%	Insufficient
7. Adaptive management	6	18	33%	33%	Insufficient
8. Enhancing sustainability & mainstreaming	9	15	60%	60%	Adequate



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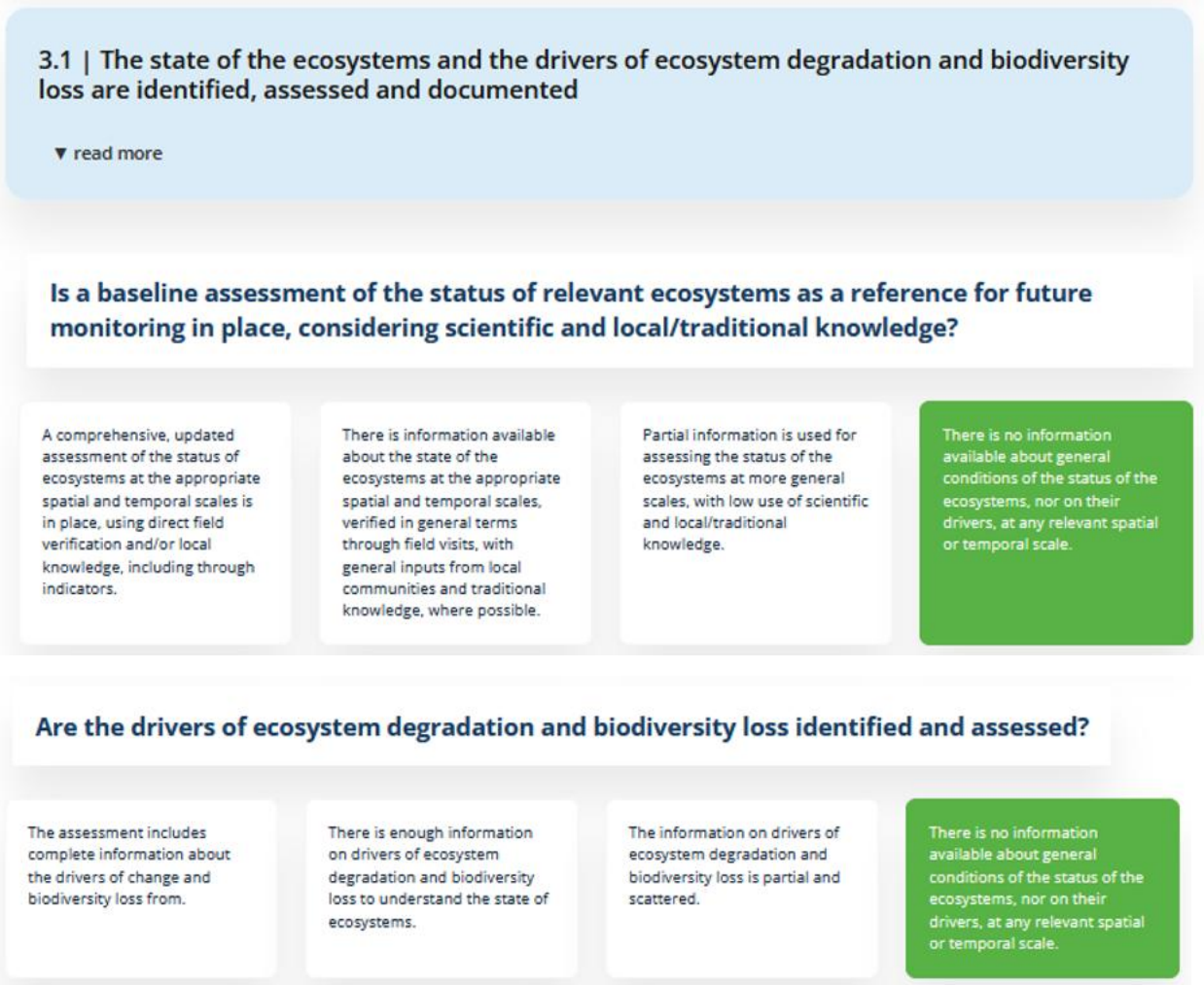
Recommendations for improvement regarding the criteria with the lowest percentage of alignment:

The first point to note is that it is neither a cause for concern nor a negative sign at this stage of the intervention that the majority of criteria have low scores, with only partial or insufficient alignment with the Standard. This is because, at the time of this assessment, the intervention is in the early design/development phase across its various components; therefore, it is important to bear in mind that there is scope for improvement, and we hope that the recommendations set out here will contribute to this.

Below is a brief analysis of the criteria for which the score is 'Insufficient' (3, 4, 6, 7 – with 6 indicating the lowest level of compliance, 0 per cent) with recommendations for improvement. To this end, the OSAT questions for those criteria have been included (not all the responses given for all the indicators are included here, so as not to make the document too long) to assess alignment with each indicator, along with the responses selected in each case, in order to provide more targeted and precise recommendations.

Criterion 3. NbS result in positive change in the state of biodiversity and enhanced ecosystem integrity, including connectivity: **INSUFFICIENT 19%**

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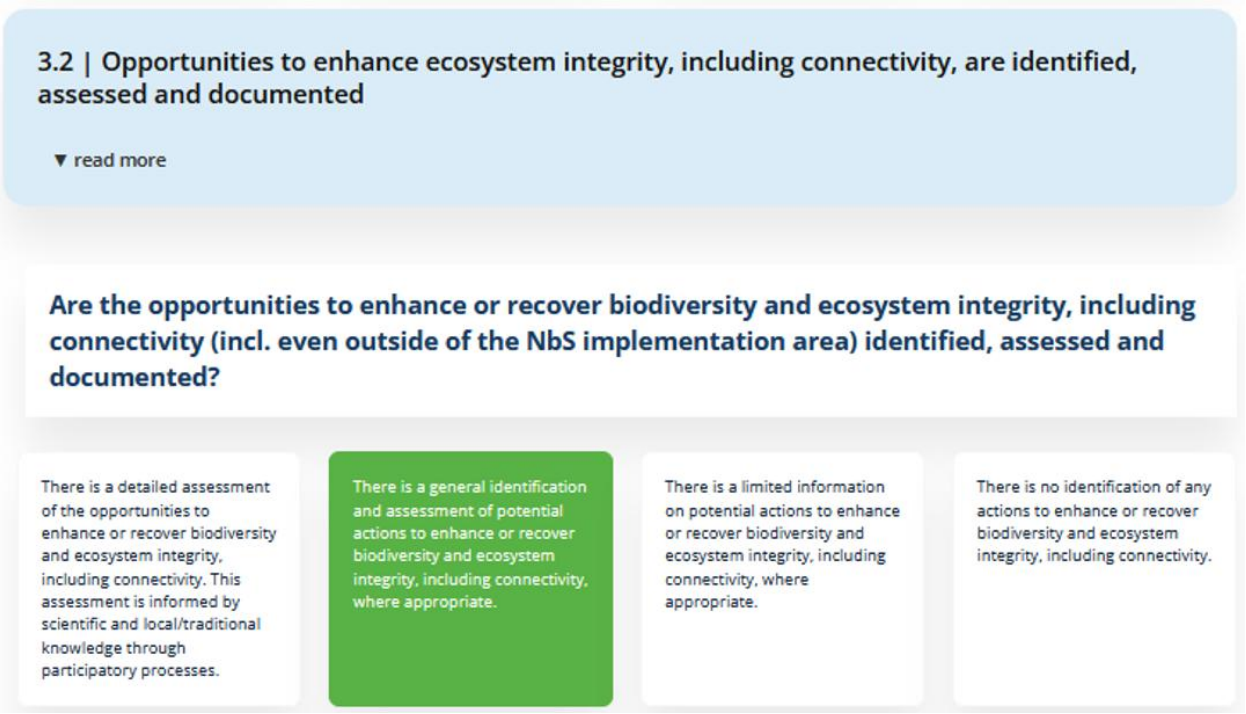


IUCN recommendation:

What should be added: **A baseline assessment and a driver analysis** integrating scientific evidence and local knowledge. **Reinforcing collaboration with scientific and research institutions** could support the development of more robust ecosystem evaluations. **At the same time integrating local and field knowledge** through regular observations and stakeholder involvement could help improve the understanding of ecosystem dynamics and pressures over time. The baseline assessment should stablish the biodiversity indicators that will be measured all over the intervention, with a SMART logic, depending on the resources and knowledge available for it.

- The baseline assessment needs to be broad enough to characterise ecological state, drivers for ecosystem loss and options for net improvements, making use of both local knowledge and scientific understanding where possible

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IUCN recommendation:

What should be added: Greater attention to **landscape-scale connectivity, supported by field observations and scientific planning**, to better understand how local actions contribute to wider ecological networks.

- Utilising NbS can provide an opportunity to enhance biodiversity conservation and ecosystem management efforts in ways that other types of intervention, in isolation (such as engineering), will not be able to achieve. If solutions are to be implemented close to natural ecosystems that are managed explicitly for conservation outcomes, the NbS should be designed to enable greater ecosystem connectivity. Furthermore, they could be designed to re-introduce lost components of an existing ecosystem, for example, by deliberately choosing formerly existing species of vegetation when re-storing.

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IUCN recommendation:

What should be added: **Defining specific and measurable biodiversity metrics and strengthening collaboration with scientific actors** could improve data collection and reporting. Indicators for measuring the improvement of biodiversity in the gardens should be added to the monitoring system (the same already stablished for the baseline). They should be simple and easier to monitor. See some pre-selected indicators for some examples, in Deliverable 3.1.

- In order to inform the design, monitoring and assessment of an NbS, targets for enhancing key biodiversity values should be established. For each NbS, the type of target may differ; for example, the target could be the percentage of ecosystem area restored or the return of a keystone species.

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IUCN recommendation:

What should be added: **Reinforcing monitoring systems** to detect potential impacts and adopting preventive approaches could help identify and mitigate potential negative effects before they become significant.

- Ecosystems are complex with interdependent components and processes. There will always be a level of uncertainty in how they will react to specific interventions or other external changes. Therefore, NbS should be designed and monitored to minimise and mitigate unanticipated risks that might undermine the ecological foundations of the solution itself.

Criterion 4. NbS are financially feasible and economically justified: **INSUFFICIENT 27%**

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IUCN recommendation:

What should be added: This suggests the need to **Develop user friendly** methodologies for cost benefit analysis, meaning simpler ways to identify and account for not only direct costs but also wider social and environmental benefits of NbS. In addition**, Capacity building programs and advisory services** can improve stakeholders' understanding of indirect costs, externalities, and their valuation, helping actors better recognise who benefits from NbS and who bears the costs over time.

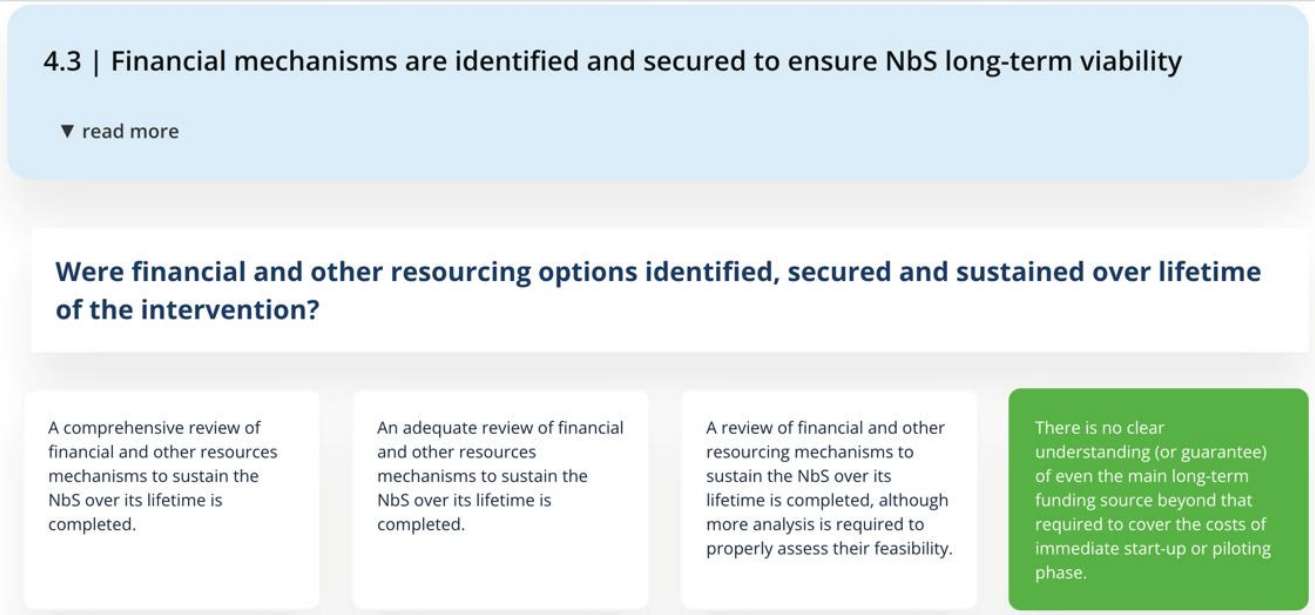
- Identification and documentation of the main benefits derived, including their direct and indirect, financial and non-financial elements are key components for assessing the economic feasibility of the intervention, over time. This information should be differentiated according to who receives the benefits and who bears the costs.

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IUCN recommendation:

What should be added: **Develop user friendly tools for cost effectiveness analysis,** which would allow stakeholders to compare NbS with alternative approaches in a clearer and more structured way. Moreover, promote **research on cost effectiveness** and ecosystem services can support the generation of evidence on the economic value of NbS outcomes**,** while **promoting comparison among alternative solutions** can facilitate shared learning about what works best in different contexts. This will be supported by FARCLIMATE all along the project through its several tasks and deliverables, for example the ecosystem services assessment framework will be included in D3.3 and D3.4



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IUCN recommendation:

What should be added: To ensure the long-term viability of the community garden network, a **diversified financing strategy should be developed**. This strategy should **combine municipal support, community contributions, partnerships with local businesses (sponsors) and civil society organisations, and revenue-generating activities** such as training events, seedling sales, local markets and other local produce initiatives. Secure formal commitments from local authorities for land access and maintenance support. A long-term maintenance and governance plan should be established to secure the financial sustainability of the gardens beyond the project lifetime.

Criterion 6. NbS seek to equitably reconcile the achievement of their primary goal(s) with any intended and unintended impacts on the continued provision of multiple benefits: **INSUFFICIENT 0%**



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Is the process of decision-making regarding safeguards and corrective measures transparent, inclusive and participatory?

Safeguards and corrective actions are established through a transparent, inclusive and participatory process and disclosed to affected stakeholders and rights-holders, including Indigenous Peoples, local communities, and vulnerable groups.	Some safeguards and corrective actions are established through a transparent, inclusive and participatory process.	The process of decision-making regarding safeguards and corrective measures is not transparent, inclusive and participatory.	No safeguards and associated corrective actions are in place.

6.2 | Safeguards and corrective actions are documented, available, accessible to affected stakeholders and rights-holders, and implemented

▼ read more

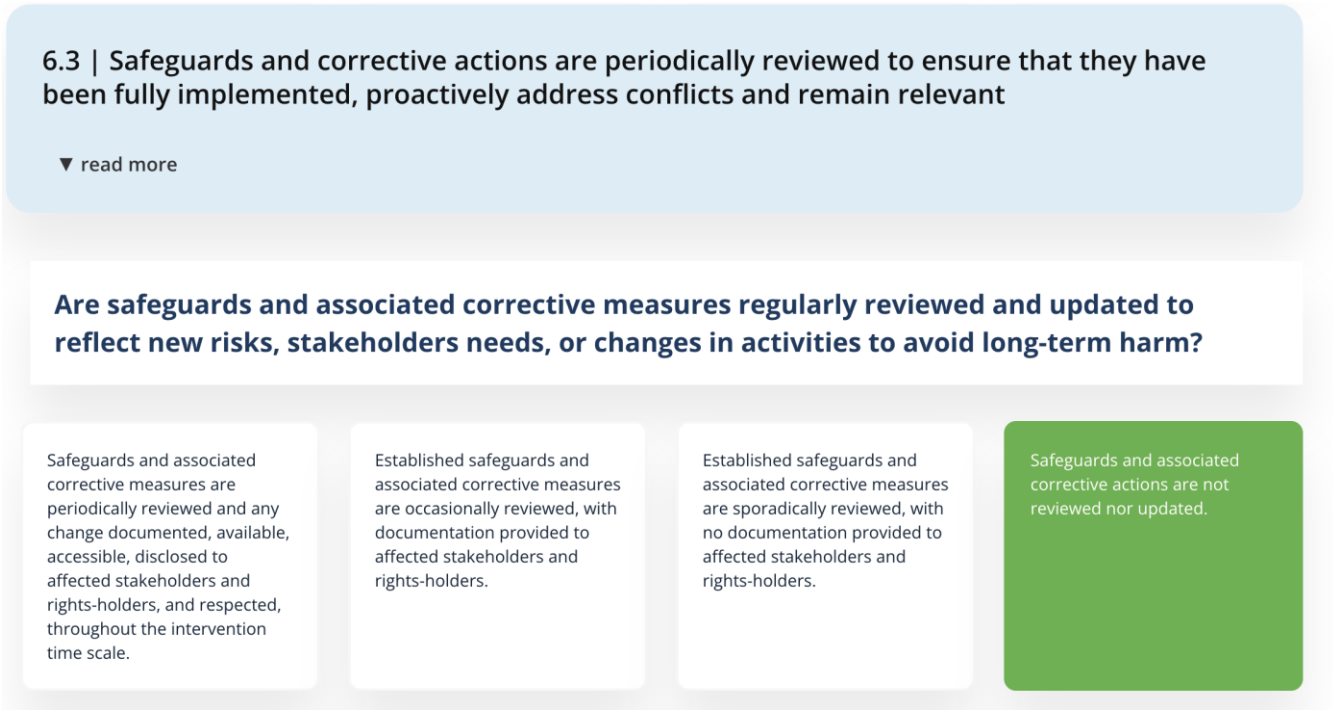
Have the established safeguards and corrective actions been disclosed with methods appropriate for the affected stakeholders and rights-holders?

The established safeguards and corrective actions are properly documented, available, accessible and disclosed to affected stakeholders and rights-holders.	Some safeguards and corrective actions are documented, available, accessible and disclosed to affected stakeholders and rights-holders.	Some safeguards and corrective actions are documented, but are not available, accessible and disclosed to affected stakeholders and rights-holders.	Safeguards and associated corrective actions are not disclosed, neither integrated in the NbS.

Are the established safeguards and corrective actions integrated in the NbS and implemented and monitored?

They are fully integrated in the NbS, implemented and respected.	They are integrated in the NbS, implemented and respected, though some knowledge gaps persist in some areas or parts of the NbS.	The established safeguards and corrective actions are integrated in the NbS, but not implemented nor regularly monitored and reviewed.	Safeguards and associated corrective actions are not disclosed, neither integrated in the NbS.

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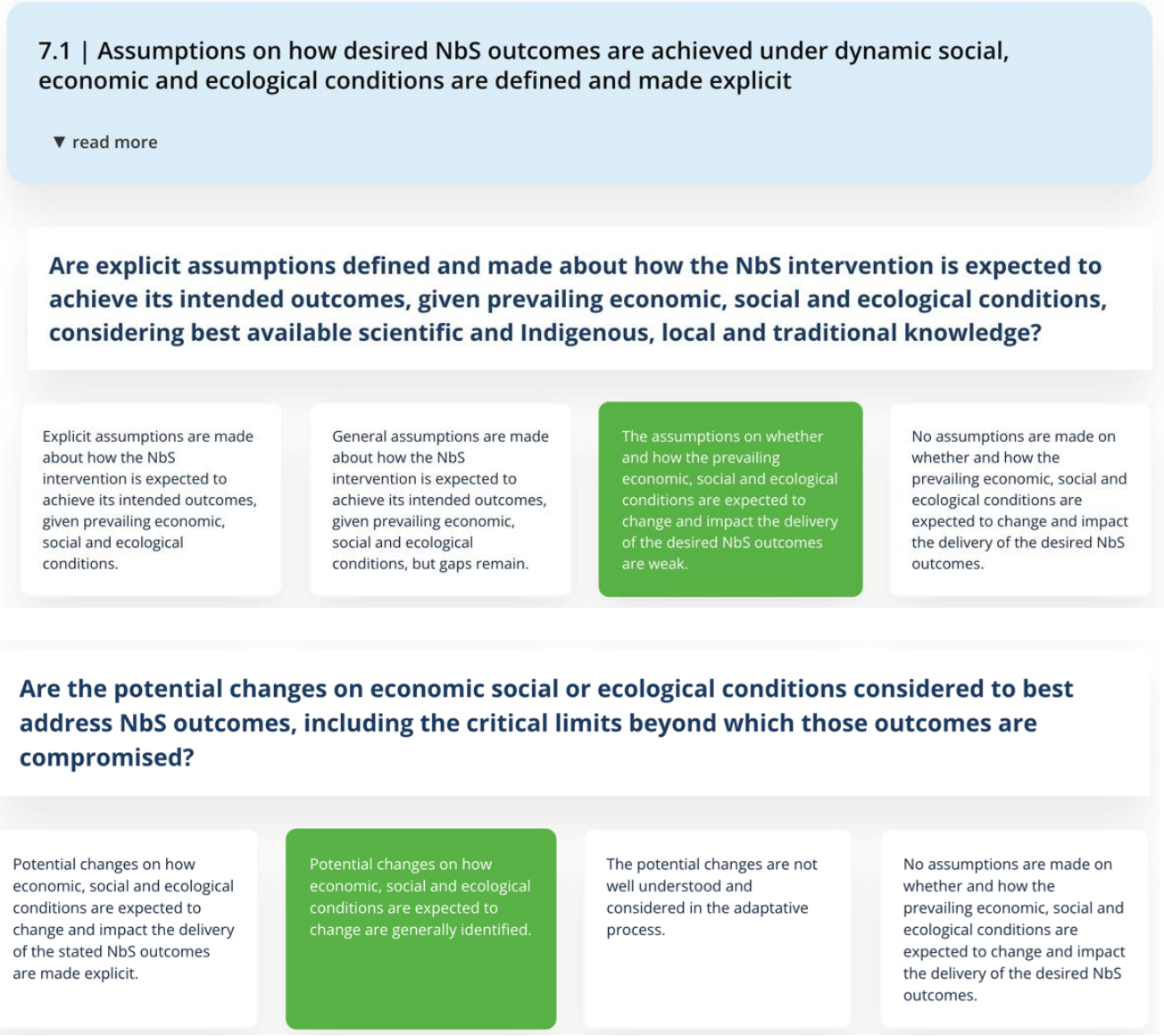
IUCN recommendation:

What should be added: For this criterion, the lack of trade-offs analysis between biodiversity goals and social and economic benefits suggests conducting **full cost-benefit accounting of interventions**, in order to better understand how different impacts interact across the project area and beyond. At the same time, **acknowledging and analysing trade-offs** can help make visible the tensions between short-term actions and long-term sustainability, supporting more informed decision-making.

- A key function of NbS safeguards is to ensure that necessary trade-offs do not negatively impact the most disadvantaged elements of society or, equally, that they are denied access to the intervention's benefits. It is therefore important that the costs and benefits of trade-off arrangements are fully understood, widely shared among affected stakeholders, and periodically revisited.

Criterion 7. NbS are managed adaptively, based on evidence: **INSUFFICIENT 33%**

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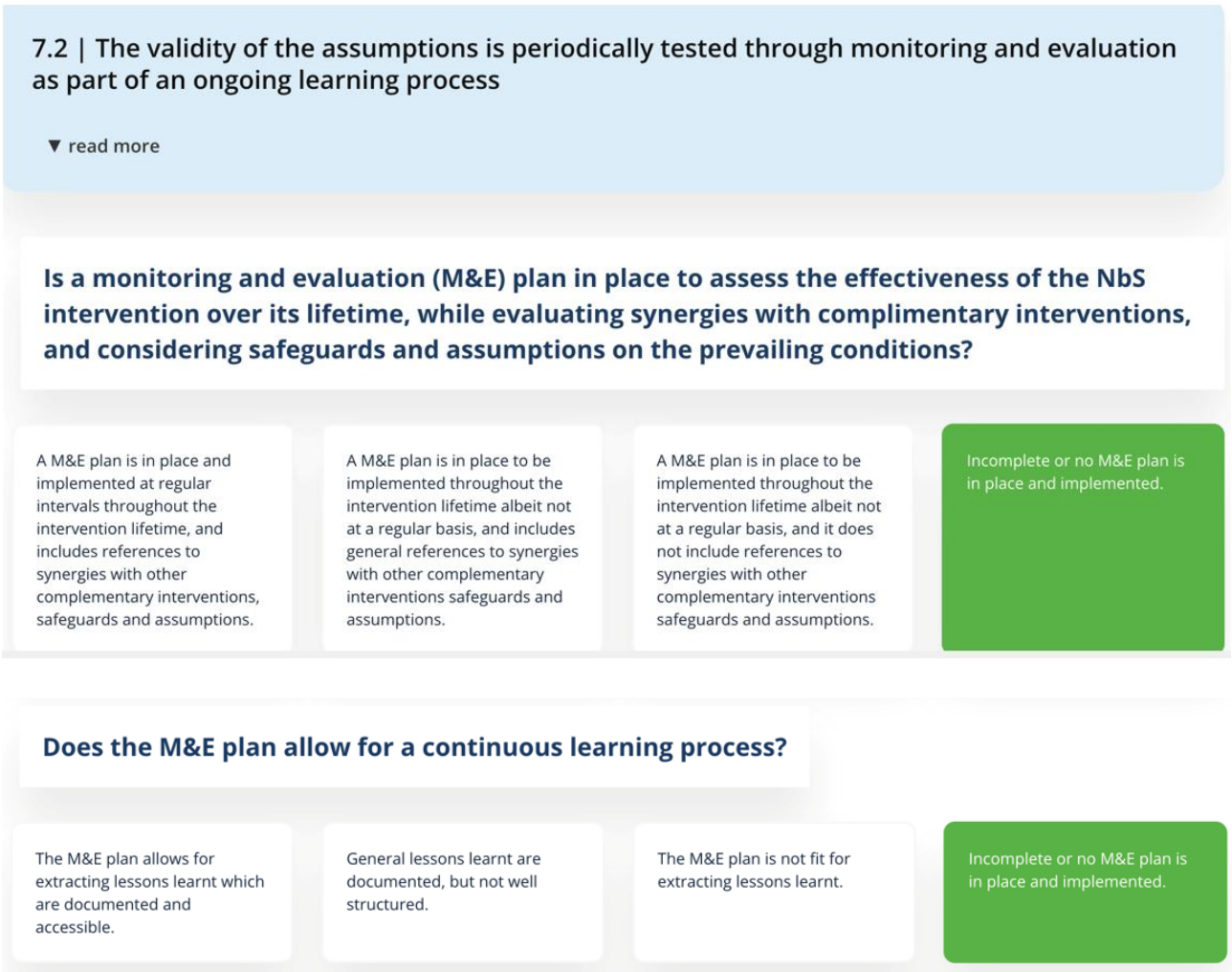


IUCN recommendation:

What should be added: The need to **develop a clear NbS strategy** meaning a clearer explanation of how actions are expected to produce results under current conditions.

- An NbS strategy, at its most basic, includes the reasoning behind the NbS, a precise articulation of the intended outcomes and clear understanding of how these should be achieved through the actions taken. It should be informed by the prevailing economic, social and ecological conditions, and clearly state the assumptions as to whether and how they are expected to change.

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IUCN recommendation:

What should be added: **Develop monitoring and evaluation processes** allowing project outcomes and assumptions to be assessed in a more systematic and transparent way.

- A monitoring and evaluation plan is a key requirement to understand whether the NbS strategy effectively delivers the intended outcomes and, thereby addressing the societal challenge; and, whether risks or unexpected impacts mean a change in strategy or action is required. Where NbS have synergies with other interventions or approaches, these should be included in the monitoring and evaluation (M&E) plan. For this Criterion, indicators 7.1 and 7.2 provide a continuous feedback loop to learn and adapt the NbS intervention. Ideally, iterative learning is institutionalised so that it carries on even after the NbS intervention ceases.

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IUCN recommendation:

What should be added: **Develop a framework for adaptive management** to formally link evidence to management adjustments.

- Learning based on evidence should drive NbS management. Furthermore, iterative learning is essential in informing adaptive management actions, in order to respond to the factors influencing NbS interventions.

Bibliography and useful resources

IUCN Global Standard for Nature-based Solutions. https://inbs.iucn.org/understand/global-standard-for-nature-based-solutions/

Martín Sánchez, A., Jimenez, R. R., Macfarlane, N. B. W., Schmid, T., Bernardini, L. G., Werni, C., Niedźwiecki, J., Padoan, E., & Latorre, G. (2024). *D2.5 Assessing Soil Health-related Interventions through the IUCN Global Standard for NbS and Mapping Opportunities to Reduce Species Extinction Risk. Middle version.* NBSOIL project funded under Grant Agreement No. 101091246 of the European Union's Horizon Europe Programme. November 2024. Unpublished project deliverable.

Martín Sánchez A., Zukowski L. (2023). *D2.4 Analysing NBS categories through the IUCN Global Standard for NBS on soil health. Initial version.* NBSOIL project funded under grant

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Urban Nature Atlas. (2024, 15 June). *'Nature Island' Community Garden - Pennenfeld, Bonn*. UNA. https://una.city/nbs/bonn/nature-island-community-garden-pennenfeld-bonn

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Appendix III: Milestone 7 – Close-To-Nature silviculture demonstrative stands

Introduction

Task 5.3 "Close-to-Nature Silviculture Management" within the FARCLIMATE project focuses on the development and improvement of Close-to-Nature Silviculture (CNS) practices in the forestry sector. This task is still ongoing; therefore, the results presented here are preliminary and subject to revision. To date, data have been collected from only two demonstrative stands, with further inventories planned in the coming months.

The work is centred on case studies in regions where forestry plays a particularly significant role. The original plan envisaged the establishment of a European network of eight CNS Labs, each comprising two demonstrative stands (16 in total). However, due to the strong interest expressed by forest owners from different locations, the 16 stands are now being redistributed across a larger number of CNS Labs. These Labs will serve as reference sites for implementing the core principles of CNS, including the promotion of native tree species, encouragement of natural regeneration, enhancement of structural diversity, and reduction of intensive management practices.

Each Lab will consist of at least one demonstrative stand, implemented by CESEFOR in accordance with a standardised protocol for inventories, database development, and monitoring. This protocol is aligned with Pro Silva (*Association Futaie Irrégulière* – AFI; https://www.prosilva.org/close-to-nature-forestry/) methodologies to ensure consistency, comparability, and knowledge exchange.

The demonstrative stands will be equipped with sensors to monitor key environmental and forestry parameters, including: ambient temperature, ambient humidity, soil temperature, soil moisture, tree water consumption, and biomass growth (tree diameter). The sensor systems will be powered by solar panels and batteries, with data transmitted through a LoRaWAN-based communication network.

In addition to automated data collection, field monitoring will be carried out systematically, including the recording of forestry interventions, following a protocol developed by CESEFOR. Moreover, Pro Silva's exemplary forests will be invited to join the European CNS Demonstrative Stands Network, thereby broadening the initiative's reach and impact.

Methodology and common protocol of inventory

The demonstrative CNS Labs were selected based on their availability and willingness to actively participate in the FARCLIMATE project. Each participating forest owner must commit to apply CNS principles in the areas where demonstrative stands would be established. These principles include:

- Conducting light thinnings that reduce competition among trees while maintaining continuous canopy cover.
- Promoting high-quality trees to maximize the benefits of future harvests.
- Supporting the development of secondary tree species.
- Removing trees of various sizes to preserve an irregular stand structure.
- Enhancing biodiversity through the retention of deadwood and habitat features.

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The selection of trees will be carried out by CESEFOR, or any other local organisation contracted by CESEFOR, while the harvesting operations will be executed by an external contractor. All economic returns generated from these interventions will be fully allocated to the forest owners.

Once agreements with the owners are secured, the methodology for establishing the demonstrative CNS Labs will be implemented. Each CNS Lab should at least count with one demonstrative stand, which refers to a forest surface that must start to follow the Close-to-Nature principles. Inside this demonstrative stand a monitoring device is stablished based on the AFI-Pro Silva framework. It consists of 10 systematically distributed plots (Figure A-1), covering a surface of approximately 20 hectares, in a representative manner. For each monitoring device, a common protocol of data inventory is applied, which included the following measurements:

- Tree position.
- Tree species.
- Diameter at breast height (DBH).
- Tree height.
- Height of the base of the crown.
- Crown dimensions (various measures of crown breadth).
- Indicators of biodiversity (presence of knots, cavities, mosses, lichens, etc.).
- Characteristics of deadwood.
- Extent and quality of natural regeneration.

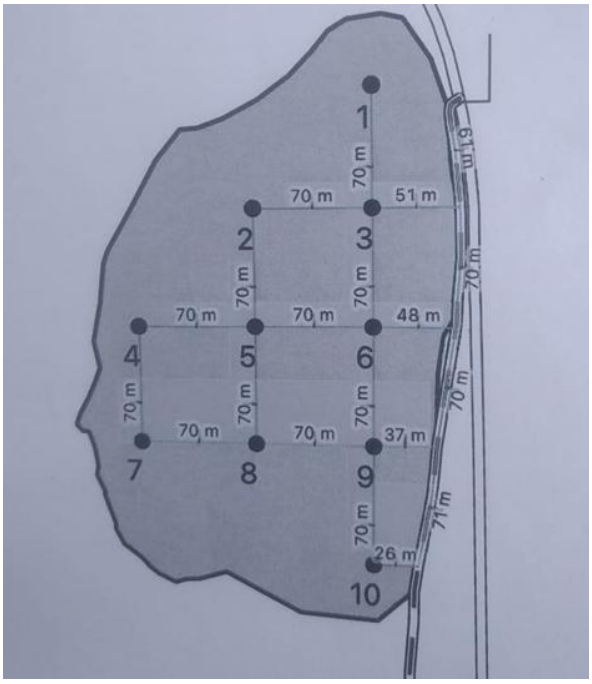


Figure A-1 - Example of a demonstrative stand, with a monitoring device established on it. Each monitoring device includes 10 plots systematically distributed.

Following completion of the inventory, tree selection will be carried out by CNS experts in accordance with the principles outlined above. This step ensures that silvicultural interventions are consistent, scientifically grounded, and replicable across all demonstrative stands.

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Current situation of the demonstrative Close-to-Nature Labs

Currently, the demonstrative CNS Labs are at different stages of development. Figure A-2 presents general information about them, while Figure A-3 includes a map showing their locations. Although the initial plan was to establish 8 CNS Labs, each comprising two demonstrative stands (16 in total), the interest expressed by owners from various locations led to a redistribution of the 16 stands across a larger number of CNS Labs. It should be noted that the selection of demonstrative stands is still in progress, and the distribution of CNS Labs may change.

Number	Demonstrative Stand Name	CNS Lab Name	Country	Bioclimatic Region	Development Status	Forest Type
1	Segovia	Pyrenean oak	Spain	Mediterranean	Monitored	Forest of Quercus pyrenaica
2	Soria	Pyrenean oak	Spain	Mediterranean	Climatic station	Forest of Quercus pyrenaica
3	Basque Country 1	Basque country	Spain	Atlantic	Located	Forest of Pinus radiata
4	Basque Country 2	Basque country	Spain	Atlantic	Accepted	Not defined yet
5	Fundão	Fundão	Portugal	Mediterranean	Located	Mixed forest of Mediterranean species
6	Galicia 1	Galicia	Spain	Atlantic	Located	Forest of Quercus robur
7	Galicia 2	Galicia	Spain	Atlantic	Located	Forest of Pseudotsuga menziiesi
8	Cádiz	Cádiz	Spain	Mediterranean	Accepted	Forest of Quercus suber
9	Madrid	Pine forests in Central Spain	Spain	Mediterranean	Accepted	Forest of Pinus sylvestris
10	Valladolid	Pine forests in Central Spain	Spain	Mediterranean	Accepted	Forest of Pinus pinea
11	Provence	Provence	France	Mediterranean	Accepted	Mixed forest of Mediterranean species
12	Vrancea	Vrancea	Romania	Continental	Accepted	Forest plantation of Pinus sp.
13	Bavaria	-	Germany	Continental	Initial contacts	-
14	Toscany	-	Italy	Mediterranean	Initial contacts	-
15	Istria	-	Croatia	Mediterranean	Initial contacts	-
16	Western Macedonia	-	Greece	Mediterranean	Initial contacts	-

***Figure A-2** - Current status of the demonstrative stands selected in the FARCLIMATE project. The development stages range from less advanced to more advanced, as follows: Initial contacts (the forest owner has shown interest, but no agreement has been reached yet); Accepted (the forest owner has agreed to the establishment of the demonstrative stand); Located (the CESEFOR team has visited the site, and the location of the demonstrative stand has been defined; Monitored (the inventory protocol has been applied); Climatic station (a climatic station has been established in the demonstrative stand). Please note that these sites may vary, as negotiations with other interested locations are still on-going.*

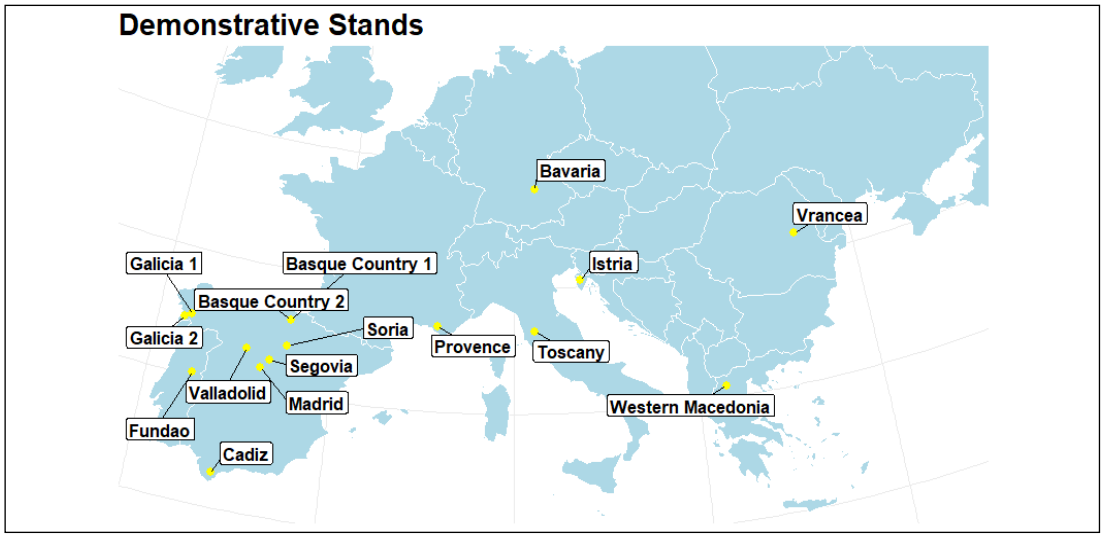


Figure A-3 - Location of the demonstrative stands in Europe.

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Datasheets

Demonstrative stand Soria			
CNS Lab	Pyrenean oak	**Bioclimatic region**	Mediterranean
Country	Spain	**Previous management**	Irregular management
Region NUTS3	ES417 - Soria	**Main tree species**	Quercus pyrenaica
Latitude	41.959026	**Secondary tree species**	*Pinus sylvestris, Fagus sylvatica and Sorbus aria*
Longitude	-2.632076	**Basal area (m2/ha)**	19.4
Altitude (masl)	1402	**Volume (m3/ha)**	130
Ownership	Public Forest	**Number of trees (trees/ha)**	418

Demonstrative stand Segovia			
CNS Lab	Pyrenean oak	**Bioclimatic region**	Mediterranean
Country	Spain	**Previous management**	Irregular management
Region NUTS3	ES416 - Segovia	**Main tree species**	Quercus pyrenaica
Latitude	41.22878	**Secondary tree species**	*Salix sp.*
Longitude	-3.4656435	**Basal area (m2/ha)**	23.5
Altitude (masl)	1368	**Volume (m3/ha)**	219
Ownership	Public Forest	**Number of trees (trees/ha)**	179

*NUTS: Nomenclature of territorial units for statistics

Demonstrative stands that have not yet reached the 'Monitored' development status are not included in either the Datasheets section or the Data Access section, as data collection has not yet begun.

Data access

Data collected in each demonstrative CNS Lab is published in the open-access repository Zenodo (https://zenodo.org/communities/farclimateproject/; after registration and sign-up). Open-access data is essential for ensuring transparency, fostering collaboration, and enabling knowledge exchange among researchers, practitioners, and policymakers. By making these datasets freely available, the FARCLIMATE project not only contributes to scientific progress but also upholds its core principles of openness, inclusivity, and sustainability.

The datasets published in Zenodo include inventory data, climatic data obtained through sensors, and tree-marking reports. However, only general information about each stand will be made available here. For access to more detailed datasets, it is necessary to use Open Forest Space, as described below.

Direct access to the Zenodo repository: Demonstrative stands FARCLIMATE project

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As mentioned, detailed data is integrated into Open Forest Space, an open-access forestry data network developed by CESEFOR. Open Forest Space is a collaborative platform that consolidates forestry-related datasets from different sources, enhancing their visibility, interoperability, and reuse. By connecting researchers, managers, and institutions, it serves as a digital hub for advancing sustainable forest management and promoting climate resilience strategies.

Please note that this platform is still under development, and the data from the demonstrative stands is in the process of being uploaded.

Access to Open Forest Space: https://selviaula.com/open-forest-space/

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