MODULE B1
Implementation Guidelines for FWC-NbS in the Mediterranean

Training Manual

October, 2025

The training programme has been developed within the framework of the NATMed project **“Nature-based Solutions on existing infrastructures for resilient water management in the Mediterranean”** funded by the PRIMA programme.

This manual is a collection of notes for workshop participants and is intended to complement the presentation delivered by the workshop facilitator.

For more detailed information on each module, please refer to the "Further Information" section provided at the end of each module, as well as the project website: **https://natmed-project.eu**

This project has received funding from the European Union’s PRIMA Research and innovation programme under Grant Agreement No 2221.

FWC-NbS TRAINING PROGRAMME

MODULE A – Lessons learnt from NATMed case studies

A1: Knowledge Sharing from the Implementation of FWC-NbS
A2: IUCN Global standards for NbS (self-assessment tool)
A3: Replicability and Upscaling of FWC-NbS projects

MODULE B – NATMed tools

B1: Implementation Guidelines for FWC-NbS in the Mediterranean
B2: Citizen engagement and co-design procedures
B3: NATMed decision-making tool for the implementation of FWC-NbS

MODULE C – Market-based Mechanisms for NbS implementation

C1: Financial mechanisms, opportunities and business models for NbS

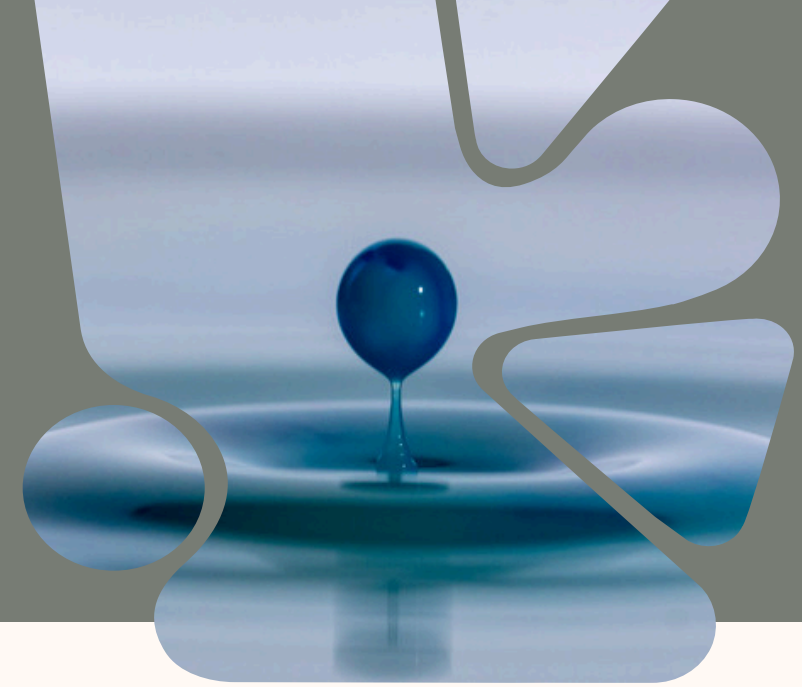
NATMed

Contents

Introduction.....6
What will you learn?.....7
Guiding questions.....7
Who is this for?.....7
Background and foundation of the guidelines.....8
Step 1 – Identify Societal Challenges and its drivers.....10
Step 2 – Develop a Theory of Change and NbS strategy.....12
Step 3 – Identify FWC-NbS Options.....15
Step 4 – Select NbS and ensure economic feasibility and sustainability.....17
Step 5 – Integrate Biodiversity and Ecosystem Improvement goals.....20
Step 6 – Develop a Participation & Governance Plan.....23
Step 7 – Monitoring and Evaluation Plan.....26

Contents

Step 8 – Synergies and interactions.....29
Step 9 – Risk analysis and balancing trade-offs.....32
Step 10 – Communication and dissemination plan.....34
Step 11 – Mainstreaming and policy impact.....36
Step 12 – Maintenance and Operation (M&O).....38
Step13 -Tendering process.....40
Other aspects to foresee.....42
Further Information.....43
Quiz.....44
Glossary.....45



Introduction

This module provides **practical, step-by-step implementation guidelines for the design, delivery, and long-term sustainability of Full Water Cycle Nature-based Solutions (FWC-NbS) in the Mediterranean context**. Building on the experience of the NATMed project and aligned with the IUCN Global Standard for Nature-based Solutions, it translates evidence, good practices, and lessons learned from real-world case studies into an actionable framework that supports practitioners throughout the entire FWC-NbS lifecycle.

Structured as a coherent implementation pathway, the module guides decision-makers, technical experts, and local and regional actors from the identification of societal challenges through design, governance, monitoring, financing, and policy mainstreaming, up to maintenance and procurement. It emphasises biodiversity enhancement, stakeholder participation, economic feasibility, and adaptive management, while remaining flexible enough to be tailored to diverse local, institutional, and environmental conditions across the Mediterranean region.

What will you learn?

By completing this module, you will gain:

- Useful information to support the development and implementation of Full Water Cycle Nature-based Solutions (FWC-NbS).
- Clear guidance on the steps to follow, from identifying societal challenges to long-term operation, monitoring, and scaling-up.
- An understanding of the key aspects to consider when implementing NbS, including ecological, social, economic, governance, and sustainability dimensions, across the full lifetime of the intervention.

Guiding questions

Which societal challenges and drivers should be addressed, and how can NbS respond to them effectively?

How can NbS interventions be designed, implemented, and managed to deliver long-term environmental, social, and economic benefits?

What key factors must be considered to ensure stakeholder acceptance, ecological integrity, and long-term sustainability of NbS?

Who is this for?

Decision-makers;
Technical experts and practitioners;
Local and regional authorities;
SMEs;
Other stakeholders involved in NbS development;

Background and foundation of the guidelines

The NATMed project has designed, implemented, and evaluated a series of FWC-NbS across **five Mediterranean countries (Spain, Greece, Italy, Türkiye and Algeria)**. Please check module A1. These interventions:

- Address common challenges shared across the Mediterranean region.
- Respond to site-specific environmental, social, and economic conditions.

All FWC-NbS interventions were assessed against the **IUCN Global Standard for Nature-based Solutions (IUCN GS)**. Please check module A2. This assessment process enabled:

The identification of good practices across multiple dimensions of NbS implementation, including:

- Project design and planning
- Governance approaches
- Social innovation
- Biodiversity conservation
- Innovation, entrepreneurship, and scaling-up
- Monitoring and evaluation

The detection of **areas for improvement.**

LEADING TO THE FORMULATION OF THOSE GUIDELINES
designed to assist NbS practitioners in developing projects or interventions by providing practical information and guidance on the steps to follow and key considerations throughout the entire lifecycle of the intervention.

Background and foundation of the guidelines

How to read the guidelines?

These guidelines are structured as a **step-by-step implementation pathway** that follows the full lifecycle of a Nature-based Solution, from problem identification to long-term operation and mainstreaming.

Each step builds on the previous one and should be read sequentially, while recognising that NbS implementation is an iterative process that may require revisiting earlier steps as new information emerges. Readers are encouraged to use the guidelines as a practical reference, adapting the recommendations to their local context, institutional setting, and available resources, and applying them flexibly throughout the duration of the intervention.

For more information on the NATMed case studies, please refer to the module "A1 Knowledge Sharing from the Implementation of FWC-NbS". For a detailed description of the IUCN GS and how it was applied in NATMed, please consult module "A1 IUCN Global standards for NbS (self-assessment tool)"

Step 1 - Identify Societal Challenges and its drivers

Start the implementation of FWC-NbS by clearly identifying the societal and water-related challenges that need to be addressed.

What to do

Evidence collection and challenge identification

Identify **common national, regional, and local societal challenges** using existing information such as climate risk assessments, sectoral reports, scientific studies, and evidence from previous projects and local experience.
Consider **both short-term and long-term challenges**, using projections where available, and taking into account climate change impacts, population growth, tourism pressures, and land-use changes.
According to the IUCN, there are **seven major societal challenges** that NbS can address:

Move **from general challenges to site-specific ones**, using evidence to define the most relevant issues at the local scale.

Identify and document the **drivers of each societal challenge**, such as:

- Climate change and extreme events;
- Overexploitation of natural resources;
- Poor water or land management practices;
- Pollution and human-induced pressures.

Pay special attention to **rapidly changing environmental conditions,** including:

- Water quality deterioration;
- Spread of alien or invasive species;
- Ecosystem degradation affecting NbS performance.

Ensure that **biodiversity-related challenges** (e.g. biodiversity loss, ecosystem degradation) are always included, as biodiversity enhancement is a core requirement of NbS.

Step 1 - Identify Societal Challenges and its drivers

What to do

Stakeholder engagement and participation

Carry out **transparent and inclusive stakeholder consultations** to:

- Capture local knowledge;
- Identify the most pressing challenges as perceived by affected groups;
- Include perspectives from local communities, vulnerable groups, authorities, researchers, and decision-makers;
- Build up trust on the interventions.

Develop and use a **Governance and Participation Plan** to structure stakeholder involvement in this process.

Documentation and communication

Document all identified challenges and drivers clearly, ensuring the information is accessible, understandable, and shared with affected stakeholders.

Actively **inform and raise awareness among stakeholders about existing challenges**, their causes and consequences, and the potential role of NbS in addressing them.

Recommended documents to be developed

- A mapping of societal challenges and their drivers (e.g. concept maps, schemes).
- A list of information sources used, including scientific publications, existing studies, stakeholder's consultations, etc.
- Documentation of stakeholder consultations, such as meeting notes.

Step 2 - Develop a Theory of Change and NbS strategy

Once societal challenges and their drivers have been identified, the proposed FWC-NbS intervention must be linked to specific outcomes through a Theory of Change and a strategy for the interventions.

Theory of change:
A Theory of Change outlines how and why a desired change is expected to occur. It connects specific actions to long-term goals by identifying all the necessary outcomes and conditions that must be in place, and identifies how these lead to the desired goals.

What to do

Define objectives, outcomes and the Theory of change

Define clear objectives that respond directly to the identified societal challenges and their drivers, covering well-being, socioeconomic, water-related, and environmental outcomes.

Develop a **Theory of Change** that explains how the proposed NbS actions are expected to lead to specific outcomes, including improvements in human well-being, biodiversity net gain, and ecosystem integrity.

Ensure that **biodiversity enhancement and ecosystem integrity** are included as horizontal objectives in the Theory of Change and NbS Strategy, even when biodiversity loss has not been identified as a priority societal challenge.

Provide a clear **justification for the assumptions** underlying the Theory of Change, explaining why and how specific actions are expected to produce the desired outcomes, based on scientific evidence, existing studies, reports, or documented experience.

Step 2 - Develop a Theory of Change and NbS strategy

What to do

Develop the NbS strategy and define success criteria

Develop an **NbS Strategy** that organises and links the intervention steps, taking into account:

- The different spheres involved (environmental, social, economic, institutional);
- Relevant plans and programmes;
- Partners and stakeholders;
- Timelines;
- Expected results and possible corrective actions.
- Some long-term goals require more planning and resources but remain essential for the successful implementation of the project
- Transferability
- Long-term sustainability.

Define concrete outcomes and benchmarks related to performance, well-being, socioeconomic aspects, and ecosystems, including qualitative and/or quantitative targets to be measured periodically throughout the intervention.

Step 2 - Develop a Theory of Change and NbS strategy

What to do

Ensure participation, monitoring and adaptive management

Actively **involve stakeholders** in the development of the Theory of Change and NbS Strategy, and ensure that these are publicly shared, accessible, and understandable to all relevant groups.

Use the defined objectives, Theory of Change, and NbS Strategy as the basis for the **Monitoring and Evaluation Plan**, which will track progress and support adaptive management throughout implementation.

Ensure that the Theory of Change and NbS Strategy inform the **design and development of the project**, allowing the **strategy to be adapted** if gaps, risks, or deviations from expected results are identified.

Recommended documents to be developed

A Theory of Change and NbS Strategy, clearly linking objectives, actions, expected outcomes, assumptions, and corresponding indicators.

Step 3 - Identify FWC-NbS Options

Once objectives, a Theory of Change, and an NbS Strategy have been defined, identify and assess appropriate FWC-NbS options that can effectively address the identified societal challenges and their drivers.

What to do

Develop a set of solution options

Develop or compile an **NbS catalogue** that includes a range of potential solutions capable of responding to the identified challenges and aligned with the defined objectives, biodiversity goals, and NbS Strategy.

Include in the catalogue both **Nature-based solutions and grey or conventional solutions,** in order to allow transparent comparison and informed decision-making.

Use **visual and comparative tools** (e.g. cost–benefit matrices, trade-off maps or decision support systems like the one developed in NATMed) to compare different solutions and support participatory discussions with stakeholders.

Assess Options

Assess each potential solution according to key criteria, including:

- What is their potential to address the identified societal challenges and their drivers?

- Do they provide broader co-benefits?

- What could be their level of acceptance by the stakeholders?

- Are they economically feasible and sustainable?

- Which solutions are the most efficient, cost-effective ones?

- Do they imply certain risks or trade-offs?

Step 3 - Identify FWC-NbS Options

What to do

Select and prioritize options

Ensure that the **local context** is a key factor in selecting solutions, taking into account environmental conditions, socio-economic characteristics, governance capacity, and cultural aspects.

Prioritise solutions that are low-impact, environmentally sustainable, and easy to replicate, and that can be implemented or managed by local stakeholders, such as farmers or local authorities.

Consider the complexity of implementation, including technical requirements, operation and maintenance needs, and the capacity of local actors to support long-term functioning.

Conduct **citizen or local perception surveys** to understand opinions, concerns, and acceptance levels related to different NbS options, including aspects such as reclaimed water use and landscape value.

Ensure continuous **information sharing and dialogue** with stakeholders, providing updates, addressing concerns, and adjusting solution choices where necessary based on feedback.

Recommended documents to be developed

- NbS Catalogue or Natural and Grey Solutions Catalogue
- Local perception surveys

Step 4 - Select NbS and ensure economic feasibility and sustainability

Ensuring the economic feasibility and long-term sustainability of FWC-NbS is essential to justify their selection, support informed decision-making, and enable durable implementation and scaling-up.

What to do

Assess costs, benefits and economic robustness

Identify and document all **costs and benefits** arising from the FWC-NbS, including direct and indirect, short-, medium- and long-term economic, environmental, social, and well-being effects.

Ensure that the assessment includes **non-economic and non-market benefits**, such as ecosystem services, biodiversity enhancement, climate resilience, human health, and social acceptance, even when these cannot be fully monetised.

Identify the **beneficiaries of the NbS**, clarifying who benefits from which outcomes and who may bear costs or trade-offs.

Select and apply appropriate **economic assessment approaches**, such as cost-effectiveness analysis, cost–benefit analysis, multi-criteria analysis, or combinations thereof, depending on data availability and decision needs.

Define and document the **assumptions and variables** underpinning the assessment, including technical efficiency, resource availability, adoption rates by users (e.g. farmers), expected reductions in water use and input costs, and relevant legal and institutional frameworks.

Use benchmarking, sensitivity analysis, or simplified decision matrices to **test robustness against key uncertainties**, such as regulatory changes, subsidies, or market conditions.

Use the results of the economic assessment to make an **informed decision on the NbS to implement**, optimise design choices, and support long-term environmental and economic sustainability.

Step 4 - Select NbS and ensure economic feasibility and sustainability

What to do

Involve stakeholders and ensure transparent decision-making

Involve **stakeholders in the identification and discussion of benefits, costs, and beneficiaries** through participatory processes, in order to capture local knowledge, perceptions, and acceptance, and to inform funding and resourcing dialogues.

Ensure that all results, assumptions, trade-offs, and decisions are **properly documented, transparent, and accessible**, contributing to confidence building, evidence generation, and mainstreaming of FWC-NbS.

Secure funding, monitoring and long-term sustainability

Analyse **funding sources and resourcing options**, distinguishing between public, private, and blended funding, and assess risks related to one-off or time-limited funding.

Develop a **portfolio of resourcing options** to support long-term sustainability, including subsidies, grants, payment for ecosystem services, carbon or biodiversity credits, community funding, volunteering schemes, or crowdfunding initiatives.

Encourage **cost-sharing through community-funded or volunteer-driven initiatives**, using tools like crowdfunding or digital campaigns to raise awareness and funds.

Explore opportunities for **green entrepreneurship and business models**, including local value chains, cooperatives or clusters, links with tourism, innovation hubs, and entrepreneurship accelerators, especially to support youth and women.

Build **strong stakeholder relationships** to access private/regional funding, improve economic sustainability, and enable replication of interventions to extend ecosystem-service benefits.

Ensure that **economic-related indicators** are defined and included in the Monitoring & Evaluation plan, allowing costs, benefits, and assumptions to be tracked over time and adjusted if needed.

Step 4 - Select NbS and ensure economic feasibility and sustainability

Recommended documents to be developed

- Benefits and costs mapping, including assumptions, beneficiaries, and potential losers.
- Economic assessment document (cost-effectiveness, cost–benefit, or multi-criteria analysis).
- Notes of stakeholder meetings related to benefits, costs, and funding.
- Decision or multi-criteria matrix supporting NbS selection.
- Portfolio of resourcing options and funding opportunities.
- Business model for long-term self-sustaining operation of the NbS.

Step 5 - Integrate Biodiversity and Ecosystem Improvement goals

Ensuring biodiversity net gain and enhancing ecosystem integrity are core objectives of FWC-NbS and must be integrated as cross-cutting priorities throughout the NbS strategy, from design to implementation and monitoring.

What to do

Assess ecosystem conditions and define biodiversity objectives

Establish a **clear ecological baseline** covering both the intervention site and the surrounding landscape, by compiling a minimum set of ecological information, including ecosystem structure and conservation status, species composition and abundance, key ecosystem functions, soil and water quality, ecological connectivity, external pressures, and existing conservation or restoration initiatives.

Understand **ecosystem degradation processes** and their underlying drivers by using updated and geographically explicit data, complemented where possible by local and traditional ecological knowledge.

Ensure that biodiversity and ecosystem diagnostics are **linked to relevant public policies and conservation frameworks**, supporting coherence between ecological needs and institutional responses.

Based on the baseline and the NbS strategy, define **clear and realistic biodiversity and ecosystem improvement objectives**, aligned with local, regional, or national conservation strategies.

Step 5 - Integrate Biodiversity and Ecosystem Improvement goals

What to do

Integrate biodiversity into implementation, monitoring, and risk management

Identify and include **biodiversity-related indicators** in the Monitoring & Evaluation plan, covering both direct biodiversity outcomes (e.g. species diversity) and parameters influencing ecosystem health (e.g. water quality, soil condition). Periodically assess these indicators to understand how the NbS intervention affects plants, animals, ecosystem functions, and ecological relationships over time.

Pay particular attention during implementation to **avoid unintended harm to ecosystems**, ensuring that construction works, excavation, and other activities do not negatively affect existing species or habitats.

Regularly review potential **adverse effects on biodiversity**, both within the intervention area and in adjacent zones, using the Monitoring & Evaluation and Risk Management plans to guide corrective actions if needed.

Ensure **full compliance with legal and regulatory frameworks** related to biodiversity protection and nature conservation.

Enhance ecological connectivity and co-benefits through inclusive design

Promote **ecological connectivity** by designing NbS that contribute to blue and green corridors, enhancing ecosystem integrity across urban and rural landscapes and across scales.

Recognise and integrate the **socio-economic and cultural** co-benefits of NbS, such as improved wellbeing, eco-tourism opportunities, agro-tourism, and sustainable land-use practices, reinforcing the multifunctional character of nature-based interventions.

Ensure **stakeholder engagement** in the identification of biodiversity values, traditional ecological knowledge, and local restoration priorities.

Step 5 - Integrate Biodiversity and Ecosystem Improvement goals

Recommended documents to be developed

- Biodiversity and ecosystem baseline report (site-specific and landscape level)
- Ecological diagnostic summary
- List of biodiversity and ecosystem wellbeing indicators to include in the Monitoring and Evaluation (M&E) plan
- Specific biodiversity and ecosystem enhancement strategy within the NbS general strategy
- Inventory of biodiversity-friendly practices to apply during the intervention

Step 6 - Develop a Participation & Governance Plan

Effective governance and active participation are essential for the successful implementation, long-term sustainability, and social acceptance of FWC-NbS, as stakeholders are both beneficiaries of the interventions and key actors in their operation and maintenance.

What to do

Define governance structures, roles, and decision-making processes

Develop a **Participation and Governance Plan** from the early stages of the intervention to define how decisions are made, who participates, how responsibilities and benefits are distributed, and how conflicts are managed.

Map all **relevant stakeholders**, including landowners, farmers, livestock breeders, tourism operators, local citizens, local and regional authorities, academia, and vulnerable groups, clearly identifying their rights, roles, responsibilities, potential benefits, and possible trade-offs related to the intervention.

Ensure that governance arrangements explicitly address **land and water access and use rights**, and formalise these through agreements or legal instruments where necessary to guarantee transparency, accountability, and long-term security.

Establish clear **decision-making, dialogue, and conflict-resolution mechanisms**, including transparent and accessible feedback and grievance processes, so that stakeholders know how to raise concerns and how these will be addressed.

Step 6 - Develop a Participation & Governance Plan

What to do

Enable inclusive and continuous stakeholder participation

Promote **inclusive participation** by actively engaging vulnerable groups, ensuring gender equality, and encouraging the involvement of young people, indigenous or local communities, academia, and local institutions.

Use **structured participatory mechanisms**, such as co-design sessions, dialogue tables, public consultations, info-days, and digital participation platforms, to support continuous stakeholder engagement throughout implementation.

Implement **awareness-raising and training activities** to build trust and acceptance, particularly on sensitive issues such as reclaimed water use, health protection, safe practices, and the benefits and opportunities generated by NbS.

Embed participation in implementation, monitoring, and long-term sustainability

Integrate stakeholder participation into **monitoring, evaluation, and risk management activities**, allowing stakeholders to validate results, contribute local knowledge, suggest corrective measures, and strengthen accountability.

Encourage **cross-sectoral collaboration** by linking NbS implementation with water management, agriculture, spatial planning, and local development, and by promoting synergies beyond the project itself.

Support **community ownership, entrepreneurship, and voluntary engagement**, including participation in restoration or monitoring activities, to strengthen the long-term social embeddedness of the NbS.

Ensure that all governance and participation activities are **systematically documented**, and that lessons learned, feedback, and outcomes are shared to support transparency, learning, replication, and scaling-up.

Step 6 - Develop a Participation & Governance Plan

Recommended documents to be developed

- Stakeholder map, including rights, roles, responsibilities, and potential trade-offs.
- Participation and Governance Plan, including decision-making processes and grievance mechanisms.
- Access and Use Rights Management Plan and benefit-sharing arrangements.
- Records and analysis of participatory monitoring and evaluation activities.

Step 7 - Monitoring and Evaluation Plan

Monitoring and evaluation are essential to track performance, assess whether Nature-based Solutions are effectively addressing societal and environmental challenges, support learning and adaptive management, and build evidence to strengthen confidence in and uptake of FWC-NbS.

What to do

Key Performance Indicators (KPIs)

Ensure that precise **human well-being outcomes and benchmarks** are defined and assessed throughout the whole lifecycle of the intervention, in order to verify whether societal challenges are being properly addressed.

Select **indicators that are directly linked to the assumptions and goals set in the NbS Strategy,** allowing practitioners to assess whether these assumptions are being fulfilled or whether deviations need to be addressed.

Ensure that indicators cover **relevant ecological, socio-economic, and human well-being aspects**, including biodiversity and ecosystem integrity, compliance with environmental regulations, and the provision of benefits and costs.

Use **SMART indicators** (Specific, Measurable, Achievable, Relevant and Time-bound) and establish a clear baseline to allow comparison between the initial state and observed changes over time.

Encourage the selection of **ecological indicators** that respond more quickly to changes, supported by evidence from similar projects and bibliographical reviews.

Step 7 - Monitoring and Evaluation Plan

What to do

Monitoring and Evaluation (M&E) Plan

Define in the **M&E plan** the parameters to be measured, the frequency of measurements, and the methodologies to be used, taking into account the availability of resources.

A **baseline** is fundamental to enable systematic review of the NbS intervention by comparing new findings against the initial state.

Monitor the selected KPIs periodically, both within and outside the intervention area, and throughout the entire lifetime of the NbS intervention.

Regularly **review assumptions, indicators, and monitoring strategies** to detect deviations from the NbS Strategy and to identify possible risks or undesired consequences.

Use monitoring and evaluation results to support an iterative learning, adjustment, and learning process, ensuring that **new evidence informs adaptation** of the NbS and related decision-making.

Plan for long-term monitoring beyond the project timeframe by identifying essential indicators, reflecting on the resources needed to sustain monitoring over time, and exploring mechanisms to secure them.

Use **available technological tools to support monitoring activities**, including citizen science platforms, remote or automated monitoring systems, and digital platforms that allow data centralisation, real-time analysis, and early warning of significant deviations.

Step 7 - Monitoring and Evaluation Plan

What to do

Monitoring and Evaluation (M&E) Plan (continue)

Link Monitoring and Evaluation activities with Communication and Dissemination strategies to strengthen transparency, trust, and social acceptance.

Involve stakeholders in monitoring, evaluation, and learning processes by sharing results, communicating evaluation outcomes, and informing them about adjustments and decision-making processes.

Where possible, **institutionalise monitoring activities through collaboration with local or regional authorities or through coordinated management frameworks** involving community representatives and relevant stakeholders.

Recommended documents to be developed

- Documentation on the KPIs selection process, and justification of choice (following the Theory of change established beforehand).
- Baseline data.
- Monitoring and Evaluation plan.
- Monitoring reports at the established frequency.

Step 8 - Synergies and interactions

Identifying and managing synergies and interactions is essential to ensure that Nature-based Solutions work effectively across sectors, respond to socio-economic and ecological dynamics, maximise positive impacts, and minimise risks at both local and wider scales.

What to do

Identify interactions and synergies

Integrate interactions between the economy, the environment, and society into the NbS Strategy, considering both local and wider spatial scales and ensuring that the NbS works across sectors.

Assess how the NbS may affect local livelihoods, productive activities, ecosystems, and areas beyond the intervention site, including potential knock-on effects.

Identify, enhance, and incorporate **synergies between NbS and other interventions**, such as engineering projects, conservation actions, financial instruments, sociocultural initiatives, or technological solutions.

Carry out a thorough **mapping of existing projects, sectors, policies, and initiatives** to identify potential synergies, and reassess them throughout the project lifetime. Identify synergies at both abstract levels (e.g. policies, strategies, citizen participation actions) and material levels (e.g. ecological connectivity and physical infrastructure).

Step 8 - Synergies and interactions

What to do

Align NbS with policies, strategies and initiatives

Align NbS objectives with relevant local, regional, national, or international policies and strategies, clearly explaining how the NbS contributes to their targets, including the Sustainable Development Goals.

Explore **how NbS can support local plans**, such as green infrastructure, circular economy strategies, climate adaptation policies, water reuse strategies, or payment for ecosystem services schemes.

Consider NbS as policy impact actions that can stimulate the development of new policies or strategies related to climate change, water management, ecosystem restoration, or carbon sequestration.

Promote synergies related to ecological connectivity by **linking NbS interventions with other NbS sites, protected areas**, or ecologically significant areas, contributing to green and blue corridors and wider green infrastructure networks.

Explore **combinations of NbS with grey infrastructure** and with Information and Communication Technologies, where appropriate, to enhance performance, efficiency, monitoring, and management.

Step 8 - Synergies and interactions

What to do

Manage risks and document synergies

Identify and assess internal and external risks arising from interactions and synergies, both within the intervention area and beyond, and integrate risk considerations into the NbS design. Pay particular attention to risks related to public acceptance, land and water use conflicts, and negative interactions between NbS and human activities.

Involve stakeholders in identifying synergies, risks, and interactions, especially when NbS affect primary sectors such as agriculture and farming, or when impacts extend to other regions.

Use existing literature, reports, studies, results from similar projects, and local knowledge to **anticipate risks, respond to deviations, and identify additional synergies.**

Compile all identified interactions, synergies, and risks into a dedicated document, explaining how they are integrated into the project and how they contribute to improving NbS performance, as well as socio-economic and ecological outcomes.

Recommended documents to be developed

- Mapping of synergies and interactions, alongside enhanced co-benefits.
- Catalogue and mapping of the existing and the to-be-developed opportunities for ecosystem integrity and connectivity.

Step 9 - Risk analysis and balancing trade-offs

Risk analysis and the careful balancing of trade-offs are essential to anticipate negative interactions, minimise unintended impacts, and ensure the long-term sustainability, effectiveness, and fairness of NbS.

What to do

Identify and analyse risks, interactions and trade-offs

Identify and map interactions between ecosystems, the economy, and society at different spatial scales and timeframes, ensuring that their drivers are clearly understood.

Identify and map existing and potential risks, both internal and external to the intervention area, and consider their evolution throughout the whole lifetime of the NbS.

Identify and map possible trade-offs arising from the NbS intervention, recognising that some desirable outcomes may conflict with others.

Use both scientific evidence and local knowledge to **understand risk patterns, interactions, and vulnerabilities**, building the analysis in collaboration with stakeholders.

Pay particular attention to **risks affecting biodiversity and ecosystem integrity**, especially when interventions are located near protected or ecologically sensitive areas, and to risks related to livelihoods, health, safety, land and water access, and public acceptance.

Evaluate identified risks based on their probability and potential harm, and identify their drivers and possible solutions to minimise or reduce them.

Apply a **strong governance approach** by recognising differentiated stakeholder impacts, mapping rights and responsibilities, and ensuring equitable consideration of trade-offs, including through formal agreements where land or resource access is involved.

Step 9 - Risk analysis and balancing trade-offs

What to do

Establish safeguards, limits and corrective measures

Establish clear limits and safeguards for each identified risk and trade-off, based on regulatory requirements, scientific evidence, and local context. Ensure that safeguards address both immediate and long-term costs and benefits, including broader co-benefits and indirect or delayed impacts.

Define **contingency measures and corrective actions** to be implemented when limits or safeguards are exceeded, to prevent imbalances and avoid destabilisation of the NbS.

Periodically **review safeguards, limits, and corrective measures** during and after project implementation, allowing their adaptation in response to changing conditions, emergencies, or stakeholder feedback.

Risk Management Plan

Compile all identified risks, trade-offs, drivers, safeguards, and corrective actions into a **Risk Management Plan**, to be integrated into the NbS design from the very beginning of the project and reviewed and updated throughout the project lifetime.

Ensure that **risk monitoring continues beyond the end of the project** where possible, recognising the need for long-term observation and potential additional funding.

Recommended documents to be developed

- Interactions, trade-offs and risk mapping analysis.
- Risk identification and management plan, including mapping, drivers, limits, contingency measures, an adaptation strategy.

Step 10 - Communication and dissemination plan

Effective communication and dissemination are essential to build understanding, trust, learning, and support for Nature-based Solutions, enabling their replication, upscaling, and long-term mainstreaming.

What to do

Communication and Dissemination (C&D) Plan

Develop a C&D Plan before the project starts, defining objectives, target audiences, key messages, tools, activities, timelines, and evaluation methods.

Ensure that the C&D Plan communicates **how NbS interventions affect ecosystems and socio-economic systems** at local and regional scales, highlighting both benefits and challenges.

Analyse expected outcomes of the C&D Plan, such as increased community engagement, education, participation, and trust.

Map **target audiences** and define tailored messages, strategies, and tactics to reach them effectively.

Adapt scientific and technical information into **clear, accessible, and locally relevant formats**, including translation into local languages where needed, to minimise cultural, technological, and socio-economic barriers.

Communicate **how NbS contribute to national and global objectives**, including human well-being, climate change, biodiversity, human rights, and the Sustainable Development Goals.

Define and apply methods to **monitor and evaluate the effectiveness of the C&D Plan**, identifying gaps and areas for improvement and adapting the strategy over time.

Step 10 - Communication and dissemination plan

What to do

Implement C&D activities

Communicate societal challenges, their drivers, and the rationale for NbS interventions in formats understandable to all stakeholder groups.

Disseminate project activities and results throughout the entire project lifecycle, from design to monitoring, clearly explaining how stakeholders and citizens can get involved.

Use **a range of dissemination means,** including social media and newsletters, stakeholder sessions and networking meetings, scientific publications and technical reports, site visits, partner websites, and institutional networks.

Share NbS monitoring, evaluation, and learning results to support transparency, adaptive management, and informed decision-making.

Provide **targeted training and knowledge-sharing activities** to strengthen skills, technical capacity, and understanding of NbS and related water management approaches, ensuring inclusivity.

Keep systematic records of all communication and participation activities, including minutes, recordings, images, and other documentation, and ensure this information is accessible.

Ensure **transparency, ethical engagement, and informed consent in all communication activities**, respecting traditional knowledge, literacy levels, gender balance, and the inclusion of vulnerable groups.

Use communication and dissemination as a **continuous process** to support learning, collaboration, confidence building, and the long-term mainstreaming of NbS.

Recommended documents to be developed

- Communication and Dissemination Strategy/plan.

Step 11 – Mainstreaming and policy impact

Mainstreaming and policy impact are essential to scale up and replicate Nature-based Solutions by strengthening institutional support, influencing decision-making, and embedding NbS into policies, regulations, and planning frameworks.

What to do

Map policy frameworks

Map existing policies and regulations affecting the NbS at local, regional, national, and international levels, identifying their impacts and opportunities for NbS implementation.

Identify regulatory gaps, barriers, and limitations, such as the focus on conventional infrastructure, lack of technical standards, or fragmented sectoral policies.

Identify opportunities to **integrate NbS into sectoral and territorial policies**, promoting integrated, multi-benefit approaches and intersectional governance mechanisms.

Consider how updated scientific and technological developments can support the **adaptation and improvement of legal and regulatory frameworks.**

Policy impact strategy

Develop a comprehensive **policy impact strategy** that defines clear goals, target policies and agencies, key messages, and tactics.

Clearly l**ink NbS objectives with expected outcomes and measurable impacts,** establishing transparent relationships between actions and results.

Use monitoring and evaluation results to demonstrate the **impacts of NbS on biodiversity**, ecosystem services, and societal challenges, and share this evidence with decision-makers.

Anticipate and **address challenges** related to political change, institutional fragmentation, limited awareness, or administrative barriers.

Develop **technical or policy guidelines** that compile lessons learned, good practices, opportunities, and recommendations to facilitate NbS mainstreaming.

Step 11 – Mainstreaming and policy impact

What to do

Strengthen engagement

Include **policy-makers and public authorities** in stakeholder mapping and engagement activities from early stages, ensuring they are directly involved in meetings, workshops, and project activities.

Support knowledge-to-policy pathways by identifying entry points for **NbS integration into planning instruments, strategies, and action plans**.

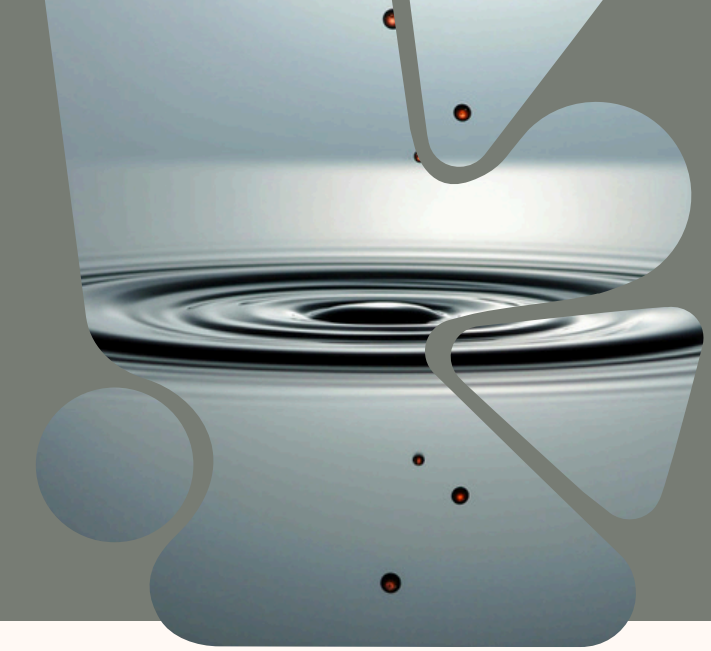
Develop **integrated results reports** that synthesise monitoring data and relevant information and share them with local, regional, and national institutions.

Encourage **stakeholder participation** in the promotion and development of policy proposals, particularly to support local and regional action.

Use mainstreaming and **policy impact actions** to reinforce communication efforts and contribute to long-term expansion and uptake of NbS.

Recommended documents to be developed

- Communication and Dissemination Strategy/plan.
- Policy Guidelines.
- Policy impact strategy.



Step 12 – Maintenance and Operation (M&O)

Effective maintenance and operation ensure the long-term sustainability, efficiency, and adaptive capacity of Nature-based Solutions throughout their lifecycle.

What to do

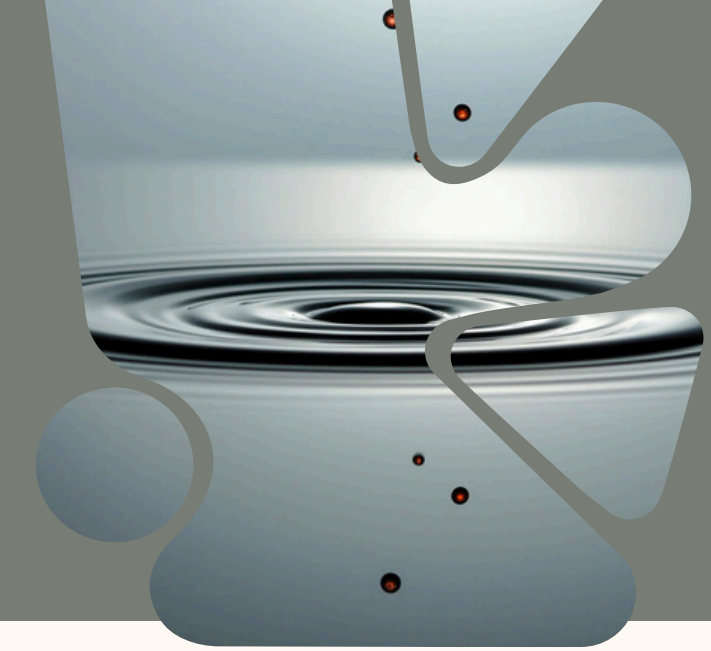
Plan and organise

Plan maintenance and operation activities as an integral part of the NbS lifecycle, recognising that implemented NbS require continuous maintenance and possible updates to remain effective over time.

Base maintenance and operation on **detailed information generated through continuous monitoring and evaluation**, applying flexible and adaptive management approaches to respond to natural variability and ecological dynamics.

Consider the complexity of the NbS when planning M&O activities, including the need for specific technical expertise, availability of financial resources, and potential increases in operational costs.

Take into account **environmental and site-specific conditions**, such as accessibility, climatic variability, seasonal flow fluctuations, and plant stress related to changing climate conditions.



Step 12 – Maintenance and Operation (M&O)

What to do

Address technical, environmental, and operational challenges

Identify and manage technical risks associated with FWC-NbS, such as clogging of distribution systems or infiltration surfaces, sediment accumulation, groundwater pollution risks, potential presence of pathogens, eutrophication, biological proliferation, ecological destabilisation, and reduced filtration capacity.

Consider **social and contextual factors influencing maintenance and operation**, including public acceptance, stakeholder awareness, and the degree of participation achieved during project implementation.

Adapt maintenance activities to local conditions, including tourism pressure, by planning operations around peak visitor periods where relevant.

Address challenges related to **multi-actor coordination**, especially in contexts where multiple agencies have overlapping mandates and roles and responsibilities are not clearly defined.

Use **automated monitoring systems** which allow for personnel cost reduction, avoiding manual errors and improving decision-making.

Acknowledge that **long-term monitoring and technical follow-up may be constrained** by time, budget, or technical scope, and consider these limitations when designing M&O arrangements.

Recommended documents to be developed

- M&O plan.

Step13 - Tendering process

Tendering processes are critical for translating co-designed Nature-based Solutions into practice, but conventional procurement approaches often struggle to accommodate the complexity, adaptability, and multi-benefit character of FWC-NbS. See also module A1.

Limitations of conventional procurement for NbS

Conventional procurement prioritises **lowest price, predefined outputs, and standard construction units**, which limits the inclusion of ecological co-benefits, adaptive management, biodiversity gains, and community engagement.

Qualitative NbS benefits are often **undervalued or difficult to justify legally** within traditional public procurement rules.

Rigid procedures, lengthy administrative processes, and fragmented institutional responsibilities can delay tendering and complicate implementation of integrated NbS interventions.

Specific challenges of FWC-NbS

Limited or unclear regulatory frameworks, especially for experimental solutions and non-conventional water use, create legal uncertainty.

Incomplete hydrological, geological, or geotechnical data increase design uncertainty and procurement risk.

Limited contractor experience with complex ecological or hybrid green–grey solutions can affect bid quality and implementation.

Financial constraints and long-term operation needs, combined with requirements for stakeholder acceptance and environmental safeguards, add complexity not easily addressed through standard tendering processes.

Step13 - Tendering process

What to do

Map regulatory constraints early and ensure that tender specifications reflect environmental obligations, water protection standards, land-use requirements, and Natura 2000 considerations before launching procurement.

Carry out robust preliminary site investigations and define **clear technical and environmental objectives**, avoiding ambiguous specifications and enabling modular or phased approaches where appropriate.

Prepare tender specifications jointly with **procurement officers and technical teams** to reduce misinterpretation, administrative delays, and legal incompatibilities.

Define clear and transparent **evaluation criteria** that prioritise technical expertise, ecological knowledge, and understanding of the local context, rather than cost alone.

Include **operation and maintenance requirements** from the outset, allocating long-term resources and allowing flexibility for adjustments in vegetation, design, or materials without requiring full legal revisions.

Properly define **implementation timelines**, accounting for plant growth, pilot phases, and ecological processes, and optimise schedules using monitoring tools where available.

Involve communities, water users, and relevant authorities early in the tendering process to reduce conflicts, ease permitting, and improve coordination across institutions.

Use tendering as a **tool to stimulate local capacities**, including SMEs, ecological engineers, agricultural cooperatives, and green jobs, supporting long-term sustainability.

Maintain **proper documentation** of progress, changes, and environmental performance, using digital tools where possible to support transparency, learning, and future procurement processes.

Other aspects to foresee

Establish a **coordinated management framework** involving local authorities, community representatives, and other relevant stakeholders, in order to strengthen management capacity and support good governance.

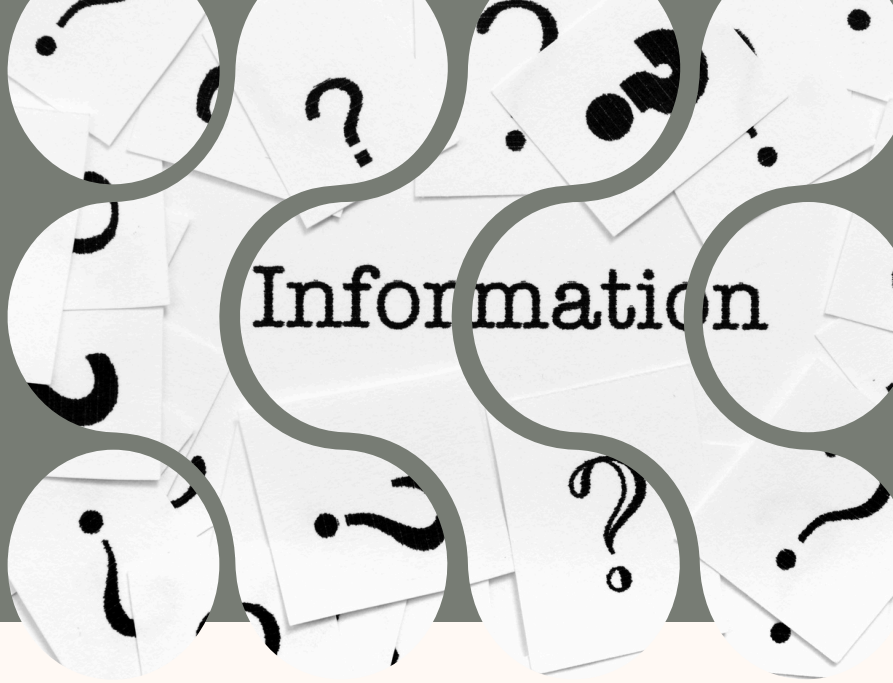
When NbS are implemented in areas affected by tourism, develop an **eco-touristic plan** to ensure compatibility between NbS objectives and tourism activities, promote sustainable use of the area, and provide information about the NbS implemented.

Use eco-tourism and on-site communication activities to **raise awareness on environmental protection**, involve visitors in conservation efforts, and reduce pressures on natural resources, such as water demand during peak tourism periods.

Seek **synergies with agriculture**, particularly in rural areas, by collaborating with farmers and promoting more sustainable and regenerative practices that improve soil and water management, enhance biodiversity, and strengthen economic and ecological resilience.

Apply **standardised evaluation methods**, such as the IUCN GS, to support comparison across interventions, learning, and identification of good practices (check module A2).

Further Information



For deeper reading and practical guidance, see:

- D4.2 Guidelines

Quiz

Q1. What is the primary purpose of identifying societal challenges and their drivers at the beginning of an NbS intervention?

A) To select contractors early in the process
B) To define the Theory of Change and guide subsequent design steps
C) To estimate construction costs
D) To comply with reporting requirements only

Q2. Why should both nature-based and grey or conventional solutions be included when identifying FWC-NbS options?

A) To reduce the number of stakeholders involved
B) To allow transparent comparison and informed decision-making
C) To comply with procurement rules
D) To prioritise the cheapest solution

Q3. Economic feasibility assessments for NbS should consider only direct and monetised costs and benefits.

- True
- False

Q4. Which action is essential for integrating biodiversity and ecosystem improvement goals into an NbS intervention?

A) Defining biodiversity objectives only at the end of implementation
B) Establishing an ecological baseline and linking it to monitoring indicators
C) Focusing solely on stakeholder perceptions of biodiversity
D) Limiting biodiversity considerations to protected areas

Q5. Which of the following is a key limitation of conventional public procurement when applied to NbS?

KPIs should be defined during the baseline phase to evaluate performance under the Standard.
A) Excessive focus on long-term ecosystem performance
B) Overvaluation of social co-benefits
C) Prioritisation of lowest price and predefined outputs
D)Mandatory inclusion of adaptive management clauses

1-B, 2-B, 3-False, 4-B, 5-C

Glossary

C&D Communication and Dissemination Plan
CW Constructed Wetland
D Deliverable
FWC-NbS Full Water-Cycle NbS
IUCN International Union for Conservation of Nature
IUCN GS IUCN Global Standard for Nature-based Solutions
KPI Key Performance Indicator
M&E Monitoring and Evaluation Plan
M&O Maintenance & Operation
NATMed Nature-based Solutions on existing infrastructures for resilient Water
Management in the Mediterranean
NbS Nature-based Solution
SMART indicators (Specific, Measurable, Achievable, Relevant and Time-bound)

NATMed

Nature-based Solutions on existing infrastructures for resilient Water Management in the Mediterranean

This project has received funding from the European Union's PRIMA Research and innovation programme under Grant Agreement No 2221.