MODULE A3
Replicability and Upscaling of FWC-NbS projects

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

What will you learn?.....5
Guiding questions.....5
Who is this for?.....5
Why Replication Matters in NbS Policy.....6
Key Lessons from NATMed Pilot Regions.....8
NATMed Replication Phases.....9
Capacity Needs for Replication.....11
Institutional and Governance Readiness.....12
Strategic Planning for Upscaling.....17
MedCoP as a Driver for Replication.....19
Adapting NbS to Local Contexts.....20
Tools and standards Supporting Replication.....23
Clustering, Networking and EU Policy Synergies.....24
Further Information.....26
Quiz.....27
Glossary.....28

What will you learn?

NATMed intends the deployment of a strong participatory governance plan and clustering action strategy, paying special attention to the scaling-up and replication of the project. The replicability Plan to boost social innovation and ensure continuous knowledge transfer of the main outputs and experiences of NATMed, together with the Participatory governance plan will form the core training material for this session.

What will you learn

- Why replication and upscaling of NbS are essential for broader impact and policy uptake.
- The key phases, methods, and tools for planning and implementing NbS replication.
- How to assess institutional and governance readiness for scaling solutions.
- How to adapt NbS to diverse local contexts to ensure feasibility and acceptance.
- How clustering, networking, and Communities of Practice support replication and long-term sustainability.

Guiding questions

Why is replication of NbS necessary beyond pilot projects?

What phases should be followed to ensure successful replication?

How do governance readiness and stakeholder engagement affect scaling?

What tools and standards can support replication planning in your city/region?

Who is this for?

Public Authorities (from national to local level),
Decision-makers,
Researchers,
Farmers,
Business actors

Why Replication Matters in NbS Policy

Why scaling NbS is needed to influence EU/Med strategies?

Scaling Climate Action

- Replication ensures that the positive impacts of NbS (flood regulation, water reuse, soil restoration) extend beyond pilot areas.
- NATMed's five pilots demonstrated that FWC-NbS can strengthen resilience under diverse Mediterranean conditions.

Policy Relevance

- NbS must reach policy-makers to influence water, agriculture, and climate strategies.
- NATMed showed that localized results (e.g. improvement of groundwater quality in Arborea, wastewater treatment, storage and reuse in Carrión, wastewater treatment and canal banks restoration) can inform regional and EU-level policy on sustainable water and wastewater management.

Efficiency and Cost-effectiveness

- Replication allows cities and regions to save resources by building on proven solutions instead of re-inventing.
- NATMed demonstrated this through adapting existing infrastructures (e.g. irrigation canals, reservoirs) rather than building new grey systems.

Why Replication Matters in NbS Policy

Why scaling NbS is needed to influence EU/Med strategies?

Social Innovation and Governance

- Replication strengthens participatory governance and citizen trust, ensuring solutions are socially accepted.
- NATMed's governance approach emphasized that scaling NbS requires inclusive decision-making and alignment with stakeholder needs (The Mediterranean Community of Practice-MedCoP was utilized).

Upscaling through Networks

- Clustering and networking link projects to amplify impact.
- NATMed designed a strategy including replication workshops, coaching, and cross-project collaboration to share methods across Mediterranean regions.

Key Lessons from NATMed Pilot Regions

Diversity Strengthens Learning

Testing FWC-NbS in five very different contexts (Spain, Greece, Italy, Türkiye, Algeria) justifies that replication is possible across varied climates, socio-economic conditions, and governance systems.

Adapt Existing Infrastructures

NATMed tests that building on existing grey infrastructures (e.g. reservoirs, irrigation canals) with NbS is often more cost-effective and politically acceptable than creating entirely new systems.

Baseline and Monitoring are Non-Negotiable

Clear baselines and systematic monitoring ensure that benefits such as water savings, groundwater recharge, and biodiversity improvements could be demonstrated. This is critical for convincing policy-makers.

Governance Barriers are Real

Each pilot faces institutional or regulatory barriers (e.g. wastewater laws in Spain, unclear land rights in Greece). Replication strategies must anticipate and address governance readiness.

Community Engagement Builds Ownership

Involving farmers, municipalities, and citizens increased acceptance and sustainability of NbS. NATMed proves that replication is not only technical but also a social innovation process.

Networks Accelerate Scaling

NATMed highlights that scaling requires networking with other projects and institutions. MedCoP and clustering activities are essential for spreading lessons learned to share experience and knowledge and finding how to overcome barriers in different geographies, design and implementations, socio-cultural and socio-economic contexts.

NATMed Replication Phases

Replication is not a single action but a structured process. NATMed designed a **four-phase approach** to ensure that replication is systematic, evidence-based, and adaptable to different contexts.

NATMed-based conclusions

- A structured pathway helps avoid fragmented replication.
- By following phases, cities can align technical, social, and governance readiness for NbS.
- NATMed's approach shows how to move from site-specific pilots to broader Mediterranean strategies.

NATMed Replication Phases

The Four Phases

Phase 1: NbS Diagnosis

Collect baseline conditions, define indicators, and set replication context.

Phase 2: Barrier/Facilitator Analysis

Assess, economic, social, cultural, technical, environmental, and legal conditions (see matrix in “Institutional and Governance Readiness).

Phase 3: NbS Catalogue

Gather FWC-NbS from NATMed and complementary solutions from other EU projects.

Phase 4: Recommendations

Produce guidance for replication and scaling

Actions to take

- Use this phased structure as a roadmap for planning replication.
- Integrate outputs from each phase into training and decision-making.

Pitfalls to avoid

- Jumping directly to implementation without diagnosis or barrier analysis.
- Treating the catalogue as a static tool rather than a living reference.

Capacity Needs for Replication

For NbS to move beyond pilot projects, local authorities, communities, and institutions need the right capacities. Replication is not only about having technical designs; it also requires governance skills, social engagement processes, funding knowledge, and tools for monitoring. NATMed's experience showed that scaling NbS in the Mediterranean depends on strengthening capacities at multiple levels, i.e. technical, institutional, and social.

Technical Know-How

- Stakeholders need training on NbS design, operation, and monitoring.
- NATMed training modules and decision-support tools address this need.

Governance & Coordination Skills

- Replication requires local authorities to manage multi-actor governance (farmers, municipalities, water agencies).
- NATMed's Participatory Governance Plan highlighted capacity gaps in cross-sector coordination.

Community Engagement

- Capacity is needed to involve citizens in co-design, maintenance, and monitoring.
- NATMed used MedCoP as a methodology to build this participatory skillset.

Financial and Business Capacities

- Municipalities and communities must understand funding models, incentives, and NbS-related business opportunities.
- NATMed stressed entrepreneurship, green jobs, and public–private partnerships as key capacity areas.

Knowledge Transfer and Networking

- Capacity for replication grows through learning exchanges with other regions and projects.
- NATMed's clustering activities showed that webinars, replication workshops, and coaching are effective methods.

Institutional and Governance Readiness

Institutional and governance readiness refers to how well the existing policies, institutions, and coordination mechanisms in a city or region can support the implementation of Full Water Cycle Nature-based Solutions (FWC-NbS). Even well-designed NbS cannot succeed if the governance framework is fragmented, unclear, or lacks capacity.

In NATMed, Governance readiness was mainly assessed through:

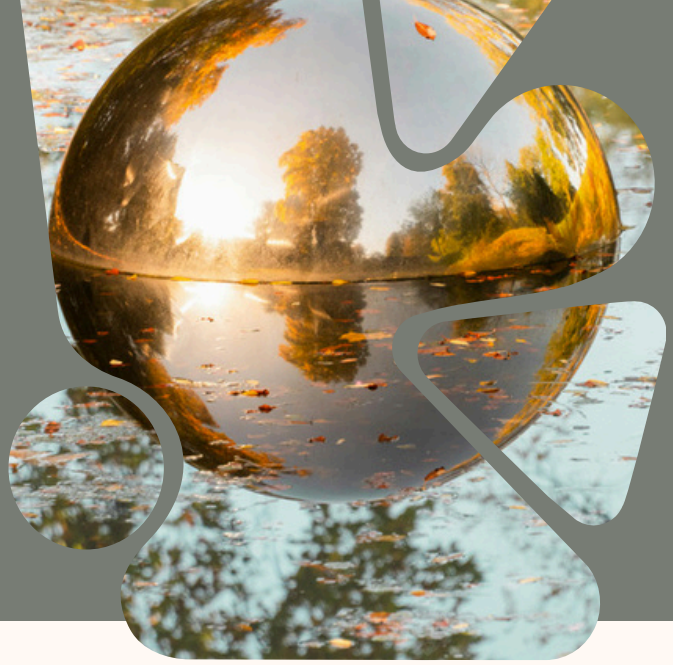
- **Stakeholder engagement** and sessions with the local.
- **Participatory Governance Plan** mapping institutional barriers and proposing solutions.
- **Mediterranean Community of Practice (MedCoP)** as a transnational mechanism for dialogue.
- **IUCN Global Standard (Module A2)** that includes governance/institutional aspects (e.g. Criterion 5: Inclusive, Transparent, and Empowering Governance). By applying the Standard self-assessment, NATMed indirectly assessed governance readiness at each case study.
- **Barrier/Facilitator Matrix**, a tool which systematically identifies what supports or blocks NbS across seven dimensions: Political / Economic / Social / Cultural / Technical / Environmental / Legal.

NATMed - BARRIERS / FACILITATORS									
Country	FWC-NbS Number	FWC-NbS Objectives	POLITICAL	ECONOMIC	SOCIAL	CULTURAL	TECHNICAL	ENVIRONMENTAL	LEGAL
Spain	FWC-NbS 1: Wastewater reuse to irrigation, improving quantity and quality of treated water storage.	Wastewater treatment							
		Treated-water storage							
		Farming practices							
Greece	FWC-NbS 2: Improve water quality and storage of natural wetland and its distribution system.	Protection from polluted discharges							
		Lake Restoration							
		Distribution system efficiency							
Italy	FWC-NbS 3: Improve groundwater quality and storage with low-cost and more efficient technological solutions.	Water quality of MAR							
		FIA Efficiency							
Turkey	FWC-NbS 4: Improve storage of groundwater in aquifers and distribution system efficiency.	MAR							
		Coastal protection							
		Distribution system efficiency							
		Farming practices							
Algeria	FWC-NbS 5: Improve storage and efficiency of artificial distribution systems, mitigating pollution and environmental degradation.	Protection from polluted discharges							
		Water Quality control							
		Channel Restoration							

Barrier

Facilitators

Institutional and Governance Readiness



Other Common Methods (beyond NATMed)

Policy and Institutional Readiness Assessments

- Mapping how national/regional policies explicitly reference NbS.
- Checking if legal frameworks allow flexibility for hybrid (grey-green) solutions.
- Example: OECD (2021) Nature-based Solutions for Water.

Capacity and Institutional Analysis Tools

- FAO's Capacity Needs Assessment framework (institutional, organizational, individual).
- UNDP's Institutional and Context Analysis (ICA) framework.

Multi-level Governance Diagnostics

- Assessing coordination between national, regional, and local levels.
- Checking integration across sectors (water, agriculture, energy, biodiversity).

Governance Quality Indicators

- Transparency, accountability, participation, and enforcement capacity.
- Often assessed via structured surveys, governance scorecards, or expert elicitation.

Comparative Case Study / Benchmarking

- Compare with regions where NbS are already mainstreamed.
- Identify enabling vs. blocking governance conditions.

Institutional and Governance Readiness

Lessons learnt from NATMed

Clear mandates and responsibilities are necessary for NbS planning, permitting, and long-term maintenance.

Governance gaps (unclear laws, fragmented institutions, lack of enforcement) were identified as barriers in several case studies.

Participation and inclusive governance improve legitimacy and local ownership, reducing risks of failure.

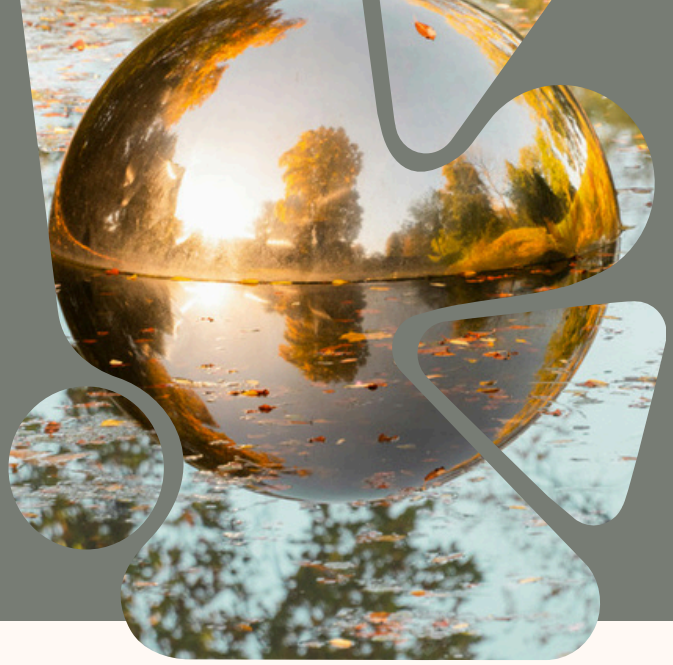
Cross-sector cooperation (water, agriculture, energy, environment, municipalities) is essential for integrated water management.

The IUCN Global Standard self-assessment highlighted gaps in governance inclusiveness and accountability across the case studies.

Applying the Standard confirmed that strong governance processes are a prerequisite for long-term NbS success.

Case studies where governance structures were clearer (e.g. Italy, Arborea) demonstrated higher Standard alignment compared to those facing legal/ownership ambiguities.

Institutional and Governance Readiness



Examples from NATMed

Spain (Carrión de los Céspedes):
Governance challenges linked to water reuse regulation-wastewater directives and legal uncertainties slowed NbS adoption.

Greece (Chimaditida):
Institutional and governance readiness was constrained by fragmented responsibilities for water, agriculture, and Natura 2000 management, making coordination and permitting complex. The CS2 team had to map authorities and stakeholder roles, clarify land-use and access rights on public land, and use MedCoP as a shared platform for dialogue. Step-by-step engagement with municipal, regional, and environmental bodies helped align NbS design with existing plans.

Italy (Arborea):
Communication between governance structures for water management and stakeholders is in need of improvement. Inclusive participatory processes and co-design can increase the effectiveness of solutions to environmental problems.

Türkiye (Bozcaada):
Enforcement gaps in conservation policies were identified; participatory processes helped align actors.

Algeria (Oued Righ):
Governance challenges related to the need for wastewater treatment before discharging into the canal of Oued Righ, as well as canal bank restoration and the effectiveness of stakeholder participation, lead to the adoption of NbS.

Participatory Governance Plan:
Introduced co-design procedures and participatory structures to overcome institutional barriers.

Institutional and Governance Readiness

Actions to take

- Map governance structures early (ministries, municipalities, basin authorities).
- Establish multi-actor governance committees (including farmers, citizens, NGOs).
- Apply the 7-dimension matrix early in replication planning.
- Align NbS planning with existing water laws and environmental regulations.

Pitfalls to avoid

- Ignoring legal compliance issues (permits, wastewater reuse).
- Overlooking local institutions' limited capacity for Operation and Maintenance.
- Designing NbS without clarifying ownership and responsibility.

Strategic Planning for Upscaling

Upscaling refers to moving from single pilot sites to wider adoption of **FWC-NbS** across multiple regions or at the **Mediterranean level**. Strategic planning ensures that lessons from local case studies can be transferred, adapted, and embedded in broader policy frameworks, avoiding the “pilot trap” of isolated, one-off projects.

Step 1. Local Replication (Case Study Level)

Why: Build first on what works locally; pilots act as laboratories for learning and adaptation.

NATMed Experience:

- Case studies tested FWC-NbS in real hydrological, institutional, and social contexts.
- Baselines, KPIs, and stakeholder involvement produced transferable knowledge.

Actions to Take: Document technical specifications, KPIs, and governance processes to make replication easier for others.

Pitfalls to Avoid: Treating pilots as isolated “experiments” with no replication plan from the start.

Strategic Planning for Upscaling

Step 2. Regional Upscaling (Mediterranean Level)

Why: Mediterranean water challenges (scarcity, drought, salinity) are cross-border; replication must extend beyond single sites.

NATMed Experience:

- Replication Plan: mapped enabling conditions for scaling.
- MedCoP: facilitated peer-to-peer exchange among Mediterranean actors.
- Governance Plan: highlighted how removing governance barriers enables upscaling.

Actions to Take: Align replication with regional platforms (PRIMA, EU partnerships) and adapt interventions to legal and hydrological contexts.
Pitfalls to Avoid: Copy-pasting solutions from one region to another without local adaptation.

Step 3. Mediterranean Mainstreaming (Policy & EU Integration)

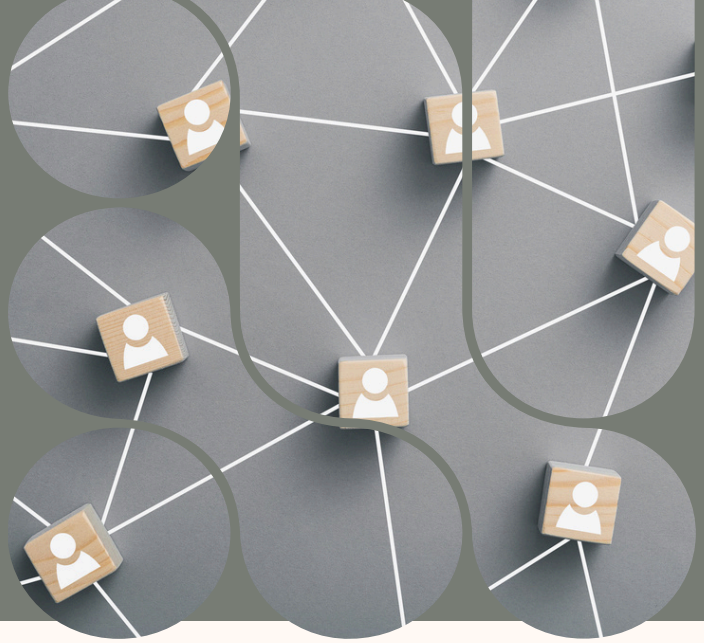
Why: Long-term impact requires embedding NbS into Mediterranean and EU-level policies and funding schemes.

NATMed Experience:

- Linked results with EU Green Deal, Horizon Europe, and regional water adaptation agendas.
- Developed tools (catalogue, DSS, guidelines) to support large-scale adoption.

Actions to Take: Engage policymakers early, build advocacy coalitions, and link replication to EU/national funding frameworks.
Pitfalls to Avoid: Relying solely on temporary project-based financing and failing to secure institutional mandates.

MedCoP as a Driver for Replication



Benefits of Developing a Community of Practice (CoP)

- **Knowledge sharing →** Facilitates exchange of experiences, traditional knowledge, tools, and lessons learned among diverse actors.
- **Capacity building →** Strengthens skills and competences through peer learning and mentoring.
- **Collaboration & networking →** Connects stakeholders across institutions, regions, and sectors.
- **Problem-solving →** Offers a safe space to collectively address barriers and co-design solutions.
- **Replication & scaling →** Ensures that successful practices in one location are known and adapted elsewhere.
- **Innovation →** Encourages creative approaches by exposing members to different perspectives.
- **Sustainability →** Builds long-term communities that outlast individual projects.

Our Experience with MedCoP in NATMed (see also Module B2)

- NATMed established MedCoP teams in each case study country to bring together local stakeholders around FWC-NbS.
- Although the original plan was to develop a single Mediterranean-wide platform, language barriers and differences in NbS interventions led MedCoP to operate primarily at the national level. However, project partners actively shared experiences and insights across case studies.
- Still, they became effective vehicles for engagement, co-design, and validation, ensuring that interventions responded to local realities.
- MedCoP also contributed to replication planning by connecting stakeholder feedback with the technical, governance, and monitoring outputs of NATMed.

Adapting NbS to Local Contexts

No two places are the same. **Even if NbS concepts are transferable, their design, implementation, and management must reflect local environmental conditions, socio-economic realities, cultural practices, and governance frameworks**. NATMed demonstrated how adaptation to local contexts is essential for successful and sustainable Full Water Cycle NbS.

NATMed-based conclusions

Hydrological differences matter → Mediterranean sites showed very different water challenges (drought in Greece, salinity and water pollution in Algeria, irrigation demand in Spain, groundwater quality in Italy, water scarcity in Türkiye).

Socio-economic context drives acceptance → Farmers' willingness, tourism dependency, or market incentives influenced what was feasible.

Governance and policy shape solutions → National water reuse laws, land tenure, or enforcement capacity strongly affected design choices.

Cultural factors matter → Stakeholder perceptions and traditional practices influenced whether NbS were embraced or resisted.

Adapting NbS to Local Contexts

Examples from NATMed

Spain (Carrión de los Céspedes):
Adaptation focused on reuse of treated wastewater and on minimizing evaporation while conserving water quality in stored water, addressing agriculture's water demand.

Greece (Chimaditida):
NbS were tailored to a Natura 2000 wetland by re-introducing traditional buffalo grazing as a controlled reed-management tool, improving habitat diversity while creating local income. Riparian buffers, reforestation and Water 4.0 upgrades for the irrigation networks were designed to reduce nutrient and pesticide run-off without undermining farmers' productivity.

Italy (Arborea):
Focused on improving groundwater quality through the Forested infiltration Area approach, aligned with dairy farming's need for secure groundwater through natural processes.

Türkiye (Bozcaada):
Combined Water 4.0 tools with conservation agriculture to fit local island conditions and support sustainable viticulture.

Algeria (Oued Righ):
NbS targeted to address environmental challenges through domestic wastewater treatment to improve the quality of the water discharged into the canal through constructed wetlands, as well as canal banks restoration.

Adaptating NbS to Local Contexts

Actions to take

- Start with a site-specific diagnosis (hydrology, soil, socio-economic, governance).
- Co-design NbS with local stakeholders to ensure social acceptance.
- Adapt technical design to legal frameworks and available resources.
- Use monitoring feedback loops to refine solutions over time.

Pitfalls to avoid

- Copy-pasting NbS from other sites without considering local context.
- Ignoring socio-cultural perceptions and livelihood needs.
- Designing NbS that exceed local institutional or financial capacities.

Note

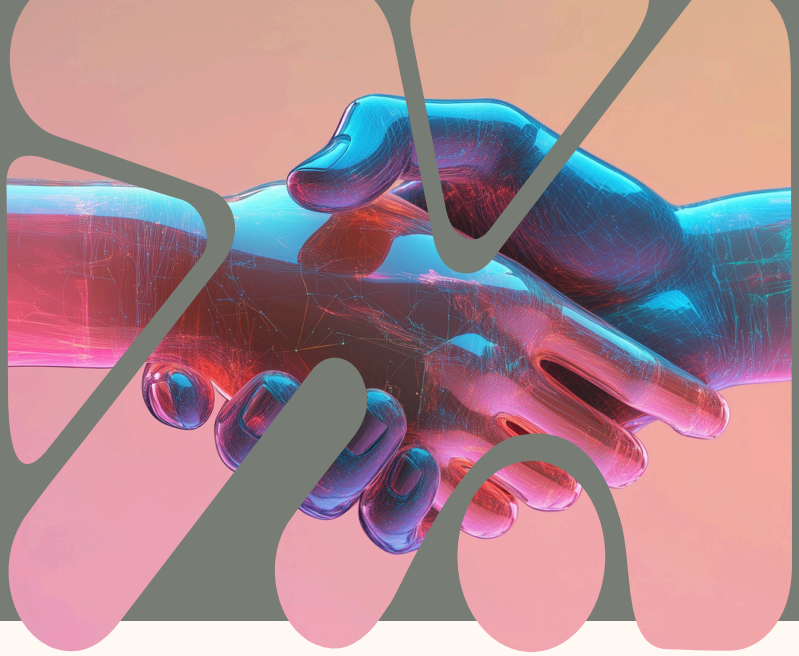
Adapting NbS requires both a strategic perspective (ensuring replication is context-sensitive) and a practical process (how to actually do it step by step). For the practical process, see Module B1.

Tools and standards Supporting Replication

Replication is strengthened when using **structured tools and internationally recognized standards.**

In NATMed, several such instruments were applied: the IUCN Global Standard for NbS (see Module A2), the Implementation Guidelines for FWC-NbS in the Mediterranean (see Module B1) and NATMed DSS (see Module B3), and the financial mechanisms (see Module C1). Each of these provides a different dimension of support from quality assurance to technical design and financial readiness.

The NbS guidelines is itself a replication tool (see module B1).



Clustering, Networking and EU Policy Synergies

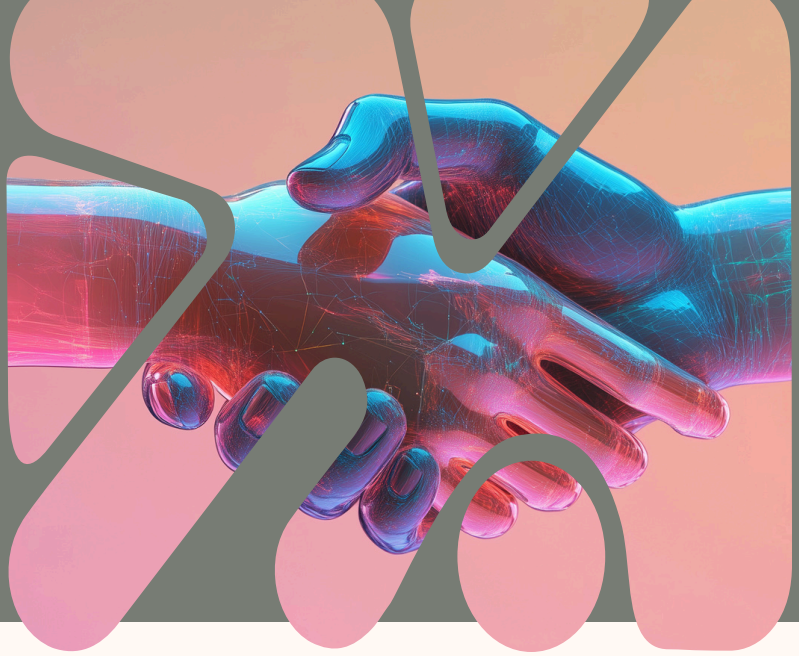
Replication and upscaling of NbS are not achieved in isolation. They are accelerated when projects and cities cluster with others, build networks, and align with EU policy frameworks. These mechanisms create bridges between local practice and large-scale adoption.

What / Why

- **Clustering →** Joint activities with other projects create economies of scale, shared lessons, and visibility.
- **Networking →** Engages stakeholders beyond the project consortium, connecting municipalities, research, businesses, and citizens.
- **EU Policy Synergies →** Aligning NbS efforts with European strategies (EU Green Deal, Water Framework Directive, Biodiversity Strategy, Mission Adaptation, Horizon Europe) ensures relevance, funding opportunities, and policy uptake.

How They Support Replication and Upscaling

- **Knowledge Transfer →** Pooling monitoring results and lessons across projects avoids duplication.
- **Capacity Building →** Joint workshops, training, and exchanges strengthen institutional capacity.
- **Policy Uptake →** By aligning with EU policies, local NbS gain legitimacy and are more likely to attract investment.
- **Scaling Across Borders →** Networks allow replication to move from local to regional to international levels.
- **Sustainability →** Communities of practice and project clusters can survive beyond the life of a single project.



Clustering, Networking and EU Policy Synergies

Clustering Beyond NATMed

- To strengthen replication and regional impact, NATMed clustered with two other PRIMA projects (**OurMED** and **SALAMMED**) to create **SUSTAIN-MED** (https://sustain-med.eu/).
- Within this working group, we launched **NextGen4MED**, a collaborative initiative aimed at empowering young water researchers across the Mediterranean. NextGen4MED fosters a multidisciplinary network, organizes events, and promotes innovation, extending project results to a broader, youth-focused community. The dedicated LinkedIn group (NextGen4MED) serves as an open space for exchange, visibility, and collaboration among Mediterranean researchers and practitioners.
- **Replication Workshops** with other sister NbS projects.

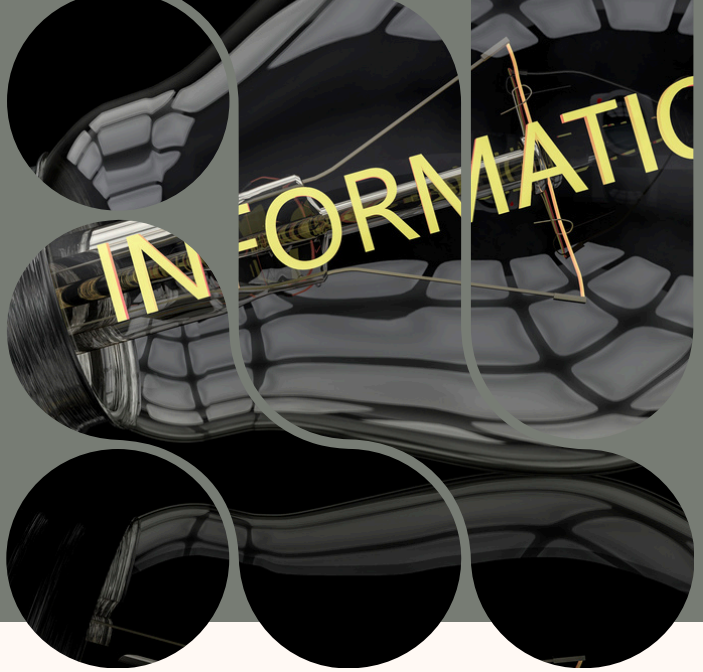
Actions to take

- Join EU or regional NbS clusters and platforms early (Mission Adaptation, PRIMA, OPPLA, NetworkNature).
- Link replication strategies to EU policy agendas to unlock funding.
- Engage with networks beyond the project consortium (cities, utilities, NGOs).

Pitfalls to Avoid

- Working in isolation without leveraging synergies.
- Treating clustering as a “tick-box” exercise rather than a replication accelerator.
- Overlooking policy alignment, which risks losing long-term support.

Further Information



For deeper reading and practical guidance, see:

- D5.1 Replicability Plan
- D5.2 Participatory Governance Plan
- D5.3 NATMed MedCoP
- D5.4 Clustering and Networking plans
- Matrix in excel file and a filled example by NATMed case studies

Quiz

Q1. True or False:

Replication of NbS saves costs and strengthens governance compared to isolated pilot projects.

- True
- False

Q2. Which of the following is not a dimension in the Barrier/Facilitator Matrix?

A) Technical
B) Legal
C) Cultural
D) Aesthetic

Q3. Why is adapting NbS to local contexts critical for replication?

A) To copy-paste solutions from one region to another
B) To reflect differences in hydrology, governance, and socio-cultural factors
C) To reduce monitoring needs
D) To avoid EU alignment

Q4. Clustering and networking mainly help replication by:

A) Providing local permits
B) Sharing knowledge and capacity building across projects
C) Replacing stakeholder engagement
D) Reducing biodiversity monitoring

1-True, 2-D, 3-B, 4-B

Glossary

- **CS** Case Study
- **D** Deliverable
- **DSS** Decision Support System
- **FWC_NbS** Full-water cycle NbS
- **IUCN** International Union for the Conservation of Nature **https://iucn.org**
- **MedCoP** Mediterranean Community of Practice
- **NbS** Nature-based Solution
- **NetworkNature** **www.networknature.eu**
- **NextGen4MED** (Empowering the NEXT GENeration of Water Researchers for the MEDiterranean
- **OECD** Organization for Economic Co-operation and Development **https://www.oecd.org/en.html**
- **OPPLA** **https://oppla.eu**
- **OurMED** **https://www.ourmed.eu**
- **PRIMA** **https://prima-med.org**
- **SALAMMED** (Sustainable Approaches to LAnd and water Management in MEditerranean Drylands) **https://www.salam-med.org**
- **SUSTAIN-MED** (Sustainable water management in the Mediterranean region SUSTAIN-MED **https://sustain-med.eu**

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.

https://natmed-project.eu