

MODULE C1

Financial mechanisms, opportunities, and business models for NBS

Training Manual

October, 2025

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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>**

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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

Contents



What will you learn?.....	5
Guiding questions.....	5
Who is this for?.....	5
The problem that FWC-NbS are intended to address.....	6
Key benefits of FWC-NbS.....	7
Economic rationale for FWC-NbS.....	8
Cost–Benefit analysis and financing strategies.....	12
Potential revenue streams from NbS.....	18
Setting up water-related revenue streams for FWC-NbS.....	20
Typologies of Business Models for NbS.....	22
Choosing a Business Model.....	25
Enabling a supportive framework for NbS.....	27
Challenges to NbS market uptake in the Mediterranean.....	29
Tools supporting business planning and investment.....	31
Further information.....	33
Quiz.....	37
Glossary.....	38



Introduction

This module introduces the economic foundations, financing options, and business models that enable NbS to be implemented and scaled effectively. It explains why NbS often provide better long-term value than grey infrastructure, presents tools to compare costs and benefits systematically and outlines potential revenue streams from NbS. The module also explores different business model typologies and the enabling policy, institutional, financial, technical, and governance conditions required for successful deployment.

What will you learn

By completing this module, you will:

- ▶ Understand why NbS can be more cost-effective than traditional grey infrastructure over their life cycle.
- ▶ Explore financial appraisal tools such as cost-benefit analysis, cost-effectiveness analysis, and multi-criteria assessment.
- ▶ Investigate the types of revenue streams NbS can generate, including water reuse tariffs, Payments for Ecosystem Services, avoided costs, and tourism-related income.
- ▶ Identify and compare business models suitable for NbS implementation across different stakeholder and market contexts.
- ▶ Recognize the enabling policy, institutional, financial, technical, and governance conditions required to scale NbS beyond pilot phases.
- ▶ Assess the financial and market readiness of NbS projects using practical tools and real-world examples.

Guiding questions

What makes NbS financially viable compared to grey alternatives?

How can NbS generate revenue and reduce costs?

Which business models best support different contexts and stakeholders?

What conditions are needed to scale NbS beyond pilot projects?

Who is this for?

Public authorities,
Water infrastructure managers,
Agricultural businesses,
SMEs and entrepreneurs,
Tourism operators,
Local communities,
Policy makers.

The problem that FWC-NbS are intended to address



The NATMed FWC-NbS addresses several key problems faced by stakeholders involved in water management, particularly in Mediterranean regions:

1. Water Imbalance and Scarcity

Many regions experience significant seasonal water imbalances, particularly during the summer months, due to increased demand from tourism and agriculture. This leads to inefficient water usage and depletion of resources, making it difficult to ensure long-term water availability.

2. Inefficient Water Infrastructure

Existing water storage and distribution systems, often based on outdated technologies, struggle to cope with rising demand and environmental challenges. Customers—such as local authorities, water infrastructure managers, and agricultural businesses—require more sustainable, adaptive solutions that improve water efficiency throughout the entire water cycle.

3. Lack of Integrated Solutions

Traditional water management practices tend to address only specific stages of the water cycle (e.g., storage or distribution), without considering the entire system. Customers need solutions that address the water cycle holistically, from upstream to downstream, ensuring a balanced approach to water conservation, storage, and distribution.

4. Environmental and Social Pressures

Stakeholders face increasing pressure to adopt environmentally sustainable practices that also benefit local communities and ecosystems. The need to align water management with ecosystem services and circular economy principles, while ensuring social equity and gender inclusion, is a growing concern.



Key benefits of FWC-NbS

Holistic, full water-cycle management

- Addresses water challenges from capture to reuse across the entire water cycle.
- Integrates multiple NbS tailored to local ecological, climatic, and socio-economic conditions.
- Manages seasonal water imbalances, reducing drought pressures and handling wet-season surpluses.
- Reduces dependence on costly or outdated grey infrastructure, improving system-wide efficiency.

Urban planners and policymakers often struggle with limited empirical evidence on the performance of NbS and a lack of clear, accessible communication about their benefits and co-benefits (World Economic Forum, 2020)

Locally co-designed and socially inclusive

- Unlike top-down or purely technical water solutions, FWC-NbS in NATMed have been co-designed with the Mediterranean Community of Practice (MedCoP) members, communities, policymakers, small businesses, farmers, and vulnerable groups.
- Solutions reflect local realities, incorporate traditional knowledge, and gain long-term acceptance, which increases implementation success and sustainability.

Environmental and climate resilience benefits

- Enhances biodiversity, soil health, and ecosystem function.
- Reduces pollution and improves overall environmental quality.
- Strengthens resilience to droughts, floods and climate extremes.
- Supports compliance with European and national water and environmental regulations.

Wide range of co-benefits

- Increases recreational, educational and tourism potential.
- Supports more sustainable agriculture and land stewardship.
- Lays a foundation for the economic value expanded in the next section.

Economic rationale for FWC-NbS



● Lower Life-Cycle and Operating Costs than Grey Alternatives

- NbS often require less capital investment and have lower long-term operational costs.
- For example, Constructed Wetlands (CWs) provide wastewater treatment performance comparable to engineered plants but operate with minimal energy inputs, no chemicals, and simple, low-cost maintenance.
- Typical amortisation periods: 0–10 years, depending on conditions such as land availability, climate, and wastewater characteristics.

● Cost-Effectiveness and Appraisal Tools

NATMed's guidelines (see resources) emphasise the importance of rigorous financial appraisal. NbS projects must map all capital expenditures (construction, planting) and operational costs (O&M, monitoring).

Benefits assessed include:

- reduced treatment costs over time;
- increased agricultural yields from water reuse;
- ecosystem restoration that reduces maintenance burdens;
- biodiversity gains and added recreational value.

Cost-benefit analysis and cost-effectiveness metrics are evaluated over short-, medium-, and long-term horizons, ensuring financial sustainability beyond initial grant funding.



Economic rationale for FWC-NbS



Co-Benefits with Direct Economic Value

NbS generate a wide suite of ecosystem services that can be monetised or recognised in economic decision-making. These include:

- Water purification reducing treatment plant loads;
- Groundwater recharge that supports long-term water security;
- Natural flood buffering, lowering the need for expensive protection infrastructure;
- Habitat creation, boosting biodiversity;
- Support of cultural, educational, and recreational activities, enhancing citizens' well-being and stimulating local economic development through tourism and environmental education.

Risk Reduction and Avoided Damages

- FWC-NbS helps municipalities avoid high costs associated with environmental risks. By reducing the frequency and severity of floods, droughts, and pollution incidents, they help prevent damage to agricultural land, homes, water systems, and public infrastructure. These avoided damages significantly improve the benefit–cost ratios of NbS, making them financially strong investments.
- The European Commission (2021) and World Bank (2017) highlight NbS as cost-effective tools for climate and water-related disaster management.

Hybrid Solutions Optimise Value

- In many cases, the most cost-effective option combines NbS with light grey upgrades—forming hybrid systems.
- Examples include aerated wetlands, where a small amount of mechanical aeration increases treatment efficiency without substantially increasing costs, or hybrid infiltration systems that enhance water percolation while maintaining low operating expenses.
- NATMed guidance recommends systematically evaluating these mixed approaches to maximise efficiency and value for money.

Economic rationale for FWC-NbS



● Savings for Users and Local Economic Impact

- Users—households, farmers, and small businesses—benefit directly from FWC-NbS.
- For instance, smart irrigation can reduce both water and energy consumption.
- NbS also creates green jobs in planning, construction, monitoring, and maintenance (especially in agriculture and tourism sectors).

60.5 to 63 million people are currently employed in NbS globally. This represents about 1.8% of total global employment. (ILO, UNEP, IUCN, 2024)

● De-risking Investments through Evidence and Transparency

- Documenting assumptions and conducting transparent appraisal builds investor trust.
- Monitoring of economic KPIs (e.g., O&M savings, avoided damages, increased yields) is essential.
- Sharing monitoring results enhances transparency and supports wider adoption.
- Clear comparisons with grey alternatives and do-nothing scenarios help demonstrate financial value.

● Planning for Scale and Long-Term Financial Sustainability

To ensure that NbS continue delivering value beyond pilot phases, NATMed highlights the need for:

- Continuous funding streams beyond grants;
- Clear allocation of monitoring responsibilities;
- Integration of NbS into municipal budgets and planning cycles;
- Alignment with regional and EU policy frameworks to unlock additional financing.

Scaling strategies must ensure long-term financial, institutional, and environmental sustainability.

Economic rationale for FWC-NbS



Practical examples from NATMed



CS1 Spain (Carrión de los Céspedes):

Constructed wetlands and floating gardens provided low-energy wastewater treatment and reduced evaporation losses, while reuse of treated water for irrigation lowered agricultural water costs and stabilized supply in dry seasons.



CS2 Greece (Chimaditida):

Link between wetland conservation and buffalo product branding improved local economic resilience, while riparian buffers and irrigation planning reduced nutrient runoff and input costs.



CS3 Italy (Arborea):

Forested infiltration areas improved groundwater quality (through reduced nitrate concentrations) and increased groundwater recharge, thereby reducing the costs of slurry displacement outside the Nitrate Vulnerable Zone (in case of attenuated NVZ obligations) and buffering farmers against seasonal drought.



CS4 Türkiye (Bozcaada):

Water 4.0 smart irrigation and conservation agriculture yielded savings on water and energy bills for farmers, while natural infiltration increased soil water retention.



CS5 Algeria (Oued Righ):

Pilot-scale constructed wetlands are being introduced to provide secondary treatment, with the goal of reducing the discharge of untreated wastewater into Oued Righ canal and enabling reuse of treated wastewater for irrigation (reducing water-related expenses for local farmers).

Cost–Benefit Analysis and financing strategies

To make FWC-NbS attractive for decision-makers and funders, municipalities must be able to compare costs and benefits systematically and identify viable financing strategies. The following tools can help assess (and in some cases quantify) the value of NbS compared to grey alternatives.

★ **Cost-effectiveness (CEA)**

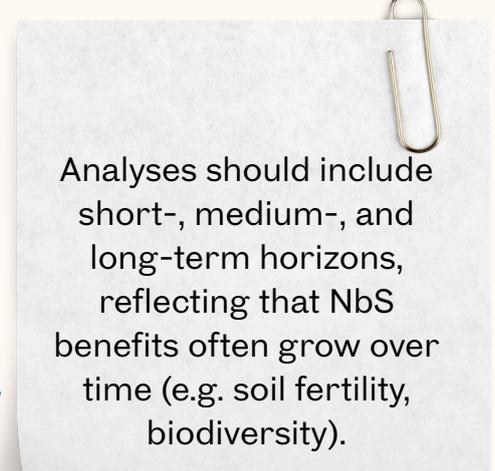
Focuses on comparing the cost per unit of outcome (e.g., cost per m³ of treated water, per hectare restored). Useful where benefits are difficult to monetise.

★ **Cost–benefit analysis (CBA)**

Compares all quantifiable costs and benefits over the life cycle; includes monetary (direct savings, avoided costs) and non-monetary (ecosystem services, recreation, health) benefits.

★ **Multi-criteria analysis (MCA)**

Compares multiple benefits, trade-offs, and impacts across environmental, social, technical, economic, and governance criteria. It allows planners and stakeholders to assess different NbS options simultaneously, weigh their relative importance, and identify the most suitable, effective, and context-appropriate solution—especially when decisions involve diverse objectives, complex ecosystems, and multiple stakeholder values. Recommended by NATMed when benefits are diverse and cannot easily be monetised (e.g. cultural values).



Analyses should include short-, medium-, and long-term horizons, reflecting that NbS benefits often grow over time (e.g. soil fertility, biodiversity).

Cost–Benefit Analysis and financing strategies

Financing strategies

Financing strategies ensure that projects move beyond pilots and become scalable, long-term solutions.

Combine **public, private, and blended finance**. Possible pathways:

- **EU/national programmes** (Horizon, LIFE, PRIMA, Green Deal funds).
- **Public-private partnerships (PPPs)** for infrastructure and water services (check *Altamirano 2021, Leveraging private sector investments in adaptation: The evolving role of climate finance in enabling a paradigm shift, CMIA*).
- **Payments for Ecosystem Services (PES)** schemes, carbon and biodiversity credits.
- **Local revenue streams:** eco-tourism, sustainable branding of agri-products, water tariffs.
- **Crowdfunding and community financing.**





Cost–Benefit Analysis and financing strategies

Adding Climate-Resilient Contracts & the Financing Framework for Water Security (FFWS)

To strengthen the financial readiness of NbS projects, municipalities and water authorities can draw on the **Financing Framework for Water Security (FFWS)**, a methodology that links project preparation with investment requirements. FFWS helps transform NbS concepts into bankable and investable projects by:

- Improving the full business case through **collaborative modelling**;
- Structuring **blended finance** strategies that combine public, concessional, and private funds;
- Integrating **climate-risk management** into PPP and performance-based contracts;
- **Aligning technical, financial, and governance components** during project preparation.

Incorporating **climate-risk clauses, KPIs, and revenue mechanisms** (e.g. water reuse tariffs, PES, avoided-cost capture) into contracts increases investor confidence and reduces risks for municipalities. FFWS thus serves as a practical tool for designing robust NbS contracts and investment models.

★ Check the basic methodological elements of FFWS in “Altamirano, M.A., de Rijke, H., Basco Carrera, L., Arellano Jaimerena, B. (2021). Handbook for the Implementation of Nature-based Solutions for Water Security: Guidelines for designing an implementation and financing arrangement. Deliverable 7.3, NAIAD (Grant Agreement No 730497). March 2021.



Cost–Benefit Analysis and financing strategies

Mosaic projects

- The future of NbS and hybrid infrastructure finance lies in **mosaic projects**, which deliver multiple services and tap into several markets simultaneously.
- Investors increasingly redesign projects to “**stack**” **funding from sources** such as water-quality credits, recreation payments, and habitat mitigation.
- Market research shows that **hybrid infrastructure** is more attractive to developers than green-only solutions.
- Implementing mosaic projects requires **innovative procurement and contracting practices** capable of coordinating multiple authorities, blending public and private funds, and managing complex service hierarchies.
- Successful contracting must clarify **functions, service levels, and trade-offs** across the entire infrastructure life cycle (design, construction, operation, maintenance).



Cost–Benefit Analysis and financing strategies

COST BENEFIT

Practical examples from NATMed



CS1 Spain (Carrión de los Céspedes): Comparative performance and cost assessment across ten CW designs ensures only the most cost-effective solutions are scaled.



CS2 Greece (Chimaditida): Agro-ecological buffers reduce fertiliser use, lowering input costs for farmers, a benefit that can be factored into CEA.



CS3 Italy (Arborea): Forested infiltration areas recharge groundwater and improve its quality, reducing the environmental costs for the intensive agriculture; CBA shows the relevance of the ecosystem services for the economical return.



CS4 Türkiye (Bozcaada): Smart irrigation reduced water and energy bills – direct savings for farmers that improve NbS financial appeal.



CS5 Algeria (Oued Righ): Planned CWs designed to reduce the discharge of untreated wastewater into Oued Righ canal as well as implementation and maintenance costs; reuse of treated wastewater provides long-term irrigation savings.

NATMed Exploitation Plan: Highlights need for a funding portfolio, from EU grants to PPPs and PES schemes, to finance both pilots and replication.

Cost–Benefit Analysis and financing strategies



Actions to take

- Apply CEA where benefits are mainly environmental and difficult to monetise.
- Use CBA for comprehensive appraisals, including avoided damages and co-benefits.
- Involve economists and stakeholders early in project design to ensure realistic assumptions.
- Build a funding mix: combine public grants, private partnerships, and innovative mechanisms (PES, credits).
- Document financial assumptions and monitoring results to convince funders.
- Prepare a well-designed, performance-based contract with clearly defined Key Performance Indicators (KPIs). This forms the foundation for successfully financing a NbS project.

Pitfalls to avoid

- Avoid focusing only on short-term costs; NbS benefits often accrue over longer time frames.
- Don't underestimate Operation & Maintenance costs — while lower than grey infrastructure, they must be planned for.
- Avoid overpromising: not all co-benefits can be monetised; use MCA where necessary.
- Don't rely solely on EU project grants; plan for post-project financing.

Potential revenue streams from NbS (e.g. carbon, water, tourism)



Water-related NbS can generate direct and indirect revenues by improving water availability, quality, and reliability. In Mediterranean regions, where droughts, over-abstraction, and pollution are pressing, monetising the value of water services creates strong incentives for sustaining NbS investments.

FWC-NbS can generate water-related revenues through reuse tariffs, avoided treatment costs, PES schemes, and efficiency gains. For Mediterranean regions, this represents one of the most promising economic cases for sustaining NbS.

General Evidence

Water tariffs & reuse fees

- Treated wastewater from NbS (e.g. constructed wetlands) can be sold or reused in agriculture, industry, or landscaping.
- Utilities or municipalities may charge a tariff for this high-quality reclaimed water.
- Example: In Spain, water reuse schemes reduce freshwater imports, with revenues from users. (OECD, 2022)

Avoided costs = implicit revenues

- NbS reduces costs of pumping, desalination, and grey treatment. Savings can be captured as financial value.
- Example: Aquifer recharge wetlands reduce the need for expensive artificial recharge or desalination.

Payments for Ecosystem Services (PES)

- Downstream water users (utilities, hydropower, agriculture) pay upstream communities that maintain wetlands, forests, or buffers.
- Well-established in watershed management schemes (e.g. Latin America, but growing in Europe).

Water quality trading & credits

- Farmers or industries reducing nutrient pollution via NbS can generate nutrient reduction credits and sell them in regulated or voluntary markets.
- Still emerging in EU but piloted in northern countries.

Potential revenue streams from NbS (e.g. carbon, water, tourism)



Potential Water-Related Revenue Streams from NATMed FWC-NbS

Case Study	NbS Measures	Potential Revenue Opportunities
CS1 Spain – Carrión de los Céspedes	Constructed wetlands, floating gardens, ultrasound treatment, water reuse for irrigation.	<ul style="list-style-type: none"> • Public funding: Experimental platform' living lab for the execution of collaborative projects. • Public-private contracts for testing of Constructed Wetland configurations.
CS2 Greece – Chimaditida	Riparian buffers, wastewater treatment, irrigation planning, grazing management.	<ul style="list-style-type: none"> • Reduced fertiliser input costs for testing of Constructed Wetland configurations. • PES-type arrangements where downstream water users contribute. • Premium branding of wetland-linked products (buffalo meat/dairy).
CS3 Italy – Arborea	Forested infiltration areas for groundwater denitrification.	<ul style="list-style-type: none"> • Avoided costs for slurry movement outside the NVZ. • Potential regional fees for groundwater denitrification service. • Acquisition of bonus points within competitive calls for access to agricultural funding.
CS4 Türkiye – Bozcaada	Smart irrigation, conservation agriculture, natural infiltration.	<ul style="list-style-type: none"> • Reduced pumping energy bills (direct savings to farmers). • Farmers' cooperatives could co-finance NbS through water efficiency gains. • Indirect tourism-related revenues from improved landscape quality.
CS5 Algeria – Oued Righ	Planned constructed wetlands, canal bank restoration.	<ul style="list-style-type: none"> • Reuse of treated wastewater for safer irrigation, reducing costs of freshwater abstraction. • Avoided maintenance costs (less sludge disposal, lower energy use). • Potential community-based PES if downstream irrigation users benefit.



Setting up water-related revenue streams for FWC-NbS

1. Map Ecosystem Services and Beneficiaries

- Identify what water-related services your NbS provides (e.g. water reuse, flood regulation, aquifer recharge, nutrient removal).
- List who benefits: farmers, utilities, municipalities, industries, households, tourism operators.

2. Quantify Benefits in Economic Terms

- Estimate avoided costs (e.g. less pumping, desalination, or chemical treatment).
- Assess added value (e.g. higher crop yields, improved product branding, tourism spending).
- Use CEA or CBA where possible to compare NbS with grey alternatives.

3. Choose the Revenue Mechanism

- Reuse tariffs → charge users of reclaimed water (agriculture, landscaping, industry).
- Payments for Ecosystem Services (PES) → negotiate payments from downstream users to upstream NbS managers.
- Efficiency-based savings → reinvest money saved on energy/water bills into NbS maintenance.
- Tourism/education fees → charge for site visits, guided tours, or eco-certified branding.

4. Set Up Governance & Legal Arrangements

- Draft contracts or agreements (e.g. PES schemes, cooperative water-user agreements).
- Ensure tariffs or fees are affordable yet cost-recovering.
- Clarify who manages revenues (municipality, cooperative, public-private entity).

5. Pilot, Monitor, and Scale

- Start small (e.g. reuse tariff for one irrigation cooperative).
- Monitor revenues, costs, and satisfaction of users.
- Scale gradually by involving more users or bundling multiple revenue streams (e.g. water reuse + tourism + branding).

Setting up water-related revenue streams for FWC-NbS

Pitfalls to Avoid

- Don't underestimate transaction costs of PES — requires contracts, monitoring, enforcement.
- Be careful with pricing: reclaimed water tariffs must be affordable yet cost-recovering.
- Avoid double counting: savings on pumping/energy are not always “new revenues” but important indirect benefits.
- Regulatory constraints: some Mediterranean countries still lack frameworks for water reuse markets.



Typologies of Business Models for NbS



Business models for NbS describe **how value is created, delivered, and captured.**

They answer key questions:

Who pays for the NbS?

Who benefits?

How are revenues and responsibilities shared?

For FWC-NbS in the Mediterranean, tailoring the right business model is essential for replication and long-term sustainability.

General Typologies

Public Sector Model

- NbS financed, implemented, and maintained by public funds (municipalities, river basin agencies).
- Most common for water-related NbS in Europe.
- Example: EU LIFE and Horizon projects → pilots owned by municipalities.
- Reference: OECD (2022) Nature-based Solutions for Water.

Private Sector Model

- Private actors (farmers, utilities, businesses) invest directly because they benefit (e.g. reduced input costs, water security).
- Example: Agribusinesses funding soil buffers or irrigation efficiency NbS.
- Reference: UNEP (2023) State of Finance for Nature.

Public–Private Partnerships (PPPs)

- Shared investment and risk between government and private entities.
- Works well when NbS provide both public goods (ecosystem services) and private gains (e.g. reliable irrigation).
- Reference: EU Green Infrastructure Financing Report (2021).

Typologies of Business Models for NbS



General Typologies (continue)

Community-based / Cooperative Model

- Communities or farmer cooperatives co-finance NbS, often through shared maintenance schemes or irrigation associations.
- Provides local ownership and long-term stewardship.
- Example: Water user associations managing infiltration areas.

Payments for Ecosystem Services (PES)

- Beneficiaries (downstream utilities, industries, or municipalities) pay those who implement NbS upstream.
- Well-suited for water quality and aquifer recharge services.
- Reference: EFI (2025) Payments for Ecosystem Services.

Market-linked Models

- NbS tied to markets for carbon, biodiversity, or eco-tourism.
- Revenue generated from credits, tourism, or product branding.
- Still emerging in Mediterranean but growing globally.



Typologies of Business Models for NbS



NATMed Contributions / Examples



CS1 Spain (Carrión de los Céspedes):

Public funding model (Living Lab), but opportunities for public funding through collaborative projects and public-private contracts for testing of Constructed Wetland configurations.



CS2 Greece (Chimaditida):

Strong potential for community-based cooperative models (farmers and buffalo breeders). Branding of products shows elements of a market-linked model.



CS3 Italy (Arborea):

Public investment in infiltration areas, but long-term could evolve into a PES model with farmers benefiting from improvement of groundwater quality.



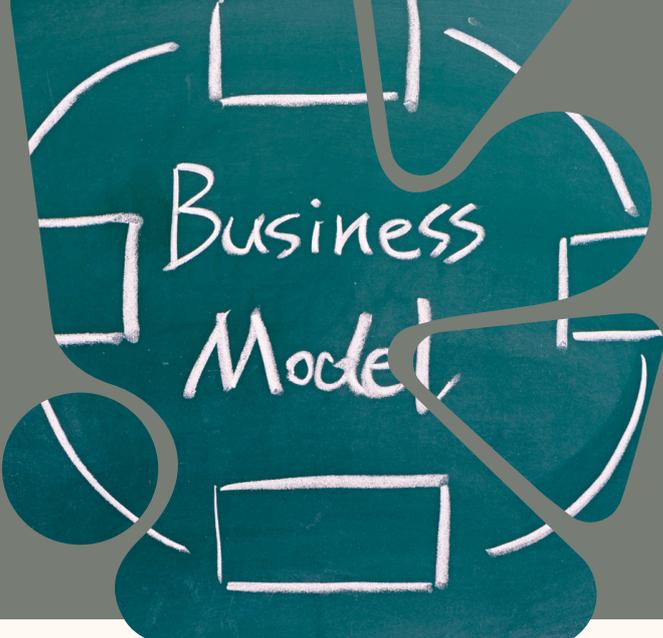
CS4 Türkiye (Bozcaada):

Mixed public-private model with smart irrigation investments directly benefiting farmers; scope for cooperative financing.



CS5 Algeria (Oued Righ):

Public-led pilot for Constructed Wetlands, but with potential for PPP in operation & maintenance if irrigation users are engaged.



Business Model

Choosing a Business Model

A business model is the story of your NbS project.

Identify beneficiaries → farmers, utilities, municipalities, tourists.

Assess willingness/ability to pay → can they finance, co-finance, or pay tariffs?

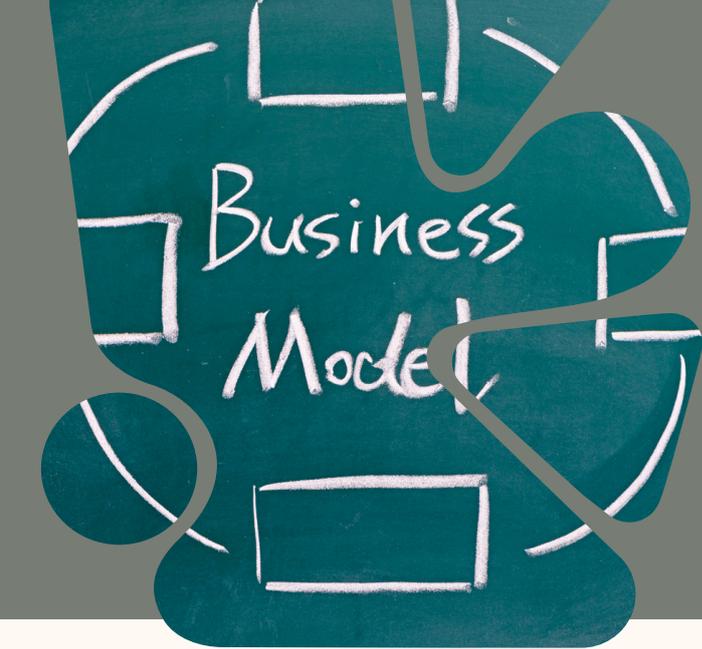
Select the structure → public, private, PPP, cooperative, PES, or market-linked.

Secure governance arrangements → contracts, roles, responsibilities.

Plan for scaling → ensure flexibility to evolve (e.g. from public-funded pilot to PPP in future).

Business model canva

Key Activities:	Key Resources	Value proposition	Key Partners	Key Beneficiaries
			Governance	
Cost Structure		Cost Reduction	Capturing Value	



Business Model

Choosing a Business Model

The Nature-Based Solutions Business Model Canvas is a practical, **visual tool developed through the Connecting Nature initiative and Horizon Nua spin off** to help cities and stakeholders plan, communicate, and structure NbS projects effectively.

It supports early-stage planning by clarifying the NbS value proposition, identifying partners and beneficiaries, and exploring financing opportunities.

The canvas is most useful once an NbS concept has been identified and before implementation begins, helping align departments within organizations and facilitating discussions with external stakeholders.

Its structure is based on the original Business Model Canvas (Osterwalder & Pigneur), organised around value creation, value delivery, and value capture, but adapted to reflect the multifunctional and cross-sectoral nature of NbS.

Pitfalls to Avoid

- Over-reliance on short-term project funding (e.g. EU grants only).
- Lack of stakeholder buy-in → without clear benefits, financing models collapse.
- Ignoring O&M costs → many NbS fail when maintenance is unfunded.
- Assuming markets (carbon, biodiversity credits) will generate revenue quickly – in reality, these require certification and infrastructure.

→ *Check the Nature-Based Solutions Business Model Canvas & Guidebook in the resources.*

Enabling a supportive framework for NbS



NbS cannot thrive without a supportive environment. Beyond technical design, an enabling framework provides the **policies, institutions, financing instruments, knowledge, and governance structures that allow NbS to be replicated and scaled**. This section presents the five core pillars of enabling frameworks and shows how NATMed pilots highlight their importance.

Policy & Legal Pillar

- Recognition of NbS in national and regional strategies (water, climate, biodiversity).
- Integration into urban planning regulations and permitting systems.
- Example: Carrión de los Céspedes (Spain) aligned with EU Regulation on water reuse (2020/741) and Wastewater treatment Directive (2024/3019).

Institutional Pillar

- Clear mandates for who designs, implements, and maintains NbS.
- Coordination mechanisms between municipalities, basin authorities, ministries.
- Example: Arborea (Italy) involved coordination between technical regional/municipal authorities and farmers.

Financial & Economic Pillar

- Instruments to fund, incentivize, and sustain NbS: grants, subsidies, PES, eco-credits, tariffs.
- Public–Private Partnerships (PPPs) and other business models can be part of this pillar.
- Example: Bozcaada (Türkiye) tested Water 4.0 irrigation technologies where shared financing could sustain adoption.

Enabling a supportive framework for NbS



Technical & Knowledge Pillar

- Availability of guidelines and standards (e.g. IUCN Global Standard).
- Access to monitoring tools and decision-support systems (e.g. NATMed DSS).
- Example: NATMed Guidelines provide step-by-step processes tailored for Mediterranean contexts.

Social & Governance Pillar

- Stakeholder engagement tools (e.g. MedCoP) that ensure local ownership.
- Co-design approaches that incorporate citizen knowledge and build trust.
- Example: Chimaditida (Greece) highlighted the role of farmers and breeders' associations in governance.

All five pillars were visible in the pilots: from policy integration (Spain's reuse compliance) to institutional coordination (Italy), financial opportunities (Türkiye, Algeria), technical guidance (guidelines), and social governance (MedCoP).

Frameworks are not abstract concepts; they are practical enablers that determine project success in the Mediterranean.





Challenges to NbS market uptake in the Mediterranean

Despite clear environmental and socio-economic benefits, NbS face **barriers to market adoption**. These challenges often arise from fragmented governance, limited financing mechanisms, and lack of market-ready business models. The Mediterranean region shows these issues clearly due to its climate vulnerabilities, institutional diversity, and socio-economic constraints.

Key Challenges

Policy and Regulatory Barriers

- NbS are not always recognized as “infrastructure” → limits access to infrastructure financing.
- Fragmented regulations across water, agriculture, and urban planning hinder integrated approaches.
- NATMed example: Algeria faced uncertainty over institutional mandates for constructed wetlands.

Financial and Investment Barriers

- Lack of established financial products for NbS (loans, guarantees, blended finance).
- Investors perceive NbS as high risk, low return due to long payback periods.
- Limited valuation of co-benefits (e.g. biodiversity, recreation) in standard cost-benefit models.
- NATMed example: In Greece, farmers saw short-term costs of grazing management but not the long-term water and soil benefits.



Challenges to NbS market uptake in the Mediterranean

Institutional and Governance Gaps

- Municipalities often lack the capacity and staff expertise to design and manage NbS projects.
- Coordination failures between local, regional, and national levels.
- NATMed example: Spain's Carrión de los Céspedes required strong university–municipality collaboration to fill capacity gaps.

Social Acceptance and Awareness

- Stakeholders may mistrust “new” green solutions compared to traditional grey infrastructure.
- Citizens and businesses often unaware of NbS benefits beyond aesthetics.
- NATMed example: Bozcaada required communication campaigns to convince farmers about Water 4.0 efficiency.

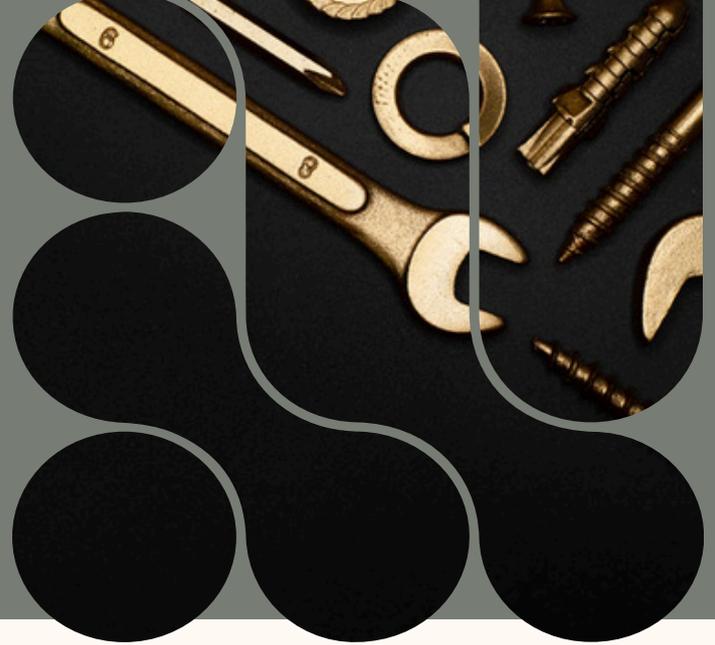
Technical and Data Limitations

- Need for site-specific data (hydrology, soil, climate) → missing in many municipalities.
- Lack of standardized monitoring frameworks → makes comparison and replication difficult.
- NATMed example: Italy (Arborea) needed detailed groundwater quality monitoring to prove cost-effectiveness.

Pitfalls to Avoid

- Designing NbS without considering market and financial viability from the outset.
- Treating NbS only as pilot projects → without pathways for scaling.
- Underestimating the role of communication and citizen engagement in market uptake.

Tools supporting business planning and investment



To scale up NbS, municipalities and stakeholders need **practical tools** to plan investments, evaluate benefits, and attract financing. NATMed has produced some of these tools, applied others during case studies, and identified additional resources from international practice.

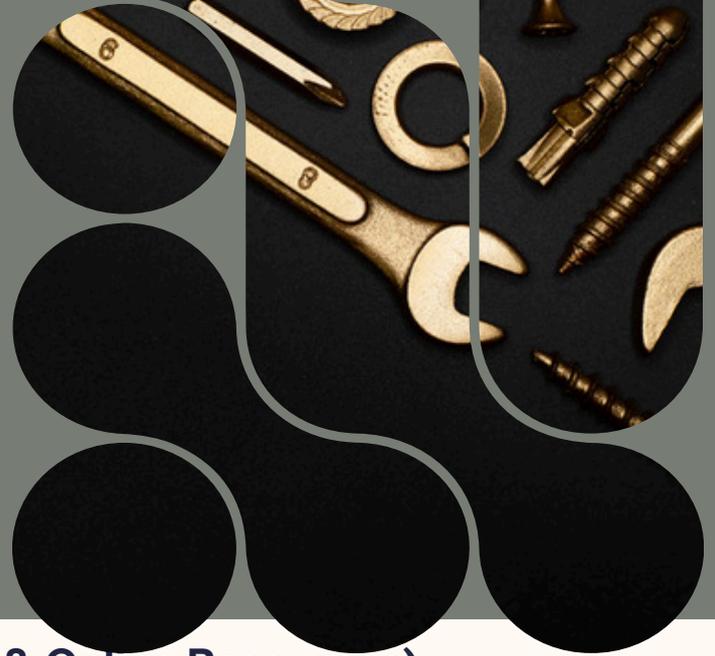
Tools Developed by NATMed

- » **The NATMed Decision Support System (DSS)** dss.natmed-project.eu: It is a tool designed to help municipalities, water authorities, and stakeholders make informed choices about planning, designing, and replicating FWC-NbS. Its main objective is to provide a structured, evidence-based platform that connects site-specific data, challenges, and indicators with practical NbS solutions tested in NATMed pilots.
- » **Replication Plan**: A structured roadmap for transferring NbS across Mediterranean contexts, useful for planning investment steps.
- » **Governance Plan**: Provides governance models that reduce investment risk by ensuring local participation.
- » **Exploitation Plan**: Identifies exploitable results, user profiles, and potential market uptake pathways.

Tools Utilized in NATMed Case Studies

- » **IUCN Global Standard for NbS (2020)**: Used in all NATMed case studies and other pilots to benchmark quality; ensures financiers trust project design.
- » **Cost-Benefit Analysis Frameworks (EC, OECD)**: Referenced in replication and upscaling discussions; showed how NbS deliver long-term economic gains.
- » **Stakeholder Mapping Templates (see module B2)**: Applied in NATMed to map local stakeholders (e.g. farmers, utilities, municipalities).
- » **Monitoring & KPIs**: Provided quantitative evidence (e.g. water reuse, recharge rates) to justify investment cases.

Tools supporting business planning and investment



Further Suggested Tools (Literature & Online Resources)

- » **TEEB (2010) – Ecosystem Service Valuation Framework:** Guidance for integrating ecosystem services into economic planning.
📌 Available at: <https://teebweb.org/publication/ecological-and-economic-foundations/>

- » **EU (2024) Cost-Benefit Assessment for NbS (DG ENV):** Provides methods to compare NbS with grey infrastructure in financial terms.
📌 EU Publications: <https://data.europa.eu/doi/10.2779/252501>

- » **WWF (2022) – Bankable NbS Framework: Success factors for designing projects attractive to investors.**
📌 WWF report: <https://www.wwf.org.uk/sites/default/files/2022-08/Common-success-factors-for-bankable-NbS-report.pdf>

- » **OECD (2020) NbS for Water Risks:** Practical framework for integrating NbS into investment strategies.
📌 OECD Policy Paper: <https://doi.org/10.1787/2257873d-en>

- » **EFI (2025) PES Guide:** Explains how to design Payment for Ecosystem Services as a revenue stream.
📌 EFI brief: <https://efi.int/publications-bank/what-are-payments-ecosystem-services-pes>

Pitfalls to Avoid

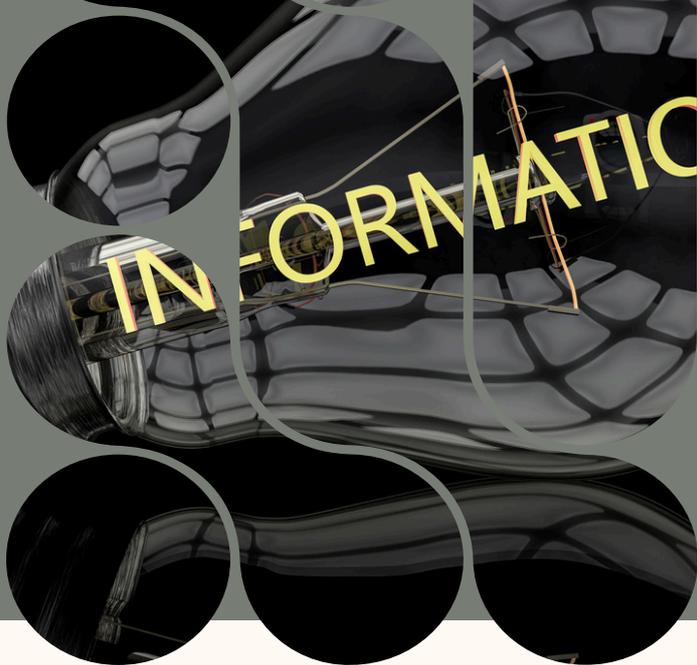
- Using tools in isolation → need to combine technical (DSS), governance (MedCoP, governance plans), and financial (CBA, PES) approaches.
- Treating tools as “templates” only → must be adapted to local context.
- Ignoring monitoring and evaluation → without evidence, investment cases remain weak.



Further Information

NATMed Deliverables:

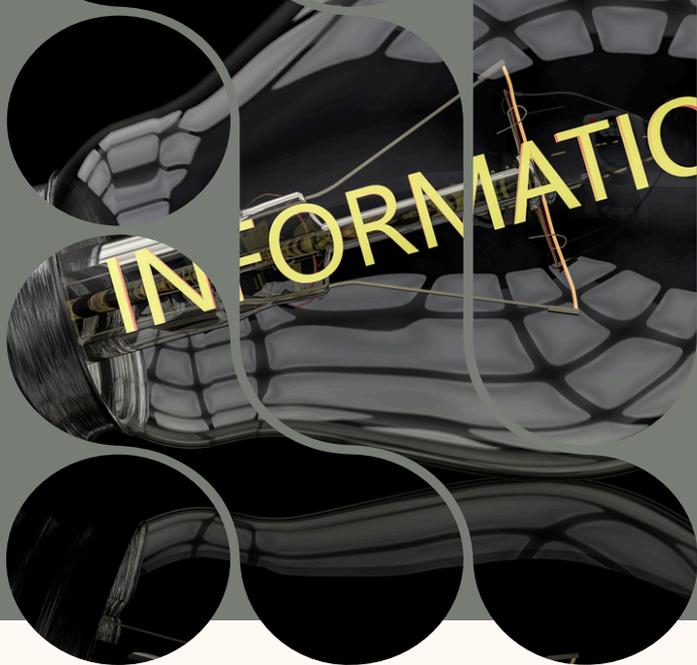
- ✿ D1.2 NbS technical, policy, legal and socio-economic definition
- ✿ D4.2 Implementation Guidelines (section on appraisal methods)
- ✿ D4.3 Decision Support Tool
- ✿ D5.1 Replication Plan
- ✿ D5.2 Governance Plan
- ✿ D5.4 Clustering and Networking Plans
- ✿ D6.6 Exploitation Plan
- ✿ D6.8 Project Results and Assets Catalogue



Further Information

References and useful resources

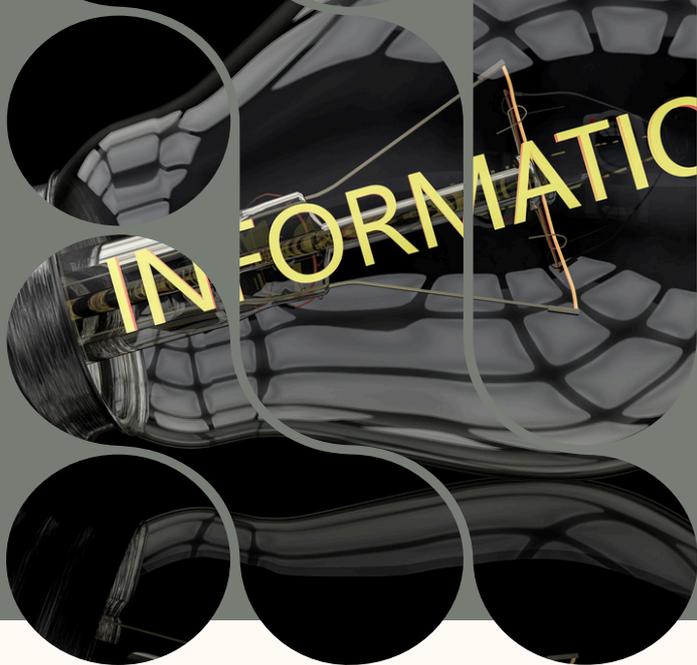
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Quiz



Q1. Which method is most appropriate when benefits cannot be easily monetised but need to be compared across multiple objectives?

- A) Cost–Benefit Analysis (CBA)
- B) Cost-Effectiveness Analysis (CEA)
- C) Multi-Criteria Analysis (MCA)
- D) Discounted Cash Flow (DCF)

Q2. Which business model relies on farmers, communities, or cooperatives co-financing NbS?

- A) Public sector model
- B) Community-based model
- C) Market-linked model
- D) PPP model

Q3. Payments for Ecosystem Services (PES) usually involve:

- A) Upstream users paying downstream users
- B) Downstream beneficiaries paying upstream managers
- C) Government paying everyone equally
- D) Farmers paying tourists for water use

Q4. A Public–Private Partnership (PPP) shares both investment and risk between government and private entities.

- True
- False

Q5. Which of the following is not one of the five pillars of an enabling framework for NbS?

- A) Policy & Legal
- B) Institutional
- C) Financial & Economic
- D) Marketing & Advertising



Glossary

- **CBA** Cost–Benefit Analysis
- **CS** Case Study
- **CEA** Cost-Effectiveness Analysis
- **CW** Constructed Wetland
- **D** Deliverable
- **DSS** Decision Support System
- **EC** European Commission
- **FWC-NbS** Full Water-Cycle NbS
- **IUCN** International Union for Conservation of Nature
- **MedCoP** Mediterranean Community of Practice
- **MCA** Multi-Criteria Analysis
- **NATMed** Nature-based Solutions on existing infrastructures for resilient Water Management in the Mediterranean
- **NbS** Nature-based Solution
- **OECD** Organisation for Economic Co-operation and Development
- **O&M** Operation & Maintenance
- **PES** Payments for Ecosystem Services
- **PPP** Public–Private Partnership
- **UNEP** United Nations Environment Programme

NATMed

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