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Project acronym: EcoDaLLi
Project title: ECOsystem-based governance with DANube lighthouse Living Lab for sustainable Innovation processes – EcoDaLLi
Call: HORIZON-MISS-2021-OCEAN-02-04 – Danube river basin lighthouse – coordination activities
Programme: HORIZON EUROPE
Start date of project: 01.01.2023
Duration: 42 Months



Deliverable 5.3

Report on upscaled innovations: Paving the way to Upscaling



Deliverable Name	Report on upscaled innovations
Deliverable Number	D5.3
Work Package	WP5
Associated Task	T5.3 - Paving the way to Upscaling
Due Date	30.04.2026
Completion Date	18.06.2026
Submission Date	19.06.2026
Deliverable Lead Partner	Acteon, SEZ

Dissemination Level		
PU	Public	x
SEN	Sensitive	

Change Control Document History				
Version	Date	Change History	Authors	Organization
V1	18/05/2026	First version	Y. Zaiter, J. Wang, G. Depaoli	ACTeon Environment
		Acknowledgement of contribution to Data collection for the deliverable	Andrea Samu	WWF Hungary
V2	26/05/2026	Formatting corrections and input added	V. Höhn	SEZ
	27/05/2026	Internal Review Feedback	Lorea Martín Abad, Priscila Franco Steier	ICLEI
V3	11/06/2026	Responding to reviewer comments	Y. Zaiter, J. Wang, G. Depaoli, V. Höhn	ACTeon Environment
	17/06/2026	Internal Review Feedback	Simona Chirila	DDNI
V3.1	18/06/2026	Responding to reviewer comments	Y. Zaiter, J. Wang, G. Depaoli	ACTeon Environment
	19/06/2026	Final Check of the Deliverable	V. Höhn	SEZ



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Executive summary

Scaling innovation in freshwater ecosystem restoration remains one of the central challenges for achieving the ecological ambitions of the Danube River Basin and broader European water policy. While numerous Nature-Based Solutions (NBS) and restoration initiatives have demonstrated technical feasibility and local benefits, relatively few have progressed beyond pilot or demonstration stages to achieve wider systemic uptake.

This policy brief examines the conditions that enable or constrain the upscaling of innovation in freshwater ecosystem restoration, with a particular focus on the Danube River Basin. The analysis draws on a structured assessment of 68 case studies from the Danube region and other European Union Member States, covering a diverse range of innovation actions, governance arrangements, and financing models. A scoring framework based on three dimensions of the innovation ecosystem (resources, actors, and enabling environment) was used to identify recurring success factors and structural barriers to scaling.

The analysis reveals a clear and consistent finding: scaling is primarily driven by governance and stakeholder mobilisation rather than by financial mechanisms alone. Across the case study portfolio, actor-related factors (including governance structures, institutional coordination, and stakeholder engagement) emerge as the most important enabling conditions associated with successful upscaling. This suggests that scaling is not simply a technical replication process, but a governance transformation process requiring institutional embedding, legitimacy, and coordination across sectors and administrative levels.

At the same time, significant structural barriers persist. Financial viability constraints, fragmented funding systems, high transaction and implementation costs, and limited institutional capacity remain the most recurrent obstacles to scaling. Importantly, these barriers are not absent in successful cases; rather, scaling tends to occur where enabling governance conditions are sufficiently strong to navigate structural constraints.

The analysis also highlights a regional distinction. Within the Danube basin, scaling appears more dependent on governance arrangements and stakeholder mobilisation, reflecting the importance of actor-related factors such as coordination mechanisms, stakeholder engagement, and collaborative implementation processes. These factors often help projects navigate institutional constraints linked to administrative capacity, financing structures, and broader enabling conditions. In comparison, non-Danube cases show stronger differentiation in both enabling conditions and barriers, suggesting that more supportive institutional environments may facilitate scaling in some contexts.

The findings further indicate that private finance mechanisms, including investors' networks and green finance instruments, currently play only a limited role in freshwater restoration scaling. This pattern is consistent with broader evidence from the Nature-Based Solutions and biodiversity finance literature, where public funding and project-based support continue to dominate implementation despite growing interest in private investment mechanisms. The results therefore highlight the need for more durable financing architectures, including blended



finance approaches, regulatory incentives, and mechanisms capable of supporting implementation beyond individual project cycles¹².

Several practical lessons emerge from the case studies. Strong technical design and evidence generation do not automatically lead to scaling. Demonstration projects frequently struggle to transition into operational mainstreaming without institutional uptake and long-term financing pathways. Conversely, community mobilisation, multi-level governance coordination, and adaptive stakeholder engagement repeatedly emerge as decisive success factors.

The central implication for policymakers is clear: scaling freshwater innovation requires more than funding individual projects. It requires strengthening governance ecosystems, reducing administrative fragmentation, improving institutional coordination, and creating financing mechanisms capable of supporting long-term implementation beyond pilot cycles.

Scaling should therefore be understood not as the expansion of isolated projects, but as a systemic transition process requiring institutional, financial, and governance transformation. In this context, the Nature Restoration Regulation and the forthcoming National Nature Restoration Plans provide a unique opportunity to embed restoration objectives into long-term planning frameworks, strengthen coordination across sectors and governance levels, and create the enabling conditions necessary for large-scale replication and mainstreaming of freshwater NBS.

¹ Carter, H., Thompson, B.S., Bull, J.W., Dickman, A., Jones, J.P.G., Shrikanth, S., Ermgassen S.O.E. (2026) Demystifying biodiversity finance. *Nat. Rev. Biodivers.* <https://doi.org/10.1038/s44358-026-00155-z>

² European Investment Bank (2023) State-of-play and way forward for public and private financial measures in Europe. https://www.eib.org/attachments/lucalli/20230095_investing_in_nature_based_solutions_en.pdf



1. Introduction

1.1. Background

The Danube River Basin is one of Europe's most complex and strategically significant freshwater systems.

Spanning 14 countries and connecting diverse ecological zones, economies, and governance structures, it represents both a major environmental asset and a coordination challenge of continental scale.

The basin supports drinking water supply, agriculture, energy production, transport, fisheries, tourism, and biodiversity of European importance. At the same time, it faces persistent structural pressures: water pollution, hydromorphological alterations, habitat fragmentation, biodiversity decline, and increasing climate-related risks such as floods and droughts.

Despite decades of policy action under the Water Framework Directive, the Floods Directive, and the EU Biodiversity Strategy, ecological restoration remains uneven, and often insufficient to reverse degradation trends. Restoration efforts frequently remain localised, project-based, and dependent on temporary funding cycles. Moving from isolated interventions to systemic transformation remains a core challenge. Recent evidence suggests that this challenge is not unique to freshwater restoration. Across the Nature-Based Solutions sector, public funding continues to dominate implementation, while private finance mechanisms remain limited in scale and often require supportive regulatory frameworks, blended finance approaches, and public-sector intervention to become viable at scale (European Investment Bank, 2023; Carter et al., 2026)³.

In this context, ecosystem restoration in the Danube Basin is not only an environmental necessity. It is a governance, financing, and institutional challenge.

Nature-Based Solutions (NBS), such as reconnecting floodplains, restoring wetlands, or rewilding river corridors, represent among the most scalable and cost-effective approaches available to support the basin's water, climate, and biodiversity objectives. While increasingly promoted across European policy frameworks, their integration into sectoral policies and implementation practices remains uneven, particularly where grey infrastructure has traditionally dominated investment decisions.

Evidence from multiple freshwater restoration cases across the Danube region demonstrates that NBS can reduce flood risk, enhance drought resilience, and restore ecological function, often delivering broader system resilience than engineered alternatives. When implemented at scale, they offer lower lifetime costs and generate co-benefits (including biodiversity gains, carbon storage, and recreational value) that significantly enhance their overall return on investment. Where communities are actively involved in design and implementation, restoration initiatives also generate social legitimacy and political support.

Yet technical effectiveness alone does not guarantee scale.

³ European Investment Bank (2023) State-of-play and way forward for public and private financial measures in Europe.

https://www.eib.org/attachments/lucalli/20230095_investing_in_nature_based_solutions_en.pdf ;

Carter, H., Thompson, B.S., Bull, J.W., Dickman, A., Jones, J.P.G., Shrikanth, S., Ermgassen S.O.E. (2026) Demystifying biodiversity finance. *Nat. Rev. Biodivers.* <https://doi.org/10.1038/s44358-026-00155-z>

Scaling requires institutionalising local agency, linking funding to measurable outcomes, and embedding simple, standardised performance indicators into financing and governance frameworks, conditions that are not yet systematically integrated across the basin.

This brief extracts actionable, evidence-based lessons from restoration cases across the Danube region, assessed through a structured, case-specific scoring framework. The analysis is strictly implementation-focused and grounded in documented experience.

The objective is clear: to shift NBS from isolate pilot projects to systemic, scalable interventions by strengthening the enabling conditions that determine whether restoration succeeds at basin scale.

1.2. Scope of the deliverable

This policy brief was developed within the framework of the EcoDaLLi project, and in particular under Work Package (WP) 5, which focuses on fostering a strong innovation ecosystem in the Danube River Basin.

It builds on previous work carried out under WP5 — notably Task 5.1, which mapped the services supporting innovation in the Danube region, and Task 5.2, which developed a guidebook to assist innovators in navigating funding, governance, and business development challenges. While those tasks focused on identifying support mechanisms and strengthening innovation capacity, this brief moves one step further.

Its core objective is to identify the levers and barriers that determine whether innovation in ecosystem restoration can scale across the Danube region.

Drawing on a structured assessment of freshwater restoration case studies, the analysis highlights the systemic conditions that enable replication, expansion, and mainstreaming of NBS — as well as the structural constraints that prevent them from moving beyond pilot stage.

- **Section 2** presents the methodological approach and scoring framework used to assess upscaling potential across case studies. It is designed to establish credibility without drowning in detail, focusing on what was measured, not how the tool was built.
- **Section 3** identifies the key factors that contribute to successful upscaling: governance models, financing mechanisms, community anchoring, and adaptive monitoring that allowed NBS to scale. This is not about what worked, but what made it scalable.
- **Section 4** examines the main barriers that constrain scaling efforts: fragmented authority, misaligned funding, lack of performance tracking, and weak institutional anchoring. This is not about why projects failed, but why scaling stalled.
- **Section 5** formulates targeted recommendations to strengthen the enabling conditions for innovation across the basin. These are concrete, non-generic actions for policymakers, funders, and innovators, targeted at EU, national, and river basin levels. Each recommendation answers: Who does what, by when, and how will we know it worked?
- **Section 6** connects the findings of this analysis with the work of EcoDaLLi and the broader framework of the Danube and Black Sea Lighthouse and the EU Mission Ocean and waters work. What was EcoDaLLi's role in supporting upscaling in the Lighthouse?

This brief is intended for policymakers, river basin authorities, innovation actors, financing institutions, and practitioners involved in the design, implementation, or support of restoration initiatives in the Danube region. Its purpose is to provide clear, evidence-based insights to help shift restoration innovation from isolated actions to systemic, scalable solutions.

The bottom line: Scaling innovation in the Danube Basin isn't about more projects. It's about smarter systems. This brief shows how to build them, based on what actually worked on the ground.

2. Methodology of the Assessment of Scaling

Understanding why some restoration initiatives scale while others remain confined to pilot phase requires moving beyond theory and examining implementation in practice.

To identify the levers and barriers to upscaling innovation in ecosystem restoration, this brief relies on a structured assessment of real-life case studies. The analysis focuses primarily on innovation actions within the Danube River Basin. In addition, selected case studies from other European Union Member States were included to serve as benchmarks, allowing comparison across regional contexts and helping determine whether identified barriers and enabling conditions are specific to the Danube or reflect broader structural patterns across the EU.

The objective was not to produce a comprehensive inventory of projects, but to assemble a sufficiently diverse portfolio of innovation cases to allow robust cross-case analysis of upscaling dynamics.

2.1. Case Study Selection

The selection of case studies was based on two complementary pillars: desk research and stakeholder input through a targeted survey. The desk research, stakeholder survey, and case study assessment were conducted between January 2026 and April 2026 as part of the preparation of Deliverable 5.3. This timeframe provides the analytical context for the case study portfolio and reflects the information available at the time of the assessment.

The first pillar consisted of structured desk research aimed at identifying innovation actions related to ecosystem restoration and NBS in the Danube region. Particular attention was given to initiatives developed under EU-funded research and innovation programmes, including Horizon Europe, Horizon 2020, LIFE, Interreg, and Mission Ocean-related projects. Additional sources included project reports, publicly available documentation, and outputs from relevant restoration initiatives operating within the basin.

This process allowed the identification of a broad pool of innovation cases addressing technological, financial, governance, and social dimensions of ecosystem restoration. From this initial screening, 68 case studies were retained. Case studies were selected based on their relevance to ecosystem restoration and/or Nature-based Solutions. To be included, cases needed to provide sufficient information on at least one of the following aspects: implementation approaches, governance arrangements, funding mechanisms, innovation processes, or upscaling experiences. These criteria ensured that the selected cases could contribute meaningfully to the assessment of barriers, success factors, and enabling conditions for scaling ecosystem restoration initiatives.

The second pillar involved direct stakeholder engagement. A structured survey was developed and disseminated among participants of the Danube Lighthouse and related innovation networks. Stakeholders were invited to provide information on ongoing or completed innovation actions in ecosystem restoration, including implementation context, governance arrangements, funding models, and perceived scaling challenges.

The survey instrument is provided in Annex I.

A total of 21 responses were collected from a diverse range of stakeholders, including project developers, public authorities, research institutions, and civil society organisations. The responses contributed additional case material and enriched contextual understanding of scaling dynamics in the region.

Together, these two pillars ensured that the case study portfolio reflects both documented project evidence and practitioner experience, providing a robust empirical foundation for the subsequent scaling assessment.

2.2. Scoring Framework

To assess the conditions enabling or constraining the upscaling of innovation in freshwater restoration, a set of factors was defined based on the three core pillars of an innovation ecosystem: resources, actors, and enabling environment.

Resources encompass infrastructure, funding availability, identification and quantification of ecological and economic benefits, and the potential for financial returns. Actors include governance structures, stakeholder engagement mechanisms, and the presence or absence of investor networks. The enabling environment covers institutional capacity, the maturity of green finance markets (e.g., green bonds), the strength of the business case, and the level of transaction and implementation costs.

Each factor was evaluated for its role in either success factors for upscaling (levers) or challenges to upscaling (barriers) of the innovation action described in the case study. The same factor could function as a lever in one context and as a barrier in another, depending on how it was structured, implemented, or institutionalised (see Annex II for the definition of each factor).

For each case study, the influence of every factor was scored on a 0-5 scale (see Table 1)

Table 1: Scoring metric.

0	1	2	3	4	5	No info
No role	Very marginal role	Marginal role	Noticeable role	Important role	Very important role	Insufficient evidence to assign a score

Scoring was applied strictly based on documented evidence within each case study. **No assumptions** were introduced, **no extrapolation** was made from general project deliverables, and **no inference** was drawn beyond what was explicitly reported. Empty cells in the assessment matrix were replaced with “No info” to reflect absence of documented evidence rather than absence of impact.

The scoring process was conducted independently for each factor and each case, ensuring that challenges and success factors were assessed separately and not conflated. This approach enabled a granular understanding of which conditions were most influential in driving or blocking upscaling, and how their relative weight varied across different contexts.

The objective of the scoring was not to rank cases, but to identify patterns: which factors consistently appeared as levers or barriers across the portfolio, and how their relative influence shaped the potential for replication, expansion, or mainstreaming of Nature-Based Solutions.

For the correlation analysis, factor-level scores were first aggregated at case-study level. For each case study, an average score was calculated for each innovation ecosystem pillar (resources, actors, and enabling environment), separately for levers and barriers. “No info” entries were excluded from these averages using the Excel AVERAGE/IFERROR functions, so that missing information did not enter the calculation as a zero value. The resulting pillar-level average scores were then correlated with the upscaling status of each case, coded as a binary variable (0 = not upscaled; 1 = upscaled). The correlation analysis is therefore based on aggregated case-level pillar scores and is intended to identify broad associations rather than statistically causal relationships.

3. What Drives Upscaling?

The empirical assessment of 68 innovation cases across the Danube region and other EU Member States confirms that upscaling is primarily driven by governance configuration and stakeholder mobilisation rather than by financial instruments or infrastructure alone. Using the aggregated case-level pillar scores described in the methodology, the correlation analysis shows that the Actors pillar is the only lever dimension positively associated with upscaling ($r \approx 0.29$), while resource and enabling-environment levers show weak or negative associations. Although moderate in magnitude, this is the strongest structural relationship observed across the innovation ecosystem pillars, confirming that scaling is fundamentally institutional rather than purely financial.

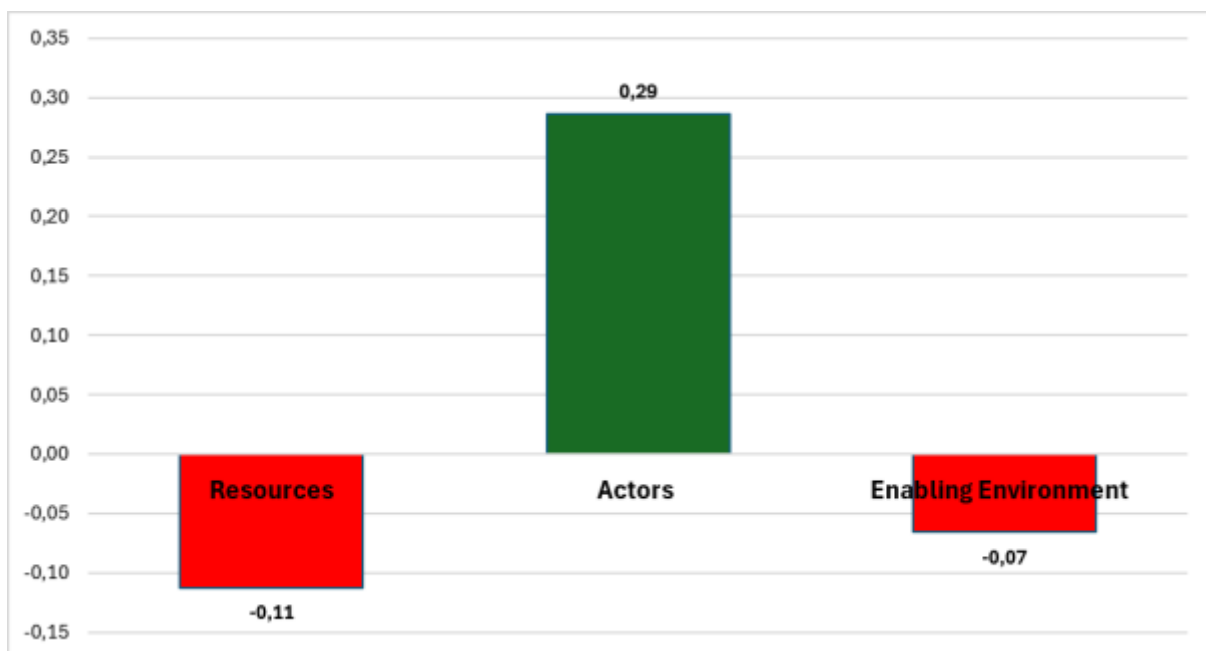


Figure 1: Correlation between Innovation Ecosystem Pillars and Upscaling (Levers).

Beyond correlation, differences in the average importance of enabling factors reinforce this conclusion (Figure 2). Upscaled cases display significantly higher average scores for enabling factors (3.79) compared to non-upscaled cases (3.46). This difference is even more pronounced outside the Danube region, where upscaled cases reach an average lever score of 4.27 compared to 3.32 for non-upscaled cases. Within the Danube basin, the differentiation is smaller (3.60 vs 3.54), suggesting that scaling dynamics are more structurally differentiated outside the basin. While differences in documentation quality may influence the visibility of some factors, the observed patterns are based primarily on factors for which information coverage was relatively high across both Danube and non-Danube case studies.

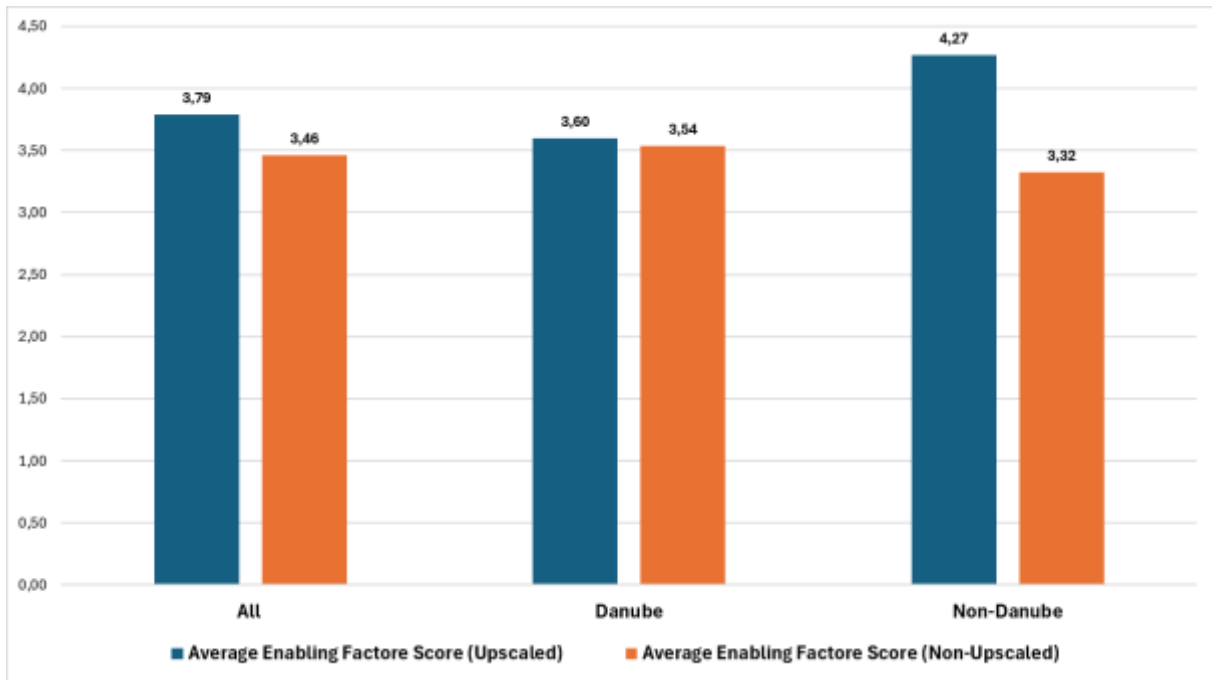


Figure 2: Average importance of enabling factors - Upscaled vs. Non-Upscaled.

At pillar level, actor-related levers show the strongest differentiation. In non-Danube upscaled cases, average actor-related enabling scores reach 4.75, compared to 3.50 in non-upscaled cases — a gap of +1.25. In Danube cases, average actor-related enabling scores in upscaled projects (4.03) also exceeds that of non-upscaled projects (3.59), though the gap is more moderate (+0.44). These patterns confirm that governance strength and stakeholder coordination systematically distinguish scaled from non-scaled initiatives.

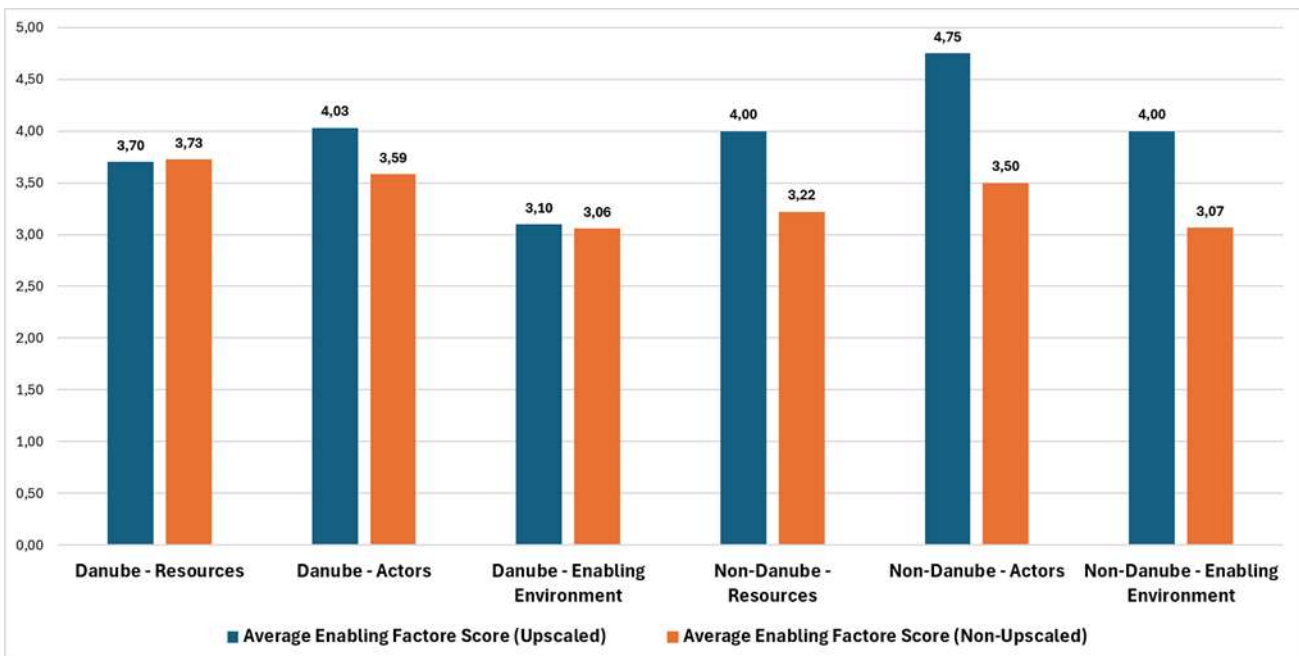


Figure 3: Average importance per pillar of innovation ecosystem (Upscaled vs Non-Upscaled).

This finding strongly aligns with the OECD Water Governance Principles, which emphasise the importance of multi-level coordination, stakeholder engagement and policy coherence as

preconditions for effective water policy implementation and scaling (OECD, 2015)⁴. Similarly, the European Environment Agency highlights **governance capacity** and cross-sector coordination as key enablers of scaling nature-based solutions (EEA, 2023)⁵. The consistency between the empirical findings and these institutional frameworks reinforces the conclusion that governance alignment, rather than capital intensity, is the central driver of scaling.

BOX: Szigetköz Region-Revitalisation (Hungary – DALIA Innovation Action)

The Szigetköz water replenishment system restores natural hydrological dynamics across a 40 km Danube floodplain branch system through a gravity-based water control structure and fish passages reconnecting former side branches. The system operates without electricity and dynamically adjusts flows to replicate historical water levels.

The case demonstrates several enabling conditions commonly associated with scaling, notably multi-sector stakeholder coordination, governance alignment across water uses, and technical operability of the restoration model.

However, despite these enabling features, evidence of formal replication pathways, long-term financing mechanisms, or institutional mainstreaming remains limited.

Szigetköz therefore illustrates an important analytical point: strong technical and governance foundations may create scaling potential, but do not automatically translate into systemic upscaling.



Source: DALIA Innovation Action; <https://www.dalia-danube.eu/demo-sites/dps-1>

In the analysed cases, governance capacity was not assessed as a purely institutional characteristic, but rather through the practical arrangements supporting implementation and scaling. Successful cases frequently combined clear coordination mechanisms across governance levels, dedicated organisations responsible for implementation, and collaboration between public authorities, research institutions, civil society organisations, and local communities. These governance arrangements helped reduce implementation barriers,

⁴ OECD (2015) OECD Principles on Water Governance. Centre for Entrepreneurship, SMEs, Regions and Cities. <https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/water-governance/oecd-principles-on-water-governance-en.pdf>

⁵ EEA (2023) Scaling nature-based solutions for climate resilience and nature restoration. European Environment Agency. <https://www.eea.europa.eu/en/analysis/publications/scaling-nature-based-solutions>

facilitate knowledge exchange, build local ownership, and maintain continuity beyond individual project cycles. The findings therefore suggest that governance contributes to scaling not only through formal institutions, but through the ability to organise and sustain collective action over time.

Stakeholder engagement emerges as the most frequently reported strong success factor in the dataset, with nearly 68% of cases scoring it at an important or very important level (62% for the Danube case studies and 81% for the Non-Danube case studies – score ≥ 4). This pattern reflects the growing body of research demonstrating that co-design processes, participatory governance and long-term stakeholder involvement reduce resistance, increase legitimacy and facilitate policy integration. The IUCN Global Standard for Nature-based Solutions explicitly identifies inclusive governance and stakeholder participation as foundational criteria for successful implementation and scaling (IUCN, 2020)⁶. The empirical evidence therefore confirms that scaling is less a technical replication process and more a negotiated institutional process

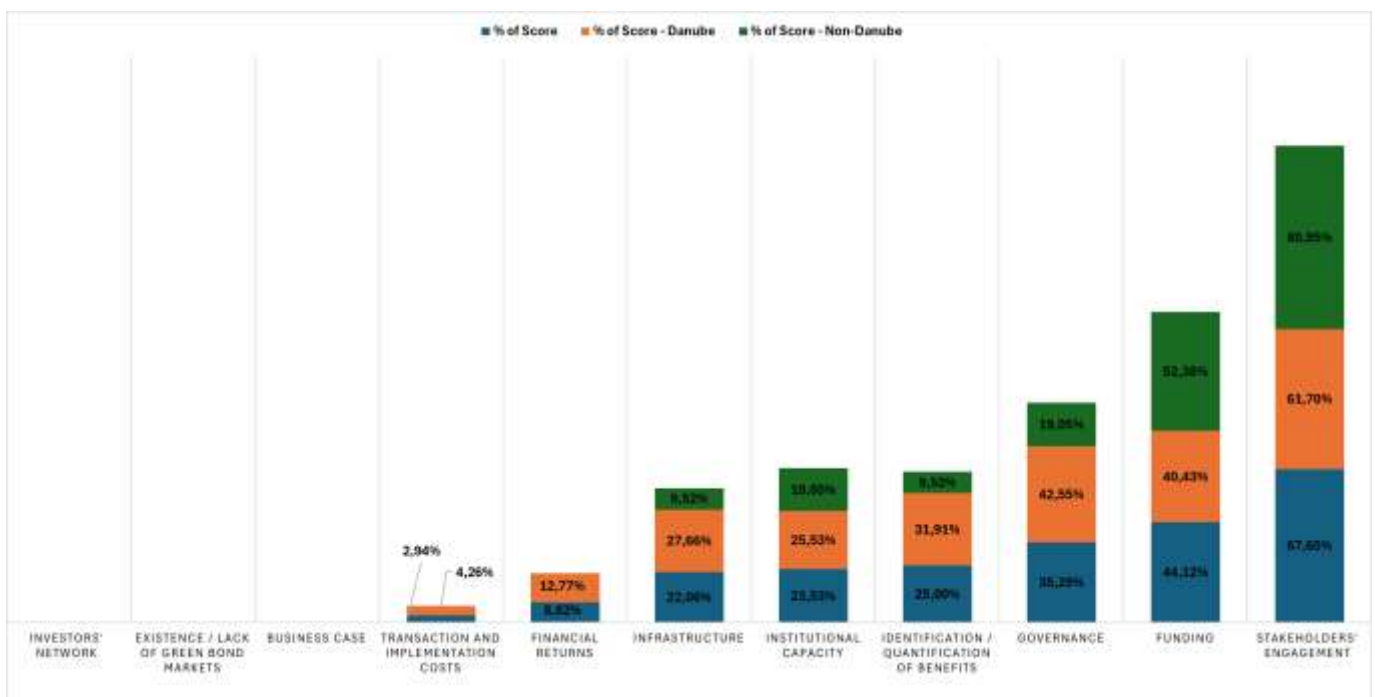


Figure 4: Success factors contributing to upscaling.

⁶ IUCN (2020) IUCN Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. First edition. Gland Switzerland: IUCN. <https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf>

A particularly important regional distinction emerges between Danube and non-Danube cases. Within the Danube basin, scaling appears primarily actor-driven: governance and stakeholder mobilisation differentiate upscaled from non-upscaled cases, while resource-based levers show limited differentiation. Interestingly, upscaled Danube cases report slightly higher enabling-environment barriers, suggesting that projects reaching systemic scale encounter institutional complexity rather than avoid it. Outside the basin, scaling is more structurally differentiated: both resource barriers and actor levers display much stronger gaps between scaled and non-scaled cases. This implies that in non-Danube contexts, scaling is more dependent on ecosystem maturity and institutional capacity, whereas within the Danube region governance configuration plays a more compensatory role.

BOX: Tackling Plastic Waste in the Bodrog Floodplain (Hungary – DALIA Innovation Action))

The Plastic Cup Initiative in the Bodrog floodplain addresses transboundary plastic pollution through an integrated model combining research, GPS-based hydrological modelling, satellite tracking of macroplastics, professional and community clean-up actions, and environmental education.

The initiative stands out for its exceptionally strong stakeholder mobilisation and governance coordination. Citizen science, volunteer engagement, and cross-sector partnerships form the backbone of implementation. Monitoring tools provide structured evidence of impact, strengthening legitimacy and public support.

While funding constraints remain present and institutional coordination requires ongoing effort, the initiative has successfully expanded its influence and operational footprint. Scaling has been driven less by financial engineering and more by governance, stakeholder engagement, and community activation.

The Bodrog case exemplifies actor-driven upscaling within a structurally complex Danube context.



Source: DALIA Innovation Action; <https://www.dalia-danube.eu/demo-sites/dps-8>

The near absence of investors' networks and green bond mechanisms as decisive enablers across cases further reinforces the conclusion that freshwater innovation scaling remains largely public-sector anchored. Despite growing policy discourse around sustainable finance, the data suggests that market-based instruments are not yet central to scaling river restoration initiatives. This finding is consistent with recent European and international evidence showing that private biodiversity and Nature-Based Solution finance remains relatively limited compared to public funding streams. While new instruments such as biodiversity credits, green bonds, impact investment funds, and blended finance mechanisms are emerging, their contribution to large-scale ecosystem restoration remains modest and often depends on enabling public policies and regulatory support (European Investment Bank, 2023; Carter et al., 2026).

A clear regional distinction emerges when comparing Danube and non-Danube cases. Within the Danube basin, scaling appears predominantly actor-driven, with governance and stakeholder engagement providing the main differentiating levers. Resource-based levers show limited differentiation between scaled and non-scaled cases. Outside the basin, however, scaling is more structurally differentiated: both actor levers and overall lever score show significantly larger gaps between scaled and non-scaled initiatives. This suggests that ecosystem maturity and institutional configuration play a stronger role in non-Danube contexts, whereas in the Danube region governance structures may function more as compensatory mechanisms within a structurally constrained environment

BOX: Draž Municipality (Croatia – DaWetRest Innovation Action)

The Middle Danube demonstration site centred on Draž Municipality tests wetland and floodplain restoration solutions across cross-border pilot and sibling sites. The initiative operates within a Horizon Europe–funded framework and mobilises a broad consortium of public authorities, research institutions, and regional actors.

Governance, stakeholder participation, and institutional capacity are strong enabling factors. Structured monitoring of biodiversity, water quality, and ecosystem resilience supports evidence generation. Funding at project level is secured and multi-actor coordination mechanisms are established.

However, structural friction remains significant. Funding continuity beyond project cycles, benefit monetisation mechanisms, and long-term institutional embedding at basin scale are not yet consolidated. The initiative demonstrates strong enabling conditions but has not moved beyond demonstration scale.

Draž illustrates the Danube pattern of high governance mobilisation operating within persistent structural constraints.

Source: DaWetRest Innovation Action; <https://dawetrest.eu/middle-danube/>

Overall, the empirical evidence suggests that scaling freshwater innovation is governed by institutional embedding rather than capital mobilisation. Projects scale when they are integrated into governance structures, supported by stakeholder coalitions, and able to navigate rather than avoid institutional complexity. Funding and infrastructure remain necessary conditions, but they are not sufficient drivers. This distinction is critical for policy

design: strengthening governance ecosystems and actor coordination mechanisms may yield greater scaling returns than focusing solely on financial innovation.

4. Scaling Pathways and Systemic Barriers

Scaling across the analysed cases does not appear to follow a purely linear or resource-driven trajectory. Instead, the empirical evidence suggests that scaling is primarily associated with actor-centred dynamics, while systemic barriers are predominantly structural and resource-related. This distinction between enabling agency and structural friction helps clarify the mechanisms through which projects transition from pilot to broader implementation. This interpretation aligns with socio-technical transition theory, which highlights how innovation emerges through interactions between agency in protected niches and structural constraints embedded in existing socio-technical regimes (Geels, 2002)⁷.

At aggregate level, average barrier scores are lower for upscaled cases (2.49) compared to non-upscaled cases (2.96), confirming that lower structural friction is associated with higher scaling probability.

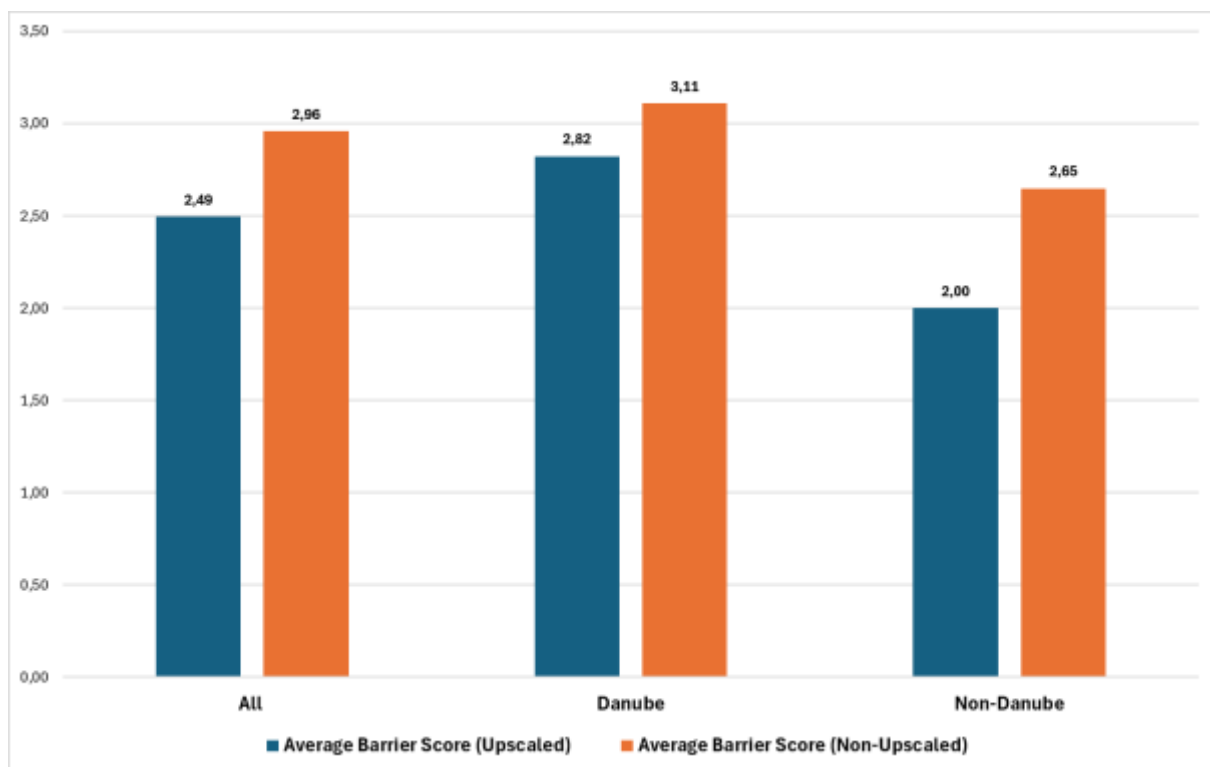


Figure 5: Average barrier scores - Upscaled vs. Non-Upscaled.

However, the difference is not dramatic, suggesting that scaling does not necessarily occur in “low-barrier environments”, but rather in contexts where enabling conditions outweigh systemic constraints. In contrast, average enabling factor scores are significantly higher for upscaled cases (3.79) than for non-upscaled cases (3.46). This asymmetry suggests that scaling is more strongly driven by the presence of enabling factors than by the mere absence of barriers. In other words, scaling appears to be proactive rather than passive: projects do not scale simply because barriers are low, but because strong enabling ecosystems are in place. This finding resonates with the scaling impact literature, which emphasises that scaling beyond local

⁷ Geels F. (2002) Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case study. *Research Policy* (31). [https://doi.org/10.1016/S0048-7333\(02\)00062-8](https://doi.org/10.1016/S0048-7333(02)00062-8)

experimentation requires organisational capacity, new resource mobilisation, and engagement with broader institutional systems (Moore et al., 2015)⁸.

Looking at average barrier scores by innovation ecosystem pillar, it remains substantial across the sample (3.22 for resource-related barriers, 3.1 for enabling-environment barriers, and 2.99 for actor-related barriers).



Figure 6: Average barrier scores by innovation ecosystem pillar.

Resource-related barriers clearly dominate, confirming that financial constraints and economic viability issues represent the most persistent structural bottlenecks.

The correlation analysis reinforces this structural interpretation (Figure 7). Resource barriers show the strongest negative correlation with upscaling ($r \approx -0.24$), suggesting that financial and economic constraints significantly reduce the probability of replication⁹. By contrast, actor and enabling-environment barriers show weaker associations with scaling outcomes.

This indicates that while governance and institutional context matter, it is primarily financial feasibility and cost structures that impose hard limits on expansion.

⁸ Moore M.L., Riddel D., Vocisano D. (2015) Scaling Out, Scaling Up, Scaling Deep. Strategies of Non-profits in Advancing Systemic Social Innovation. *The Journal of Corporate Citizenship* (58). DOI: 10.9774/GLEAF.4700.2015.ju.00009.

⁹ Correlations were calculated using average pillar-level scores per case study, excluding "No info" entries from the calculation. The results should be interpreted as exploratory associations based on documented evidence rather than causal relationships.

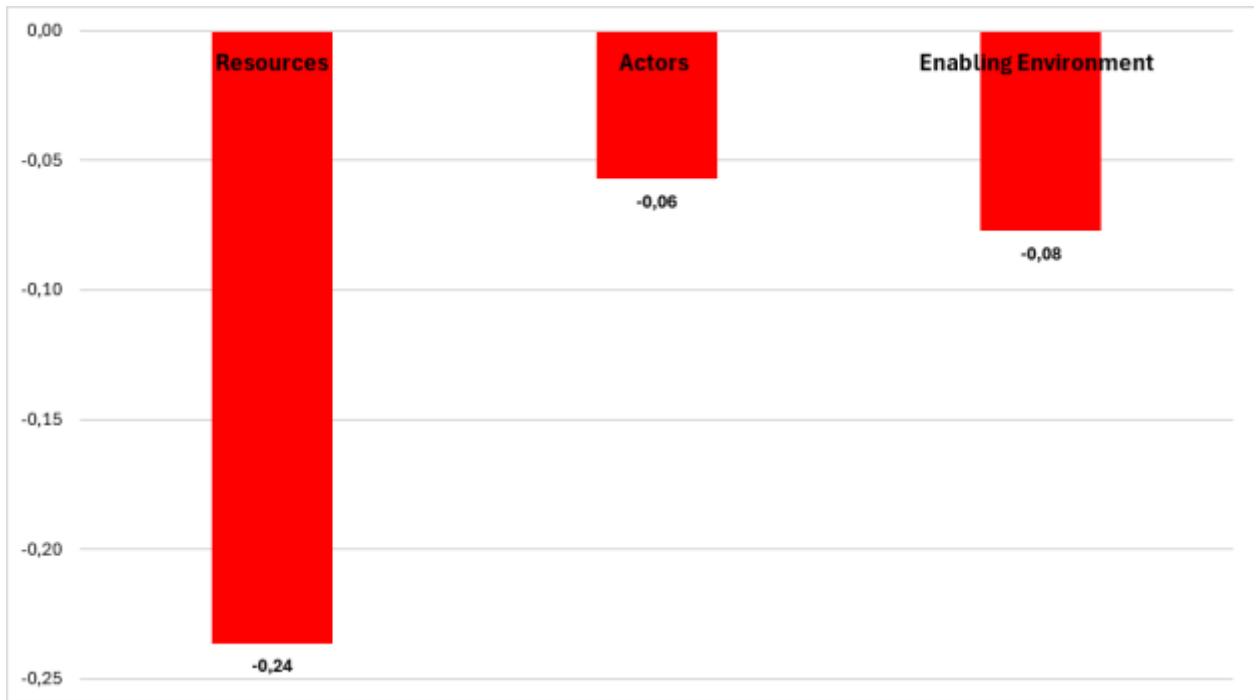


Figure 7: Correlation between Innovation Ecosystem Pillars and Upscaling (Challenges).

BOX: Kolubara & Tamnava River Basins – NBS Conceptual Design (Serbia – RECONNECT Innovation Action)

The Kolubara and Tamnava River Basins case illustrates a recurrent structural barrier to scaling Nature-Based Solutions: the transition gap between conceptual design and operational implementation.

Developed through the RECONNECT project and supported by international technical expertise, the initiative advanced robust conceptual planning for flood resilience through Nature-Based Solutions, including multi-criteria analysis, participatory assessment, and methodological design work. The case demonstrates analytical and technical readiness, with evidence of stakeholder engagement and structured assessment of potential benefits. However, these enabling conditions have not translated into concrete implementation or systemic replication.

The principal barriers appear structural rather than technical: insufficient institutional embedding, limited financing pathways, and weak integration of Nature-Based Solutions into operational policy and investment frameworks.

The Kolubara case illustrates that methodological maturity alone is insufficient for scaling when governance and financing systems are not configured to move innovation from design to implementation.

Source: Reconnect Project; <http://www.reconnect.eu/>

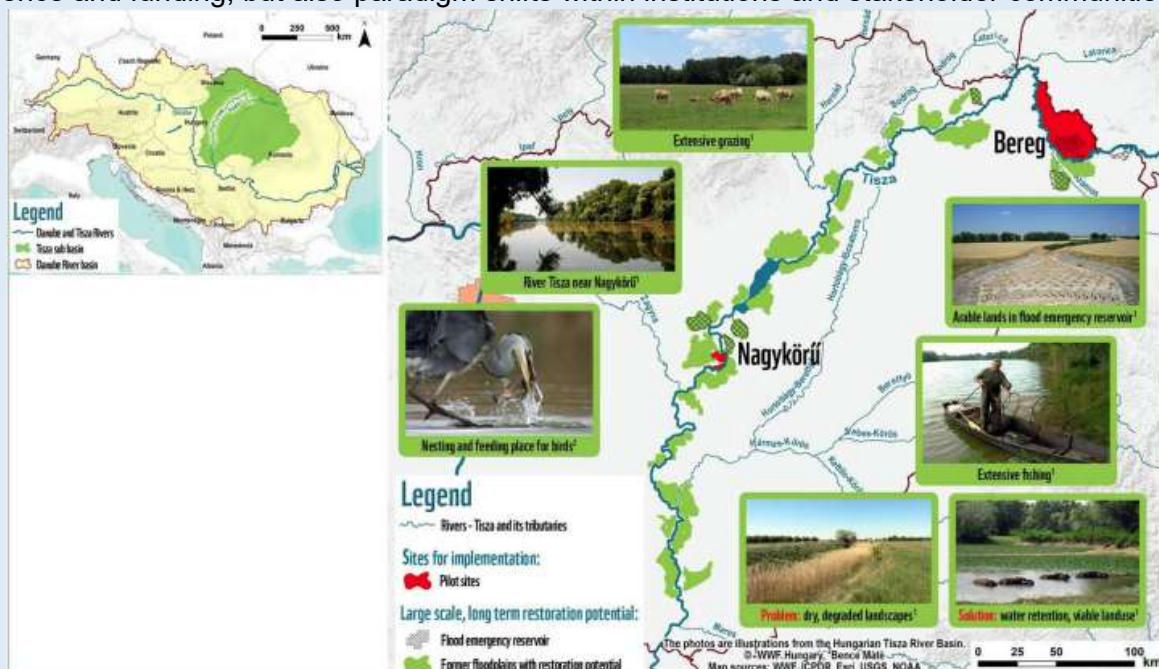
BOX: Tisza 21 (Hungary- Merlin Project)

The scoring profile reveals high barriers across almost all dimensions of the enabling environment and actor pillars. Strong resistance from key sectors has historically limited the adoption of nature-based approaches, particularly within professional communities accustomed to grey infrastructure solutions. Long-standing engineering paradigms, prioritisation of conventional flood control measures, and limited experience with NWRMs have generated institutional inertia and scepticism toward innovative water retention strategies.

Land availability constitutes an additional structural constraint, as both public and private land ownership patterns limit opportunities for large-scale water retention in floodplains. The agricultural sector, in particular, remains hesitant to support land-use transitions toward water retention, with only a minority of land users expressing openness to new approaches. Financial schemes are described as insufficiently aligned with land-use change objectives, reducing incentives for widespread adoption.

Importantly, the case also highlights gradual shifts in perception. Extreme drought events and sustained expert dialogue have begun to challenge established paradigms, and certain management bodies now express willingness to explore innovative solutions. However, the absence of robust financial mechanisms and persistent institutional resistance continue to inhibit systemic scaling.

Tisza 21 therefore demonstrates that scaling failure is not primarily a question of technical feasibility or analytical readiness. Instead, it reflects deeper political economy dynamics, governance lock-in, and sectoral resistance. The case underscores that transformative upscaling requires not only evidence and funding, but also paradigm shifts within institutions and stakeholder communities.



Source: Merlin Project; <https://waterquality.danube-region.eu/wp-content/uploads/sites/13/2023/11/8.-Kajner-Soil-and-water-retention.pdf> ; <https://project-merlin.eu/cs-portal/case-study-09.html>

Factor-level analysis further clarifies the nature of these systemic constraints. Funding

constraints, limited financial returns, and transaction and implementation costs rank among the most frequently high-scoring barriers. Institutional capacity also appears as a recurrent bottleneck. This pattern aligns with European Environment Agency findings highlighting the importance of sufficient funding, governance capacity, policy coherence, and enabling institutional conditions for the broader implementation of Nature-based Solutions (EEA, 2021)¹⁰. Importantly, these barriers are systemic: they are embedded in governance and financing systems rather than tied to individual project design.

The regional comparison reveals an additional structural dimension. Average barrier scores are consistently higher in Danube cases (2.82 for upscaled, 3.11 for non-upscaled) than in non-Danube cases (2.00 and 2.65 respectively). This suggests that scaling in the Danube region operates within a more constrained structural environment. Higher average for institutional capacity barriers and transaction costs indicate that administrative layering and coordination complexity may increase systemic friction.

The comparison of average barrier scores between upscaled and non-upscaled cases further illustrates the structural character of constraints. While upscaled cases exhibit lower average barrier score (2.49) than non-upscaled cases (2.96), the difference remains moderate. This suggests that scaling does not occur in barrier-free environments. Instead, structural constraints persist even in successful cases. The implication is that scaling requires managing or navigating systemic barriers rather than eliminating them.

Notably, funding emerges as both a dominant barrier and a recurring systemic friction point. Its dual role reflects a broader structural paradox: financing mechanisms are often designed for infrastructure stability rather than adaptive experimentation. As a result, innovative Nature-based Solutions frequently struggle to access long-term capital, predictable revenue streams, or blended finance instruments.

Transaction and implementation costs also represent a significant barrier cluster. High coordination costs, lengthy permitting procedures, and cross-sectoral negotiations increase the institutional burden associated with replication.

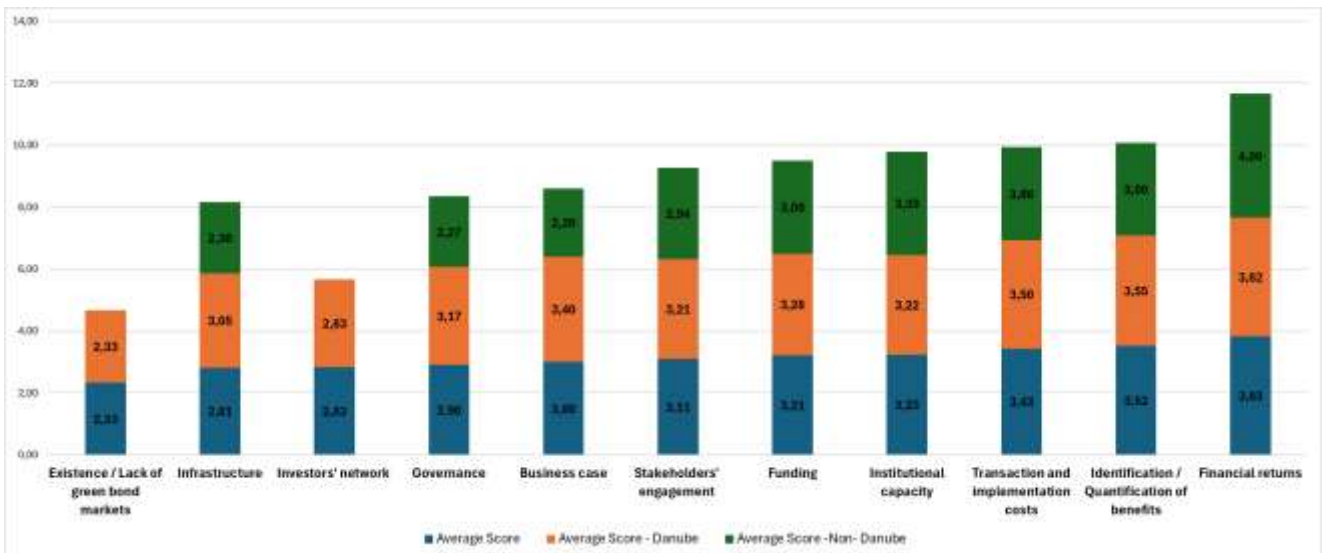


Figure 8: Average score per factor (Challenges).

¹⁰ EEA (2021) Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction. <https://www.eea.europa.eu/en/analysis/publications/nature-based-solutions-in-europe>

From a systemic perspective, the evidence indicates that barriers are predominantly structural rather than relational. Resource and institutional constraints are embedded in governance frameworks, financial architectures, and administrative systems. Actor-related barriers appear less prominent than resource and institutional barriers in the assessed cases. However, this should not be interpreted as evidence that relational capacity is unimportant. In less mature institutional environments, governance arrangements often rely heavily on informal coordination, stakeholder networks, and individual leadership. The findings therefore suggest that scaling is constrained primarily by structural conditions, while relational capacity remains an important mechanism for navigating and overcoming these constraints.

In summary, the scaling challenge appears rooted in three interrelated systemic barriers:

- **Financial viability constraints**, including funding fragmentation and limited long-term revenue models.
- **Institutional and administrative complexity**, particularly in multi-level governance settings.
- **Transaction and implementation costs** associated with coordination and regulatory compliance.

These structural constraints do not prevent scaling outright, but they significantly shape its feasibility, speed, and geographical distribution. Scaling, therefore, should not be understood merely as a function of project performance but as a systemic negotiation with entrenched financial and institutional architectures.

BOX: Maramureş PES Pilot Site (Romania)

The Maramureş pilot site, developed under the Danube PES project, tests a Payment for Ecosystem Services (PES) mechanism linking tourism revenues and local economic activity to biodiversity conservation. The site covers a high ecological value landscape composed of villages, Natura 2000 areas, forests, and traditional agricultural land.

The Maramureş Heritage Trail connects protected areas and villages while generating tourism-related economic activity. Part of this revenue is intended to feed a Biodiversity Conservation Fund supporting conservation actions, creating a direct financial link between ecosystem service beneficiaries and ecosystem management.

Unlike many restoration initiatives that depend primarily on public project funding, this model explores a financing mechanism designed to align local economic activity with ecosystem stewardship. The ecological and recreational value of the area creates a basis for economic valuation and incentive alignment.

Although the scheme remains at pilot scale and has not yet been replicated more broadly, it illustrates a potentially promising pathway for reducing dependence on short-term grant funding through locally anchored financing mechanisms.

Source: WWF ;

https://wwf.panda.org/discover/knowledge_hub/where_we_work/black_sea_basin/danube_carpathian/our_solutions/green_economy/pes/the_danube_pes_project/pilot_activities/maramures_pilot_site/

5. Discussion

The analysis of 68 freshwater innovation cases across the Danube region and other EU Member States reveals that scaling is not primarily a question of capital mobilisation or technical replication. Rather, it is a systemic governance process shaped by institutional embedding and constrained by structural financial and administrative architectures. Two overarching insights emerge from the empirical evidence.

First, scaling is fundamentally actor-driven. Governance configuration, stakeholder mobilisation, and institutional coordination consistently distinguish upscaled from non-upscaled cases. Projects that successfully scale are those embedded within functioning governance ecosystems, supported by cross-sector coalitions, and anchored in institutional structures capable of navigating complexity. This confirms that scaling is not a purely technical diffusion process, but a negotiated institutional transformation. In practice, freshwater innovation spreads when it is socially legitimised, politically supported, and administratively integrated.

Second, systemic barriers remain predominantly structural and resource-related. Financial viability constraints, fragmented funding systems, transaction and implementation costs, and administrative complexity represent persistent bottlenecks across cases. Importantly, these barriers do not disappear in upscaled initiatives; they remain present but are managed more effectively. Scaling therefore does not occur in barrier-free environments. Instead, it occurs when enabling conditions outweigh structural friction.

This distinction between enabling agency and structural constraint is particularly visible in the regional comparison. Within the Danube basin, scaling appears more compensatory: governance strength and stakeholder mobilisation help projects navigate a comparatively more constrained structural environment. Outside the basin, scaling dynamics are more sharply differentiated, suggesting that ecosystem maturity and institutional consolidation play a stronger role. These regional differences highlight that scaling strategies cannot be uniform; they must be adapted to institutional density, governance configuration, and administrative complexity.

Another critical insight concerns the limited role of private finance mechanisms. Despite increasing policy emphasis on sustainable finance, investors' networks and green bond instruments do not emerge as decisive drivers of scaling in the dataset. Freshwater innovation scaling remains largely public-sector anchored, dependent on governance structures and programme-based support. This suggests that while financial innovation may complement scaling strategies, it cannot substitute for institutional coordination and administrative capacity.

Taken together, the findings point toward a systemic interpretation of scaling. Freshwater innovation does not scale automatically when funding is available, nor does it scale simply because policy frameworks exist. It scales when governance ecosystems are capable of integrating innovation into institutional routines, coordinating stakeholders across levels, and absorbing administrative complexity. Structural barriers, particularly those related to funding fragmentation and transaction costs, define the boundary conditions within which scaling can occur.

In conclusion, scaling freshwater innovation is best understood as a governance transformation challenge rather than a financing gap alone. Strengthening institutional coherence, reducing administrative fragmentation, and enhancing coordination capacity may yield greater scaling returns than focusing exclusively on financial instruments. While financial viability remains a necessary condition, it is not a sufficient driver. The decisive factor is

whether innovation becomes embedded within stable governance arrangements capable of sustaining replication over time.

Ultimately, scaling emerges as a systemic rebalancing process: when enabling institutional capacity outweighs structural friction, diffusion becomes feasible. Where structural barriers remain dominant, innovation remains localised. Policy efforts aimed at mainstreaming freshwater Nature-based Solutions should therefore prioritise institutional embedding, governance integration, and structural barrier reduction as central components of long-term scaling strategies.

The findings also suggest several implications for policy and programme design. First, funding instruments should move beyond supporting pilot projects and place greater emphasis on long-term implementation, institutionalisation, and replication pathways. Programmes such as Horizon Europe could strengthen scaling outcomes by requiring clearer governance strategies, stakeholder engagement plans, and post-project implementation mechanisms. Second, the Nature Restoration Regulation and the forthcoming National Nature Restoration Plans have the potential to act as important enablers of upscaling by providing long-term restoration targets, greater policy certainty, and stronger institutional anchoring. Their effectiveness, however, will depend on the extent to which implementation frameworks are accompanied by adequate financing, governance capacity, and coordination mechanisms across sectors and administrative levels.

6. EcoDaLLi's Role in Upscaling within the Danube & Black Sea Lighthouse and Mission Ocean Framework

Scaling innovation in ecosystem restoration is a central requirement for achieving the systemic transformation targeted by the EU Mission “Restore our Ocean and Waters by 2030” and its implementation through the Danube and Black Sea Lighthouse. While the analytical work of this deliverable identifies the key enabling factors and barriers to upscaling based on empirical evidence, this section examines how EcoDaLLi has contributed to reinforcing these factors.

This section therefore frames upscaling not as an isolated project outcome, but as a critical mechanism for delivering basin-scale impact, linking EcoDaLLi's work to the strategic objectives of the Mission and the long-term transformation of the Danube and Black Sea region.

Upscaling as a Mechanism for Mission Implementation

Within the Mission Ocean framework, upscaling represents a core pathway for translating local innovation into systemic change. The Mission aims to move beyond isolated pilot projects and achieve measurable environmental improvements at basin and sea-basin level. In this context, the ability to replicate, adapt, and mainstream successful solutions is essential.

These findings highlight that scaling is not a purely technical process, but a governance-driven transformation, requiring coordination across administrative levels, long-term institutional support, and alignment of policy and funding frameworks. This reinforces the understanding that achieving Mission targets, such as large-scale ecosystem restoration, improved water quality, and enhanced climate resilience, depends on strengthening the enabling conditions for scaling, rather than only increasing the number of pilot initiatives.

Contribution of EcoDaLLi to the Danube and Black Lighthouse

EcoDaLLi plays a central role in strengthening the innovation ecosystem of the Danube River Basin by facilitating coordination, knowledge exchange, and stakeholder engagement across sectors and governance levels. The findings of the here presented analysis directly contribute to this objective by identifying the conditions under which innovations, particularly Nature-Based Solutions, can move beyond pilot stage and achieve wider uptake.

The analysis confirms that successful upscaling depends primarily on governance configuration, stakeholder mobilisation, and institutional embedding. These elements directly align with EcoDaLLi's ambition to foster integrated governance frameworks, enable cross-border cooperation, and create a functioning innovation ecosystem capable of delivering restoration at scale. By providing an evidence-based understanding of these mechanisms, this deliverable supports the operationalisation of the Lighthouse and strengthens the capacity of the region to implement complex, multi-actor restoration initiatives.

Synergies with Lighthouse Projects and Initiatives

The Danube and Black Sea Lighthouse brings together a wide range of Innovation Actions and regional initiatives addressing ecosystem restoration, pollution reduction, and climate adaptation. This deliverable complements these efforts by providing a cross-cutting analysis of scaling dynamics derived from a diverse portfolio of case studies.

The evidence collected demonstrates that many Innovation Actions operate with strong technical solutions and pilot-scale success but face common barriers when attempting to scale, including fragmented funding systems, institutional complexity, and limited long-term financing pathways. By consolidating these experiences into a structured analytical framework, D5.3 enables knowledge transfer across projects, supports mutual learning, and contributes to a shared understanding of scaling challenges within the Lighthouse community.

This positions EcoDaLLi as a key interface between individual project experiences and system-level learning, facilitating coherence and alignment across the Lighthouse portfolio.

Role of EcoDaLLi Tools in Supporting Upscaling

EcoDaLLi's core instruments, including the Practices Living Lab System (PLLS), the digital portal, and the broader stakeholder network, provide essential infrastructure for supporting the upscaling process. These tools enable:

- Knowledge sharing and visibility of innovative solutions,
- Stakeholder matchmaking across sectors and regions,
- Access to resources, guidance, and support services, and
- Facilitation of co-creation and participatory governance processes.

In this context, the findings of this report can be operationalised through these mechanisms, translating analytical insights into practical support for innovators and policymakers. The portal and living lab system act as enablers of scaling by reducing information asymmetries, strengthening collaboration, and promoting replication across contexts.

This integration ensures that the deliverable is not only analytical but also directly linked to actionable support structures within the EcoDaLLi ecosystem.

Pathways to Long-Term Impact and Post-Project Sustainability

Looking beyond the project duration, the challenge of upscaling remains central to the continuation and consolidation of Mission-driven activities. The herein presented findings



underline that sustainable scaling requires long-term institutional embedding, stable governance arrangements, and financing mechanisms that extend beyond project-based funding cycles.

EcoDaLLi contributes to these objectives by establishing a foundation for a durable innovation ecosystem in the Danube and Black Sea region, including networks, tools, and knowledge resources that can be further build on in subsequent phases of the Mission. The insights generated through the innovation analysis provide a basis for future policy development, investment strategies, and capacity-building activities aimed at sustaining and expanding restoration efforts.



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Annex I: Stakeholder Survey

Introduction: The EcoDaLLi project, and this survey

The EcoDaLLi project

This survey is conducted as part of the Horizon Europe project EcoDaLLi (<https://ecodalli.eu/>) which is funded to support the European Commission's Mission on "Restoring our Ocean and Waters by 2030".

The main objective of EcoDaLLi is to **centralise Danube governance structures in terms of innovative solutions for improved ecological restoration, protection and preservation of the Danube basin and its Delta** by **fostering a stronger innovation ecosystem** within a well-connected Practices Living Lab System, supported by a digital Portal, completely linked to the Mission Implementation Platform. Fostering a stronger innovation system in the region is the objective of **Work Package 5** of the project.

This questionnaire

This questionnaire is conducted within the WP5 of EcoDaLLi project and serves two objectives:

- To collectively **assess the contribution of EcoDaLLi** to the development and upscaling of innovation in ecosystem restoration in the Danube region.
- To **identify real-life case studies** of innovation actions in ecosystem restoration, including successful upscaling, attempted but unsuccessful upscaling, and promising cases where upscaling has not yet been attempted.

Please note that your participation is **anonymous**. This survey will take about **15 minutes** to complete. Thank you for your participation.

Section 1: Respondent profile

1. What type of organization do you represent?
 - EcoDaLLi project partner
 - Organisation in the network of an EcoDaLLi partner
 - Research or academic institution
 - Private company / business organisation
 - Public authority
 - Non-governmental organisation (NGO) / Environmental organisation
 - Other (please specify)

2. In which country or countries of the Danube River Basin does your organisation mainly operate?

3. What is your role in relation to ecosystem restoration or innovation?
 - Project manager
 - Researcher
 - Innovator / practitioner
 - Policymaker
 - Other (please specify)

4. What is your level of involvement with EcoDaLLi?
- Directly involved as a partner
 - Participated in EcoDaLLi activities (events, pilots, workshops, calls, etc.)
 - Aware of EcoDaLLi but not directly involved
 - Not previously familiar with EcoDaLLi

Section 2: Evaluation of EcoDaLLi's contribution to the development and upscaling of innovation in the Danube region

5. Which EcoDaLLi activities or outputs are you familiar with?
- Lighthouse projects
 - Innovation actions / pilots
 - Calls, mentoring, or support schemes
 - Events, workshops, or trainings
 - Knowledge products (reports, guidelines, tools)
 - Networking or matchmaking activities
 - Other (please specify)
6. How would you assess EcoDaLLi's overall contribution to the development and upscaling of innovation in ecosystem restoration in the Danube region?
- Very significant
 - Significant
 - Moderate
 - Limited
 - No contribution
 - Don't know
7. In your view, to which of the following areas has EcoDaLLi contributed?
- Testing or piloting of innovative approaches
 - Strengthening collaboration across sectors or countries
 - Improving access to knowledge, tools, or expertise
 - Encouraging stakeholder engagement
 - Mobilising funding or financial resources
 - Increasing visibility of ecosystem restoration innovation
 - Development of new or improved ecosystem restoration solutions
 - Other (please specify)
8. Which actors do you think have benefited most from EcoDaLLi's activities?
- Innovators and practitioners
 - NGOs
 - Public authorities

- Researchers
- Private sector
- Local communities
- Other (please specify)

9. Can you briefly describe one concrete way in which EcoDaLLi has influenced your work or your organisation?

Section 3: Identification of case studies

10. Are you aware of, or involved in, one or more innovation actions in ecosystem restoration in the Danube region?

- Yes
- No

11. Could you briefly describe one case study (action or project) of innovation in ecosystem restoration by filling in the table below?

Response

Name of the case study

Location (country, region, etc.)

Main innovation

Website (if available)

Any other additional information about the case study *Open text*

12. What is the upscaling status of this action? (*Definition: upscaling refers to the process of expanding an innovation beyond a pilot site, by learning from implementation, and adapting or replicating the approach to achieve wider impact elsewhere*)

- Already upscaled
- Upscaling attempted but not successful
- Not upscaled yet

13. If upscaling has already occurred, which are the top 3 factors that contributed the most to making it possible?

- Resources - Access to appropriate infrastructure (e.g. technical, digital, monitoring infrastructure)
- Resources – Availability of adequate funding
- Resources – Clear identification and, where possible, quantification of environmental and socio-economic benefits
- Resources – Ability to demonstrate financial returns or economic viability
- Actors – Existence of a clear and supportive governance structure
- Actors – Effective engagement of relevant stakeholders
- Actors – Presence of investors or funding network
- Enabling environment – Sufficient institutional capacity to implement and sustain the solution
- Enabling environment – Presence of green bond markets and other dedicated green financial instruments
- Enabling environment – Existence of a clear and credible business case
- Enabling environment – Acceptable transaction and implementation costs
- Other (please specify)

14. If upscaling has not occurred or was not successful, which are the top 3 factors that most limited the process?

- Resources – Lack of access to appropriate infrastructure (e.g. technical, digital, or monitoring infrastructure)
- Resources – insufficient or unstable funding
- Resources – Difficulties in identifying or quantifying environmental and socio-economic benefits
- Resources – Limited ability to demonstrate financial returns or economic viability
- Actors – Lack of a clear or supportive governance structure
- Actors – Limited or ineffective engagement of relevant stakeholders
- Actors – Absence of investors or funding network
- Enabling environment – Insufficient institutional capacity to implement and sustain the solution



- Enabling environment – Limited availability of green bond markets or other dedicated green financial instruments
- Enabling environment – Absence of a clear or credible business case
- Enabling environment – High transaction and implementation costs
- Other (please specify)

Section 4: Additional remarks

15. Would you like to add any additional information or comments?

Thank you for your participation!



Annex II: Definition of upscaling factors


Resources	
Infrastructure	The development and upscaling of innovation must be supported by adequate infrastructures, in particular for technological solutions: for example, to implement remote sensing technologies you need to access a satellite network, have the necessary IT capacity, and so on.
Funding	Availability, accessibility, and continuity of financial resources required to develop, implement, maintain, and scale an innovation or restoration initiative. This includes public funding, private investment, grants, subsidies, and other financing mechanisms supporting implementation and long-term sustainability.
Identification/Quantification of benefits	The ability to identify, measure, and, where appropriate, monetise the environmental, social, and economic benefits generated by an innovation or restoration initiative. This includes the availability of evidence, indicators, monitoring systems, and valuation approaches that demonstrate the outcomes and impacts of the intervention.
Financial returns	The capacity of an innovation or restoration initiative to generate direct or indirect economic value for investors, implementers, or beneficiaries. This may include revenues, cost savings, cost avoidance, improved operational efficiency, return on investment (ROI), or other financial benefits that contribute to the long-term economic viability of the initiative.
Actors	
Governance	The framework of rules, roles, institutions, and decision-making processes that shape the planning, implementation, and management of an innovation or restoration initiative. This includes authority and accountability arrangements, coordination across sectors and governance levels, policy coherence, and mechanisms for stakeholder participation and collaboration.
Stakeholders' engagement	Failed or successful stakeholder engagement.
Investors' network	Structured community or group of individuals and entities—such as angel investors, venture capitalists, and, institutional investors—who collaborate to identify, evaluate, and fund business opportunities.
Enabling environment	
Institutional capacity	Ability of existing institutions to set, achieve, and sustain the implementation of an innovative solution



<p>Lack of green bond markets</p>	<p>Green bond markets are specialized financial markets for debt instruments issued by governments, banks, or corporations exclusively to fund projects with positive environmental or climate impacts.</p>
<p>Business case</p>	<p>Justification for a proposed project or undertaking on the basis of its expected commercial benefit.</p>
<p>Transaction and implementation costs</p>	<p>Transaction costs are the expenses and efforts incurred when exchanging goods, services, or assets, separate from the actual price of the item. They include search/information costs, negotiation fees, legal fees, and enforcement costs. These "costs of doing business" cover everything from broker commissions and transportation to the time spent managing a transaction.</p> <p>Implementation costs are the total expenditures, including non-recurring, out-of-pocket expenses, incurred to adopt, install, and integrate innovative solutions or practices. They cover the entire process of making a new solution operational, ranging from initial planning and software customization to staff training and system, which often occur after the preliminary project stage but before full operational use.</p>

Annex III: Overview of Assessed Case Studies and Key Observations

Table 2: Overview of Assessed Case Studies and Key Observations.

No.	Case Study	Upscaled?	Country	Key Notes on Success Factors and Challenges
1	Rain gardens Link to case study	✗	SRB	Main barriers to upscaling in this case relate to the early stage of NbS in Serbia, absence of standards and procedures, and limited depth of performance monitoring (visual inspection only), which constrains robust benefit quantification. Main enabling factors are the demonstrated technical functionality of rain gardens under local soil and continental climate conditions, effective runoff infiltration with reduced peak flows, and strong vegetation performance, suggesting technical viability and adaptability. The study is framed as filling research gaps and providing proof-of-concept to support future implementations. No financial structuring, valuation mechanisms, or explicit economic analysis is provided.
2	Kolubara & Tamnava River Basins – NBS Conceptual Design (RECONNECT) Link to case study	✗	SRB	This case study reflects a strong methodological and conceptual development of Nature-Based Solutions (NBS) in Serbia, particularly through EU-funded and internationally supported research (RECONNECT, UNDP, IUCN). Multi-criteria analysis and participatory planning approaches were applied, demonstrating technical and analytical readiness. However, no concrete NBS projects have been implemented or upscaled at national level, and NbS remain insufficiently embedded in policy and financing frameworks. The main gap appears to lie in the transition from conceptual design to institutional mainstreaming and practical implementation.
3	Donau-Auen National Park Link to case study	✗	AT	The Donau-Auen National Park demonstration site is implemented within a strong environmental governance context and benefits from Horizon Europe funding. The project is supported by a structured economic evaluation framework combining Input–Output modelling and selective Cost–Benefit Analysis, which enables systematic quantification of investment impacts and monetisable ecosystem service benefits. This provides a solid analytical basis for potential upscaling. However, while the methodological and institutional foundations are strong, large-scale replication beyond the demonstration context has not yet been realised, and long-term financial structuring for basin-wide scaling remains to be demonstrated.
4	Szodliget Link to case study	✗	HU	The Szodliget demonstration site, implemented under the Danube4All Horizon Europe project, benefits from coordinated transnational governance, structured monitoring, and a robust methodological framework for assessing economic and ecological impacts. The development of a multi-method valuation approach strengthens the evidence base for scaling Nature-Based Solutions. Nevertheless, upscaling beyond the pilot phase remains prospective, and the translation of quantified benefits into sustained financial mechanisms or broader investment mobilisation is not yet evident.
5	Razim-Sinoe Lagoon System	✗	RO	The Razim-Sinoe Lagoon System demonstration site under the Danube4All Horizon Europe project applies a structured multi-method evaluation framework, including methodologies for quantifying economic and ecological benefits of Nature-Based Solutions. The site benefits from transnational collaboration and robust



	Link to case study			scientific and monitoring design, contributing to the generation of evidence that can inform future upscaling. Nonetheless, upscaling beyond the demonstration context has not yet been realised, and the translation of quantified benefits into long-term financial mechanisms or broader investment frameworks for large-scale implementation remains prospective.
6	Kvorning - re-wetting/peatland restoration Link to case study		DK	The Kvorning case is explicitly embedded in Denmark's national peatland restoration programme, with defined hectare targets, secured public funding, and strong institutional leadership. Governance and institutional capacity constitute decisive enabling factors. Landowner coordination remains a noticeable implementation constraint. No case-specific CBA modelling or private financing mechanism is explicitly described in the technical deliverables.
7	Basque Streams Link to case study		ES	The Deba case demonstrates structured governance and stakeholder engagement mechanisms, particularly through conflict-resolution processes for barrier removal. A Regional Scalability Plan exists, but no explicit financial model, valuation framework, or secured scaling finance is referenced in technical deliverables.
8	Beaver re-introduction Link to case study		SE	Scaling occurs primarily through ecological processes supported by national forestry institutions. No financial mechanism, valuation framework, or structured scaling instrument is explicitly described in deliverables.
9	Room for the Rhine Branches Link to case study		NL	The case is strongly institutionally embedded within Dutch river governance, supported by Rijkswaterstaat and a formal stakeholder board. No explicit financial engineering or valuation framework is described in technical deliverables.
10	Kampinos wetlands Link to case study		PL	The Kampinos case benefits from successive LIFE project funding and strong protected-area governance. No explicit financial innovation or valuation framework is described.
11	Peatlands of Bosnia and Herzegovina Link to case study		BIH	The Hutovo Blato peatland case is characterised by significant hydropower infrastructure pressures and complex multi-entity governance arrangements, which are explicitly identified as the primary constraints to scaling. The involvement of energy companies is described as the main implementation challenge. At the same time, broad institutional participation across ministries and agencies constitutes an enabling factor. The development of carbon-crediting projects is mentioned as a potential financial incentive, but no formalised valuation framework or structured long-term financing mechanism is explicitly described in the deliverables.
12	Danube Flood Plain Austria Link to case study		AT	The Austrian Danube Floodplain case demonstrates strong institutional embedding through viadonau and the establishment of a formal cross-sector stakeholder board. Governance and structured stakeholder coordination constitute central enabling factors for scaling. Multiple river pressures (navigation, flood

				protection, ecological restoration) are acknowledged, implying coordination complexity. No explicit financial instrument, valuation framework, or case-specific CBA is described in the deliverables.
13	Danube Flood Plain Romania Link to case study	✗	RO	The Romanian Danube Floodplain case operates within a large agricultural floodplain context involving multiple public authorities and local stakeholders, including farmers. Institutional participation across water, agriculture and environmental bodies constitutes an important enabling factor. However, no explicit economic valuation, financial mechanism, or structured scaling framework is described in the deliverables. Upscaling remains regionally embedded and institutionally driven.
14	Tisza Link to case study	✗	HU	The Tisza case combines floodplain restoration with the development of economically viable floodplain farming systems. Strong multi-level stakeholder involvement and governance participation are explicitly described and constitute key enabling factors. The regulated river context represents a structural constraint. While economic viability is referenced as an objective, no explicit financial structuring or case-specific valuation framework is described in the technical deliverables.
15	Germany's Blue Belt Link to case study		DE	Germany's Blue Belt represents a nationally embedded restoration programme with secured long-term funding through a cross-ministerial agreement and explicit budget allocations. Strong federal institutional leadership, large spatial scale coverage, and structured stakeholder participation constitute decisive enabling factors for scaling. Comprehensive scientific monitoring supports evaluation of programme outcomes. While multifunctional synergies are emphasised, no explicit monetised cost–benefit framework or innovative financial instrument is described in the fact sheet.
16	Emscher catchment Link to case study		DE	The Emscher Catchment represents a long-term, large-scale river restoration programme implemented over more than 30 years with an investment exceeding €5.6 billion. Strong institutional capacity through EmscherGenossenschaft and substantial secured funding constitute decisive enabling factors for upscaling. The project addresses a heavily modified river system in an urban-industrial context and involves a wide range of stakeholders, including municipalities, citizens, NGOs and mining companies. Although multifunctional benefits are explicitly described (flood protection, climate resilience, biodiversity, regional development), no explicit monetised cost–benefit framework or innovative financing instrument is referenced in the fact sheet.
17	Lima Catchment Link to case study	✗	PL	The Lima Catchment case focuses on passive and active restoration within a Natura 2000 and RAMSAR context under the LIFE FLUVIAL project. Stakeholder agreements for rewetting and rewilding are explicitly identified as necessary for further scaling, making stakeholder engagement a central factor. Regional authorities and landowners play an important role. Although monitoring tools (e.g., UAV-based pathogen monitoring) are applied, no explicit financial mechanism, cost–benefit framework, or secured long-term funding structure is described in the fact sheet. Upscaling remains regional and agreement-dependent rather than institutionally embedded at national scale.
18	Sorraia	✗	PL	The Sorraia case is embedded in an intensive agricultural floodplain context and is strongly dependent on farmer engagement. The development of a prototype ecoscheme contract and agro-environmental certification indicators represents a structured attempt to integrate restoration into agricultural policy

	Link to case study			instruments. Monitoring protocols are explicitly mentioned. However, no secured funding mechanism, monetised valuation framework, or formal national scaling instrument is described in the fact sheet. Upscaling remains dependent on agricultural scheme adoption and stakeholder agreements.
19	Komppasuo peat extraction area Link to case study	✗	FI	The Komppasuo case focuses on restoration of peat extraction areas within large northern river basins in Finland. The fact sheet highlights substantial potential scale (20,000 ha of sites to be closed) and emphasises evidence-based decision-making to guide future land-use and restoration planning. A wide range of stakeholders, including peat companies, ministries, regional authorities and local associations, are explicitly involved. Business opportunities and greenhouse gas reduction are mentioned as part of the value proposition. However, no explicit monetised valuation framework, secured long-term financing structure, or formal national scaling instrument is described. Upscaling remains planned and evidence-driven rather than fully institutionalised.
20	Tzipori catchment Link to case study	✗	IL	The Tzipori Catchment case involves restoration of a small Mediterranean stream within an intensively cultivated watershed. Broad stakeholder participation across governmental, academic, civil and business sectors is explicitly described, with watershed partnerships forming a central mechanism. Continuous water quality monitoring and remote sensing indicate structured ecological evaluation. While economic potential is referenced, no explicit financial model, secured long-term funding mechanism, or monetised valuation framework is described. Upscaling remains regional and partnership-driven rather than institutionally embedded at national level.
21	Scheldt catchment Link to case study	✗	BE	The Scheldt (Zwalm) case focuses on restoration within a small river basin context, combining wastewater treatment upgrades, barrier removal, habitat restoration and buffer strip implementation. Provincial institutional leadership and multi-actor participation constitute enabling factors. Tailor-made agreements with farmers are explicitly planned for further implementation, indicating that stakeholder engagement remains central for scaling. Online monitoring is mentioned, but no explicit monetised valuation framework or structured financing instrument is described. Upscaling remains regional and agreement-dependent.
22	Forth catchment Link to case study	✗	UK	The Forth Catchment case combines river and peatland restoration within a broader 10+ year national peatland project valued at £250 million. Strong institutional leadership by NatureScot and Forth Rivers Trust, combined with research support from the University of Stirling and UK Centre for Ecology & Hydrology, constitutes a significant enabling factor. Monitoring through the Forth ERA programme provides structured data collection. While the case is linked to a national funding framework, the fact sheet does not describe a specific monetised valuation framework or innovative financial instrument. Upscaling is supported by national investment but remains regionally implemented.
23	Ervidel floodplain Link to case study	✗	PT	The Ervidel Floodplain case focuses on riparian rehabilitation and habitat enhancement within an intensively managed Mediterranean irrigation landscape. Farmers constitute the central stakeholder group, and scaling is explicitly linked to the development of a prototype ecoscheme contract for irrigation farmland. Monitoring protocols and agro-environmental certification indicators are proposed, indicating structured evaluation efforts. However, no explicit monetised valuation framework, secured long-term funding mechanism, or

				innovative financial instrument is described. Upscaling remains dependent on agricultural scheme adoption and contractual arrangements rather than institutionalised national implementation.
24	Slaná river basin Link to case study	✗	SK	The case study describes a single pilot implementation of tools on planing and testing NSWRM. Factors worth noting: valorization method will be tested during the pilot action (although no financial returns available yet). Consultations with stakeholders are especially mentionned (for national dialogues or regional workshops).
25	Kamniska Bistrica River catchment Link to case study	✗	SI	The pilot describes testing tools and preparing implementation for catchment, but does not indicate any actual replication beyond this location. Although no real business case for now, the case study does mention developping an implementation place based on CEA(cost efficient analysis) to support deployment, which could be used for future business case.
26	Kamienna Basin Link to case study	✗	PL	Case study character same as above (aiming to test tools and prepare implementation plans without actual upscaling measures). Issues are only “partially included in the strategic planning documents”, indicating governance /planning integration might be incomplete and therefore a potential challenge for upscaling. Factors worth noting: stakeholder engagement (explicitly mentioned for tool development process), and a cost-effective analysis (although costs are not specified).
27	Nagykunsági Basin Link to case study	✗	HU	Case study character same as above (aiming to test tools and prepare implementation plans without actual upscaling measures). Issues are only “partially included in the strategic planning documents”, indicating governance /planning integration might be incomplete and therefore a potential challenge for upscaling. The most worth noting potential success factors are : tools are tested with data to calculate effectiveness (benefit quantification) and relationship between cost&effect will be considered (potential future business case) and skateholders integration (especially mentioned).
28	Bednja river basin Link to case study	✗	HR	Case study character same as above (aiming to test tools and prepare implementation plans without actual upscaling measures).The most worth noting potential success factor is governance (as the whole project activities are comply with River Basin Management Plan and Flood risk management plan).
29	Aist Basin Link to case study	✗	AT	Case study character same as above (aiming to test tools and prepare implementation plans without actual upscaling measures). The most worth noting potential success factor is governance (as project activities are included in various strategic national planning documents) and stakeholder engagement (explicitly documented).
30	Schwarzer Schöps river basin Link to case study	✗	DE	Several existing measures are present, indicating existing physical NBS infrastructure. Multiple public authorities and institutional actors are formally involved, suggesting governance and skateholder engagement and institutional enabling environment.
31	Petite Glâne river basin	✗	CH	Stakeholders that could possibly be involved are listed, although not engaged yet (so a potential challenge&success factor for both this case study and upscaling). NBS related infrastructures already


	Link to case study			existed. Institute support and governance are also precised (through AGRIDEA - The Centre for Agricultural Advisory and Extension Service, and sectoral authorities).
32	Cechticky steam catchment Link to case study	✗	CZ	This case study investigates natural small-scale water retention and nutrient mitigation measures in an agricultural basin facing soil erosion, drainage system problems, drought, and unstable water quality affecting a downstream drinking water reservoir. The drainage systems under development could be a challenge factor to upscale as the moderisation and regulation of such measures could be complicate to replicate in other sites. Participation of government, local authorities, and farmers are specified - making them notable success factors.
33	Cherio River basin Link to case study	✗	IT	The case study focuses on agricultural and forest land use impacts on flooding and runoff in support of natural small-scale water retention planning. The involvement of local actors to identify strategies and solutions for an efficient water management is specially described. Reginal government, local agencies and farmers' participations are also both potential success factors and challenges for upscaling, as they play already an important role in this case study.
34	Csorsza Link to case study	✗	HU	The case study is about hydrological and land-use dynamics in a small agricultural and partly forested watershed in Veszprém County, Hungary, analysing natural small-scale water retention measures to mitigate runoff and support water management in the Lake Balaton catchment region. Integration of local stakeholder interests is likely to support local engagement and uptake. Furthermore, its location within the Lake Balaton watershed, a priority environmental area, aligns the study with regional water quality and management objectives, strengthening institutional interest and potential support.
35	Dotnuvėlė river basin Link to case study	✗	LT	The case study is about a moderately sized agricultural catchment dominated by moist soils and multiple ponds, used to study water and nutrient retention dynamics in agricultural landscapes. Current stakeholders participation are the environmental protection agency of Lithuania and local farmers, with in search of more local stakeholders.
36	River Dviete Basin Link to case study	✗	LV	The case study is about restoring floodplain ecosystems and improving water management, particularly through meadow restoration, re-meandering river sections, and cooperation among local stakeholders to enhance environmental outcomes within this Natura 2000 site in Latvia. The performance evaluation and modeling are based on observed and simulated data using special infrastucture, which could be a challenging factor if upscaling. the case study also has local partnerships with municipalities. Funding from EU Horizon programme supported this project.
37	Kråkstadelva catchment Link to case study	✗	NO	The case study implemented a range of Natural/Small Water Retention Measures, with a aim to identify land management strategies to improve water retention in the soil and reduce flooding risk and improve downstream water quality. Local involvement are extensive as the catchment used to be a study site in many projects. And the monitoring station could provide useful information on the catchment and enhances the ability to assess impacts. Funding from EU Horizon programme supported this project.

38	Kebele patak Link to case study	✗	HU	The case study investigates water retention measures in an agricultural catchment, aiming to address soil erosion, nitrate pollution, floods and drought risks. The work is based on a cross-border Hungarian Slovenian cooperation (framework supporting since 1994) and stakeholder (local actors) participation. Besides, fundings are provided under EU programmes. Funding from EU Horizon programme supported this project.
39	Liberty Island Life project Link to case study	✗	HU	Several factors acted as challenges to the upscaling of the project, and namely lack of monitoring, less interest than expected among the key sectors to implement similar restorations along Danube. Less information is available about the success factors which intervened in the project, the followings were listed: adequate partners on board; technical solution for restoring the side-channel feasible; management bodies' strong presence is necessary for successful implementation.
40	LOGOS for Waters Link to case study		HU	Measures implemented in the project were only partly upscaled. Key challenges were limited funds increasing costs; difficult to monitor results, mostly the indirect impacts; limited land availability conflict of interest of private interest and public needs. Success factors were the followings: increasing interest from settlements for nwrms; great upscaling potential and intention; wide range of innovative measures on the ground; adequate partnership if ministerial institutions are in the projects; serious risk of extreme weather and hydro events (drought, flash flood , etc).
41	MICACC Life Link to case study		HU	Measures implemented in the project were only partly upscaled. Projects were rarely bankable. Public funding limited, when it appeared, suddenly availability of 'value chain', that is experts and companies available to assist municipalities in implementation became a limiting factor. Land ownership structure was another limiting factor. On the other hand, low cost of some intervention types made them successful.
42	Tisza 21 Link to case study	✗	HU	The Tisza21 is not a project, but the working name of the program which was implemented along the Hungarian Tisza. There are some parallel going projects on different pilot sites or along different Tisza stretches. Key challenges that were encountered were strong resistance at the key sectors for long years to do something for (natural) water retention; no experience in NWRMs, implying many critics before testing them; grey measures as business as usual are in priority and fit in the profession of many responsible colleagues; limited availability of lands (private or public) for waters in the landscape. Key success factors were long expert discussions and some extreme dry years support to move toward the paradigm shift; Some management bodies have the intention to work on innovative solutions; the hardest cooperation with the agri sector and land users, small minority of them are open toward new solutions; Not adequate finance schemes limit the intention to land use change.
43	Táti islands Link to case study	✗	HU	Upscaling was hindered by worsening of hydrological conditions due to climate change, therefore making the interventions more costly and less effective on local level. No information is available on potential success factors that might have supported upscaling.

44	Erebe Islands Link to case study		HU	All factors screened were listed as important challenges hindering upscaling of this project, with institutional capacity and transaction and implementation costs playing an outstanding role. No information is available on potential success factors that might have supported upscaling.
45	Fokorúpuszta project Link to case study		HU	Key challenges to upscaling were the followings: Flood Frequency Dependency: The ecological success of the habitat relies on appropriate flood events — too few floods mean less frequent inundation, while overly large floods may strain infrastructure and management; and Management Complexity: Coordinating between authorities and local stakeholders about water management and habitat operation still requires formal agreements to ensure consistent long-term maintenance. At the same time, some factors were critical to upscaling, and namely funding, quantification of benefits, financial returns, stakeholders' engagement and institutional capacity.
46	Danube/Black Sea Basin Strategic Partnership on Nutrient Reduction, Tranche I Link to case study		HU	Key challenges to upscaling were the followings: Benefits depend on continued floodplain connectivity: lower water levels in the Danube do not reach sidearms; Danube brings more fine sediment which abolishes dredging efforts; and Scaling up restoration required further funding beyond the project. At the same time, some factors were critical to upscaling, and namely funding, governance, stakeholders' engagement and institutional capacity.
47	Wimbe basin Link to case study		BE	The case study examines how natural small-scale water retention measures can reduce flood risk, low-flow problems, erosion, and nitrate pollution in the Wimbe catchment, a largely forested and agricultural basin. The project benefits from strong institutional and stakeholder involvement, including regional authorities, environmental NGOs, water managers, and local farmers who help design and implement retention measures. Funding from EU Horizon programme supported this project.
48	Pesnica river catchment Link to case study		SI	The case study examines how natural small-scale water retention measures can reduce soil erosion, nutrient pollution, and hydrological extremes in an agricultural catchment. The institutional and stakeholder involvement from agricultural advisory and research organisations working with farmers, which supports the design and evaluation of retention measures. Funding from EU Horizon programme supported this project.
49	Tetves catchment Link to case study		HU	The Hungarian case study investigates how natural small-scale water retention measures can improve water retention, reduce soil erosion, and manage nutrients in an agricultural basin. Several concrete measures (such as riparian forest buffers, forested buffer strips, no-till management with cover crops, and conversion of cropland to meadow) are tested on their effects on water and nutrient retention at catchment scale. Stakeholders engaged include local farmers and General Directorate of Water Management, and more potential stakeholders have also been identified. Soil erosion monitoring station has been installed. Funding from EU Horizon programme supported this project.
50	Upper Zgłowiaczka river basin		PL	The case study investigates how natural small-scale water retention measures and land-management practices can improve water retention and reduce nitrate pollution in a highly agricultural catchment facing

	Link to case study			water deficits. Funding from EU Horizon programme supported this project. Many different types of stakeholders are (or will be) engaged: ministry, local farmers, agricultural organizations, etc. Workshops, meetings and field visits are organised regularly to collect effects. A policy survey has been filled to identify barriers for implementing.
51	Sävjaån catchment Link to case study	✗	SE	The case study investigates how natural small-scale water retention measures can reduce nutrient pollution, flooding, and drought impacts in a lowland catchment with mixed forest and agricultural land use. 3 factors for the successful implementation of measures: understanding of biophysical functioning, community engagement, and land ownership.
52	Maramures pilot site Link to case study	✗	RO	As part of the Danube PES project, the pilot site tests a PES scheme that links tourism revenues and other local funding sources to biodiversity conservation in a large landscape containing villages, protected areas, and Natura 2000 sites. The Maramureş Heritage Trail, which connects seven villages and seven protected areas and generates tourism revenue that feeds a Biodiversity Conservation Fund used to support conservation activities. The site also benefits from its high ecological value, which provide ecosystem services such as carbon sequestration, recreation, and tourism that can be economically valued. Finally, the PES scheme creates a financial mechanism that channels money from ecosystem service beneficiaries (e.g., tourists and local businesses) to conservation actions, helping align local economic activities with biodiversity protection.
53	Iezer pilot site Link to case study	✗	RO	The pilot site tests a PES approach to support biodiversity conservation and sustainable fish-pond management. The fish ponds system with the high biodiversity value of the sites are the main enabling factor for this pilot site. Besides, monetary ecosystem services values are estimated (as a basis for PES scheme). Measures are also co-financed by the European Fisheries Fund. Finally, this successful demonstration of extensive fish pond management in this pilot can have application for the many other fish ponds along the Lower Danube, in Romania as well as Bulgaria, Moldova and Ukraine (no further info as not yet upscaled).
54	Ciocanesti pilot site Link to case study	✗	RO	The pilot site tests a PES scheme to support biodiversity conservation while maintaining commercial fish-pond production in a former Danube floodplain area. The site has high ecological value as a Natura 2000 wetland hosting large numbers of migratory and endangered bird species, and the PES scheme supports conservation by monetizing ecosystem services such as biodiversity, fish production, and carbon sequestration to incentivize sustainable management. Measures are also co-financed by the European Fisheries Fund. This successful demonstration of extensive fish pond management in this pilot can have application for the many other fish ponds along the Lower Danube, in Romania as well as Bulgaria, Moldova and Ukraine (no further info as not yet upscaled).
55	Rusenski Lom Nature Park pilot site Link to case study	✗	BG	The pilot site tests a PES scheme to support conservation and sustainable rural development in a Nature Park. The site's high ecological value supports the monetization of ecosystem services, to finance conservation and sustainable management. Factors that contribute to the development of the scheme are:

				constant communication, time and money in data collection and analyses, sources of income, and support from institutions.
56	Persina Nature Park pilot site Link to case study	✗	BG	The pilot site tests a PES scheme to support wetland restoration and sustainable management in Persina Nature Park. Factors that contribute to the development of the scheme: political framework, sources of income, and support by national and local institutions.
57	Szigetköz region-revitalization of the ecological system Link to case study	✗	HU	The demo site focuses on restoring the ecological functioning of a Danube floodplain by implementing a water replenishment system that restores natural water levels and reconnects river branches. A key enabling factor is the engineered but nature-based water replenishment system. The project also relies on strong stakeholder cooperation, with planning and management carried out collaboratively through an operating committee with multiple sectors and local actors.
58	Reconnected Floodplain Link to case study	✗	DE	The demo site focuses on restoring an 8km stretch of the Danube floodplain to re-establish natural hydrological dynamics and ecological functions in one of Germany's largest floodplain forests. The project benefits from engineered hydrological restoration measures. Impacts are described, but only qualitatively.
59	Dyje sub-catchment of the DRB Link to case study	✗	CZ	The demo site aims at restoring the hydrological balance and ecological functioning of floodplain ecosystems affected by dams and historical river modifications in the Danube basin. The activities involve partnerships (as the river catchment are shared between Czech Republic and Austria) and regional actors.
60	Upper catchment of Vah River rehydration Link to case study	✗	SK	The demo site focuses on restoring springs and improving watershed hydrology by applying nature-based rainwater retention measures. Impacts are measured quantitatively through monitoring of several indicators. Collaborations and volunteer efforts to assure ecosystem restoration.
61	Begecka Jama Sustainable Solutions for ecosystem monitoring and Restoration Link to case study	✗	SRB	The demo site focuses on improving water quality and ecosystem health in a protected Danube floodplain area by using a constructed wetland system to naturally treat wastewater and reduce pollution entering the nature park. The effectiveness of the constructed wetland system (i.e. its benefits) if validated through monitoring.

62	Sturgeon migration by-pass Iron Gates land II Link to case study	✗	RO	The demo site restores ecological connectivity for migratory sturgeon by developing and testing an innovative bypass solution to help fish migrate past the hydropower dams. The project operates across countries (Romania; Serbia and Hungary), involving research institutes and water management actors working together. Quantitative data is collected for monitoring and testing.
63	Danube Delta Monitoring system and knowledge of sediment flow spilled in the Black Sea Link to case study	✗	RO	The demo site develops a continuous monitoring system to better understand sediment transport and water dynamics. Data collected from monitoring stations and modelling approaches allow researchers to analyze sediment transport and water–sediment relationships.
64	Tackling Plastic Waste in the Bodrog Floodplain Link to case study		HU	The demo site tackles plastic pollution in rivers through the Plastic Cup Initiative, combining research, river clean-ups, and environmental education to prevent plastic waste from reaching the oceans. The initiative strongly relies on citizen science, community clean-ups, and awareness campaigns, actively involving volunteers and local actors in monitoring and removing plastic waste. Benefits (or effectiveness) are observed through online map, GPS-based model, and satellite images. Presently, the Plastic Cup Initiative stands out as one of the most influential and effective river cleanup initiatives in the Danube River Basin.
65	Crisuri Water Basin Administration Link to case study	✗	RO	The demo site aims to reduce plastic pollution in rivers by installing litter traps to capture floating waste before it spreads downstream. The installed traps are equipped with buoys and debris containers to collect floating plastic waste in rivers.
66	Draž Municipality Link to case study	✗	HR	The middle Danube demo site focuses on testing and demonstrating wetland and floodplain restoration solutions in the Danube basin, particularly around Draž municipality and nearby cross-border areas, to improve biodiversity, water quality, and climate resilience. The site operates within the EU Horizon Europe-funded DaWetRest project, which provides financial support and a large consortium of research organisations, public authorities, and regional partners working on wetland restoration. The project involves local communities, regional stakeholders, and managing authorities from several Danube countries. The demonstrator tests concrete restoration interventions and monitoring approaches across pilot and sibling sites in the Middle Danube region to evaluate impacts on biodiversity, water quality, and ecosystem resilience.
67	Lake Sărățuri Murighiol Link to case study	✗	RO	The Danube Delta demonstrator focuses on restoring and sustainably managing wetland ecosystems in the Danube Delta through nature-based solutions that improve biodiversity, water quality, climate resilience, and benefits for local communities. It is supported by a consortium of universities, research institutes, authorities, NGOs, and other partners working on wetland restoration across the Danube basin, within the

				EU Horizon DaWetRest project. Apart from monitoring, it also improves RAS (Recirculating Aquaculture System) for fish farming solutions.
68	Calimok-Brashlen Protected Area Link to case study		BG	The lower Danube demonstrator focuses on restoring wetlands and improving ecosystem functioning, using innovative restoration measures to enhance biodiversity, water quality, and climate resilience in the Lower Danube floodplain. As part of the EU Horizon DaWetRest project, it brings together a large consortium of research institutes, authorities, and organizations to implement restoration actions. The project engages local communities, authorities, researchers, and environmental organizations. Freshwater is monitored and managed through an intelligent system integrating mobile multiparameter monitoring stations, river research drones, terrain modelling of inland canals, automated lock operations, and pilot tidal power generation, supporting floodplain biodiversity restoration and data exchange through open interfaces.