

Nature-Based Solutions in the Danube Region

From restoration practice to scalable water management

EUSDR Priority Area 4 – Water Quality

Nature-Based Solutions in Action: Scaling Innovation Across Europe

Why NbS for water management?

The point is not to replace engineering — it is to restore functions that engineered systems often suppress.

CORE IDEA

1

FLOODS

**Restore floodplains
and give water space**

↓ peak flow

2

DROUGHT

**Retain water in soils,
wetlands and side arms**

↑ resilience

3

WATER QUALITY

**Filter, retain and transform
pollutants naturally**

↓ pollution

NbS = protecting, restoring or sustainably managing ecosystems to address societal challenges while delivering biodiversity benefits.

The Danube is a natural NbS laboratory

A transboundary river basin where one intervention can deliver several benefits — if designed at the right scale.

DANUBE CONTEXT

- 14 basin countries → solutions must work across administrative borders.
- Floods, drought, water quality and biodiversity are interconnected.
- Natural water retention and ecosystem restoration can address several risks at once.
- The strongest examples combine local action with basin-level learning.

Think “river basin function”, not isolated green projects.

Challenges in the Danube region



- Mobility
- Energy
- Environment
- Risks
- Social & economic aspects
- Security

14 countries →

- transboundary cooperation
- integrated river basin management
- climate adaptation
- disaster risk reduction
- water retention
- ecosystem restoration

Where EUSDR PA4 fits

PA4 is a platform for water-quality cooperation, not the NbS story itself.



Water Quality

PA4



Environmental
Risks

PA5



Biodiversity,
Landscapes & Soil

PA6

NbS

shared implementation
space

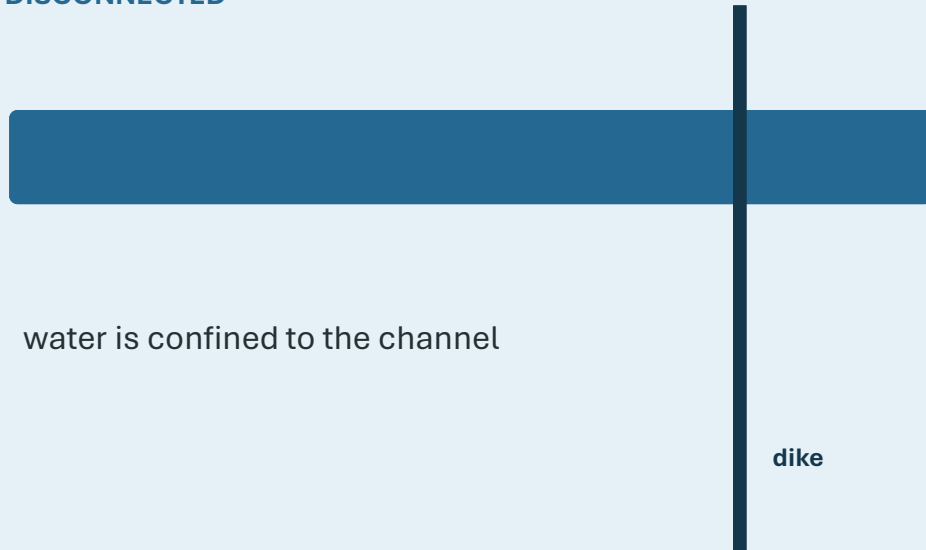
For PA4, the key question is: how can restoration and retention also improve water quality and strengthen integrated river-basin management?

Good practice #1 — reconnect the floodplain

Danube Floodplain / MERLIN: restore the river–floodplain relationship instead of relying only on hard protection.

FLOOD RESILIENCE

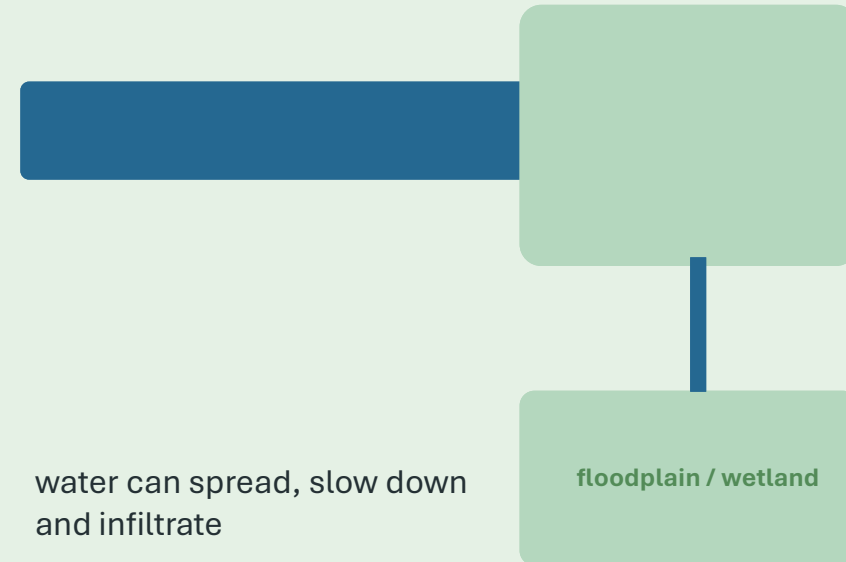
DISCONNECTED



water is confined to the channel

dike

RECONNECTED



water can spread, slow down
and infiltrate

floodplain / wetland

Multiple benefits: flood-risk reduction • habitat • nutrient retention • drought resilience

Good practice #2 — restore side arms and natural water dynamics

RESTORIVER Foki side arm, Slovakia: a targeted reconnection can reactivate a much larger wetland system.

RIVER RESTORATION

DANUBE

reconnected
side arm + wetland

- biodiversity
- fish spawning habitat
- soil moisture & groundwater support
- longer water retention

More water reaches the side arm even in drier periods

Lesson: restore natural processes where a relatively small intervention can unlock system-scale benefits.

Good practice #3 — work with agricultural landscapes

MERLIN Danube/Tisza cases show that restoration does not have to mean “leave the landscape alone”.

WATER RETENTION

river

Seasonal storage

floodplain / wetland

Irrigation + retention

agricultural land

Flood-compatible land use

The transferable practice is co-design:

align water retention, farming, biodiversity and flood management objectives — and make the trade-offs explicit.

Good practice #4 — wetlands as multifunctional infrastructure

DaWetRest: combine restoration with monitoring, community engagement and pathways to replication.

WETLAND RESTORATION



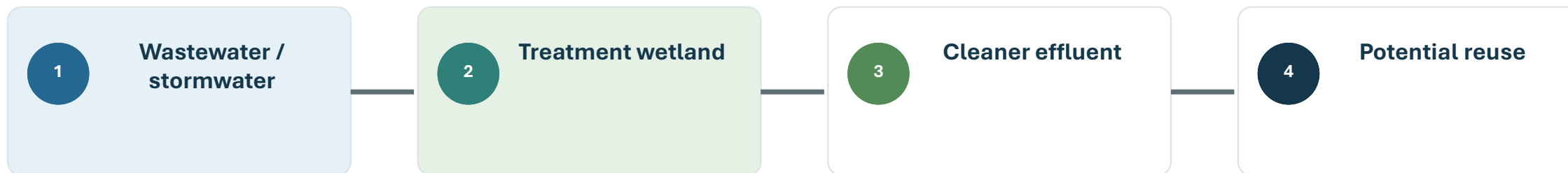
DaWetRest's useful message for scaling:

technical restoration is only one part of the solution; implementation also needs monitoring, people, institutions and viable long-term models.

Good practice #5 — bring NbS into small settlements

D-CLEAN: an emerging Danube example where treatment wetlands connect water quality, resilience and water reuse.

WATER QUALITY



- Targets small and remote communities where conventional solutions may be difficult to operate.
- Links organic/nutrient pollution reduction with climate resilience.
- Explores reclaimed water for agricultural irrigation — a circular-economy connection.

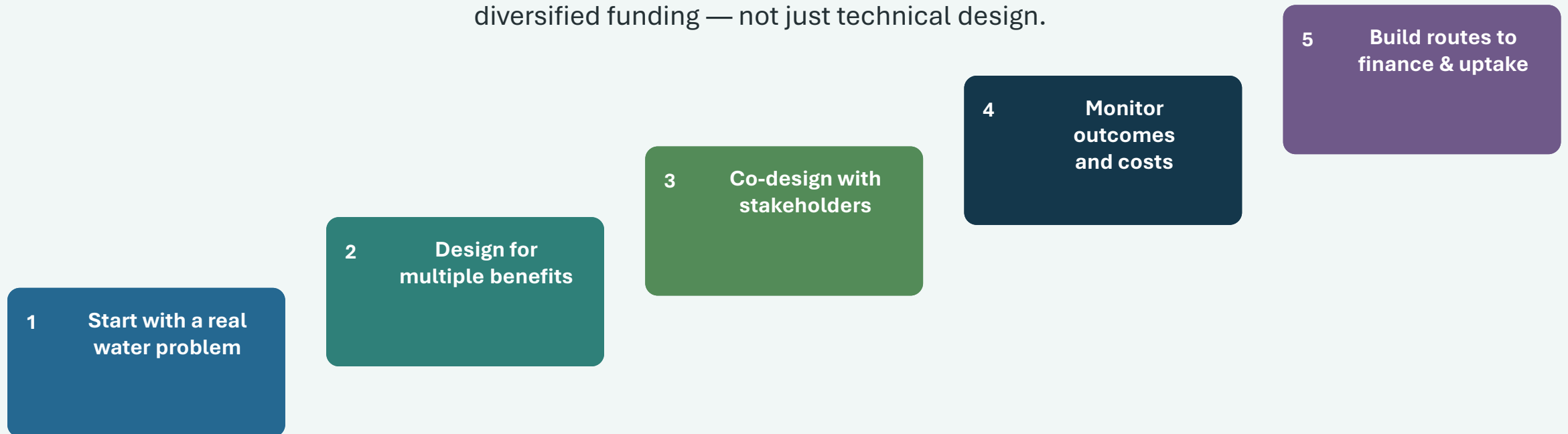
Important: D-CLEAN is ongoing (2025–2028), so present it as an emerging practice rather than a completed impact case.

What makes a Danube NbS scalable?

The projects point to a common implementation pattern.

From “pilot project” → “repeatable implementation model”

MERLIN’s cross-sector work highlights the importance of stakeholder coordination, long-term monitoring and diversified funding — not just technical design.



A PA4 perspective: from projects to basin-scale practice

01

RESTORE FUNCTIONS

Reconnect rivers, floodplains, wetlands and riparian areas where this improves water-system performance.

02

CONNECT SECTORS

Water quality, flood risk, biodiversity, agriculture and spatial planning should be designed together.

03

SCALE WHAT WORKS

Use projects as evidence and learning platforms — then embed proven approaches in policies, investments and routine management.

The Danube does not need one “perfect” NbS. It needs many context-specific solutions that add up.

**Nature-based solutions work best when we restore natural functions,
connect sectors and design for replication from the beginning.**

Selected sources DaWetRest • D-CLEAN • Danube Floodplain • RESTORIVER • MERLIN

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