



**RETOUCH
NEXUS**

2023

2026

The RETOUCH NEXUS project promotes a cross-sectoral Water–Energy–Food–Ecosystems (WEFE) Nexus approach to support a resilient EU water economy. It ensures that water governance considers ecological, social, and economic dimensions, fostering coherence and effectiveness across sectors and governance levels.

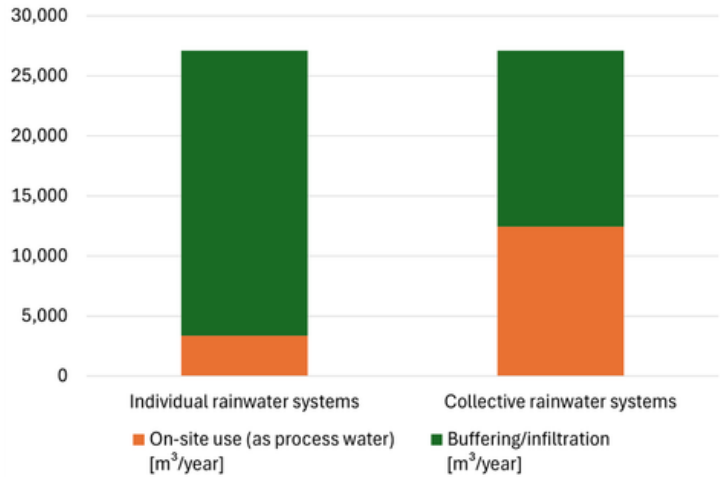


Policy brief | Upscaling of water governance Instruments | Collective & scalable strategies for non-conventional water resources

This policy brief examines methodological approaches to scaling economic instruments and models for water governance. Case studies are illustrative, and broader application is possible through context-specific analysis.

Introduction: Decentralised solutions of circular water management (e.g. buffering and using rainwater locally or to recharge groundwater) improve household, industrial and/or agricultural water availability, and ecosystem support. However, the business case for these solutions is often unclear, hindering investments.

Modelling Approach: Cost–benefit analysis (CBA) compares the total societal costs and benefits of selected scenarios in monetary terms. For decentralised water solutions, CBA integrates a water balance module, monetary valuation of benefits (and savings), and costs such as investments, land use, maintenance, and operation. Scenarios compare different scales, and sensitivity analysis account for uncertainty in parameters.



Comparing potential rainwater use, buffering and infiltration at a greenfield business park for individual systems vs. a collective solution

RETOUCH NEXUS CASE STUDIES - LESSONS LEARNED

Benefits (+)/costs (-) of collective rainwater use relative to BAU (companies operate individual rainwater tanks). Overall net saving over a 40-year period.

Category	Benefits (+) & Costs (-) in €
Groundwater extraction & tariff costs	-72,335
Drinking water production costs	106,845
Wastewater treatment costs	-18
Flooding costs	0
CAPEX	142,644
OPEX	65,672
Collective vs individual systems	242,808

Indicators (data requirements and resulting insights)

- Net present value and benefit-cost ratio of rainwater management scenarios.
- Volumetric indicators: rainwater captured, reused, infiltrated, and overflowed per scenario.
- Treatment, production, abstraction costs/benefits.
- WEFE co-benefits: groundwater recharge rates, ecosystem support, agricultural water availability.

Implications for WEFE Nexus framework

- Decentralised rainwater solutions reduce energy need for treatment, enhance agricultural water availability, support ecosystems by groundwater recharge.
- Policy frameworks should recognise cross-sectoral benefits to justify collective investments.
- Actor-based distributional analysis is needed to design equitable cost-sharing mechanisms.

RETOUCH NEXUS CASE STUDY

The Flanders (Belgium) case study applies CBA to the Keiberg Vossem greenfield business park demonstration site, comparing a business-as-usual scenario, that complies with Flemish legislation and guidelines vs. an innovative collective rainwater harvesting system over a 40-year horizon with a 4% real discount rate. Benefits are valued using avoided costs: wastewater treatment (€0.30/m³), drinking water production (€0.59/m³), and groundwater-related costs (€0.40/m³). The analysis supports the Flemish Blue Deal policy framework.

Preliminary results show the increased cost-effectiveness of collective rainwater systems vs individual or no infrastructure. Benefits span hydrological, economic, environmental, and resilience dimensions. Surplus rainwater contributes to groundwater recharge, supporting ecosystems and agriculture - a critical WEFE co-benefit.

Governance mechanisms

- Flemish Blue Deal as policy framework for water resilience.
- Multi-actor governance for coordination between businesses, municipalities, water utilities (De Watergroep), and VITO.
- Contractual set up for collective rainwater trading and distribution.
- Phased implementation strategies to manage infrastructure scale-up efficiently.

Potential Economic Instruments

- Incentives (e.g. pricing), subsidies, legislation supporting collective rainwater infrastructure (tanks, pipes, pumps).
- Avoided-cost pricing: monetising the societal value of decentralised water management.
- Cost-sharing by beneficiaries (businesses, municipalities, utilities).
- Groundwater abstraction tariffs as a complementary incentive for rainwater reuse.



Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or REA. Neither the European Union nor the granting authority can be held responsible for them.



SCALING OUT

TO INCREASE IMPACT BY REPLICATING A MODEL IN SIMILAR CONTEXTS, PROVIDING FLEXIBILITY, RESILIENCE, AND COST-EFFECTIVE GROWTH, OFTEN FOCUSING ON SHARED FEATURES.

MODELLING STRATEGY

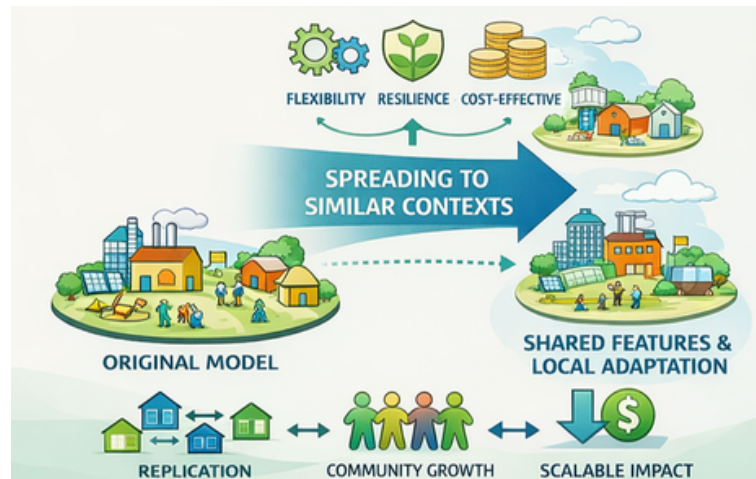
CBA methodology for decentralised rainwater management

The CBA framework can be replicated at other business parks, industrial zones, and residential areas in Flanders and across similar European water-stressed regions. The core methodology (water balance + avoided-cost valuation) is retained while adapting site-specific parameters.

Example: Apply the same CBA to the two other Belgian demonstration sites (industrial and household contexts) and then to similar sites in the Netherlands, northern France, or western Germany.

Assumptions & potential Risks:

- Benefits are highly location-specific (e.g., flood risk determines buffer value).
- Treatment, production, abstraction costs differ across sites.
- Non-monetary benefits are harder to transfer.



Scaling out general framework.

Mitigation measures:

- Sensitivity analysis to provide a range of outcomes.
- Clear governance guidelines for collective rainwater systems to support replication.

SCALING UP

TO INCREASE THE COVERAGE, SIZE, CAPACITY, SCOPE, OR OUTPUT OF A MODEL TO A WIDER CONTEXT, ESSENTIALLY MAKING IT BIGGER AND MORE EFFECTIVE. IT'S ABOUT GROWING SUBSTANTIALLY, NOT JUST LINEARLY, TO PROVIDE MORE COMPREHENSIVE INSIGHTS.



Scaling up general framework.

Assumptions & potential Risks:

- Increasing complexity with scale.
- Governance structures become more complex.
- System design must remain within efficient scale to avoid diminishing returns.

ECONOMIC INSTRUMENT

Regional/national circular water financing framework

Scaling up means expanding from a single business park (~20 businesses) to parks with 100+ businesses, and then from site-level to regional or national programmes. This involves larger pipe diameters, higher infrastructure investments, and more complex governance.

Example: Integrating decentralised rainwater systems into the Flemish Blue Deal at regional level, with standardised incentive structures, permitting procedures, and cost-sharing models applicable across Flanders.

Mitigation measures:

- Sensitivity analysis to identify efficient system sizes.
- Clear governance and contractual frameworks.
- Phased implementation to ensure cost-effectiveness as scale increases.

Conclusions / Final Remarks

- **Collective systems create value:** Shared rainwater infrastructure can be cost-effective, while improving water supply resilience.
- **System-wide cost savings:** Each cubic meter harvested can reduce pressures on different water uses.
- **Stronger planning choices:** Applying multi-benefit cost-benefit analysis supports evidence-based infrastructure decisions

