RETOUCH NEXUS

REsilienT water gOvernance Under climate CHange within the WEFE NEXUS

Deliverable D4.4

Policy briefs for effective, sustainable and integrated governance structure at multiple levels

Adria Rubio-Martin (UPV), Safa Baccour (UPV), Manelle Sokar (EQY), Maria Vrachioli (TUM), Joshua Holzer (TUM), Pietro Sala (TUM), Juan Pablo Henao (TUM), Roberto Villalba (TUM), Ema Lazorcakova (SUA), Miroslava Rajcaniova (SUA), Erik Ansink (VUA), Clara Luxardo (VUA), Katarina Negacz (VUA), Aaron Cutajar (EWA), Kylie Spireti (EWA), Wim Schiettecatte (vito), Karel Bagnoli (vito)

Date (15/12/2025)

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.

RETOUCH NEXUS

RETOUCH NEXUS Partners

Technical University of Munich - TUM (Germany) - Maria Vrachioli, Johannes Sauer, Markus Disse, Juan Pablo Henao Henao, Jingshui Huang & Joshua Holzer

Valencia Polytechnic University - UPV (Spain) - Manuel Pulido-Velazquez, Adria Rubio-Martin & Safa Baccour

Vrije Universiteit Amsterdam - VUA (Netherlands) - Erik Ansink, Nicolien van der Grijp, Daniel Petrovics & Leon Bremer

adelphi research gemeinnutzige - adelphi (Germany) - Annika Krammer, Elsa Semmling, Karolina Heck & Binayak Das

Slovak University of Agriculture - SUA (Slovakia) - Jan Pokrivcak, Ema Lazorcakoova & Miroslava Rajcaniova

Euroquality - EQY (France) - Barthélémy Maillard, Clémence Gracia & Manelle Sokar

Vlaamse Instelling voor Technologisch Onderzoek - vito (Belgium) - Katrien Van Hooydonk, lilian Taverner, Steven Broekx & Wim Sciettecatte

De Watergroep - DWG (Belgium) - Pauline Ottoy, Charlotte Jacobs & Ian Montauban van Swijndregt

Energy and Water Agency - EWA (Malta) - Manuel Sapiano, Nicholas Ellul, Nadine Vella, Aaron Cutajar, Nadia Gatt Gafa & Marco Graziani

Hoogheemraadschap Hollands Noorderkwartier - HHNK (Netherlands) - Floor van Schie, Ronald Koolen & Marja Korting

Greening the Islands - GtI (Italy) - Gianni Chianetta, Emilio Gabrielli, Fransesco Luise, Mattia Monaco, Andrea Morabito, Sabrina Pentecoste, Jean Karl Micallef-Grimaud, Graziana Salvati

Regierung Oberfranken - RegOb (associated) (Germany) - Andrea Kuenzl

Ministry of Agriculture and Rural Development - MARD (associated) (Slovakia) - Martin Kovac

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.

DELIVERABLE 4.4

Project Acronym	RETOUCH NEXUS
Project Title	REsilienT water gOvernance Under climate CHange within the WEFE NEXUS
Project Coordinator	Maria Vrachioli
Project Duration	01.01.2023 – 31.12.2026

Nature of the deliverable		
R	Document, report (excluding the periodic and final reports)	X
DEM	Demonstrator, pilot, prototype, plan designs	
DEC	Websites, patents filing, press & media actions, videos, etc.	
OTHER	Software, technical diagram, etc.	

Dissemination Level		
PU	Public, fully open, e.g. web	X
CO	Confidential, restricted under conditions set out in Model Grant Agreement	
CI	Classified, information as referred to in Commission Decision 2001/844/EC	

Deliverable No.	4.4
Dissemination level [1]	Public
Work Package	WP4 - Multi-level,multi-sector water governance settings
Task	T4.4 - Pathways towards improved integrated water governance for (..)
Lead beneficiary	UPV
Contributing beneficiary(ies)	EQY, EWA, SUA, TUM, vito, VUA
Due date of deliverable	31/12/2025
Actual submission date	15/12/2025

Quality procedure			
Date	Version	Reviewers	Comments
8/09/2025	0.1		First content draft
15/10/2025	0.5		First template draft
8/11/2025	1		First draft of the PB
8/12/2025	1.5		Revised PB according to internal review
15/12/2025	2		Final version integrating all changes

Acknowledgements

This report is part of the deliverables from the project "RETOUCH NEXUS" which has received funding from the European Union's Horizon Europe research and innovation program under grant agreement N° 101086522. More information on the project can be found at www.retouch-nexus.eu

Executive summary

This deliverable presents a set of targeted policy briefs developed under Task 4.4 of the project. Building on the baseline governance analysis (T4.1), the identification of key challenges (T4.2), the review of innovative water governance schemes and practices (T4.3), and the economic instruments proposed in WP3, these briefs synthesize evidence-based recommendations for achieving effective, sustainable, and integrated water governance across the water–energy–food–ecosystem nexus at the different case study scales. The policy briefs address decision-makers and stakeholders at local, river-basin, national, and European levels.

Key findings highlight that current governance frameworks remain largely sectoral and fragmented, leading to persistent conflicts over resource allocation, suboptimal implementation of economic instruments, and limited uptake of innovative organisational models. Technical, economic, legal, and institutional barriers continue to hinder the transition toward truly integrated approaches. The briefs propose a coherent package of actionable recommendations structured around four pillars:

1. Strengthening multi-sector and multi-scale stakeholder partnerships through inclusive platforms and clear coordination mechanisms.
2. Adapting legislative and institutional frameworks to enable the integration of nexus-oriented economic instruments.
3. Promoting hybrid governance models that blend hierarchical, market-based, and network-based arrangements, tailored to local contexts.
4. Establishing common planning and monitoring frameworks that explicitly incorporate water, energy, food, and ecosystem objectives at river-basin and regional levels.

By implementing these recommendations, policymakers can overcome existing silos, enhance resilience to climate and socio-economic pressures, and ensure long-term sustainability of water-related ecosystems and services. The policy briefs are accompanied by proposed roadmaps for the case studies, and specific entry points for immediate regulatory and institutional reform. All policy briefs have been translated to the relevant local languages of the case studies to ensure maximum dissemination and engagement potential in the local contexts. Deliverable D4.4 thus provides a strategic bridge between research insights and policy action, offering stakeholders clear pathways toward integrated water governance that is fit for the challenges of the 21st century.

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.

Table of content

Contents

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.

POLICY BRIEF | PATHWAYS TOWARDS IMPROVED INTEGRATED WATER GOVERNANCE FOR SUSTAINABILITY IN THE JÚCAR RIVER BASIN

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.

KEY STAKEHOLDERS

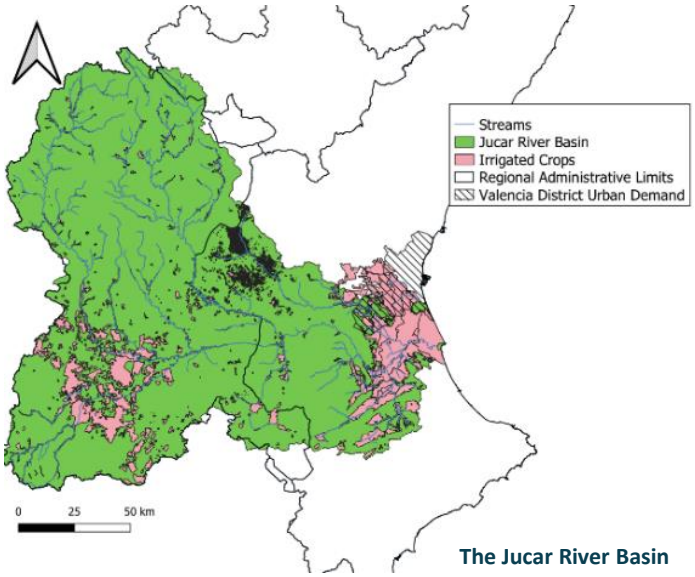
- National and regional governments
- Jucar River Basin Authority
- Municipalities
- Research institutes
- Agricultural Users Communities
- Hydropower industry
- Environmental and NGO groups

PRIORITY ACTIONS

- Integrate WEFE nexus considerations into basin-wide policies using economic modeling and decision-support tools.
- Engage underrepresented stakeholders in participatory platforms for co-production and context equitable planning.
- Adopt water pricing, cross-sectoral financing, and adaptive monitoring to boost resilience and long-term sustainability

INTEGRATED PARTNERSHIP FOR INCLUSIVE GOVERNANCE

Effective and inclusive water governance in the Júcar basin requires cross-sector and multi-level partnerships that connect water, energy, food, and ecosystems. While the basin management plan supports participation among the authority, irrigation communities, cooperatives, and hydropower operators, links with smallholder farmers and environmental NGOs remain limited. A WEFE Nexus approach calls for participatory platforms that support shared problem-solving, empower underrepresented stakeholders, and promote knowledge co-production to assess trade-offs and synergies.



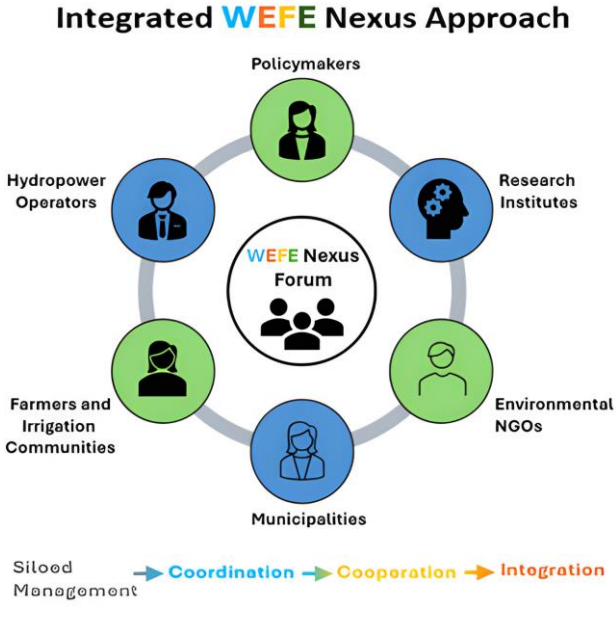
The Jucar River Basin

CONTEXT

The Júcar River is Valencia's main water source, yet the region faces frequent droughts driven by water scarcity, irregular hydrology, and groundwater overuse, pressures intensified by climate change and political tensions between Castilla-La Mancha and Valencia. Innovative solutions for sustainable water management, supported by efficient governance and economic tools, are essential to balance water use with energy production, agriculture, and environmental needs in line with the Water Framework Directive.

NEXUS GOVERNANCE CHALLENGES & BARRIERS

Water, energy, food, and ecosystem security are central to the Júcar basin's sustainability, but rising demands, resource scarcity, and uncertainty have intensified their interconnections and the risks of poor management. Governance remains fragmented, with rigid legal frameworks, weak cross-sector coordination, and inconsistent policies across scales and stakeholders. Additionally, overlapping institutional competences and limited engagement of non-water actors in participatory processes create coordination gaps.



FRAGMENTATION VS INTEGRATION

Aspect	Current State (Fragmented)	WEFE Nexus Approach (Integrated)
Policy Focus	Water-dominant; energy/food/ecosystems indirect.	Explicit WEFE linkages with quantified trade-offs.
Stakeholder Engagement	Limited to water/irrigation/hydropower actors; excludes smallholders/NGOs.	Multi-sectoral platforms for co-decision and knowledge co-production.
Coordination Mechanisms	Rigid laws, overlapping competences, scale mismatches.	Adaptive institutions, shared data systems, cross-financing.

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.

PATHWAYS TO SUSTAINABLE NEXUS WATER GOVERNANCE

Success in advancing pathways toward more effective water governance hinges on political will, stakeholder buy-in, and funding from sources like EU recovery funds or national green investments. Key principles include:

- **Integration:** Map interlinkages, gaps, and stakeholder needs; use nexus tools and economic models to reveal trade-offs, cascading impacts, and systemic vulnerabilities, enabling coherent, basin-wide strategies.
- **Inclusivity:** Involve underrepresented groups through co-design and participatory platforms, ensuring governance reflects diverse perspectives, mitigates power imbalances, and fosters equitable resource distribution.
- **Adaptability:** Build real-time monitoring and feedback loops into governance, enabling flexible, responsive strategies that enhance resilience and prevent rigid, outdated planning.
- **Sustainability Indicators:** Use multidimensional metrics to track efficiency, synergies, and stakeholder satisfaction, ensuring accountability, continuous improvement, and alignment with long-term resource security goals.

Economic instruments, especially water pricing, link allocation decisions to scarcity by encouraging efficient use through volumetric and tiered tariffs, while maintaining equity via differentiated rates and subsidies. Public funding supports initial modeling and reforms, while private investment scales innovations like smart metering and drought-resistant technologies. Integrated economic models help identify high-return options, such as solar-powered irrigation, that attract private capital and reduce scarcity risks. Revenues from water pricing can feed resilience funds for adaptive infrastructure, and WEFE platforms help ensure financial flows support nexus goals, improving resource security, reducing conflicts, and generating economic benefits.

PROGRESSION TIMELINE ROADMAP (2025-2035)

2025-2027
Short-term Foundations

2028-2030
Medium-Term Implementation

2031-2035
Long-Term Consolidation and Scaling

Phase	Short-Term: Build awareness and evidence-based	Medium-Term: Test and integrate solutions	Long-Term: Embed and expand resilience
Key Actions	• Perform comprehensive WEFE nexus audits (quantify linkages via modeling). • Organize inclusive workshops for joint problem identification. • Develop shared data systems (open-access dashboards on water flows, energy use, crop yields).	• Launch participatory platforms for co-decision • Revise basin plans to include energy/food/ecosystem goals explicitly. • Introduce cross-financing and pilot innovations like ecosystem-based agriculture.	• Institutionalize a WEFE governance body with legal mandates. • Implement adaptive monitoring (early warning for scarcities). • Scale successes and influence national/EU policies.
Responsibilities	• Basin authority (lead), research institutions, regional governments.	• Irrigation communities, hydropower operators, NGOs, smallholders.	• National government (oversight), local communities.
Enablers/ Tools	• EU Horizon funds; tools like GIS mapping and nexus simulators.	• National plans; knowledge co-production with universities.	• Sustainable financing mechanisms; international best practices.
Challenges & Mitigations	• Resistance from siloed sectors. Mitigated via incentives.	• Funding gaps. Mitigated via public-private partnerships and transparent data protocols.	• Climate variability. Mitigated with scenario planning and continuous inclusion audits.
Milestones / Outcomes	• Baseline report on trade-offs; multi-stakeholder alliance formed; initial synergies identified.	• Pilot projects operational; policy amendments adopted; capacity building for 500+ stakeholders.	• Full integration achieved; 20-30% resource efficiency gains; model for Mediterranean basins; reduced vulnerability to pressures.

RETOUCH NEXUS

RETOUCH NEXUS
2023 2026

POLICY BRIEF | PATHWAYS TOWARDS IMPROVED INTEGRATED WATER GOVERNANCE FOR SUSTAINABILITY IN THE UPPER MAIN RIVER BASIN

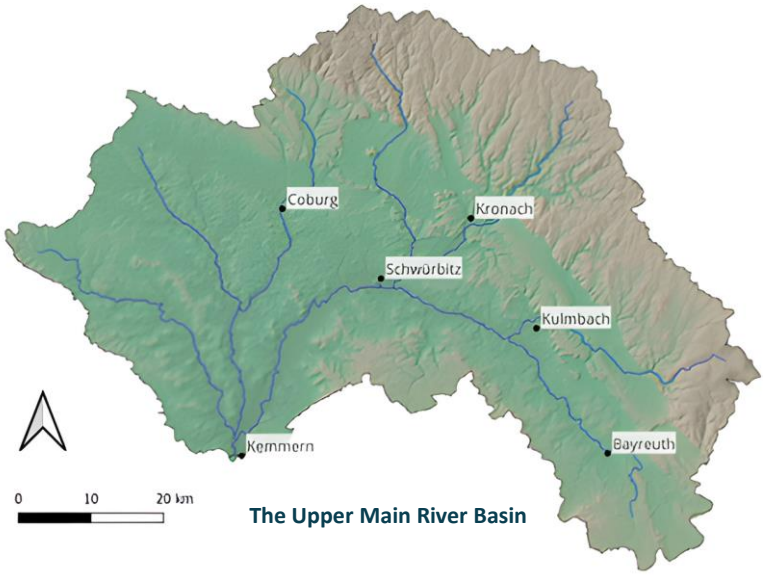
The RETOUCH NEXUS project promotes a cross-sectoral Water–Energy–Food–Ecosystems (WEFE) Nexus approach to support a resilient EU water economy. It ensures that water governance considers ecological, social, and economic dimensions, fostering coherence and effectiveness across sectors and governance levels.

KEY STAKEHOLDERS

- Bavarian State Ministry of the Environment agencies
- Government of Upper Franconia
- Regional water authorities
- Universities
- Farmer groups

PRIORITY ACTIONS

- **Promote multi-stakeholder partnerships** that include civil society, private actors, and underrepresented groups.
- **Integrate economic instruments** (e.g., water pricing, subsidies for Nature-Based Solutions – NBS) to incentivize sustainable resource use.
- **Introduce digital engagement and data-sharing platforms** to improve transparency and stakeholder collaboration.



The Upper Main River Basin

CONTEXT

The **Upper Main River Basin (UMRB)** in northern Bavaria faces growing **climate-related pressures**, including reduced groundwater recharge, seasonal shortages, and rising competition for water. **Intensive cereal production** adds water-quality challenges, while fragmented institutional responsibilities limit coordination. At the same time, active local actors and new digital initiatives create opportunities to advance more integrated, participatory, and adaptive water governance.

NEXUS GOVERNANCE CHALLENGES & BARRIERS

- **Fragmentation** remains a core issue as responsibilities for water, agriculture, energy, and ecosystem management are distributed across different administrative levels and institutions with limited coordination.
- **Technical and institutional barriers** further complicate effective governance. Data on water availability, demand, and quality remain fragmented, and a comprehensive quantitative assessment of the basin's water resources is still lacking.
- **Outdated tools** (e.g., water allocation priority rules) and interoperable data systems could support cross-sectoral coordination.

FRAGMENTATION VS INTEGRATION

Aspect	Current State (Fragmented)	WEFE Nexus Approach (Integrated)
Policy Focus	Water-dominant; limited links to energy, food, ecosystems.	Integrated WEFE planning, quantified trade-offs, adaptive allocation.
Stakeholder Engagement	Mainly water authorities. Farmers, NGOs, and youth tend to be excluded.	Multi-level, inclusive platforms for co-decision and knowledge sharing.
Coordination Mechanisms	Rigid laws, overlapping competences, poor data sharing.	Adaptive institutions, shared data systems, cross-sector collaboration.
Outcomes/Risks	Fragmented strategies, conflicts, vulnerability to climate extremes.	Resilience, efficiency, equitable resource use, reduced conflicts.
Examples	Participatory water boards.	Expanded to NGO-led monitoring, farmer-research partnerships, digital tools.

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.

INTEGRATED PARTNERSHIPS FOR INCLUSIVE GOVERNANCE

Transitioning toward integrated governance requires cross-sectoral and multi-level cooperation among key institutions:

- **High-level actors:** Bavarian State Ministry of the Environment and Consumer Protection (STMUV), Government of Upper Franconia, and regional water authorities, with strong policy-shaping power.
- **Local actors:** Farmers, civil society, and research institutions show high engagement but limited influence in formal decision-making.
- **Existing networks**, such as Flussparadies Franken e.V. and Runde Tisch Umweltbildung Oberfranken facilitate dialogue but remain dominated by public-sector voices.

Enhancing inclusive governance calls for stable coordination platforms that ensure continuous dialogue between government, local stakeholders, and private actors. Strengthened partnerships can improve transparency, accountability, and policy innovation within the WEFE Nexus.

PATHWAYS TO SUSTAINABLE NEXUS WATER GOVERNANCE

Achieving sustainable and nexus water governance in the UMRB calls for a combination of:

1. **Participatory planning:** expanding engagement using innovative tools, such as online participation platforms and citizen science initiatives, which promote knowledge exchange, enhance legitimacy, and ensure shared ownership of governance reforms.
2. **Policy & Governance Reforms:** target a basin-wide coordination framework that aligns water management with agricultural, spatial planning, and ecosystem objectives. Further, modernize legal and planning frameworks to support adaptive, data-driven management capable of responding to changing hydrological conditions.
3. **Monitoring & Accountability:** establish shared monitoring systems across institutions to track water availability, quality, and use. In parallel, innovative economic instruments, such as dynamic water pricing schemes, incentives for nature-based solutions, and tradable water use permits, can encourage more efficient resource allocation.
4. **Policy Innovation:** introduce instruments that align economic incentives with sustainable water use. Examples include differentiated water tariffs that reflect scarcity conditions, subsidy schemes encouraging the adoption of nature-based solutions, and the testing of tradable water use permits among sectors to increase allocation efficiency.
5. **Education and Capacity Building:** promote water awareness among younger generations through workshops in schools and in community forums. Including water governance, sustainability, and climate adaptation topics in school curricula can strengthen long-term capacity to manage water sustainably.

PROGRESSION TIMELINE ROADMAP (2025-2035)

2025-2027
Short-term Foundations

2028-2030
Medium-Term Implementation

2031-2035
Long-Term Consolidation and Scaling

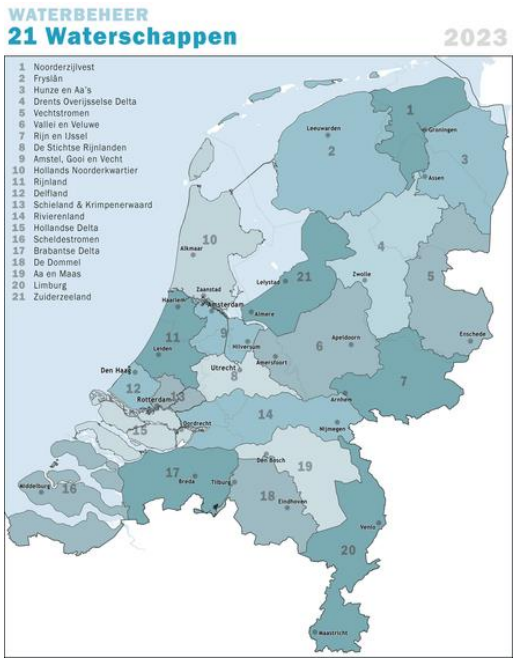
Phase	Short-Term: Build awareness and evidence-based	Medium-Term: Test and integrate solutions	Long-Term: Embed and expand resilience
Key Actions	• Establish a **cross-sector coordination platform.** • Launch a **participatory digital platform** for stakeholder engagement and data sharing. • Develop a **joint monitoring framework** for water quantity and quality across sectors.	• Pilot **economic instruments** (e.g., water pricing incentives, subsidies for NB). • Embed **participatory monitoring and digital tools** into basin policies. • Strengthen **education and capacity-building** in schools and communities.	• Institutionalize a **basin-wide coordination framework** with legal mandates. • Integrate **dynamic water pricing and tradable water permits** into policy frameworks. • Expand **adaptive monitoring** for long-term resilience.
Main Actors	• STMUV (lead), Regional Water Authorities, Municipalities, Research Institutions, Civil Society, Farmers.	• STMUV, Regional Water Authorities, Research Institutions, Educational Institutions, Local Governments, Hydropower operators, NGOs, Farmers.	• National Government, Regional Governments, STMUV, Regional Water Authorities, Private Sector, Civil Society.
Expected Outcomes	• Improved governance coordination. • Shared data systems are operational. • Greater transparency and inclusion across stakeholders.	• Pilot instruments implemented. • Adoption of nature-based solutions increases. • Higher water awareness and stakeholder capacity.	• Integrated WEFE governance institutionalized. • Efficient water allocation and improved resource valuation. • Enhanced resilience to water scarcity and long-term adaptive planning.

RETOUCH NEXUS

POLICY BRIEF | BUILDING EFFECTIVE PARTICIPATION - PATHWAYS TOWARDS IMPROVED INTEGRATED WATER GOVERNANCE FOR SUSTAINABILITY IN THE NETHERLANDS

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.



Map by Unie van Waterschappen

CONTEXT

This policy brief outlines a pathway toward more sustainable and integrated water governance through effective stakeholder participation. Drawing on insights from 21 regional water authorities and 11 expert interviews, we identify key barriers in formalising participation within programmes and policy consultation processes and propose targeted actions to address them. The analysis combines scientific literature and publicly available policy documents, offering practical guidance for policy and decision-makers in water governance.

NEXUS GOVERNANCE CHALLENGES & BARRIERS

The Netherlands faces increasingly complex water challenges driven by climate change, including polluted waterways, soil subsidence, sea level rise, and salinisation, all compounded by growing and competing demands from cities, agriculture, and industry. Addressing these issues requires socio-economic and political adaptation grounded in a whole-of-society approach, moving beyond centralised and technocratic processes. This shift underpins the rise of integrated, adaptive, and nexus-based water governance, highlighting the interconnections across sectors, scales, and actors. In this context, public participation is essential for legitimate policy and decision-making. Yet effective participation is not guaranteed: when poorly designed or implemented, it can undermine outcomes, trust, and legitimacy, especially when reduced to tokenistic box-ticking rather than genuine dialogue.

The 21 Dutch water authorities are adopting a nexus-based approach and rethinking public participation. While historically engaged in participatory practices, such as projects and elections, their legitimacy now increasingly depends on the structural role of participation and adequate stakeholder engagement in policy processes.

The challenge lies in understanding when and how participation can be meaningfully and effectively embedded in policy development and decision-making, in ways appropriate to the specific policy challenges.

KEY MESSAGES & PRIORITY ACTIONS

- An integrated, adaptive, nexus approach to policy establishment in water governance requires, and is supported by, effective and meaningful participation.
- The major gaps experienced by water authorities in participatory processes are organisational and cultural, knowledge, procedural and in internal capacity.
- Policy development processes ask for nexus sensitive and adequate participatory processes and stakeholder engagement that are thoughtfully designed.
- Action to meaningful participation is institutionalisation within the organisation, knowledge sharing and capacity strengthening.

LEGAL & INSTITUTIONAL BARRIERS TO EFFECTIVE PARTICIPATION

Two recent national legal frameworks define how public authorities in the Netherlands organise and justify participation in policy and programmes development:

1. **The Environment and Planning Act (2024)** requires all governmental authorities to justify how citizens, civil society, and other governmental bodies were involved in policy preparation and decision-making.
2. **The Decentralised Government Participation Act (2025)** obliges decentralised governments to adopt a formal participation ordinance that specifies how stakeholders are involved in the design, the implementation and evaluation of policies. These legal frameworks provide a clear mandate to strengthen participatory implementation. Neither provide operational guidelines, thereby maintaining flexibility for contextual adaptation across governance contexts and policy settings.

Stakeholder engagement is widespread but uneven across the water authorities. While most have participation ordinances, few provide detailed implementation guidelines, relying mainly on general principles. The main barrier lies in turning participation ambitions into concrete processes.

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.

IDENTIFIED GAPS FOR INTEGRATED PARTICIPATION FOR INCLUSIVE GOVERNANCE

Stakeholder engagement mainly occurs through established networks and consultation with agricultural organisations, NGOs, municipalities, provinces, water companies, and industry. However, key governance gaps remain:

- **Organisational and cultural:** Participation and stakeholder engagement are not yet seen as an integral part of policymaking. Technocratic focus, hierarchical structures, and perceptions of lengthy processes limit shared decision-making.
- **Knowledge and responsibility:** Participation is not clearly anchored within organisational structures, with scattered knowledge and no designated staff, leading to fragmented ownership and misaligned activities.
- **Procedural:** Uncertainty persists on how to structure participation, identify stakeholders, and coordinate across sectors while avoiding fatigue.
- **Capacity:** Limited trained staff, time, and resources constrain the design and facilitation of meaningful participatory processes.

PATHWAYS TO SUSTAINABLE NEXUS WATER GOVERNANCE THROUGH EFFECTIVE PARTICIPATION

Act upfront, frame the problem

Participation across WEFE areas should be embedded at the start of policy and programme development as a structural and deliberate choice, not an afterthought. Participation should not be a goal in itself but a context-specific, stakeholder-driven process. Early reflection and clear problem framing help determine when it is needed and guide its design. Choosing participation means linking water issues to wider societal challenges and committing the necessary time, flexibility, and space within policies to adapt to local developments.

Design clearly

Designing participation clearly and with care is essential to determine who to involve, why, and how, ideally together with stakeholders. The process design, expected added value, and resource implications should be made explicit, along with scope, timing, budget, and risks. While limited participation may sometimes suffice, it may not be perceived as such by stakeholders. Provide transparency, define conflict resolution and manage expectations. Ensure transparency about the expected power delegation in relation to stakeholders' influence on the final product to manage expectations.

Engage strategically

Create adequate and feasible stakeholder engagement. Stakeholders across sectors and scales should be identified and engaged early, with their roles validated through consultation. A systematic approach, especially attentive to minority and underrepresented groups, helps avoid blind spots. Participation methods should fit the stakeholder landscape, policy challenge, available resources, and desired objectives. Keep power dynamics into account.

Monitor, evaluate and mutually learn

Effective participation requires clarity, transparency, and mutual gains and learning. Transparent expectations, receptivity, clear roles, and accountability build trust and shared norms. Monitoring should capture outcomes and stakeholder experiences, supported by an engaged policy team that keeps the process adaptive and receptive. Emphasizing learning in practice and sharing successes and lessons across stakeholders, teams and clusters strengthens collective knowledge and external relations. Adaptive capacity remains essential. Most misunderstandings come from mismanaged expectations, conflicting values, and limited incorporation of results.

Build capacity

Rely on and mobilise existing knowledge within their organisations, particularly that of environmental and area managers, while avoiding overburdening. Their project-based experience provides a foundation for policy-level participation, and cross-disciplinary teams can link practical and strategic knowledge. External expertise can strengthen capacity and support learning, while staff training builds long-term skills and reduces dependency on outside support.However, when resources are limited, hiring external help can be beneficial, but this should not come at the expense of the policy team's involvement.

Embed in culture

Create a long term, participatory organisational culture for meaningful, structured participation. Authorities and board members should promote organisational awareness of the value of participation. Sharing examples, guidelines, or a participation roadmap can help embed it in programmes and policymaking, emphasising flexibility and adaptability. Effective participation requires evolving practices from ambitions into a core part of the governance identity, supporting a shift toward integrated, inclusive, and sustainable water governance.

OPTIONABLE MEASURES

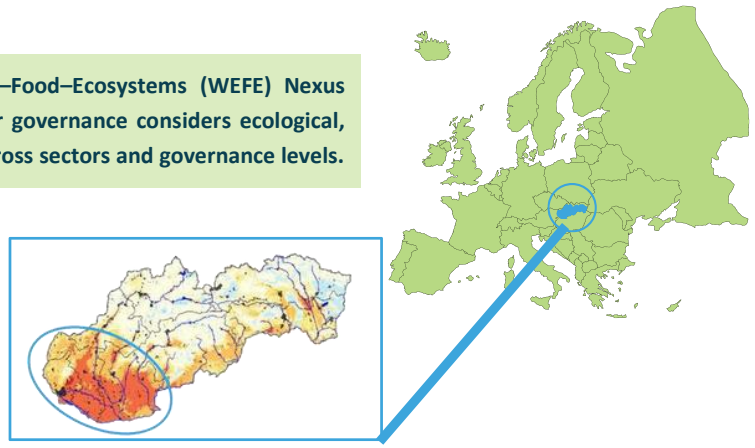
- Check-list / reflection forms / questionnaires.
- Systematically discuss and document the participatory motives.
- Create a "seat at the table" principle in early planning.
- Develop a flexible participation design guide for policy and programmes.
- Co-create and iterate in a design team.
- Mobilise existing expertise and encourage cross-team collaboration in process design.
- Conduct a stakeholder analysis at the start of each policy or programme trajectory.
- Use stakeholder matrices to visualise interests, influence, and engagement levels.
- Apply nexus-oriented engagement exercises.
- Develop a participation method and monitoring framework with quality indicators.
- Record and communicate how participatory input is applied.
- Reflexive evaluations and learning sessions / periodic external evaluations.
- Engage with learning institutes and co-share other authorities.
- Establish an internal participation network / focal point / contact person to coordinate efforts.
- Organise training sessions and workshops for staff on participatory methods.
- Hold learning opportunities to share experiences across departments.
- Take part in external knowledge networks.
- Create a learning agenda, an internal participation platform or hub for sharing tools, templates, methods and stories.
- Align participation objectives with climate adaptation, spatial planning, and drought resilience programmes.

RETOUCH NEXUS

POLICY BRIEF | PATHWAYS TOWARDS IMPROVED INTEGRATED WATER GOVERNANCE FOR SUSTAINABILITY IN SLOVAKIA

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.



KEY STAKEHOLDERS

- Policy Makers, ministries
- Agencies

PRIORITY ACTIONS

- Implement measures that improve soil water retention, invest in modernization of irrigation and water retention infrastructure, and impose water pricing reflecting environmental and economic value of water.
- Establish clear coordination mechanisms across different water using sectors and actors, applying nexus thinking, and integrate water and landscape planning taking river basins into account.
- Institutionalize participatory water councils and adaptive management cycles to strengthen stakeholder engagement and policy responsiveness.
- Develop and implement a unified, interoperable water data platform supporting real-time monitoring and decision-making.

INTEGRATED PARTNERSHIPS FOR INCLUSIVE GOVERNANCE

- The Water Policy Concept promotes participation and multi-level partnerships through both mandatory and voluntary processes. However, fragmented institutional responsibilities and a lack of a unified framework limit stakeholder engagement. Centralized, top-down governance often overlooks bottom-up input, hindering inclusive policy development, cross-sector coordination, and adoption of a WEFE nexus approach.
- Cross-sectoral initiatives such as Dialogue on Water and Soil or adaptation and optimization of water infrastructure show promise but require greater intensity, continuity, and structured knowledge sharing to be effective.

Robust monitoring and transparent reporting are essential to support evidence-based decision-making and build public trust.

CONTEXT

- Climate change exposes Slovakia to drying, floods, and droughts, reducing agricultural productivity and degrading ecosystems, calling for an integrated policy response.
- Water governance is highly fragmented across ministries and management stages, undermining water quality and efficiency.
- Effective participation of technical and non-technical stakeholders is key for legitimacy, ownership, and coordinated water governance.

NEXUS GOVERNANCE CHALLENGES & BARRIERS

- Water governance is highly fragmented, with responsibilities split between the Ministries of Environment and Agriculture, and limited coordination. State enterprises and municipalities often have overlapping or conflicting roles. While the Water Policy Concept offers a strategic framework, planning, implementation, and stakeholder cooperation remain misaligned.
- Frequent leadership changes disrupt continuity. Decision-making suffers from inconsistent, outdated data scattered across sources. The legal framework is complex and hard to enforce. Fragmented land ownership hinders modernization and maintenance of water infrastructure.
- The Action Plan Water is the Value outlines measures but lacks timelines, funding, and implementation details. The Carbon and Water Bank concept is stalled. Fees for water use don't reflect true environmental or economic costs. Climate adaptation strategies are still underdeveloped.

FRAGMENTATION VS INTEGRATION

Aspect	Current State (Fragmented)	WEFE Nexus Approach (Integrated)
Policy Focus	Separate focus either on water or agriculture.	Joint WEFE Nexus approach.
Stakeholder Engagement	Limited and formal, some relevant stakeholders have limited access to information and no say.	Multi-sectoral co-decision with inclusion of all technical and non-technical stakeholders.
Coordination Mechanisms	Inconsistent policies and regulations.	Learning and communicating institutions, joint comprehensive databases, sharing information.
Outcomes/Risks	Inconsistent policies and regulations.	Efficient, inclusive policy-making.
Examples	Stand-alone sectoral strategies.	Implementation of design, policies and strategies using WEFE Nexus approach.

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.

PATHWAYS TO SUSTAINABLE NEXUS WATER GOVERNANCE

- Effective participatory planning requires engagement of stakeholders across all sectors and administrative levels to foster legitimacy, ownership, and coordinated implementation.
  - **National Level:** Develop a comprehensive, multi-sector water strategy integrating water, food, and ecosystem priorities. Use integrated spatial planning to align water governance with land use and environmental goals. Streamline water management authorities, increase funding and capacity building, and unify fragmented water data into an interoperable digital platform.
  - **Regional Level:** Strengthen communication and information sharing among stakeholders across the WEFE nexus. Adopt watershed and river basin units as the primary frameworks for integrated water and land use planning, facilitating ecosystem-based management and cross-sector coordination.
  - **Local (Subregional) Level:** Enhance stakeholder engagement and participatory decision-making by fostering regular dialogue and collaboration among WEFE nexus actors.

- To enhance cross-sector integration and adaptive management, governance and legal frameworks should be revised to clarify roles, improve coordination, and increase flexibility. This includes an inter-ministerial platform for dialogue and joint decision-making across water, agriculture, environment, and land-use sectors, embedding adaptive management through regular policy reviews based on monitoring and stakeholder input, and strengthening regional water authorities along river basins. Aligning water governance with spatial planning and reinforcing public participation and enforcement will boost coherence and accountability.

- Addressing technical, economic, legal, and institutional barriers requires innovative policy instruments and organizational models. Slovakia can use economic tools like subsidies for water retention and regenerative agriculture, tiered tariffs reflecting scarcity, and tradable permits for efficiency. Financing mechanisms such as carbon-water banks and public-private partnerships can fund infrastructure and ecosystem restoration. Organizational innovations, including watershed-based bodies and multi-stakeholder platforms, can foster collaboration and adaptive governance, aligning incentives, reducing fragmentation, and supporting sustainable water management.

PROGRESSION TIMELINE ROADMAP (2025-2035)

2025-2027
Short-term Foundations

2028-2030
Medium-Term Implementation

2031-2035
Long-Term Consolidation and Scaling

Phase	Short-Term: Cross-Sectoral Governance Alignment	Medium-Term: Strengthening institutions	Long-Term: Stakeholder Engagement and Performance Evaluation
Key Actions	• Establishing an inter-ministerial coordinating body to enhance cross-sectoral collaboration in water governance. • Aligning water management plans with spatial and land-use planning to ensure cohesive policy implementation.	• Strengthening regional water authorities to improve localized decision-making and management. • Developing the Carbon and Water Bank concept to support water retention in the landscape. • Developing a unified water data platform to consolidate information from multiple sources.	• Enhancing stakeholder involvement through participatory water councils or community-based monitoring. • Institutionalizing regular evaluation mechanisms to assess progress against water management objectives and climate adaptation goals.
Responsibilities	• National government, regional and localself-governance.	• National government, regional and local self-governance, land owners, IT partners, research institutes.	• National government, regional and localself-governance, landowners and users, environmentalNGOs, public.
Enablers/ Tools	• National plans, GIS mapping, policies supporting nexus.	• National plans; funding, digital collaboration platform, research.	• Legal framework for participation.
Challenges & Mitigations	• Institutional Resistance, political instability.	• Budgetconstraints, political instability, limited technical capacity.	• Low engagement, coordination complexity.
Milestones / Outcomes	• Integrated policy decisions and cohesive policy implementation.	• Strongerecosystem-based management, consolidated water data.	• Inclusive decision-making with representation from communities.

RETOUCH NEXUS

POLICY BRIEF | INTEGRATED WATER GOVERNANCE: FLANDERS' BLUE DEAL INTO ACTION

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.

Greyfield businesspark Tielt-Noord
Rainwater use for industry and farmers
Smart water buffering

Newly developed residential area
Agnetenpark in city of Peer
Rainwater use for households

Newly developed business park Keiberg-Vossem
Rainwater harvesting and use for industry
Aquifer storage and recovery / blue-green infra

KEY STAKEHOLDERS

- Water utilities
- Project developers and investors
- (Local) governments
- Sector and business area representatives
- Research institutes

PRIORITY ACTIONS

- Integrate policies for coordinated, nexus-based water management
- Scale up collective, decentralized water reuse systems with clear rules and fair pricing
- Empower utilities and research partners to drive circular innovation

REGIONAL PARTNERSHIPS FOR INCLUSIVE GOVERNANCE

SCaling up decentralized water solutions requires legal and financial coordination, shared ownership, and clear agreements. Decentralized water systems strengthen resilience by spreading risk, ensuring service continuity, and reducing vulnerability to droughts, floods, pollution, or infrastructure failures. This enhances preparedness and reliability in times of crisis. Flanders' water utilities can bridge governance and technical gaps by linking centralized and decentralized systems. Fostering local partnerships and developing innovative financing and pricing models are key. As trusted public actors, they can drive circular, collaborative, WEFE-aligned water management, supported by research organizations that translate innovation into practical business and financing models.

CONTEXT

The case study advances in integrated water management across two business parks and a residential area, aiming beyond network optimization toward sustainable living and working. Mandatory rainwater collection in Flanders enables circular rain applications. Built on multi-stakeholder partnerships, the sites demonstrate industrial reuse, irrigation, and domestic applications. By embedding a local WEFE nexus approach and tackling financing and governance challenges, the case study supports the EU Water Resilience Initiative and strengthens the market readiness of sustainable decentralized solutions.

NEXUS GOVERNANCE CHALLENGES & BARRIERS

Flanders has responded to growing water stress with its Blue Deal, but WEFE-nexus implementation remains difficult due to divided responsibilities and the need to integrate agricultural, energy, and environmental goals. Long-term water security requires complementing centralized supply with local measures such as circular rainwater use, which eases pressure on the system, reduces treatment costs, and boosts drought and flood resilience. Flanders emphasizes that circular use of rain- and wastewater is vital to address water stress, and to ensure a stable 24/7 drinking water provision.

FRAGMENTATION VS INTEGRATION

Aspect	Current State (Fragmented)	WEFE Nexus Approach (Integrated)
Policy Focus	Central water systems and individual rainwater management - in line with the Flemish legislation.	Central water systems complemented with decentral collective water systems.
Stakeholder Engagement	Limited.	Essential for governance, investments, pricing, and financing models.
Coordination Mechanisms	Water utilities and individual rainwater management.	Complexity increases: local companies or residents take part in decentral water systems.
Risks	Water blackouts during persistent droughts, flooding.	Increased complexity vs. long term governance.
Examples	Tap water provision by local utility.	Regional case studies in Peer, Keiberg-Vossem and Tielt.

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.

PATHWAYS TO SUSTAINABLE NEXUS WATER GOVERNANCE

- **Early involvement** of banks and investors increases the bankability of projects and helps to shape viable financing structures.
- **Developing robust business models** is necessary, supported by comprehensive cost-benefit analyses, to demonstrate the full value of collective, local water systems. This includes the creation of alternative water sources, avoided flood damage, avoided investments in central infrastructure (e.g., sewerage), and environmental co-benefits.
- **Well-designed pricing mechanisms** are needed to align incentives, improve cost recovery, and reward efficient water use.
- **Comparing individual versus collective** decentral systems is key to identify when joint investments create greater societal value, facilitating fact-based decision-making.
- The **legal and organizational frameworks** are critical. Clear governance models, ownership structures, and risk allocation mechanisms enhance the confidence of investors and enable fair collaboration among partners.
- **Transparent agreements** on roles and responsibilities between utilities, municipalities, and private actors are essential for long-term system sustainability.
- **Adopting a local WEFE nexus approach** means linking water, energy, food, and ecosystems within the same local and decentralized projects. Integrating rainwater harvesting and use, and e.g. energy recovery from wastewater enhances both water and energy resilience. By coupling water management with renewable energy and efficiency measures, local systems can cut costs and emissions while improving circularity.
- **At the project planning level:** valuing ecosystem services such as groundwater recharge and flood mitigation ensures that investments deliver lasting environmental and social benefits.

PROGRESSION TIMELINE ROADMAP (2025-2035)

2025-2027
Short-term Foundations

2028-2030
Medium-Term Implementation

2031-2035
Long-Term Consolidation and Scaling

Phase	Short-Term: Cross-Sectoral Governance Alignment	Medium-Term: Strengthening institutions	Long-Term: Stakeholder Engagement and Performance Evaluation
Key Actions	• Develop a framework for evaluating the business case for decentralized collective water systems. • Build public awareness on water challenges.	• Additional demo and full-scale cases. • Apply RETOUCH CBA methodology and developed business models.	• Standardization of decentralized WEFE business cases, applicable to new industrial and residential developments (relation to a more robust water supply).
Responsibilities	• VITO (lead framework & cost-benefit analysis - CBA). • Utilities, municipalities, investors (data & input).	• Utilities, municipalities, investors, project developers (standardization). • Refining methodologies and developing track records by research institutions.	• Utilities, municipalities, investors, project developers (standardization).
Enablers/ Tools	• VITO business case framework. • Cost-benefit and co-benefits analysis. • Pricing mechanism design.	• A thorough cost-benefit analysis methodology, a workable business case framework and inspiring references. • Impact monitoring of implemented and operational full-scale cases.	• Embedding in legislation.
Challenges & Mitigations	• Low investor confidence → clear business cases are needed. • Limited awareness → targeted communication needed.	• Mastering case complexity ⟶ track record of cases, knowledge dissemination.	• Ad hoc case complexity and the need for a flexible approach ⟶ continuous development of the methodology, based on new (regional) insights.
Milestones / Outcomes	• Business case framework ready. • First pilot CBAs completed.	• Impact monitoring and confirmation of the outcomes of preceding CBAs for different cases.	• Exponential growth of decentralized water cases in a hybrid relation to an optimized centralized tap water supply.

RETOUCH NEXUS

POLICY BRIEF | PATHWAYS TOWARDS IMPROVED INTEGRATED WATER GOVERNANCE FOR SUSTAINABILITY IN MALTA

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.

KEY STAKEHOLDERS

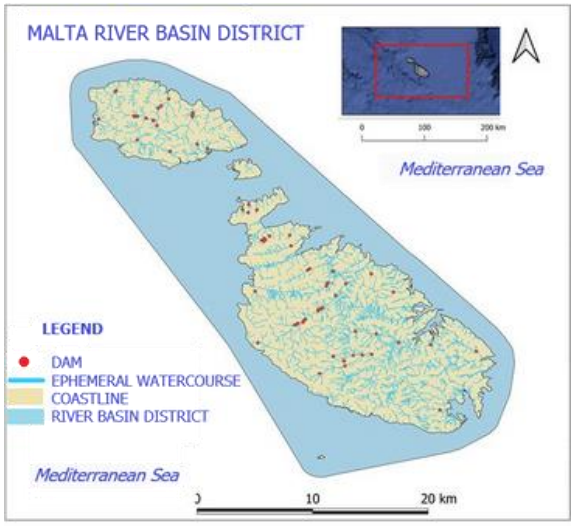
- Ministries and relative competent authorities
- Utilities and Service Providers in the Energy and Water Sectors
- Environmental-NGOs
- Water User Representatives

PRIORITY ACTIONS

- Increased consideration to economic cost recovery for groundwater abstraction, underpinned by robust economic models that consider all four elements of the WEFE nexus.
- Integrate the WEFE nexus comprehensively within the programme of measures of the River Basin Management Plan required under the Water Framework Directive, broadening the scope and impact.
- Expand the existing Water Table stakeholder platform to ensure balanced representation and engagement from the food, energy, and ecosystems sectors.

INTEGRATED PARTNERSHIPS FOR INCLUSIVE GOVERNANCE

The Water Table in Malta exemplifies how government, public entities, NGOs, and private sector actors can collaborate to shape long-term visions, policies, and governance. Serving as an example of how Malta's small size and highly centralized administrative system can lend itself well to effective co-ordination, the potential for replicability of this stakeholder grouping, which is based on voluntary participation, across other WEFE sectors, could be the key towards integrated holistic governance which considers all elements of the nexus. Scaling the model up to include other elements may however warrant further formalization to ensure that the broader scope is not detrimental to the responsiveness and level of participation currently enjoyed.



CONTEXT

Malta, a small and densely populated island with a semi-arid climate and no permanent inland water, faces competition among food production, ecosystem preservation, and renewable energy. Heavy reliance on desalination and growing use of treated wastewater highlight water-energy-food interdependence. Combined with climate vulnerability, these conditions demand innovative governance and an integrated WEFE-nexus approach to ensure sustainable resource management and compliance with water legislation.

NEXUS GOVERNANCE CHALLENGES & BARRIERS

- The islands' Mediterranean climate and high climate-change vulnerability, which can make immediate climate emergencies take priority over long-term nexus planning.
- Rapid population growth and competition for limited land among food, ecosystems, and renewable energy, which make coordination insufficient and require broader, more complex governance structures across WEFE sectors.

FRAGMENTATION VS INTEGRATION

Aspect	Current State (Fragmented)	WEFE Nexus Approach (Integrated)
Policy Focus	Water-Energy nexus strongly considered in policy making and closely administered from a policy making perspective.	A holistic approach which expands the current water-energy nexus policy design mechanisms to include all WEFE-elements.
Stakeholder Engagement	Water Table Stakeholder Grouping is active and has a broad scope. Other WEFE elements currently not included.	Broadening of the scope of the current stakeholder grouping to especially consider food and ecosystems.
Coordination Mechanisms	Inter-Ministerial Committee set up to ensure effective and timely implementation of RBMP.	WEFE coordinating body built into the national administration.
Outcomes/Risks	Aside from Energy-Water, silo policy-making with competing/conflicting priorities.	Better coordinated prioritization with sufficient flexibility to adapt to changing circumstances.

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.

PATHWAYS TO SUSTAINABLE NEXUS WATER GOVERNANCE

- **BROadening of the Stakeholder Groupings:** The brief of the Inter Ministerial Committee on Water should primarily be expanded to include all four WEFE elements, potentially through a sub-committee with a political mandate to coordinate water policy design with other Ministries as necessary, with particular emphasis on coordination of land-use.
- **Mainstreaming into policy design:** Policymaking should systematically account for WEFE impacts and linkages. This can be supported by further developing the assessment tool currently piloted to evaluate WEFE impacts in the 4th RBMP's programme of measures.
- **Prioritising water reuse:** Water reuse should be prioritised at all levels, including households, supported by targeted legislative measures. A dedicated fund could help advance WEFE-related initiatives.
- **Water pricing models:** Recovery of costs for water use, in line with the principles established in the Water Framework Directive, should reflect the WEFE nexus and promote efficient use. Legislative interventions will be required to optimise water pricing policies.
- **Education and awareness:** Embedding a "WEFE-by-design" approach in policymaking requires education focused on holistic resource management. Capacity building and public information campaigns, including media outreach, can help mainstream the concept and strengthen understanding of nexus interdependencies across and beyond WEFE sectors.
- **Financing the transition:** Expanding existing 'green' funding at national and project levels, including domestic initiatives like greywater systems, is essential. EU-funded projects should lead by demonstrating practical, integrated resource management, driving broader change.

PROGRESSION TIMELINE ROADMAP (2025-2035)

2025-2027
Short-term Foundations

2028-2030
Medium-Term Implementation

2031-2035
Long-Term Consolidation and Scaling

Phase	Short-Term: Cross-Sectoral Governance Alignment	Medium-Term: Strengthening institutions	Long-Term: Stakeholder Engagement and Performance Evaluation
Key Actions	• Engage with stakeholders (public and private sector) to introduce the NEXUS context. • Review data management across sectors (WEFE) for the development of integrated data-bases at the national level.	• Develop a National Community of Practice (CoP) on the integration of the NEXUS in management planning. • Integrate the NEXUS in the development of management plans such as the River Basin Management Plan. • Promote the application of the NEXUS through pilot and demonstration initiatives.	• Develop a review framework for assessing the NEXUS friendliness of sectoral management plans. • Extend the application of the NEXUS beyond the water sector, influencing other national sectoral policies. • Promote the impact of the NEXUS approach in ensuring increased climate resilience.
Responsibilities	• Policy and Regulatory Authorities.	• Policy and Regulatory Authorities, Sector Representatives, NGOs.	• Ministries, Policy and Regulatory Authorities.
Enablers/ Tools	• National and EU funding instruments; Data Management Platforms.	• National and EU funding instruments; Community of Practice.	• National and EU Funding instruments; NEXUS assessment tool. • Communication Tools.
Challenges & Mitigations	• Resistance from stakeholders to new context to be mitigated by Effective Communication.	• Lack of interest in Community of Practice to be mitigated by Promotion of cross benefits from NEXUS approach.	• Resistance from other policy sectors to be mitigated by Effective engagement and promotion of cross-policy impact.
Milestones / Outcomes	• Integrated data management platform including all pillars of the NEXUS.	• Establishment of Community of Practice and number of operational demonstration projects.	• Development of NEXUS review tool and its application to sectoral policies of the four NEXUS pillars.

RETOUCH NEXUS