

## Addressing WEFE Nexus Issues in Transboundary Basins

Managing shared water resources across borders is a complex challenge, where competing demands and governance gaps can lead to conflict. This factsheet explores the key issues and solutions for balancing water, energy, food, and ecosystem needs in transboundary basins, highlighting pathways toward sustainable and cooperative management.

### The WEFE Nexus: a delicate balance in transboundary basins



In landscapes where rivers and water bodies stretch across provincial, regional and national borders, a delicate balance is required to sustain communities, economies, and ecosystems. Water is not just a resource; it is a lifeline intricately connected to human well-being, energy production, food security, and environmental health. This interdependence defines the Water-Energy-Food-Ecosystem (WEFE) nexus.

Managing this balance in transboundary basins presents a series of complex challenges. When multiple governance entities such as countries share a water source, competition, political hurdles, and environmental concerns become ever more pronounced.

Upstream and downstream regions struggle to agree on water allocation for different user needs. People need drinking water, farmers desire irrigation, industries require water for production, and hydropower plants demand consistent flows. Climate change exacerbates tensions, as extreme droughts and/or floods become more likely further stressing already fragile agreements. Meanwhile, overuse challenges the maintenance of ecological low flows and a lack of pollution control can raise havoc to ecosystem quality. These imbalances in turn hamper the provision of ecosystem services that are critical for ensuring water security. Policies ensuring water, food, energy and ecosystem security are not always aligned to yield synergistic effects. The lack of harmonized governance systems and structures complicates alignment further. To make matters worse, information on water availability, quality, and future risks is often not congruent or shared openly, leaving decision-makers without evidence.

## Transboundary challenges and solutions

Managing transboundary waters is like orchestrating a symphony where every instrument must play in harmony. Yet, in many cases, discord arises when regions, or particular user groups, prioritise their own water needs over collective well-being. The lack of shared governance frameworks, power imbalances, and lobbying leads to unequal access to resources, often leaving downstream areas at a disadvantage. National interests and political agendas complicate collaboration, sometimes resulting in unilateral actions that disrupt regional stability. Legal inconsistencies, outdated treaties, and the incongruences of the used evidence base, including data and models, pose significant barriers, preventing effective coordination. Meanwhile, local communities—the very people most affected by water decisions—are frequently left out of discussions.

Addressing these challenges requires bold, cooperative solutions. Harmonized policies based on the same indicators and thresholds can create unified approaches to water governance, ensuring that all countries work towards shared goals. Establishing joint water management bodies with real decision-making power and including a wide range of user groups on an equal footing allows for transparent and equitable resource distribution, potentially preventing conflicts before they arise. Transparency is crucial, which is why data sharing and monitoring mechanisms must be strengthened and aligned. Basins can benefit immensely from having and using the same real-time, reliable information about water flow, quality, and usage.

Nature itself offers solutions. By investing in nature-based approaches, such as reforestation, grassland conservation and wetland restoration, basins can enhance ecosystem resilience while simultaneously improving water quality and availability. No system is perfect, and disputes are bound to arise. Strengthening conflict resolution mechanisms ensures that disagreements are resolved through diplomacy rather than escalating into prolonged tensions.



## The NEXOGENESIS Project: Enhancing water diplomacy

Recognising these challenges, the NEXOGENESIS project is an initiative aiming to bridge gaps to foster cooperation. Its goal is to enhance water diplomacy by promoting an integrated approach that considers the interconnected nature of water, energy, food, and ecosystems. The project is not just about policies; it is about people—bringing together governments, researchers, local communities, and businesses to co-develop solutions through a co-creation approach.

One of its major contributions is the development of a decision support tool, the NEPAT that allows basin actors to better understand the trade-offs involved in water management, as well as the advantages of cooperation over unilateral action. By using unified and user-validated advanced modelling techniques, stakeholders can visualise how changes in one sector affect other sectors. Moreover, the project actively engages in stakeholder dialogues, ensuring that the voices of all affected parties are heard.

NEXOGENESIS builds on knowledge co-creation. By equipping the basin stakeholders, including water managers and policymakers, with the necessary knowledge and skills to understand the current water, energy, food and ecosystems security issues their basin is facing, the project ensures the creation of a common baseline. The use of the same evidence-base and tools creates a common vision for streamlining the implementation of policies for future improved management, hence strengthening cooperation across borders. Training sessions, policy recommendations, and collaborative research efforts help co-create a common language for water diplomacy, allowing for transformative change towards effective and collaborative stakeholder river-basin wide agreements.

More information about our solutions and local activities can be found at: <https://nexogenesis.eu/>



## Moving forward towards sustainable water governance: from conflict to collaboration

The sustainable management of transboundary waters is not just an environmental issue—it is a matter of security, development, and human well-being. The interconnected nature of water, energy, food, and ecosystems means that a problem in one sector inevitably ripples into another. NEXOGENESIS provides a framework for addressing these challenges, fostering international cooperation, and ensuring that decisions are made with a long-term vision in mind.



By integrating science, policy, and diplomacy in a co-creative way, transboundary water conflicts can transform into opportunities for collaboration. With the right governance structures, technological innovations, and inclusive dialogues, provinces, regions and nations can move beyond competition and work together to safeguard quality, quantity of and access to the shared water resources for the multiple users of future generations.

More about the project: <https://nexogenesis.eu/>

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### The NEXOGENESIS consortium

