

# Addressing WEFE nexus challenges in the Jiu River basin

The Jiu River flows south from the Carpathian Mountains through several Romanian counties before joining the Danube near the Bulgarian border. Covering 16,758.59 km<sup>2</sup>, the Jiu river basin supports 1.46 million people and is characterized by agriculture, forestry, and coal mining. Human interventions, such as dams, have contributed to erosion and environmental challenges, while floods and droughts continue to impact the region, which includes several EU Natura 2000 protected sites.



The basin faces interconnected challenges related to water availability, the transition to a carbon-neutral economy, climate change adaptation in agriculture, and wetland restoration along the Danube, requiring balanced resource management and nature-based solutions.

## NEXOGENESIS' actions in the River basin

- **Co-creation of technical and transdisciplinary knowledge** to support stakeholders' awareness and participation in nexus-based actions on different governance levels, in 6 project workshops, with hands-on experiencing the application of project methods and tools;
- A **comprehensive governance assessment developed, and relevant policies mapped** in WEFE sectors, validated with stakeholders and integrated into modelling and NEPAT;
- **Active participation in different initiatives** at regional and national level to promote nexus thinking towards transversal sectors such as sustainable development, green transition, and climate adaptation;

## Stakeholder Engagement Goals

The main goals of engaging stakeholders are:

- **System knowledge:** Understanding social, economic, institutional, and ecological contexts within the WEFE Nexus, analysing structures, and identifying conflicts.
- **Target knowledge:** Raising awareness of water scarcity, improving communication tools, and fostering a shared understanding to reduce conflicts.
- **Transformation knowledge:** Promoting integrated water management, enhancing collaboration, tailoring the NEXOGENESIS platform, and building capacity for sustainable resource monitoring.

As the Jiu Case study is a follower case, it is focused on introducing concepts and identifying potential challenges for applying the methodology proposed by NEXOGENESIS. Thus, the choice for the System Dynamic Model (SDM) was to showcase the response of the Jiu WEF system under four RCP-SSP scenarios, with and without (existing) policies execution.

The SDM results were further incorporated in the NEPAT web-based platform facilitating the assessment of policy impacts across nexus sectors considering all synergies and trade-offs at once. The results show that while the implementation of one or more policies may enhance synergies between sectors (e.g., afforestation contributes to mitigating the impact of climate change), they may also lead to trade-offs (e.g., the expansion of irrigated agriculture is expected to increase nitrogen leaching to water bodies).

The tool was tested in several user experience sessions organised in the case study involving policymakers and academic scholars, offering valuable insights for initiating stakeholders' dialogues on WEFE nexus interlinkages and the potential impact of different policies implementation in the Jiu River basin. The information available on NEPAT platform from other NEXOGENESIS Case studies was fully translated in Romanian language for creating the opportunity to expand the local stakeholder's perspective with additional relevant aspects such as transboundary impacts (from Nestos and Lielupe).

The proposed roadmap in the Jiu Case study reflects the results of co-creation processes and stakeholders' dialogues being tailored for a robust NEXOGENESIS legacy to encourage a favourable setting for streamlining nexus thinking into policy making.

A comprehensive approach is used to this end including routes for strengthening the capacity of policy makers (water authorities, sustainable development working groups) and embedding nexus thinking in academic education (economic geography, agroecomics).



## Key lessons from the Jiu River Basin Case Study

The Jiu River Basin Case study reveals crucial insights into managing interconnected water, energy, food, and ecosystem challenges:

- **Seasonality's Impact:** Resource allocation is heavily influenced by seasonality, with agricultural irrigation demands peaking during dry months, often conflicting with hydropower needs due to national energy priorities.
- **Stakeholder Integration:** Early and multi-level stakeholder engagement, including national ministries, regional authorities, and local communities, is vital for aligning project goals and ensuring broader ownership. However, governance fragmentation remains a challenge.
- **Energy Sector Participation:** Involving the energy sector is difficult due to rigid approval processes, but their insights are invaluable once engaged.
- **Political Influence:** Political shifts and short-term priorities frequently disrupt regulatory enforcement and progress, making continuity a challenge.
- **Technical Expertise:** Experts in water, agriculture, and environmental management provide stability and continuity, counterbalancing political turnover.
- **Process-Driven Engagement:** Creating safe spaces for dialogue where stakeholders can discuss interconnections between their sectors often has a greater impact than technical outputs.
- **Informal Interactions:** Informal interactions (such as road trips, shared meals), foster trust and collaboration, strengthening formal decision-making processes.
- **Knowledge Transfer:** Effective communication of information and expertise across hierarchical levels is essential for long-term adoption of integrated approaches.

The experience in the Jiu Case study underscores the need for long-term commitment, strategic stakeholder engagement, and understanding both formal governance structures and informal dynamics to achieve sustainable change in complex resource systems.

These lessons provide a foundation for replicating and scaling similar integrated management approaches in other regions.



## Recommendations

1. **Adapt Stakeholder Engagement Approaches** – Leverage informal and formal spaces to foster collaboration, ensuring long-term participation beyond project timelines.
2. **Improve Cross-Sector Coordination** – Strengthen communication between overlapping institutions to reduce governance fragmentation and conflicting policies.
3. **Align with Energy Sector Priorities** – Instead of focusing solely on water management, integrate nexus thinking into energy transition and climate resilience strategies to enhance engagement.
4. **Institutionalise Nexus Thinking** – Embed integrated resource management approaches into policy frameworks, ensuring continuity beyond project cycles.
5. **Strengthen Knowledge Transfer Mechanisms** – Establish structured knowledge-sharing pathways within institutions to mitigate the impact of political changes.
6. **Ensure Long-Term Facilitation Support** – Multi-stakeholder engagement requires dedicated facilitation and resources to maintain momentum beyond project funding.
7. **Expand Geographic and Sectoral Reach** – Replicate successful approaches in other river basins and integrate nexus thinking into broader sustainable development initiatives.
8. **Incorporate Nexus Thinking into Education** – Collaborate with universities to embed interdisciplinary resource management into curricula, fostering a new generation of professionals who naturally consider interconnections.
9. **Leverage Just Transition Mechanisms** – Align resource management strategies with economic transition policies to secure sustainable funding and political support.
10. **Use Existing Policy Frameworks as Entry Points** – Engage energy and climate stakeholders through existing national and EU policies, integrating nexus approaches into established decision-making processes.

These insights provide a roadmap for sustaining progress in integrated resource management and stakeholder collaboration in and beyond the Jiu River Case study.

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

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