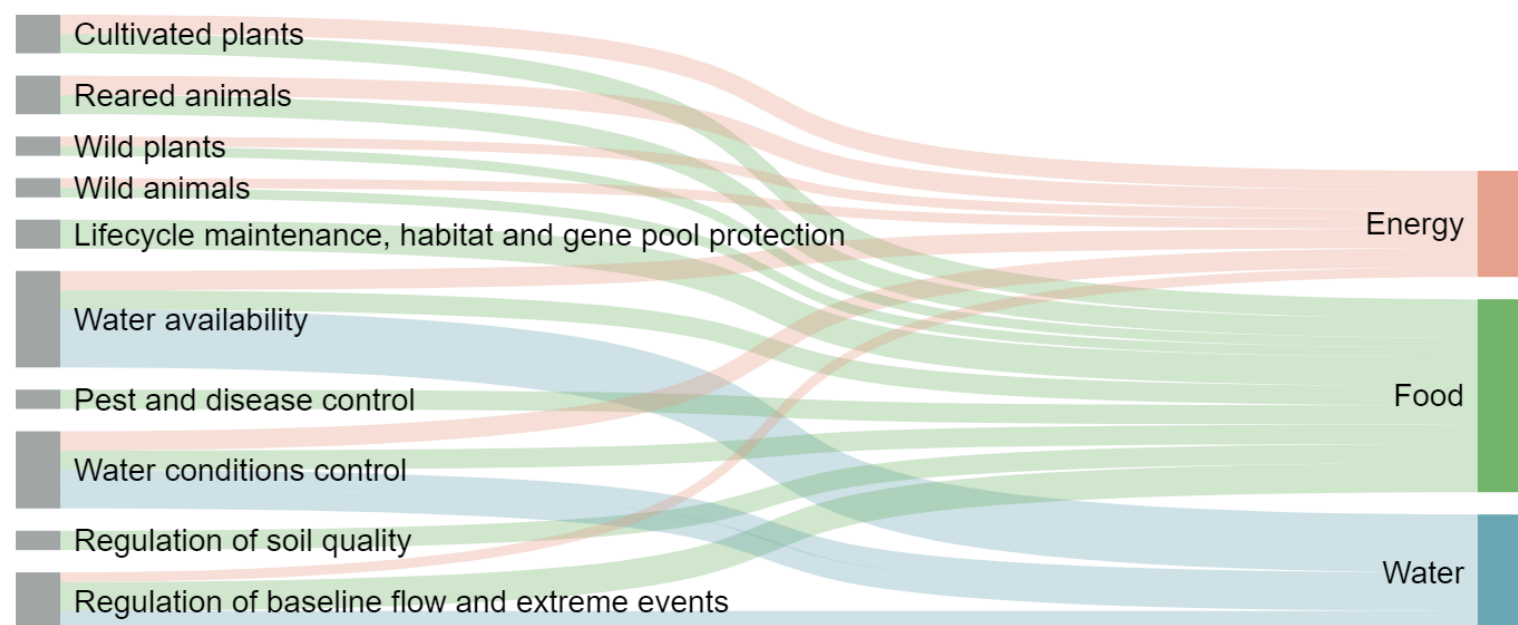


UNRAVELLING THE KNOT OF THE WATER-ENERGY-FOOD NEXUS USING ECOSYSTEMS SERVICES

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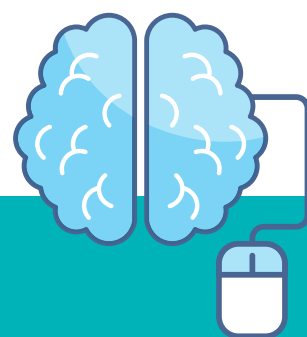
Type of Ecosystem Services contributing to different nexus sectors

THE UNTWIST PROJECT (MSCA-IF 2021-2023): aims to advance the understanding of Water, Energy and Food interactions by adopting an Ecosystem Services-based perspective supporting the integrated management and governance of the nexus under global change scenarios.



Integrate Ecosystem Services as cross-cutting dimension of the WEF nexus

ESs flows as common assessment metric to disentangle synergies and trade-offs across sectors



Exploit Artificial Intelligence (AI) potential to model nexus interactions

Semantic web to build tailored integrated models combining available sectoral knowledge



Test scenarios to identify best practices for long-term nexus sustainability

Water nexus-related social, economic and environmental dynamics under envisioned global change scenarios

CASE STUDIES APPLICATION:



Pas, Ason, Miera river basin (SPAIN)



Po river basin (ITALY)

1. WEF SYSTEM CONCEPTUALIZATION

Semi-structured interviews with local stakeholders' representative of different WEF nexus sectors:

- identify main system components (i.e. sources, beneficiaries, flows of ecosystem services) sustaining their sector or activities of concern;
- describe their dependencies and feedbacks with external drivers of change.

2. CRITICAL INTERACTIONS ASSESSMENT

Development of an integrated model to spatially-temporally represent most relevant ESs flows exchanged through the WEF:

- integration of available sectoral data and models through the k.LAB modelling platform and the k.IM language;
- increase the interoperability and reuse of existing WEF nexus knowledge.

3. SYNERGIES AND TRADE-OFFS ANALYSIS

Scenario analysis to identify trade-offs and synergies between multiple ESs under changing conditions:

- hotspots where such interactions cause a mismatch between supply and demand of specific services and the reason of such conflicts;
- the space for potential intervention to improve sustainability of the WEF nexus and proactively adapt to global changes.