

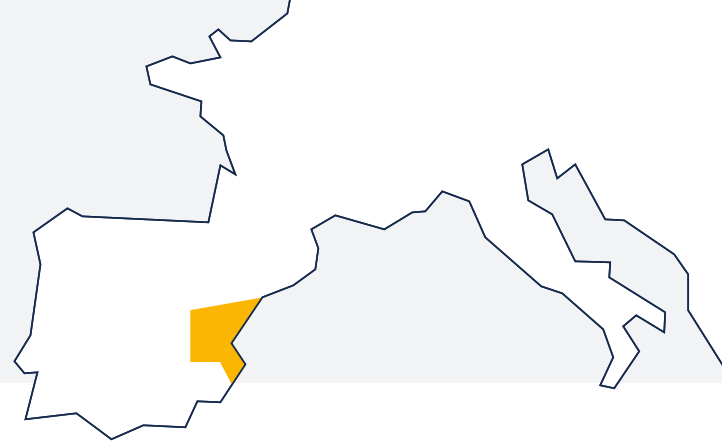
Júcar River Basin

SPAIN



BRIEF OVERVIEW

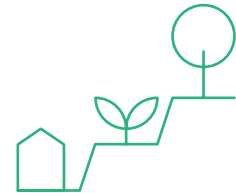
The Júcar River Basin is a semi-arid area that covers 22,261 km². It is one of the **most relevant in Eastern Spain**.



It has a **Mediterranean climate** with heavy rainfall in the autumn (particularly in October), a second peak in April and May, and minimal precipitation during summer.



Agriculture accounts for the largest share of water use at 89%, followed by urban use at 9%, and industrial use at 2%.



The Júcar is the **primary source of urban water supply to Valencia** and its metropolitan area, Spain's third-largest city. It encompasses an important wetland surrounded by rice crops, **l'Albufera**.



There is a fragile balance between water demand and available sources, due to **prolonged drought periods**. This situation has historically been managed through **groundwater pumping** and sets of **regulatory measures** designed specifically for the region.

IDENTIFIED WEFE CHALLENGES & PROSPECTED SOLUTIONS

Water scarcity

- Promoting **efficient water-use practices**
- **Improving existing infrastructure**, particularly irrigation
- Implementing **effective water purification and reuse** to lower overall consumption

Implementing and integrating renewable energies effectively while ensuring the energy model remains fair, accessible, and efficient for all

- Distributing implementation costs and **promoting renewable energy self-consumption**.

Sustainable management

- Investing in **environmental education** and **participatory governance** processes to strengthen cross-sector coordination and increased social awareness.

Agri-food sustainability

- Shifting to an **efficient, ecological, and profitable production model** that prioritises sustainability by encouraging rain-fed agriculture and supporting local markets, while using new technologies like crop early warning systems.

Environmental sustainability: Protecting the ecological integrity of the Júcar River basin and its associated ecosystems

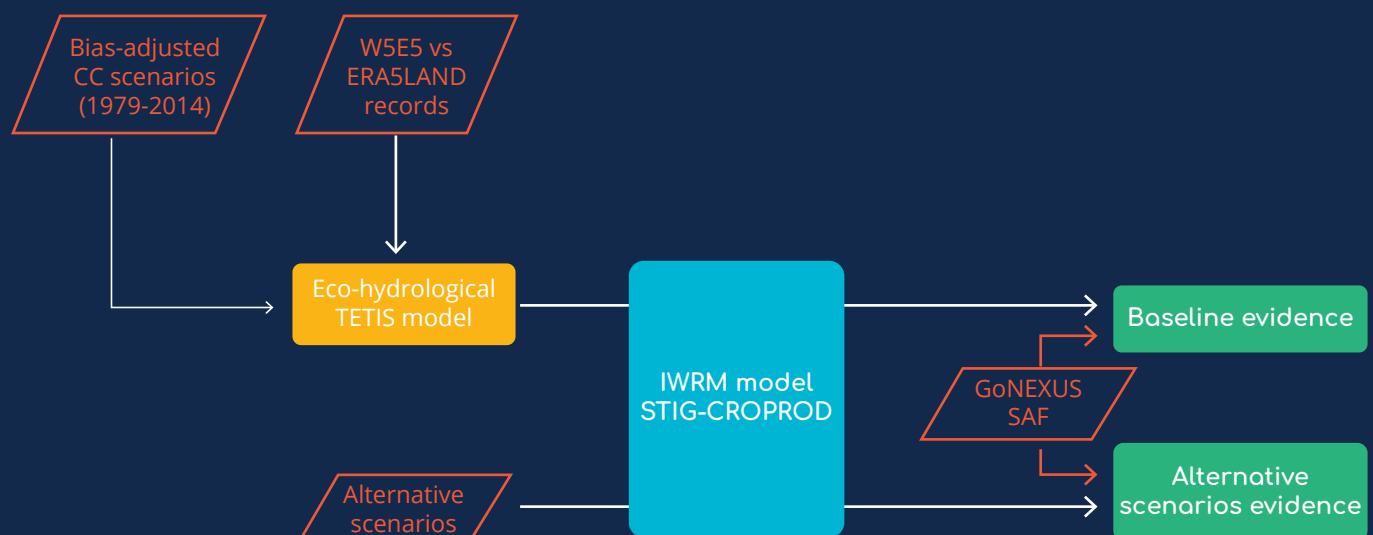
- Increasing investments in **hydrological and forestry restoration**
- **Evaluating ecological flows**
- Implementing stricter **regulations on exploitative activities and discharges**.



MODELLING TOOLS

The modelling framework centres on two key models: the **eco-hydrological TETIS model** and the **STIG-CROPROD hydroeconomic Integrated Water Resource Management (IWRM) model**.

This integration allows for a thorough analysis of the spatial and temporal distribution of hydrological impacts resulting from climate and socioeconomic changes. It supports the calculation of Water-Energy-Food-Ecosystems (WEFE) indicators (evidence) derived from the **GoNexus Sustainability Assessment Framework (SAF)**.



SCENARIOS

During the second GoNexus Dialogue, stakeholders explored **two potential local scenarios** using fictional newspaper articles set in 2050. These articles were positively received, encouraging stakeholders to actively participate in discussions about the scenarios and resulting in valuable contributions.

Scenario 1 - Increase in agricultural exploitations and free market

This scenario aims to explore the potential for **expanding agricultural product markets**, boosting related activities, increasing the use of renewable energy all while assessing their environmental impact.

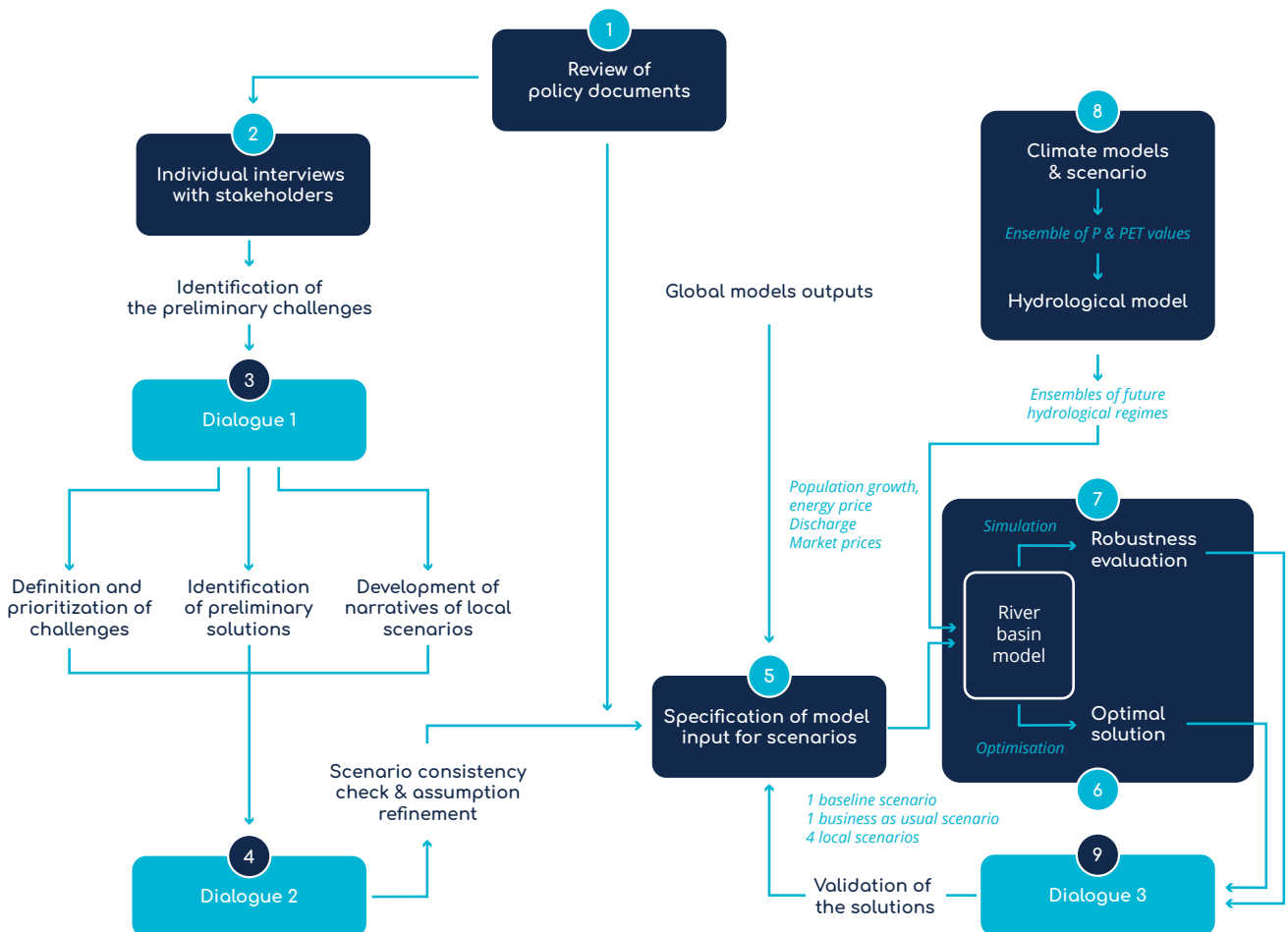
Scenario 2 - Environmental protectionism

This scenario aims to **identify potential synergies between the agricultural and energy sectors** with a focus on sustainability, while reducing current environmental impacts and accounting for future reductions in contributions due to climate change.



DIALOGUES

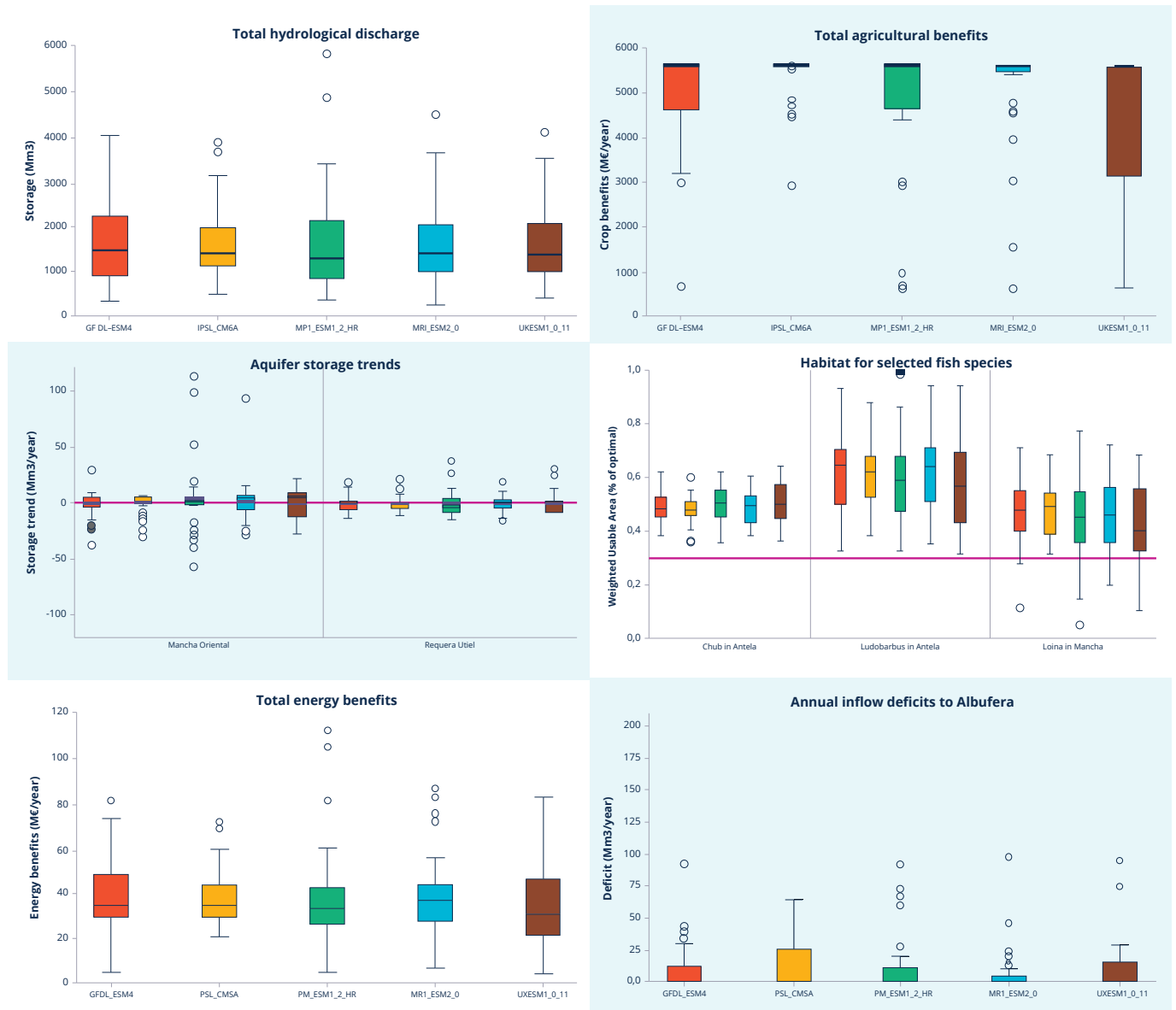
The GoNexus Dialogues are based on a **participatory approach**. This involves examining documents and scientific data from external studies and global models, engaging various stakeholders representing the WEFE nexus through interviews and workshops, and employing a range of simulation and optimisation models for the basin.



EVIDENCE

The analysis of five climate models for the Júcar River Basin demonstrate **the interconnections between the WEF sectors**. In this context, energy production remains largely unaffected by proposed actions, though energy costs fluctuate depending on aquifer levels.

Aquifer storage levels, in turn, **impact agricultural productivity and profits**, as increasing storage results in reduced crop yields and earnings. Meanwhile, the ecological health of the Albufera wetland is **negatively correlated to agricultural benefits**, and while fish habitats are impacted, the effect on them is relatively minor.



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