ACQUAOUNT Decision Support Tool (DST)

The Decision Support Tool (DST) is a core offline output of the ACQUAOUNT project, designed to support water resource planners and decision-makers in the pilot sites of Sardinia (Tirso Basin), Tunisia (Jeffara Basin), Jordan (Jordan Valley), and Lebanon (Bekaa Valley). The tool integrates the data generated by ACQUAOUNT to evaluate and optimize Integrated Water Resources Management (IWRM) strategies over the long term, under various climate change scenarios. At its core, DST provides a scenario-based modeling framework that merges hydrological, agricultural, and socio-economic information to assess the effects of different management options on regional water availability. The DST materializes the interactions between water resources, policy interventions, technological innovations, and socio-economic systems over time. It captures the linkages crucial for understanding how future choices influence water security and resilience.

The DST supports decision-making across four key dimensions:

- Atmospheric forcing – testing climate projections (e.g., SSP1_2.6 and SSP_3.7) against a business-as-usual baseline.
- Technological advancement – assessing the role of ACQUAOUNT innovations (e.g., soil moisture sensors, irrigation advisories).
- Stakeholder-driven future scenarios – co-designed with local actors to reflect real-world priorities and constraints evaluating hard, soft, and hybrid policy interventions.

By combining these elements, the tool enables the quantification of avoided losses, estimating how proactive interventions reduce socio-economic and environmental impacts caused by water scarcity.

The DST is articulated in a four-pillar modeling chain:

- Pilot characterization (water systems, institutional frameworks)
- Modeling suite setup and validation
- Scenario-based projections
- Assessment of physical and socio-economic outcomes.

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The DST links management rules to hydrological outputs, converts water availability into governance responses, and translates these into quantified benefits, using indicators such as crop productivity, economic performance, and ecosystem health. While data quality and availability vary across pilots, the DST methodology remains robust and replicable, ensuring comparability and regional applicability.

Ultimately, the DST is more than a technical model, it is a strategic decision framework that helps translate climate information into actionable, site-specific adaptation pathways for sustainable water management in the face of increasing climatic and anthropogenic pressures.

VERSION 2 (MORE CONDENSED)

ACQUAOUNT Offline Decision Support Tool (DST)

As a key output of the ACQUAOUNT project, the offline Decision Support Tool (DST) helps water planners and decision-makers in Sardinia, Tunisia, Jordan, and Lebanon assess long-term strategies for Integrated Water Resources Management (IWRM). The DST consolidates the data generated by the project and provides a structured framework to simulate and evaluate the impacts of different water management scenarios under climate change uncertainty.

By integrating hydrological, agricultural, and socio-economic models, DST enables users to:

- Compare business-as-usual and future scenarios across physical, policy, and technological dimensions.
- Assess the effectiveness of governance strategies, and agritech innovations tested in ACQUAOUNT.
- Quantify avoided socio-economic and environmental losses from proactive water management measures.

The DST supports scenario analysis across four dimensions: atmospheric conditions, technological innovation, governance strategies, and stakeholder co-designed management narratives. Results from the tool will provide evidence-based and locally tailored decision-making for climate-resilient water management.

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PICTURES

Figure 1: DST Modeling suite and linkages (non abbiamo risoluzione migliore per ora)

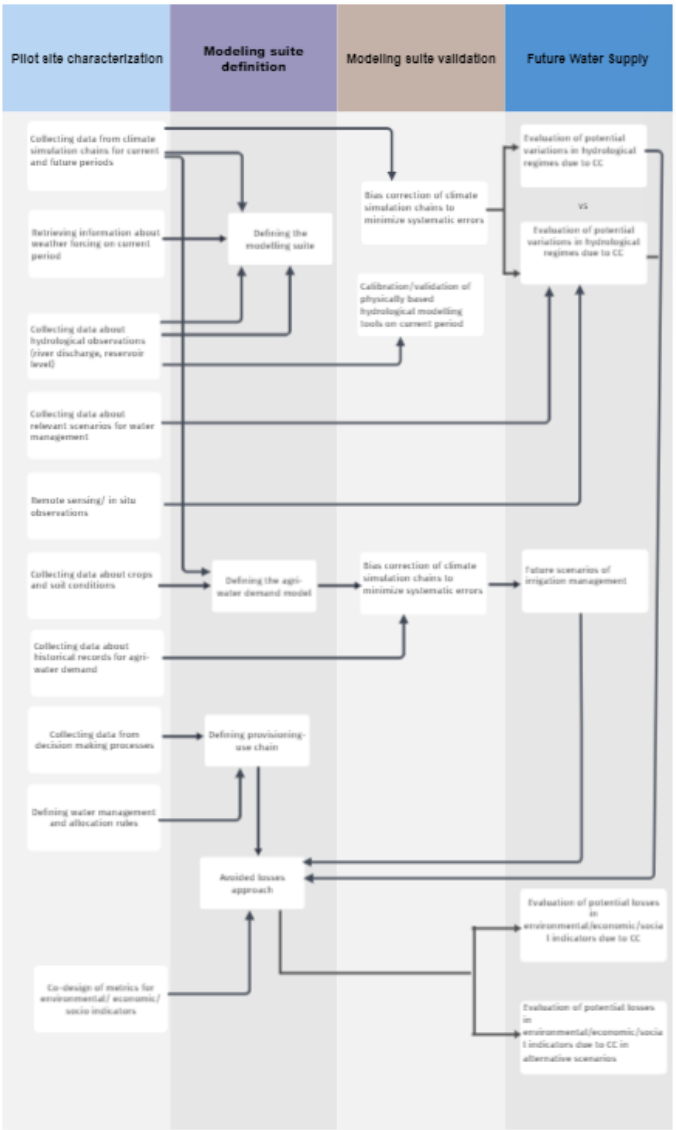

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Figure 2: ACQUAOUNT Pilots

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