

## Research Priorities on Local/Transboundary Water: Jordan

### Contextual and Analytical Background



Jordan is among the most water-scarce countries in the world. The country's 89,000 km<sup>2</sup> of predominantly arid terrain is punctuated by the Jordan Rift Valley, which historically served as a fertile agricultural corridor. Average annual rainfall is only about 136 millimeters, concentrated in the winter months, while evaporation rates are among the highest globally. Water scarcity is compounded by rapid population growth, refugee inflows, climate change impacts, groundwater over-abstraction. Agriculture, which consumes nearly half of all freshwater withdrawals, contributes less than 5% to GDP—illustrating the imbalance between water allocation and economic returns. The WEFE nexus further constrains resource management. Over 90% of energy demand is met through imports, leaving the country exposed to price fluctuations and supply disruptions. Efforts to expand renewable energy—now contributing around 13% of the energy mix—are promising, particularly in coupling solar power with desalination and wastewater treatment. Institutionally, Jordan maintains a relatively advanced water governance framework, led by the Ministry of Water and Irrigation (MWI) and the Jordan Valley Authority (JVA). However, overlapping mandates, limited data integration, and fragmented coordination among ministries, governorates, and research institutions hinder evidence-based policymaking. The absence of a binding legal framework for transboundary water governance further limits Jordan's diplomatic leverage in regional negotiations.

### Main Analysis and Insights

#### Additional Water Resources

The development of additional water resources is the top national priority. This includes: large-scale seawater desalination, brackish groundwater treatment, expansion of treated wastewater reuse, and renewable energy-powered water supply systems. Desalination, especially when it is combined with solar energy, becomes a key element for long-term resilience in view of the structural deficit between supply and demand. Expanding reliable water supplies is also essential to sustain domestic food production, stabilize agricultural livelihoods, and reduce vulnerability of national food systems to climate variability and external supply shocks. However, these solutions should be integrated within a broader WEFE nexus approach to ensure that increased water availability supports efficient agricultural production while avoiding greater energy dependency or unintended environmental degradation.

#### Transboundary Water Governance

Jordan's water future is inseparable from transboundary cooperation. The Yarmouk River remains politically sensitive, and the Jordan River basin continues to experience declining flows and increasing pollution pressures. The "Research Priorities" report calls for formalizing and strengthening water-sharing mechanisms, particularly with Syria, and enhancing engagement in regional platforms. Jordan's accession to the UN Water Convention represents an important step toward strengthening rules-based transboundary water governance, supporting cooperation frameworks, improving data exchange, and reinforcing internationally recognized principles of equitable and reasonable water use. National legislation should embed the principles of transboundary governance, while compensation mechanisms may help balance sectoral competition—especially in agriculture. Priority actions include modernized bilateral agreements; joint monitoring systems; integrated basin management and regional technical dialogue.

## Stakeholder Perspectives and Research Priorities

Stakeholder consultations highlight the need to align national research agendas with policy priorities. The main challenges identified include over-pumping of groundwater, insufficient data-sharing mechanisms, limited coordination between academia and ministries, and weak enforcement of water laws. Opportunities exist in integrating research on climate resilience, treated wastewater reuse, and solar desalination technologies.

- Jordan's Priorities Matrix, developed through this project, identified five key areas for research and investment:
- Development of non-conventional water resources, particularly desalination and brackish water treatment, to enhance supply reliability
- Groundwater quality and monitoring, to manage contamination and depletion.
- Strengthening transboundary water cooperation, particularly with Syria on the Yarmouk River and the shared Azraq Basin, to promote conjunctive management of surface and groundwater resources and advance the inclusion of transboundary aquifers in regional water agreements.
- Climate change impacts on hydrological patterns and agricultural adaptation.
- Nexus-based integration across WEFE sectors.

## Institutional and Policy Reforms

The analysis emphasized the need to amend Jordan's Water Authority Law to incorporate transboundary water governance principles and to establish a water-sharing compensation mechanism balancing agricultural and urban demands. Institutional reforms should promote cross-sectoral integration, enhance data transparency, and strengthen local participation through basin-level councils.

### Summary and Policy Recommendations

- Jordan's path towards water security requires a coordinated strategy that bridges national resilience and regional cooperation.
- Enhance water diplomacy through the periodic review and modernization of all transboundary water agreements—including the 1994 Water Annex—as well as updating arrangements with Syria and Saudi Arabia, ensuring adaptive allocation, transparent monitoring, and compensation mechanisms responsive to changing climatic and regional conditions.
- Institutionalize the WEFE nexus through integrated planning at the ministerial level, linking irrigation policies to renewable energy deployment.
- Scale up non-conventional water sources by investing in energy-efficient desalination, wastewater recycling, and groundwater recharge projects.
- Strengthen data-driven management through national water information systems integrating hydrological, climatic, and agricultural datasets.
- Promote local resilience via participatory water governance in Jordan Valley and improved water pricing mechanisms to decrease overuse.

**By implementing these measures, Jordan can transform its structural water deficit into an opportunity for technological leadership, regional cooperation, and sustainable development.**

For Citation: Water Diplomacy Center. (2026). Research Priorities on Local/Transboundary Water: Jordan. WDC. <https://doi.org/10.5281/zenodo.21976996>