

Tunisia Policy Brief

Aquifer Recharge and Wastewater Reuse in Tunisia: Bridging Policy and Practice

Non-Conventional Water (NCW) for Water and Land Governance

AG-WaMED Project (PRIMA / European Union)



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Executive Summary

Tunisia has a long history of adapting to water scarcity through non-conventional water (NCW) practices, particularly managed aquifer recharge (MAR) and the reuse of treated wastewater. The country's legal framework, centered on the Water Code (1975, revised in 2001 and 2019), provides one of the most advanced regulatory bases in the region. National institutions, notably the General Directorate for Water Resources (DGRE) and the National Agency for Environmental Protection (ANPE), have been instrumental in promoting NCW as a strategic response to climate change and recurrent droughts.

However, adoption faces persistent obstacles, including fragmented governance, high operational costs, technical limitations, and strong cultural resistance to wastewater reuse. At the same time, Tunisia benefits from a solid regulatory system, significant state subsidies, active research institutions, and international cooperation, which position the country as a regional leader in NCW experimentation.

In Tunisia, NCW strategies are primarily based on aquifer recharge and treated wastewater reuse, complemented by soil and water conservation practices.

National and Institutional Context

Water governance in Tunisia is highly structured, with the Ministry of Agriculture, Water Resources and Fisheries overseeing national water management. The DGRE manages groundwater and recharge projects, while the ONAS (National Sanitation Utility) is responsible for wastewater treatment and reuse. This institutional setup reflects strong state control, but also exposes weaknesses in horizontal coordination and integration across ministries and agencies.

The Water Code provides a detailed legal basis for NCW, with successive reforms expanding the scope of wastewater reuse and groundwater protection. Yet, implementation is uneven: local actors often lack resources and authority, and the participation of farmers and civil society remains limited.

Policies and Strategies on Water and Land

Tunisia has consistently integrated NCW into national strategies. MAR projects have been carried out since the 1980s, with investments in recharge structures and monitoring networks. Wastewater reuse is formally recognized, and treated effluents are used in irrigation for crops such as olives and fodder.

Soil and water conservation programs, supported by state subsidies, reinforce these strategies. International donors (e.g., FAO, GIZ, EU) have also played a key role in financing pilot projects and capacity-building initiatives.

Despite this progress, NCW remains concentrated in specific regions and faces technical and social barriers that hinder broader scaling.

Barriers to the Adoption of NCW

The expansion of NCW in Tunisia is hindered by several structural and cultural barriers. Governance remains centralized and fragmented, with overlapping mandates between agencies, which limits efficiency and delays implementation. Financial barriers are significant: despite subsidies, the operational and maintenance costs of MAR and wastewater reuse systems remain high, making them difficult to sustain in the long term.

Technical limitations include insufficient monitoring, outdated infrastructure, and gaps in training. In wastewater reuse, water quality concerns and weak enforcement of standards further complicate adoption. Social barriers are particularly strong: cultural and religious perceptions generate resistance to using treated wastewater, particularly for food crops. This resistance reduces farmer uptake and weakens the legitimacy of national policies.

Summary of key barriers:

- Centralized and fragmented governance.
- High operational and maintenance costs.
- Limited technical capacity and outdated infrastructure.

- Weak enforcement of water quality standards.
- Strong cultural resistance to wastewater reuse. Outdated or malfunctioning infrastructure.
- Weak training and technical capacity.
- Persistent social resistance to wastewater reuse.

Drivers for the Upscaling of NCW

Tunisia also benefits from enabling conditions that support NCW development. The Water Code provides a comprehensive legal framework, and the state plays a strong role in subsidizing soil and water conservation practices. Dedicated institutions such as the DGRE and ONAS provide technical expertise and continuity in implementation.

Research centers and universities generate valuable knowledge, while international cooperation supports innovation and pilot programs. Moreover, Tunisia's long-standing experience with MAR projects offers a strong technical foundation, which can be further expanded through the integration of modern monitoring technologies.

Summary of key drivers:

- Advanced legal framework (Water Code).
- State subsidies for soil and water conservation.
- Strong institutions (DGRE, ONAS).
- Research capacity and technical expertise.
- International cooperation and donor support.
- Decades of experience with MAR projects.

Conclusions and Recommendations

Tunisia's experience shows that strong legal frameworks and state support are not sufficient if governance fragmentation, financial constraints, and sociocultural resistance persist. To accelerate NCW adoption, the following recommendations are proposed:

- **Strengthen multilevel governance**, involving local stakeholders and water user associations in decision-making.
- **Simplify regulations for wastewater reuse**, while ensuring safety and quality standards.
- **Expand financial incentives** for farmers and municipalities to adopt NCW solutions.
- **Invest in modern infrastructure** and technical upgrades for recharge systems.
- **Develop structured training programs** to enhance cognitive and technical capacity.
- **Promote cultural acceptance** of wastewater reuse through communication, awareness campaigns, and demonstration projects.

References and Project Credits

This policy brief is part of the **AG-WaMED Project (PRIMA / European Union)**, which seeks to strengthen water and land governance in the Mediterranean through the adoption and scaling-up of **non-conventional water resources**.