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Integrated Land and Water Management with Non-Conventional Waters in the Mediterranean Area

SESSION: LAND FOR FOOD SECURITY AND CLIMATE ACTION

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المملكة المغربية
ROYAUME DU MAROC



وزارة إعداد التراب الوطني والتعمير
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MINISTÈRE DE L'AMÉNAGEMENT DU TERRITOIRE NATIONAL
DE L'URBANISME, DE L'HABITAT ET DE LA POLITIQUE DE LA VILLE



الأراضي العربية
Arab Land Initiative



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Non-conventional water resources for water-scarce countries

Definition:

Non-conventional water resources are by-products of specialized processes, may need suitable pre-use treatment, require pertinent on-farm management when used for irrigation, or result from specific techniques to collect/access water (Qadir et al., 2007).

Examples:

1. Desalinated seawater and highly brackish groundwater
2. Rainfall-runoff water captured by water harvesting
3. Wastewater from domestic, municipal, and industrial activities
4. Agricultural drainage water

Three PRIMA project joining efforts



Advancing non conventional water management for innovative climate-resilient water governance in the Mediterranean Area



Adaptive agreements on benefits sharing for managed aquifer recharge in the Mediterranean region



Innovative Aquifers Governance for Resilient Water Management and Sustainable Ecosystems in Stressed Mediterranean Agricultural Areas

The **Partnership on Research and Innovation in the Mediterranean Area (PRIMA)** is a public-public institutionalised Article 185 European Partnership between the European Union and Participating States.

Three PRIMA project joining efforts

	AG-WaMED	AGREEMAR	AGREEMed
Duration	2022-2025	2022-2025	2022-2025
Funding	PRIMA Section II	PRIMA Section II	PRIMA Section II
Countries and Partners	Italy (UNIFI, POLIMI), Spain (UPM), Tunisia (IRA), Egypt (ALEXU), Greece (AGRERI), Algeria (UTEBESSA), the Netherlands (VUA, in kind)	Germany (TUD, adelphi), Portugal (LNEC), Cyprus (ERATOSTHENES CoE), Spain (UPV), Tunisia (INAT)	Morocco (UM6P, UIZ), Spain (OBREAL-Global), Germany (TUB, DELTA), France (IAMM, SEMIDE), Tunisia (CERTE), Jordan (GJU), and Italy (IRIDRA)

Our multiple demo sites



Living Labs:

Italy – Val d'Orcia

Spain – Segura River basin

Tunisia and Algeria – Wadi El Kebir

Egypt - Wadi Naghamish



Regional Demo Sites:

Portugal – Alentejo and Algarve

Spain – Jucar Water District

Cyprus – Republic of Cyprus

Tunisia - Chiba watershed



Demo-Sites:

Jordan – Jordan Valley

Morocco – Souss-Massa basin

Tunisia – Hammamet



AGREEMed Jordan Valley demo site

Non-conventional waters trials and other activities



Italy – Val d'Orcia

- **Small Agricultural Reservoirs for water harvesting:** underutilized in the area and recovered as climate change adaptation

Spain – Segura River basin

- Irrigation water resources complemented with effluent from **wastewater treatment plants** and the **Mojón desalination plant**

Tunisia and Algeria – Wadi El Kebir (transboundary)

- **Medium-sized water harvesting structures** are used for supporting rainfed farming (olive, almond, etc.), including **flood diversion** for **managed aquifer recharge**

Egypt - Wadi Naghamish

- **Water harvesting with different types of dams** (loose stones, cemented stones, and concrete) and **desalination**



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Non-conventional waters trials and other activities

Feasibility mapping of MAR in
all sites at regional scale,
validation at local scale



Portugal – Alentejo and Algarve

- Comporta WWTP (use of **secondary treated wastewater in infiltration basins to recharge the underlying aquifer**) and Furta Galinhas dam (**surface dam to retain flash flood waters and agricultural surpluses** with subsequent infiltration into the aquifer)

Spain – Jucar Water District

- Belcaire pond (**storage pond to store water from peak surface flows to recharge the Rambleta aquifer**) and Algar reservoir (**surface dam to retain water during peak flows and infiltrate them** into the Fuente de Quart and Plana de Sagunto aquifers)

Cyprus – Republic of Cyprus

- Akrotiri aquifer (**tertiary treated wastewater infiltrated in existing ponds and stored and in the aquifer for irrigation**) and Yermasoyeia aquifer (**surface dam to retain flash flood waters and agricultural surpluses for ecologic purposes**).

Tunisia - Chiba watershed

- Use of **treated wastewater in infiltration ponds, dam water release and in-channel modifications**, and injection of transferred water resources in existing pumping wells.

Non-conventional waters trials and other activities



Jordan – Jordan Valley

- **Environmental Conservation:** prevent degradation and preserve biodiversity.
- **Renewable Energy:** shift towards renewable sources, reducing reliance on non-renewables for **desalination**.

Morocco – Souss-Massa basin

- **Water Quality Assessment:** evaluate **nitrates pollution and seawater intrusion**.
- **Expanded Water Sources:** **develop new sources** for increased water availability.
- **Efficient Irrigation:** adopt techniques to minimize water losses in agriculture.

Tunisia – Hammamet

- **Water-Saving Equipment:** deploy specialized equipment **for sustainable water use in irrigation practices**.
- **Technological Enhancements:** implement complementary technologies to **improve treated wastewater quality**.
- **Community Behavior Change:** encourage behavioral shifts among the local population regarding water usage.

The importance of participation AG-WaMED

Living Labs:

- Development of **Living Labs** with the **Responsible Research and Innovation (RRI) Roadmap** ©
- 4 meetings carried out in each LL



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The importance of participation



Regional Demo Sites:

- **Co-creation** of a general **participatory governance framework**
- Implementation of a **participative multi-actor approach** for fostering the engagement of stakeholders



The importance of participation

Demo-Sites:

- Demo site implementation with local institutions;
- outreach and workshops on the demo sites;
- **education and training;**
- socio-economic footprint analysis for **potential investment and market release opportunities**



Main takeaways from the projects and way forward

- **Stakeholders' involvement** is fundamental at all levels, from institutions to farmers and citizens
- Technology is available, but the **implementation in real life needs multiple tests and learning from lessons**
- **Land degradation – water sustainability Nexus**: unsustainable water practices led to land degradation and sustainable water use can revert the trend
- Importance of social and economic sustainability
- Integration of non-conventional water sources with **Managed Aquifer Recharge**
- **Future coordination on non-conventional water scale led by AG-WaMED, AGREEMar and AGRE**



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