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WEFE-NEXUS TO ENSURE WATER, FOOD, ENERGY AND ENVIRONMENTAL SECURITY IN THE WADI JIR WATERSHED (MATMATA, TUNISIA)

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Concept

NEXUS-NESS integrates trans-disciplinary datasets and scenarios available from consolidated breakthrough applied research and knowledge on WEFE Nexus (large scale WATNEEDS and river basin scale FREEWAT) models for building an operational NEXUS-NESS Service (NNS). NNS is deployed to **empower stakeholders with actionable information** demonstrating its operational use in tackling WEFE Nexus challenges. The **multiple socio-environmental and economic benefits and the distributional impacts** of WEFE Nexus approach are quantified and shared in “stakeholder language” to tackle the pressing needs and issues in real case conditions while promoting prevent fair and sustainable use of natural resources. **NEXUS-NESS aims to test and prototype an operational WEFE Nexus service or NNS** channelizing science-driven data, actions and indicators “like a funnel” into real case studies, for its operational use by stakeholder also employing integrated socio-environmental and economic assessment models.

The Nexus Ecosystem Labs (NELs)

NEXUS-NESS will develop with stakeholders a Nexus-Ness Service to co-validate WEFE Nexus strategies for fair access to resources in four Nexus Ecosystem Living Labs supported by the RRI Roadmap, a Multi-Stakeholder User Platform and a WEFE Nexus forum for promoting the solution in the Euro-Med area.



Partners



NEL -Wadi Jir watershed, Tunisia

The *Wadi Jir* watershed NEL is a research project, that will co-create and co-test plans for fair and sustainable sharing of food production resources - including energy, water, food and ecosystem.

Tunisian NEL location

The Tunisian NEL is located in the region of Matmata and it is represented by the Wadi Jir catchment and the spreading perimeter of new Matmata (Figure 1). The study area belongs to the region of southeastern Tunisia). It covers administratively the delegations of new Matmata and Matmata. It can be considered, from the ecological, hydrological as well as socio-economical point of view, as representative of the arid south-eastern Tunisia.

The watershed of Wadi Jir, with a surface area of 146 km², is controlled at the outlet of new Matmata city by a floodwater diversion. This is a bypass dam that drains the floods from *Wadi Jir* to an irrigation command area where flood water area spread, namely the “spreading perimeter”, with a size of around 9,21 km² (Figure 1).

Goals and objectives of the Wadi Jir watershed NEL

The main objective of the *Wadi Jir* watershed NEL is to mobilise and engage all relevant stakeholders to co-define and co-test specific Water-Energy-Food-Ecosystem Nexus plans (WEFE Nexus plans) for fair and sustainable allocation of resources. Through the NEL, local and regional stakeholders will be engaged and mobilised through participatory workshops applying the Responsible Research and Innovation (RRI) Roadmap for identifying needs, prioritising them, ideating and framing a WEFE-Nexus future, co- defining a common WEFE-Nexus common vision, co-design an action plan for moving towards this vision, implement actions, measure, and adjust the action plan and intensify actions to move even closer to the WEFE-Nexus common vision.

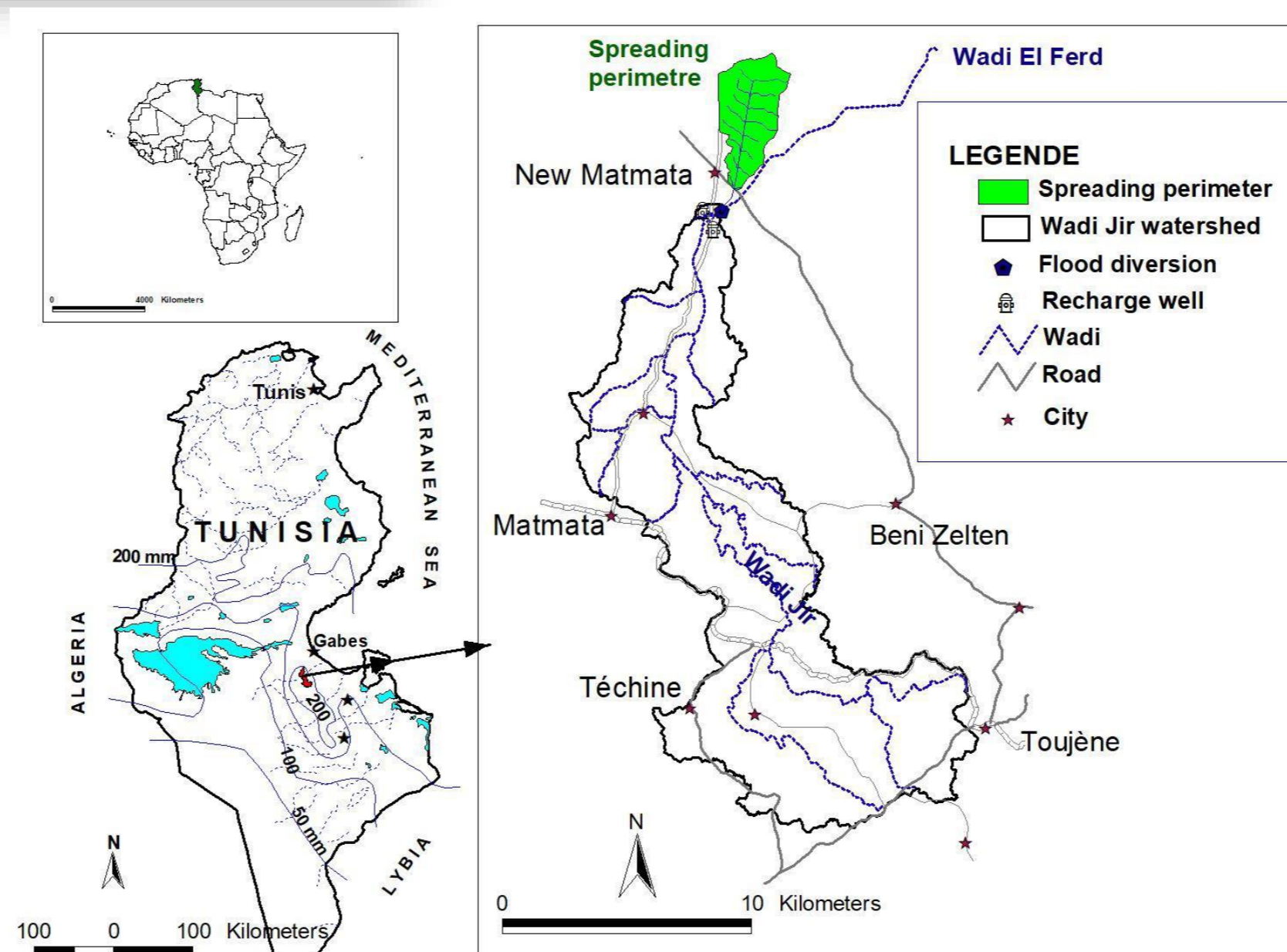


Figure 1. Location map of Wadi Jir watershed and the spreading area.



Wadi Jir watershed NEL Grand Challenges

1- Identification of the best water allocation and adapted crop for sustainable food production and ecosystem conservation

- 1.1- Ensuring equitable and effective surface water use (Reduce conflicts)
- 1.2- Evaluating the potential impact of introducing water-saving technologies (underground cisterns) and eventual changing cropping practices in spreading perimeter

2- Ensuring self-sufficiency in water and energy needed

Investigate the ability to collect groundwater and lighting up rural houses using solar energy (photovoltaic films)

3- Ensuring rural development (tourism, HMAP production)

- 3.1- Promote and protect the troglodyte habitat of Matmata
- 3.2- Preserve biodiversity, promote the use of herbal, medicinal and aromatic plants (HMAP)HMAP and create business opportunities

NEXUS-NESS

NEXUS-NESS is an European Union initiative committed to help local stakeholders improve food production. Balancing water, energy, agricultural and natural ecosystem resources to create innovative, sustainable and profitable solutions.

NEXUS-NESS Results and Impacts

- Co-produce with stakeholders WEFE Nexus management plans for fair and sustainable allocation of resources
- Develop and co-validate a novel NEXUS-NESS Service transferring the state of the art of hydrological and environmental sciences of the WATNEEDS and FREEWAT models
- Adopt bottom up approaches, supported by the RRI Roadmap and the novel Multi Stakeholder and User Platform, to engage stakeholders and citizens to promote WEFE Nexus Innovation Ecosystem in the four Living Labs



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