

NEXUS-NESS



**TECHNOLOGICAL AND SOCIO-CULTURAL
CHANGE
FOR ACHIEVING
SUSTAINABLE AND FAIR
WATER, ENERGY, FOOD AND ECOSYSTEM
RESOURCE MANAGEMENT**



PRIMA

PARTNERSHIP FOR RESEARCH AND INNOVATION
IN THE MEDITERRANEAN AREA



NEXUS-NESS

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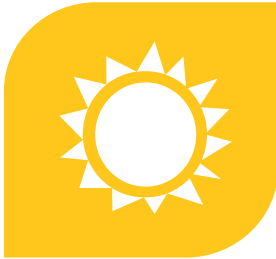
Mohamed Bahnassy, Alexandria University



**WATER
SECURITY**



**FOOD
SECURITY**



**ENERGY
SECURITY**



**ECOSYSTEM
PROTECTION**



**Transferring science advancements
of biophysical modelling of
interlinked WEFE dynamics**

WEFE Nexus
Management and Transition plans for
Nexus strategy operationalization



**WEFE Nexus
Water-Energy-Food-Ecosystem
indicators and scenarios**

Solution co-design with stakeholders
Nexushare engagement platform
Nexus Geo-Service



**Fostering technological and
socio-cultural change for
Nexus strategy operationalization**

Stakeholder engagement
and gender dimension in the
Nexus Ecosystem Labs



**From WEFE Nexus policies to impact:
Socio-Economic and Environmental
assessment of Nexus Strategies**

Cost-benefit analyses of Nexus strategies
Citizen awareness and communication
science-art co-creation NexusArt

NEXUS-NESS is a PRIMA Euromed-funded Innovation Action (2021-2025), developed by a consortium of 13 academic, innovation and business organizations from Italy, Spain, France, Germany, Cyprus, Tunisia and Egypt. Supported by 3M euro of fundings, the project promotes and co-demonstrates, in four Nexus Ecosystem Labs, the multiple benefits of mainstreaming Water Energy Food Ecosystem (WEFE) nexus approaches in the Mediterranean region.

THE NEXUS-NESS PROJECT

NEXUS-NESS addresses the pressing challenges of water scarcity and climate vulnerabilities in Mediterranean regions by operationalizing the **Water-Energy-Food-Ecosystem (WEFE) Nexus** approach.



An Innovation Ecosystem Approach to:

- Co-develop context-specific transition strategies with stakeholders
- Incorporating ecosystem-based solutions
- Technological innovations and socio-cultural change with participatory planning

NEXUS-NESS developed practical **tools and indicators to measure WEFE interlinkages** towards integrated resource management.

- Ground and surface water modeling
- Salinity intrusion and land protection
- Green energy for water and food
- Green and blue crop water scenarios



In Italy nature-based solutions and agrivoltaic systems were implemented as means to resolve seasonal resource challenges. In Spain irrigation system modernization under nexus lenses and innovation

Tunisia and Egypt living labs emphasized eco-cultural and socio-hydrological change, gender mainstreaming, and local stakeholder engagement to shape actionable transition roadmaps.



VAL DI CORNIA
NEL ITALY



A CENTRAL INNOVATION

The development of the **NexusShare** platform and the **Nexus-NESS Geoservice**. Novel web applications enabled processing of key indicators, supported scenario simulations, and provided accessible, data-driven decision support systems to stakeholders. Cost-benefit analyses demonstrated the economic viability of interventions like irrigation modernization and solar energy integration, with notable returns in both social and environmental terms.



NEXUS-NESS adopted a **transdisciplinary, multi-actor, and multi-level governance** approach, working to bridge the gap between science, policy, and practice. Capacity building, policy alignment, communication and dissemination were prioritized in the final phases, including the organization of field visits, local training, and preparation of business models for long-term exploitation.



Long lasting impact

Solutions and business models for sustained impact, with plans for replication, stakeholder empowerment, and knowledge transfer continuing beyond the project's duration.



CONSORTIUM in numbers

13 partners from 7 countries:

3

SMEs

7

Universities

3

Non-profit
research

PROJECT DURATION

4 years (2021 - 2025)

PROJECT BUDGET

3M€



Nexus Ecosystem Labs (NELs)

- 4 Living Labs (NELs) established in: Italy, Spain, Tunisia, Egypt
- Each NEL addresses site-specific “Grand Challenges” (12 in total) co-identified with stakeholders
- 16 NEL workshops implemented



Stakeholder Engagement

- Engaged hundreds of stakeholders and citizens
- Created a Multi-Stakeholder User Platform (**Nexushare**)
- Stakeholders involved in:
 - Co-design of solutions
 - Co-validation of models and scenarios
- Transition planning and socio-technological pathways towards impact





TOOLS & PLATFORMS DEVELOPED

3 new WebGIS & dashboards:

- **NEXUS-NESS Geo-Service** (developed and deployed across all 4 NELs)
- **WATNEEDS** (crop irrigation demand and water availability)
- **FREEWAT** (hydrological simulation and stakeholder-informed modelling)
- **WEFE Nexus Indicators & Index** (including SDG-based indicators)

Developed and delivered a 2-module **Gender Dimension Training Course**

- WEFE Nexus Management and Transition Plans
- NexusArt science & contemporary art co-creation for awareness
- Capacity building strategy using a "Training of Trainers" approach



In the media

- <https://prima-nexus-ness.org>
- Active on Twitter, LinkedIn, Facebook
- In the international & local news



Communication products:

- 3 project videos
- Infographics & Newsletters
- Scientific posters, sessions and workshops
- Participation in 10+ international conferences
- 10 scientific publications (more in progress)



Università
per Stranieri
di Perugia



Sant'Anna
Scuola Universitaria Superiore Pisa



POLITECNICO
MILANO 1863



FONDAZIONE ENI
ENRICO MATTEI



Design
&Data



UNIVERSITÀ
DEGLI STUDI
FIRENZE



L'INSTITUT
agro
Rennes
Angers



POLITÉCNICA



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