

Partnering for Nexus in the MENA region: lessons from UfM/Sida/GWP-Med Matchmaker-II and other agendas



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Union pour la Méditerranée Union for the Mediterranean الإتحاد من أجل المتوسط





Sustaining Partnerships to advance the Resilient Water Sector in MENA Region



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Networking for IWRM

• IWRM is mainly concerned with the allocation of water between competing uses

• IWRM does not address broader issues such as security



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NEXUS

- Nexus approach integrates policy-making, planning and management across sectors and scales
- Inter linkages between sectors to improve investment planning, optimize resource use and reduce trade-offs.
- Offers effective implementation of the SDGs.
- The Nexus and the Integrated Water Resources Management (IWRM) are complementary concepts

- Nexus finds optimal solution and trade-offs among all sectors
- The global level 15% of the available in your global water resources are used for energy whilst 8% of global energy are used in the water sector
- NEXUS helps controlling the ongoing depletion of water resources, phasing out of conventional water use for irrigation?.
- Nexus creates cooperation between science and policy and in return improve the legitimacy of certain national policies.

Examples from MENA Region

- 1. Solar energy for desalination of groundwater to grow cash crops (Jordan and Palestine).
- 2. NRW and toolbox for master planning (Morocco, Lebanon and Jordan).
- 3. Access to sanitation (Morocco and Jordan).
- 4. RADAR probing to monitor groundwater (Oman, Tunisia and Jordan) extended to Qatar, Kuwait, .
- 5. Best irrigation management practices (irrigation manual in Jordan, Tunisia and Morocco).
- 6. NRT (UAE-ICBA, Tunisia, Oman, Jordan and Yemen).
- 7. Green Nanotechnology to produce membranes (Morocco and Jordan).
- 8. Toilet flushing



Application of Near Real-Time Irrigation Monitoring Systems

Objective:

 Test and demonstrate weather, soil, and plant sensor systems to improve irrigation water use efficiency in a variety of environments, production systems and scales.



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Impact:

Improve the efficiency of irrigated agriculture by demonstrating to farmers and policy-makers the real-world implementation of atmosphere, soil, and plant sensor systems.

Partners:

- International Center for Biosaline Agriculture (ICBA), UAE
- Sultan Qaboos University (SQU), Oman
- National Center for Agricultural Research and Extension (NCARE), Jordan
- Sana'a University, Yemen
- National Research Institute for Rural Engineering, Water and Forestry (INRGREF), Tunisia



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TUNISIA, JORDAN& OMAN



Mitigating Environmental Risks of Wastewater Reuse for Agriculture

- 1. Extra crops/revenues for when using TWW instead of saline groundwater (Agribusinesses).
- 2. DSS model subscriptions charges.



MOROCCO & JORDAN

Development of biofouling-resistant nano-composite (BRN) membranes

- Membrane biofouling is a major problem in reverse osmosis desalination due to the accumulation and growth of microorganisms onto the membrane surface
- The fouling of membranes demands considerable attention from industry and research communities due to the negative impacts in the desalination process.

TUNISIA

FARMERS' BEHAVIOUR

- 23 farmers: 10% the total area.
- 74% are conjunctively using TWW and GW.
- Bitter orange (79%), citrus (33%), forage (11%: sorghum, maize), garden market (10%: potatoes, water melon).



- For forage: TWW is preferred to GW: valuable source of nutrients (saving fertilizers) → higher yield under TWW.
- For trees: the conjunctive use of TWW and GW: a strategy against the lack of TWW supply



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Training Course: Water Integrity for MENA Region

Promoting Integrated Water Resources Management in the Arab Region 3rd Arab Water Week, Dead Sea, Jordan, 14-15 January 2015

INTRODUCTION

Promoting water integrity and fighting corruption in the water sector has the potential to create dramatic and lasting improvement for human dignity, health and equitable access to water. Additionally, it helps create a fertile ground for socio-economic development and investments in water.

Starting in 2014, the United Nations Development Program (UNDP) Water Governance Facility at the Stockholm International Water Institute (SIWI) is implementing a regional Water Integrity Capacity Building Programme in the Middle East and North Africa (WI MENA) in collaboration with regional and local partners. During 2014 the programme conducted water integrity risk assessments and mapped the capacity needs of the main stakeholders in water resources management in five pilot countries, namely Jordan, Lebanon, Morocco, Palestine, and Tunisia. Existing training material on water integrity has been adapted to fit the needs as identified, and a pool of water integrity trainers have been created to deliver the water integrity trainings on the ground.



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Training Course: Water Integrity for MENA Region

Promoting Integrated Water Resources Management in the Arab Region Sharm El Sheikh, Egypt, 09-10 May 2015 (2 days)

INTRODUCTION

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Partnering for NEXUS MENA

WEFE Nexus in Jordan and Palestine

Prove, through piloting,

the integrated concept of applying **local WEFE Nexus technical solutions**

while capacitating beneficiary groups on employment options,

offering measurable and **scalable** contributions for further application in MENA countries,

and assisting the **UfM Water Agenda** to enter and mark progress on tangible benefits,

contributing to Sweden's Strategy for MENA 2021-2025



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Matchmaker 2 WEFE Nexus approach

The Project technical pilots incorporate the WEFE Nexus and their inter-relations:

- Water: Utilising tertiary treated wastewater, through a nature-based solution (NbS) ie. constructed wetlands, for irrigation.
- Energy: Utilising solar power infrastructure for irrigation while lowering costs, reducing the carbon footprint, and increasing water efficiency for energy production (where applicable).
- Food: Utilising treated wastewater for agriculture production.
- **Ecosystem:** Assisting local ecosystems and the services they provide through constructed wetlands towards increasing food production; increasing the irrigated farms' ecological niche; improving environmental conditions over the irrigated area e.g. soil conditions, including compared to the direct application of wastewater coming from a plant (that does not include tertiary treatment).



Nexus Impacts of Matchmaker 2

KPI's

- Volume of treated wastewater (effluent of constructed wetlands) used
- Energy production coming from renewable energy sources (solar)
- Equivalent carbon dioxide saved from entering the atmosphere due to solar power
- Cost impact on the selected farms
- Quality of Treated wastewater (effluent of constructed wetlands) quality
- Quality of the ground water in the areas irrigated with treated wastewater
- Number of families benefiting by the interventions (direct beneficiaries)
- Number of female farmers engaged in the project
- Number of young scientists and researchers involved
- Number of trainees on monitoring and evaluating WEFE Nexus approach

Cont'd Impact of Matchmaker 2

KPI's

- Comparative analysis between the pilot farms and the conventional farms in terms of health and productivity
- The cost affordability of wastewater management and project operation.
- The return on investment from capacity development program.
- On Job training sessions
- Job creation, specifically for females in the targeted areas and the number of employees who were contributed to the project compared to the situation before implementation.
- Furthermore, employability/entrepreneurship benefits will stem from capacitation activities implemented within the Project.

Technical Interventions, in Palestine & Jordan, include

Building 3 constructed wetlands for tertiary treatment of the WWTP outflow, providing 45 m³ (Palestine) and 21 m³ (Jordan) of treated wastewater/day, and reusing that for irrigation in 3 pilot farms

- Planting of trees in the new irrigation areas in the 3 pilot farms
- Installing 3 irrigation networks of >60 dunums (Palestine) and >9 dunums (Jordan) in the 3 pilot farms

 Installing 3 solar power stations supplying with 60 kWp (Palestine) and 37 kWp (Jordan) to cover the irrigation pumping costs of the new plantations



Soft activities supporting the Technical Interventions in Palestine & Jordan, in a cross-country context

- Advice to farmers for shifting cultivations to valuegenerating crops is provided
- Farmers are capacitated towards increasing their business opportunities
- Brief Market Analysis presenting an overview of current national market on WEFE Nexus technologies and applications as well as trends in natural resources efficiency uptake, is elaborated





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