MENA Water Matchmaker II Project: Integrated technical solutions for sustainable agriculture in Jordan and Palestine

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Background

Water, food, energy and ecosystems are essential for human health and livelihoods, poverty reduction and sustainable development, including by addressing climate change impacts. These sectors are interlinked through a nexus of natural, institutional, economic and social frameworks. The WEFE Nexus approach provides an integrated framework towards a coherent implementation and achievement of the related SDGs, in particular Goals 6, 11, 12 and 13. Interdependencies among Nexus sectors may result in synergies, however they may also lead to conflict and unfavorable socio-economic consequences. Thus, trade-offs are often a reality and should be considered while striving to secure balance among Nexus sectors' needs.

Around the Mediterranean, increasing water stress, including due to climate change impacts, affects all productive sectors, while a rise of energy costs for water production is observed in several UfM countries. Growing needs for natural resources due to demographic change, increase of living standards, shift of production patterns, domestic (rural to urban) and inter-national migration flows and other socio-economic factors, further exacerbate the demand and highlight the need for integrated action. Historically, the water, energy, food and ecosystem sectors have been managed separately with limited synergies across them. Over past years, natural resources efficiency, particularly related to agricultural production and food systems, often aiming at national food security objectives, has been sought at policy and operation level in UfM countries. While understanding of the WEFE interdependencies increase, some steps are taken towards cross-sectorial cooperation in policy development and technical agendas, mostly at piloting stage. UfM

countries have repeatedly articulated their standing request for such action-lines with tangible outcomes that provide for local solutions that can be replicated and upscaled.

WEFE Nexus technical solutions include a variety of practical interventions that benefit at least two of the four WEFE sectors. Part of these refer to a range of small to medium scale local applications, that can be applied in rural and urban contexts, to improve natural resources management, increase resources' use efficiency, raise crop productivity 'per drop' and 'per KWh', mobilize alternative sources to increase the local water budget, etc. At larger scale, multi-purpose infrastructure like multi-purpose dams and wastewater treatment plants of different scales combined with resource recovery and bi-products production, desalination using renewable energy sources, etc. can offer multiple socio-economic benefits in more than two sectors.

Increasing unemployment in some UfM countries, especially among youth and women, that is expected to further aggravate in the COVID-19 era, advocates for timely creating income generation opportunities while demonstrating solutions with positive impacts to sustainability objectives. It is estimated that, throughout the next decade, 50 million jobs shall be created in the MENA alone to absorb the growing labor supply, including as a contribution to tackling some of the root causes of international migration. If WEFE Nexus technical solutions are transferred, applied and mainstreamed in UfM countries, with the support of political will, planning tools and investment, they can create opportunities for new skills, new job fields and new markets. Such jobs may include various positions -from technical to managerial- in sustainable agriculture, integrated urban water management, industry, tourism, etc. Circular economy, sustainable production and consumption and blue economy provide background for the development of such 'green/blue jobs'.

Thus, investing on promoting employment and entrepreneurship opportunities operationally linked with WEFE Nexus mainstreaming, may create a new market, provide for income generation and foster increase of the local water budget through sustainable options. Youth and women should be in the focus of such investments, provided with assistance for enforcing their employability skills and creating/assisting business plans.

Implementing these, a synergetic action of the WEFE Nexus & WEM FPs would aim to increase local natural resources efficiency in UfM countries and to promote employability and entrepreneurship for Youth & Women in WEFE Nexus/ Non-Conventional Water Resources (NCWR) fields, also for migration prevention, while replicating good practices.

Aims and Goals

Jordan is a water-scarce country that faces significant challenges related to competing water uses by different sectors. At the same time, the increasing demand for water and energy, along with the need to provide food security and conserve ecosystems, has put enormous pressure on the country's limited resources. Therefore, the application of the

integrated WEFE Nexus approach is crucial to achieving sustainable development goals and improving the livelihoods of the Jordanian people. The MENA Water Matchmaker 2 Project aims to 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. These contribute to national priorities for natural resource efficiency, as well as the UfM Water Policy Framework for Action 2030 and its Financing Strategy and the Strategy for Sweden's regional development cooperation with the MENA 2021-2025. The Project is managed by the Global Water Partnership-Mediterranean (GWP-Med) engaging regional and national partners in its implementation. It is supported by the Swedish International Development Cooperation Agency (Sida) and UfM.

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

- Water: Utilizing tertiary treated wastewater, through a nature-based solution, ie. constructed wetlands, for irrigation.
- Energy: Utilizing solar power infrastructure for irrigation, while lowering costs, reducing the carbon footprint, and increasing water efficiency for energy production (where applicable).
- Food: Utilizing treated wastewater for agriculture production.
- Ecosystems: 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 wastewater treatment plant that does not include tertiary treatment.

The applied WEFE Nexus technical intervention in Salta contributes to sustainable agriculture through reuse of treated wastewater from the Wadi Shuayb Wastewater Treatment Plant for irrigation in three farms, after its tertiary treatment through constructed wetlands, with renewable solar energy powered pumping, and climate-resilient planting. More specifically, it includes:

- Building 3 constructed wetlands for tertiary treatment of a portion of the secondary treated effluent of the Wadi Shuayb Wastewater Treatment Plant, providing 21 m3 of treated wastewater/day for irrigation in 3 pilot farms.
- Planting of trees in the new irrigation plots in the 3 pilot farms.
- Installing 3 irrigation networks of total 9 dunums in the 3 pilot farms.
- Installing 3 solar power stations supplying with 40 kWp to cover the irrigation pumping costs of the new plantations.
- Donating canopy analyzers to research institutes measuring health of plants irrigated with treated wastewater from constructed wetlands.

Actions taken

The applied WEFE Nexus technical intervention in Salt contributes to sustainable agriculture through reuse of treated wastewater from the Wadi Shuayb Wastewater Treatment Plant for irrigation in three farms, after its tertiary treatment through constructed wetlands, with

renewable solar energy powered pumping, and climate-resilient planting. More specifically, it includes:

- Building 3 constructed wetlands for tertiary treatment of a portion of the secondary treated effluent of the Wadi Shuayb Wastewater Treatment Plant, providing 21 m3 of treated wastewater/day for irrigation in 3 pilot farms.
- Planting of trees in the new irrigation plots in the 3 pilot farms.
- Installing 3 irrigation networks of total 9 dunums in the 3 pilot farms.
- Installing 3 solar power stations supplying with 40 kWp to cover the irrigation pumping costs of the new plantations.
- Donating canopy analyzers to research institutes measuring health of plants irrigated with treated wastewater from constructed wetlands.

Main Achievement to date

- A medium scale WEFE Nexus/NCWR technical demos were implemented in Jordan and Palestine (3 demos in each country)
- Analysis of the effluent of the NbS to secure that it complies with the Palestinian standards for irrigation
- Developing partnerships with local universities to assess the impact of the technical interventions using procured technical equipment and empower youth and female researchers to lead the monitoring and evaluation of project impacts
- Conduct training workshops to facilitate discussions between relevant governmental institutions, farmers and NGOs on scalability of WEFE Nexus interventions
- Establish discussion within decision makers on the merits of Nexus solution at the MENA region scale through high panel discussions at the Arab Ministerial Water Council

Partners
Swedish International Development Cooperation Agency - SIDA Union for the Mediterranean Global Water Partnership Mediterranean - GWP MED

The applied WEFE Nexus technical intervention in Salt, Jordan, contributes to sustainable agriculture through reuse of treated wastewater from the Wadi Shuayb Wastewater Treatment Plant for irrigation in three farms, after its tertiary treatment through constructed wetlands, with renewable solar energy powered pumping, and climate-resilient planting. The project provides a proof of the added value of the WEFE Nexus approach and demonstrating its potential for replication in Jordan, the Middle East and North Africa (MENA) and beyond.

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Nexus Dimensions
Ecosystems
Energy
Food
Water

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