

**Terms of Reference**  
**for the elaboration of Technical Study**  
**for the intervention in Wadi Al-Arroub Wastewater Treatment Plant, Hebron, Palestine**  
**of the MENA Water Matchmaker 2 Project**  
**supported by UfM / Sida**

## **1. Background and context**

### *1.1 The MENA Water Matchmaker 2 Project*

Middle East and North Africa (MENA) is shaped by its unique geographical, ecological, geopolitical and cultural features. It is challenged by natural conditions including water scarcity, demographic change, unemployment including among the youth, poverty, changing consumption patterns including rising water and food demands, urbanization, growing energy needs, environmental degradation, climate change, gender disparities and more. In parts, MENA faces an enduring economic crisis, war, socio-political instability, conflicts and is impacted by large-scale migratory movements. Most of such natural and man-made challenges are directly linked with water.

The [UfM Water Agenda](#) is a key process aiming at enhancing regional cooperation towards sustainable and integrated water management in the region. Furthermore, the new [Sweden's Strategy 2021-2025 for regional development cooperation in MENA](#) provides a strong vehicle for translating priority policy lines to actions for impact.

The Project 'Making Water Cooperation Happen in MENA: Piloting Tangibles', aka MENA Water Matchmaker 2 Project, aims to equip UfM MENA countries with tangible and scalable local technical solutions, combined with employability capacitation as well as with selected applicable and shareable policy tools, for improved water management and climate resilience, through multi-stakeholder, multi-sectorial and gender mainstreaming approaches.

The Project's main objective is to prove, through piloting, the integrated concept of applying Water-Energy-Food-Ecosystems (WEFE) Nexus technical solutions at local level while capacitating priority beneficiary groups on employment options, offering measurable and scalable contributions for further application in UfM MENA countries, and assisting the UfM Water Agenda to enter and mark progress on tangible benefits at local level, while contributing to Sweden's Strategy for MENA 2021-2025.

The Project is structured around three inter-connected Outcomes:

Outcome 1. MENA local stakeholders tangibly benefit from multi-sectorial efficiency approaches through implementation of WEFE Nexus/NCWR pilot technical solutions at local level, and prioritize further such interventions through fit-for-purpose technical & financing options towards local benefits.

Outcome 2. MENA youth, with emphasis on women, assisted towards employment and entrepreneurship opportunities in WEFE Nexus/NCWR fields.

Outcome 3. MENA stakeholders' understanding on integrated WEFE Nexus/NCWR, WEM, gender and youth challenges and solutions increased, through knowledge sharing and media engagement.

In the core of the Project is the implementation of two demonstratable and scalable technical WEFE Nexus interventions combined with employability/entrepreneurship capacitation activities, that will be implemented in Jordan and in Palestine, through a cross-country approach and towards regional benefits for MENA countries.

### *1.2. The Wadi Al-Arroub Wastewater Treatment Plant, Sa'ir, Hebron, Palestine*

The Wadi Al-Arroub Wastewater Treatment Plant, in Sa'ir, Hebron, works with activated sludge process, was constructed with financial support<sup>1</sup> by the Spanish Agency for International Development Cooperation, and operates since 2014. The Plant's wastewater treating capacity is 1.300 cubic meters per day, and it operates by 80% with solar energy.

The Plant was built

- to tackle the negative effects of the sewage water flow through the Arroub Stream including the emission of unpleasant odours, the spread of harmful insects, and the impacts on the soil and its ecosystem through the accumulation of salts and solids in the soil, and
- to contribute to the local water balance by reusing the treated wastewater for irrigation.

Following the increasing demand for treated wastewater sources, the Plant was expanded and upgraded in 2016 to accommodate the generated wastewater from the Arroub refugee camp.

The Plant is equipped with a double two-tanks system, that first collects and treats the wastewater in an aeration tank where Oxygen is injected in the mixed liquor, and then gets in a final clarifier tank that allows the biological flocs to settle separating the biological sludge from the clear treated water. However, the second two-tanks system is still not in full operation, missing infrastructure like pumps, etc.

The treated wastewater flows into the Wadi Al-Arroub whereby farmers on both sides pump that water to irrigate their farmland. The wastewater reuse offers already certain success since some landowners grow trees and forage plants and they are able to harvest them four times a year. Female farmers own significant number of farms in the valley, inherited from their parents, creating opportunities to embrace gender mainstreaming in the management of wastewater reuse for irrigation and in the promotion of agribusiness.

Following the Plant's inauguration, the Applied Research Institute–Jerusalem (ARIJ) volunteered to operate the facility for 2 years and then to hand it over to the Palestinian Water Authority (PWA). However, this has not happened until today, and likewise is with the local municipality. Currently, a newly establish entity, the local Joint Service Council, has showed interest in undertaking the management of the Plant aware of the importance of maintaining the facility operational to deliver treated wastewater, strengthening the local food production security whilst mitigating potential environmental risks from miss-management of the facility. Other key stakeholders include the Palestinian Water Authority, Ministry of Local Government, Ministry of Agriculture, Hebron Municipality, civil society organisations, etc.

### *1.3. The Project intervention in Wadi Al-Arroub Wastewater Treatment Plant*

The MENA Water Matchmaker 2 Project's technical intervention in Palestine will be increasing the utilisation of the Wadi Al-Arroub Wastewater Treatment Plant outflow, powered by solar energy, for efficient irrigation while promoting entrepreneurship opportunities for local, particularly female, farmers in agribusiness. The specific area of focus is Kawaziba, Irkan Trad, in Sa'ir Region.

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<sup>1</sup> 1.2 million Euros; Source: Palestinian Water Authority, March 2017

Working at the intersection of water engineering and crop cultivation science towards income generation, the Project intervention in Wadi Al-Arroub will demonstrate the technical and economic feasibility of the WEFE Nexus approach coupled with low-cost and low-energy Nature-based Solutions for water treatment such as constructed wetlands, to upgrade the quality of treated wastewater prior to be reused in farming while contributing to the local water budget, thus decreasing consumption of potable water needed for domestic uses.

The overall aim of the Project intervention is to utilise the treated effluent to irrigate up to 400 dunums (40 ha), to assist controlling pollution and environmental degradation, and to productively use crops for agroindustry. Within these, the Project local intervention will assist:

- further utilising the non-conventional source of produced treated wastewater for irrigation
- promoting utilisation of renewable energy sources
- improving water efficiency in agriculture
- increasing food production, hence increasing local income and employability
- Supporting transboundary water management
- demonstrating low-cost and low-maintenance NbS for custom-designed water treatment
- increasing climate resilience and biodiversity protection through WEFE Nexus approach
- supporting local governance and building local competencies in safe management of treated wastewater
- providing an integrated and scalable demonstration for MENA region.

A multi-output Technical Study, that is the purpose of the assignment, will assist in further setting and detailing contents of the Project's intervention, including related to improving the Plant's technical operations as well as selecting three or more farms in Wadi Al-Arroub owned by females/youth and planted with crops approved according to specifications for irrigation with treated water, namely pomegranate, olive and fodder. As these farms are established and already supplied with treated wastewater by the Al-Arroub Plant, elements like water and energy efficiency, crop productivity, employability, market access, etc. aimed by the Project intervention would be assessed and further detailed.

## **2. Description of the Assignment**

### *2.1. Objective*

The objective of the assignment is the delivery of a multi-output Technical Study for detailing contents of the MENA Water Matchmaker 2 Project intervention in Wadi Al-Arroub, Hebron, Palestine, through:

- technical advice for further defining contents of the local intervention through a WEFE Nexus approach;
- profiling and assisting selection of beneficiary farmers, focusing on female owners (e.g. members of the local female farmers association) as well as farms under the Ministry of Agriculture that are operated by young farmers;
- describing technical specifications responding to national standards, including related to quality of treated wastewater, the irrigation network and the size/capacity of solar panels needed for transferring treated wastewater to the selected farms;
- defining costs per item of the intervention, including related to the needed irrigation network and solar panels installation;
- defining bills of quantities;
- providing designs;
- providing any other needed content for delivering the procurement document for tendering implementation of the intervention.

## 2.2. Contents

Overall elements to be considered while elaborating the multi-output Technical Study include:

- maximising the Al-Arroub Plant wastewater treatment capacity;
- optimising the wastewater treatment technology through Nature-based Solutions;
- fully operating the Al-Arroub Plant with renewable energy sources;
- promoting risk reduction and mitigation of potential environmental pollution;
- promoting sustainable local agribusiness;
- assisting the Al-Arroub Plant governance by building local, and national as relevant, capacities to operate the facility;
- exploring options towards the financial sustainability of the Al-Arroub Plant;
- exploring the potential of Public Private Partnerships.

Expected end-results from the implementation of the Project's intervention in Al-Arroub, the setting of which will be shaped with the assistance of the Technical Study that will be assigned by the present Call, include:

- assisting reuse of 1.300 m<sup>3</sup>/day of treated wastewater for strengthening food security and female farmers;
- building 3 scalable constructed wetlands in support of beneficiary farms for further treating and improving quality of wastewater that flows from the Al-Arroub Plant to the valley;
- contributing to food security by broadening permissible high value crops to be grown using treated wastewater;
- reducing water consumption at pilot sites level by 30% based through improved irrigation practices;
- promoting innovative entrepreneurship and sustainable employability;
- assisting gender balance and women empowerment;
- assist building local competencies to sustain the operations of the Al-Arroub Plant;
- assist establishing an appropriate governance structure for sustainably managing the Al-Arroub Plant, contributing from documenting the case to related national policy framework and practices for water demand management and non-conventional water resources utilisation;

Key Performance Indicators (KPIs) to track for assessing impacts from the full implementation of the intervention may include as an example:

- The environmental situation and health conditions in the intervention area (COD, BOD<sub>5</sub>, SS, Oil, Petroleum, Anion, TN, Ammonia ,TP, Chroma, pH, Coliform).
- The total Irrigated Agricultural Land through the use of treated water to irrigate crops.
- The average income of benefited families in the targeted area.
- The quality of ground water in areas where treated wastewater flows.
- The level of food security at the community level.
- The return on investment from capacity development program.
- 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.
- The volume of reused treated wastewater in agricultural sector.
- The cost affordability of wastewater management and project operation.

It is noted that, in order to assess impacts resulting from the Project intervention, the consultant of the present assignment must take into consideration several factors, such as time, seasons, type of crops, influence of surrounding environment, etc.

### 2.3. Requested Services

Responding to the above, the assignment includes delivery of the following outputs:

1. Define site specifications
2. Prepare and discuss the work plan of this assignment with GWP-Med Team
3. Conduct stakeholders mapping and survey of their views on the intended interventions
4. Elaborate assessment of the current farming and irrigation practices, with focus on the potential of wastewater reuse and including a gap analysis on the current water reuse in farming
5. Elaborate assessment of Al-Arroub Plant's status and of the treated wastewater quality and their compliance with the Palestinian technical standards and specifications
6. Elaborate assessment of the environmental and social impact from transferring and utilizing treated water from the Al-Arroub Plant for irrigation
7. Elaborate assessment of options for implementing Nature-based Solutions for improving the Al-Arroub Plant operations, including costs, bills of quantities and designs, as needed for possibly selected options
8. Conduct study for expanding the solar system to generate energy for the remaining 20% energy requirements to operate the Al-Arroub Plant, including costs, bills of quantities and designs, as needed
9. Conduct study on currently irrigated crops in the site, including related to local knowledge on permissible crops irrigated by treated wastewater, and on options for optimizing cultivations by expanding the currently operating irrigation system as well as by introducing high value crops in terms of their contribution to food security and/or financial return to farmers, with emphasis on women, youth and families in rural areas, including costs, bills of quantities and designs
10. Define selection criteria for beneficiary farms in the site
11. Elaborate assessment on the potential of engaging agriculture business entrepreneurs in testing different technologies, production models, farming and management practices, using treated wastewater from the Al-Arroub Plant, and ability and willingness to pay certain amount (e.g. 5% of the generated income) to the facility
12. Facilitate agreements and assist signing MoUs with farmers of the selected agricultural lands for the safe use and dispose of treated wastewater resources.
13. Assist assessing indicated KPI's and, as needed, related gaps.
14. Elaborate draft procurement document for the Project's intervention in Al-Arroub for the selection of contractor, including ToR for consultants and possibly technical sub-contractors
15. Prepare a brief final report summarizing the tasks developed during the reporting period.

**The consultant will attend on-line consultation meetings as needed.**

### 2.4. Assignment Outputs

The assignment will have the following outputs

1. Work plan for this assignment agreed (Tasks 1 and 2).
2. Technical Study delivered (consisting of inputs from Tasks 3 to 13)
3. Draft Procurement Document prepared for the Project's intervention in Al-Arroub for the selection of contractor, including ToR for consultants and possibly technical sub-contractors (Task 14)
4. Brief final report delivered (Task 15)

### 2.5 Reporting line

The consultant will work under the direct supervision of Dr. Ghazi Abu Rumman, GWP-Med Senior Programme Officer and Head of the GWP-Med operations in Amman who is serving as Project Coordinator for Technical Solutions.

### 3. Duration of the Contract

The overall duration of the contract will be maximum 45 days.

### 4. Contract Price and Schedule of Payments

The maximum fee for this assignment is 20,000 EUR. This amount includes all other costs, income taxes and any other amount payable or cost that may be required for the completion of the work/service, including VAT.

The schedule of payments is as follows:

- 1st payment: (40%) upon signatory
- Final payment: (60%) upon satisfactory submission of the final report.

### 5. Selection Criteria

#### 5.1. Pass/Fail criteria

Successful participants must (in case of a group of experts / company the experience listed below applies for the lead expert)

- have MSc on Environmental/Civil/Hydraulics/Mechanical/Chemical Engineering; or Water Resources Management; or Sustainable Development (for the Team Leader in case the participant is a legal entity.
- have Excellent oral and written communication skills in English and Arabic.
- reside in Palestine and be able travel without restrictions to the Project area.

#### 5.2. Qualification and Experience

The required and desired qualifications (for the company or/and the lead expert) are presented below. **Failure to provide the minimum required qualifications is considered ground for disqualification.** Qualifications additional to the minimum requested per category will receive additional score under the evaluation process as described in section '5.3 Awarding Criterion and Evaluation process'. Desired qualifications will be awarded additional points as indicated in section Evaluation.

#### Work experience (Required)

- Minimum ten (10) years of experience on wastewater treatment and reuse for irrigation purposes in MENA
- Minimum five (5) years of experience on solar energy applications for water management
- Minimum two (2) assignments/projects implemented in MENA having among outputs the elaboration of a Technical Study towards procuring technical interventions on treated wastewater reuse utilising solar energy for irrigation purposes

#### Work experience (Desired)

- Minimum five (5) years of experience on Water-Energy-Food-Ecosystems Nexus in MENA

- Minimum five (5) years of experience on entrepreneurship or employability related to sustainable agriculture

### 5.3. Awarding Criterion and Evaluation process

The Award criterion is the most economically advantageous tender on the basis of best price / quality ratio.

Offers shall be evaluated as follows:

Offers qualified in terms of exclusion grounds and selection criteria will be further evaluated on the basis of the requirements presented under section “Qualification and Experience”, as follows:

Name of Firm / Participant:			
(1) Criterion	(2) weighting (w)	(3) points of criterion (c) 100p Base +10p for extra criteria over base up to 50 additional points	(4) Score = (2) x (3)
<b>Required qualifications</b>			
<b>Minimum</b> ten (10) years of experience on wastewater treatment and reuse for irrigation purposes in MENA	35%		
<b>Minimum</b> five (5) years of experience on solar energy applications for water management	15%		
<b>Minimum</b> two (2) assignments/projects implemented in MENA having among outputs the elaboration of a Technical Study towards procuring technical interventions on treated wastewater reuse utilising solar energy for irrigation purposes	30%		
<b>Desired qualifications</b>			
<b>Minimum</b> five (5) years of experience on Water-Energy-Food-Ecosystems Nexus in MENA	10%		
<b>Minimum</b> five (5) years of experience on entrepreneurship or employability related to sustainable agriculture	10%		
<b>Total</b>	100%		

**Failure to provide the minimum requirements in any of the required qualifications is considered ground for disqualification**

**The Evaluation Committee may decide to invite applicants for virtual meeting.**

Each section/evaluation criterion is evaluated autonomously. The final scoring of each evaluation criterion is the outcome of its scoring multiplied by the corresponding weighting factor. The overall score of the technical offer is the sum of the final scoring of all the Sections/evaluation criteria. The overall score of the technical offer is calculated on the basis of the following formula:

$$B_i = w_1 \times c_1 + w_2 \times c_2 + \dots$$

For the overall score which will determine the ranking of offers, technical evaluation will be weighted with 90%, and the financial offer with 10%.

The final listing of the most advantageous offers will be made on the basis of the following formula:

$$\Lambda_i = 0,9 * (B_i/B_{max}) + 0,1 * (K_{min}/K_i).$$

Where:

- B<sub>max</sub>: the max score received by the best of the technical offers received
- B<sub>i</sub>: the score of the technical offer
- K<sub>min</sub>: The cost of the financial offer with the minimum price offered.
- K<sub>i</sub>: The cost of the financial offer

The most advantageous offer is the one with the greater value of  $\Lambda$ .

In case of equality of overall scores, the retained proposal is the one whose corresponding technical proposal received the highest rating.