Terms of Reference

for the elaboration of Technical Study
for the intervention in Wadi Shuayb Wastewater Treatment Plant, Al-Salt, Jordan

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 four 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 Salt Wastewater Treatment Plant, Salt, Jordan

The Salt Wastewater Treatment (WWT) Plant, in Salt, Jordan, was established in 1973 with the aim of treating sewage and reusing the treated water for irrigating crops. The Plant's wastewater treating capacity is 7,600 m^3/day (currently overloaded 10,000 m^3/day). Water flows by gravity in Wadi Shuayb and farmers pump the treated wastewater off the valley to irrigate their crops. The treated wastewater flows at the Shoaib Water Dam, and then further to the Jordan River, being a transboundary water resource flow from the East to the West Bank.

Overall, water volumes flown in the Wadi Shuayb come from 2 wastewater treatment plants (Salt and Fuhais & Mahis stations); a snapshot from these stations is given in the below table.

WWT	Annual inflow MCM/year	Annual outflow MCM/year	Annual water reuse MCM/year	# of reuse agreements	Irrigated area (ha)	Indirect annual water reuse MCM/year	% Direct annual water reuse	% of total water reuse
Salt	3.6	3.45	3.45%	20	12.0	3.32	3.72%	96.28%
Fuhais & Mahis	1.11	1.09	1.09	2	1.1	1.093	0.06%	99.94%
Total	4.71	4.54	4.54	22	13.1	4.41	2.84%	97.16%

Average quality of the treated wastewater in Salt Wastewater Plant is presented in the following table:

Annual Average Water Quality	Value
pH	**7.76**
BOD	**20**
COD	**98**
TSS	**31**
TDS	**78**
NH4	**25**
NO_3	**12**
TN	**50**
PO_4	**13**
E. Coli	**300K**

A first expansion of the Salt Plant was carried out in 1995, but the urban expansion in the area required a more comprehensive expansion of the Wadi Shuaib purification plant to serve the largest segment of citizens in the city of Salt. The Ministry of Water and Irrigation, that is the authority in charge of the Plant, completed in early 2021 the qualification process assigning the contractors to implement the bid project to raise the efficiency of the Salt Wastewater Treatment Plant. This includes increasing the Plant's treating capacity from 7,600 m^3/day to 25,000 m^3/day and expanding services to new areas in Salt and the surroundings. The expansion will be implemented in two phases, with a capacity of 12,500 m^3/day for each stage, funded with 29 million Euros by the German Reconstruction Bank (KFW), aimed to be launch before the end of 2021.

The expansion will take place by connecting new but existing networks in the city of Salt to the wastewater treatment plant, and this will not consume new lands. In addition, there is no need to acquire lands adjacent to the purification plant, since the space of the current plant will be upgraded using modern technology and will benefit from renewable energy, raising the absorptive capacity while solving the problem of unpleasant odors prevalent in the place.

The water coming out of the Plant conforms to the national specifications and is suitable for restricted cultivation. Quality is monitored jointly by Water Authority of Jordan (WAJ), Ministry of Health and Ministry of Environment and also by staff of the Plant itself to ensure the compliance to the Jordanian Standard for reclaimed domestic wastewater JS893/2006.

20 agreements have been signed between WAJ and farmers in the area to reuse treated water in agriculture. The site of the station is surrounded by two chains of mountains, from the east and west, which makes the cost of pumping water to the farms in the mountain very high.

Another related problem facing the region, particularly hampering to development of solar energy sources, is that the sun does not shine on the place for long hours. This reduces the efficiency of solar panels and their ability to operate pumps, which leads us to think about the need to store energy to be consumed when the sun’s rays are insufficient.

The Wadi Shuaib Dam was suffering from the leakage of sewage water from areas adjacent to the station, in addition to the leakage of part of the treated water resulting from the station that mixes with winter water. The dam has a small capacity and safety valves are opened on its sides, which leads to the flow of water into the Jordan river.

1.3. The Project intervention in Wadi Shuayb Wastewater Treatment Plant

The MENA Water Matchmaker 2 Project’s technical intervention in Jordan will be increasing the utilisation of the Wadi Shuayb Wastewater Treatment Plant outflow, powered by solar energy, for efficient irrigation while promoting entrepreneurship opportunities for local, particularly female, farmers in agribusiness.

Working at the intersection of water engineering and crop cultivation science towards income generation, the Project intervention in Wadi Shuayb 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 more lands, 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, increasing the total irrigated agricultural land
- improving water efficiency in agriculture
- promoting utilisation of renewable energy sources
- increasing food production, hence increasing local income and employability
- promoting growing medicinal plants irrigated with quality treated wastewater
- increasing the level of food security at the community level, while designing water-wise food precincts
- improving the environmental situation and health conditions in the intervention area (COD, BOD5, SS, Oil, Petroleum, Anion, TN, Ammonia, TP, Chroma, pH, Coliform).
- ensuring high quality of ground water in areas where treated wastewater flows.
- supporting transboundary water management
- demonstrating low-cost and low-maintenance Nature-based Solutions (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
- increasing the return on investment from capacity development programmes
- 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 contribute in further improving the Plant's technical operations as well as studying the area of the station in order to come up with solutions to reduce the cost and raise the efficiency of pumping water by installing sufficient solar panels to provide the energy needed for pumping and supporting the station with an irrigation network.

Elements like water and energy efficiency, crop productivity, employability, market access, etc. aimed by the Project intervention would be assessed and further detailed by the assignment.

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 Shuayb, Salt, Jordan, 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
- 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 such as:

1. studying places that are more exposed to solar energy and exploiting it in installing solar panels
2. studying the Wadi Shuaib Dam current situation
3. assessing the ability of energy storage system installation
4. assessing the volume of transboundary water between East and West Bank.

2.2. Contents

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

- optimising the technology in Salt WWT plant through Nature-based Solutions;
- potential operating the Salt WWT Plant with renewable energy sources;
- promoting risk reduction and mitigation of potential environmental pollution;
- promoting sustainable local agribusiness;
- assisting the Salt WWT Plant governance by promoting local public hearing to the impact of the Plant;
- exploring options towards the financial sustainability of the Salt WWT Plant;
- exploring the potential of Public Private Partnerships.

Expected end-results from the implementation of the Project's intervention in Wadi Shuayb, 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 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 Salt WWT Plant to Jordan River;
- contributing to food security by broadening permissible high value crops, like medicinal plants, to be grown using treated wastewater;
- reducing water consumption at pilot sites level by 30% 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 Salt WWT Plant.

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

1. The environmental situation and health conditions in the intervention area (COD, BOD5, SS, Oil, Petroleum, Anion, TN, Ammonia ,TP, Chroma, pH, Coliform).
2. The total Irrigated Agricultural Land through the use of treated water to irrigate crops.
3. The average income of benefited families in the targeted area.
4. The quality of ground water in areas where treated wastewater flows.
5. The level of food security at the community level.
6. The return on investment from capacity development program.
7. 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.
8. The volume of reused treated wastewater in agricultural sector.
9. The volume of transboundary water between East and West Bank
10. The cost affordability of wastewater management and project operation.

Benchmarking of points 2, 3, 5, 6, 7, 10 can be easily collected on a survey with farmers.

Chemical and biological tests can be done at the beginning and end of the project, these tests can be performed at accredited laboratory in Jordan such as (Royal Scientific Society, Water, Energy and Environment Center of The University of Jordan, Laboratories Department of Water Authority in Jordan).

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 Wadi Shuayb Plant's status and of the treated wastewater quality and their compliance with the Jordanian technical standards and specifications JS893/2006.
6. Elaborate assessment of the environmental and social impact from transferring and utilizing treated water from the Wadi Shuayb Plant for irrigation.
7. Elaborate assessment of options for implementing Nature-based Solutions for improving the Wadi Shuayb 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 energy requirements to operate the Wadi Shuayb Plant, including costs, bills of quantities and designs, as needed
9. Conduct study on currently onsite irrigated crops, including the 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, including from medicinal plants, 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 Wadi Shuayb Plant, and ability and willingness to develop more contracts between WAJ and potential new farmers.
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 Wadi Shuayb 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 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 Wadi Shuayb 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 Jordan 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.

<u>Work experience (Required)</u>

- 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)
Required qualifications			
Minimum ten (10) years of experience on wastewater treatment and reuse for irrigation purposes in MENA	35%		
Minimum five (5) years of experience on solar energy applications for water management	15%		
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.	30%		
Desired qualifications			
Minimum five (5) years of experience on Water-Energy-Food-Ecosystems Nexus in MENA	10%		
Minimum five (5) years of experience on entrepreneurship or employability related to sustainable agriculture	10%		
Total	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:

Bi = w1 x c1 + w2 x c2 +……

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:

$\Lambda i = 0,9* (Bi/Bmax) + 0,1 * (Kmin/Ki)$.

Where:

- Bmax: the max score received by the best of the technical offers received
- Bi: the score of the technical offer
- Kmin: The cost of the financial offer with the minimum price offered.
- Ki: The cost of the financial offer

The most advantageous offer is the one with the greater value of Λ.

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