

## Terms of Reference

**For the Supply of Two (2) Portable Plant Canopy Imagers and Delivery of the Instruments at  
Al-Balqa Applied University, Jordan and An-Najah National University, Palestine**

**In the framework of  
MENA Water Matchmaker 2 Project**

**Funded by UfM / Sida**

### **1. Background and context**

#### 1.1. The 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 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.

Water-food-energy connections lie at the heart of sustainable, economic and environmental development and protection. The demand for all three resources continues to grow for various reasons: a growing population, ongoing population movements from farms to cities, rising incomes, increased desire to spend those incomes on energy and water intensive goods/varying diets, international trade, urbanization and climate change. The WEFE Nexus approach uses context-specific solutions based on different levels of interventions to achieve long-term economic, environmental and social goals.

In the core of the MENA Water Matchmaker 2 project is the implementation of two demonstrable 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.

## 2. Description of the Assignment

### 2.1. Objective

The objective of the assignment is:

- The supply of two (2) portable canopy imagers with the specifications described in Chapter 3 of the present ToR.
- The delivery of the equipment at:
  1. Al-Balqa Applied University, Jordan
  2. An-Najah National University, Palestine

The exact recipients will be announced after the award of the contract.

The delivery of the instruments will take place in the presence of the GWP-Med representative who will sign the respective good delivery note.

### 2.2 Deliverables:

A/A	Deliverables
1	The supply of two (2) portable canopy imagers with the specifications described in Chapter 3 of the present ToR (including operation manual and all the necessary materials for the instruments to be ready to use).
2	The delivery of the equipment at: <ul style="list-style-type: none"> <li>• Al-Balqa Applied University, Jordan</li> <li>• An-Najah National University, Palestine</li> </ul>

The applicant must provide the data sheet and the operation & maintenance manual of the offered equipment in their offer.

## 3. Technical Specifications of the Canopy Imagers

The Portable Canopy Imager should adopt the following features:

### Required:

- Self-levelling digital camera that provides 150° field-of-view image of the plant canopy.
- To measure photosynthetically active radiation (PAR) and calculates sunflecks using 24 photodiodes.
- To provide non-destructive calculation of leaf area index (LAI) using image PAR sensors.
- To calculate LAI of plant canopies across multiple size classes.
  - To have adjustable camera lens focus for varying canopy heights.
- Image and data visible in the field and saved for further analysis.

- Full, user-selectable range of zenith and azimuth angles, digitally applied.
- User selectable and literature-based thresholding methods.
- Performs measurements under any sky condition.

The Portable Canopy Imager should adopt the following technical specifications:

PAR (range accuracy)	:	0 – 2,500 umol m2s / 5 umol m2s
Lens	:	Equidistant wide-angle lens
	:	Self-levelling hemispherical lens
Fish-eye lens angle	:	150°
Resolution	:	5 megapixels or more
Measuring time	:	< 1 second
Interface (option 1)	:	7” capacitive touch screen
	:	USB port
Interface (option 2)	:	Handheld computer
	:	USB port
Operating temperature	:	5 – 50 °C
Weight	:	1 – 2 kg (max)
Global Positioning System feature.		
Internal compass for standardizing measurements across locations.		
Neutral Density Filters to optimize images across varying light conditions.		

Country of Origin:

United States of America, Europe, Japan

#### 4. Duration of the Contract

The overall duration of the contract will be up to the 31<sup>st</sup> of August 2022.

#### 5. Contract Price and Schedule of Payments

The maximum fee for this assignment is **42,000 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 service, **Including VAT**.

100% after the completion of the service (including delivery).

#### 6. Terms and Conditions

Language

The language of this procedure, the tender documents and the offers is English. Any documentation (certificates, etc) submitted in any other language should be accompanied by a translation in English, certified by a lawyer or public authority.

## **7. Monitoring and Progress Controls**

Dr. Ghazi Abu Rumman, GWP-Med Senior Programme Officer and Head of the GWP-Med operations in Amman, will be providing oversight and guidance from the side of the Project Team.

Services will be rendered and will be considered completed upon approval of the deliverables by the Senior Programme Officer and the GWP-MED Executive Secretary Mr. Vangelis Constantianos.

## **8. Awarding Criterion and Evaluation process**

The Award criterion is the most economically advantageous tender on the basis of the lowest price.