International Labour Organization

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Terms of Reference for service provider to develop a tool focused on energy efficiency and quantification of energy demand, specifically tailored for pre-designing solar PV systems

1. BACKGROUND AND OVERALL OBJECTIVE

Lebanon has been suffering from a severe financial and economic crisis with long-lasting effects on its economy and its people. With the drastic devaluation of the currency, prices of imported items have risen sharply, and households are now increasingly struggling to cover food needs. The combined effects of the crises have resulted in unprecedented levels of unemployment and pushed both the Lebanese population and the approximately 1.5 million Syrian refugees further into poverty. The Lebanese agriculture sector remains one of few sectors where both Syrian refugees and vulnerable Lebanese host communities can legally find employment as well as vulnerable Lebanese host communities but has been particularly hard-hit by the ongoing crises.

The International Labour Organization (ILO) is therefore implementing a project aimed at 'Promoting Decent Jobs for Lebanese host communities and Syrian refugees' funded by the Swedish International Development Agency (Sida). The project focuses on the agriculture and agri-food sector as a key sector for the livelihoods of both Lebanese and Syrian vulnerable population groups and in particular women of both communities and aim to develop specific agricultural and agri-food value chains with potential for decent job creation that will benefit both groups.

The project makes use of the ILO's Approach to Inclusive Market Systems (AIMS)[1] to safeguard jobs and livelihoods of vulnerable Lebanese and Syrian communities threatened by the crises and encourage decent job creation for both groups in sectors with potential.

Within one component, the project focuses on developing an adequate offer of a solar energy system and promoting the adoption of this system to farms' needs. This intervention will provide stable and affordable electricity access to farmers and agri-businesses while supporting solar energy system suppliers in reaching rural areas with systems adapted to the agriculture sector.

2. OBJECTIVES AND SCOPE OF WORK

Between 2020 and 2022, Lebanon faced a dual electricity crisis triggered by diesel shortages and subsidy removal, exacerbating the country's economic challenges. This dual crisis not only strained the power generation capacity but also inflicted severe repercussions on the agricultural sector. Fuel scarcity disrupted agricultural operations, leading to a decrease in productivity and an increase in operational costs. Farms and businesses, such as cold storage facilities and agri-businesses, halted operations due to energy shortages, while transportation costs surged, resulting in losses of perishable goods.

Despite the clear demand for energy across various agricultural operations such as irrigation, post-harvest processing including cold storages, and the running of farming infrastructures, the transition to solar energy faces significant challenges, including the high costs of installation and maintenance, inconsistent quality of service from small-scale installers and the reliance on informal sources for information, among others. These

[1] More information on AIMS on www.ilo.org/aims

barriers highlight the complexity of shifting agriculture towards sustainable energy solutions and the critical need for specific strategies that tackle financial, informational, and regulatory challenges to enable wider adoption of solar technology. An understanding of the diverse energy needs within the sector is crucial, as solar energy holds considerable potential to address the demands of specifically post-harvest activities effectively, making targeted interventions essential for facilitating its broader solar integration into the agriculture sector.

During the preliminary research and the key informant interviews phase, stakeholders disclosed several overlooked topics that remained untapped in the energy sector:

1- Energy efficiency audits: These assessments are crucial for analysing the energy consumption patterns and efficiency in a building, facility, or system. However, despite their potential benefits, the implementation of such audits, even at basic levels (levels 1 and 2), remains prohibitively expensive for small businesses and the agriculture sector. Moreover, there exists a significant gap in the adoption of these audits among small businesses due to a lack of established culture and willingness to invest in them, further impeding their dissemination and proper implementation.

2- Dissemination of accurate information on solar PV systems: Consumers interested in solar PV technology require expert guidance regarding the appropriate sizing of systems based on their energy demands. Typically, this information is provided by distributors, technicians, or suppliers. However, due to the high demand for solar PV systems, information dissemination primarily benefits larger businesses, leaving farmers and agri-businesses with limited access to essential information.

3- Finding serious and reliable customers: Solar energy companies have noted considerable challenges in servicing customers within the agriculture sector, largely attributed to the lengthy process of screening these clients. This extended vetting period often leads to a low success rate in converting initial inquiries into completed sales as it takes time and resources to filter serious customers. Therefore, these companies have raised concerns that this not only slows down their operations but also affects their productivity and profitability, as they invest significant resources in such processes that frequently fail to come to execution.

To address these challenges, the project is exploring a pilot intervention aimed at addressing the scarcity of energy-efficient information, the misinformation prevalent among rural consumers regarding solar PV systems and the lengthy and costly process finding reliable and serious customers.

More precisely, the project is exploring the development of a user-driven tool centred on energy efficiency recommendations and quantification of energy demand, specifically tailored for pre-designing solar PV systems. This tool will aim to help farmers and agri-businesses determine the appropriate size of solar PV systems needed for their operations and estimate the payback period, as well as receiving guidance and recommendations on how to implement energy efficient measures.

By providing this information, this assignment has a threefold approach aiming to:

- Facilitate decision-making and promote the potential adoption of solar energy systems in the agriculture sector.
- Lower barriers of information on practical energy efficiency recommendations to reduce energy consumption and therefore energy related costs of farms.
- Support solar energy suppliers reach serious customers who are willing to invest in solar energy systems, specifically in rural areas.

Special attention will be given to exploring the specific needs and technologies of the agriculture sector overall including for example, cold storages powered by diesel, as preliminary assessments indicated that

this area is currently underexplored by market actors, with farmers, cooperatives, and other agriculture actors heavily dependent on costly diesel generators to perform agriculture activities and run their facilities.

However, achieving this goal would entail conducting preliminary research into various aspects such as the energy needs in agriculture, the types of machinery used, their energy consumption pattern, among others.

Following this groundwork and based on its initial findings, a user-centric tool will be developed combining energy efficiency recommendations with pre-designing solar PV systems for agriculture-related energy needs.

For that, the overarching goal of this consultancy is to support the development of the technical specifications of the tool along with the offline content (paper prototype of the tool).

Below are key related activities related to this consultancy:

Step 1: Conduct mapping and initial concept of tool

- Conduct desk research and mapping of available tools in Lebanon or relevant regions that can serve as reference points.
- Develop workplan of the assignment and initial plan/concept on the offline design of the tool.

Step 2: Conduct field assessments to gather information to feed into the offline tool development

- Conduct on-site assessments with farmers, agri-business owners, and relevant stakeholders to understand their energy requirements and consumption patterns. These assessments would serve as case studies for collecting data on energy challenges, needs and consumption trends while contributing to the development of the tool.
- Engage with industry experts and research institutions to gather additional insights and validate findings.
- Conduct KIIs, FGDs or roundtable with various actors (PV suppliers and importers, wholesalers, agri-businesses owners, cooperatives, etc.) and farmers to validate the idea/proposal and needs, and co-design tool.
- Support the ILO in conducting mapping of actors who might be potential owners/hosts of the tool and are interested and willing to lead and operate the tool while ensuring its sustainability and its dissemination to end consumers.
- Once the mapping out of actors is completed, form an advisory committee consisted of the longlisted potential owners/hosts of the tool to ensure that this committee participates in the development of the concept/tool by providing feedback and recommendations and to familiarize with its concept.
- Document research findings and insights in a study, including recommendations for the development of the tool, highlighting areas to be incorporated to enhance its practicality and user-friendliness.

Step 3: Develop the technical specifications of the tool along with an initial offline content (paper prototype of the tool)

- Develop the technical specifications of the tool along with a draft or an initial offline content (paper prototype of the tool). This draft / initial offline content (paper prototype of the tool) should include the purpose of the tool, for whom it is designated, the user preferences, the tool functionalities, etc.
- The development of specifications along with the initial offline content (paper prototype) of the tool will be based on the outcomes of step 1 and 2 of the consultancy, targeting 1) the self-assessment on energy efficiency providing general recommendations and 2) the quantification of energy demand, specifically tailored for pre-designing solar PV systems with a payback calculator providing specific recommendations for the agriculture sector.

- The service provider, and in order to complete the process of the offline tool development (technical specifications and initial offline content/paper prototype), should:

- Consult with the advisory committee to ensure a proper development of the tool by receiving proper feedback and recommendations.
- Consult with developers and/or IT experts/firms (that develops mobile apps) to deliver "feasible" concepts and proposals for development with estimated costs.

- Participate in presentation with actors to introduce the tool and its concept.

3. DELIVERABLES

Activities	Deliverable	Timeline (tentative)
Step 1: Conduct mapping and initial concept of tool • Conduct desk research and mapping of available tools in Lebanon or relevant regions that can serve as reference points. • Develop workplan of the assignment and initial plan/concept on the design of the tool.	**Deliverable 1** • Workplan with detailed timeline for the assignment and initial plan/concept on the design of the tool	13 - 20 May 2024
Step 2: Conduct field assessments to gather information to feed into the tool development • Conduct on-site assessments with farmers, agri-business owners, and relevant stakeholders to understand their energy requirements and consumption patterns. These assessments would serve as case studies for collecting data on energy challenges, needs and consumption trends while contributing to the development of the tool. • Engage with industry experts and research institutions to gather additional insights and validate findings. • Conduct KIIs, FGDs or roundtable with various actors (PV suppliers and importers, wholesalers, agri-businesses owners, cooperatives, etc.) and farmers to validate the idea/proposal and needs, and co-design tool. • Support the ILO in conducting mapping of actors who might be potential owners/hosts of the tool and are interested and willing to lead and operate the tool while ensuring its sustainability and its dissemination to end consumers. • Once the mapping out of actors is completed, form an advisory committee consisted of the longlisted potential owners/hosts of the tool to ensure that this committee participates in the development of the concept/tool by	**Deliverable 2** • A progress report containing all information gathered from field assessments, stakeholders' consultation with specific proposal on how to develop the tool. The report should also include all analysed data on identifying key areas of energy consumptions. The raw data obtained through the assessments should also be included.	21 May – 7 June 2024

providing feedback and recommendations and to familiarize with its concept. • Document research findings and insights in a study, including recommendations for the development of the tool, highlighting areas to be incorporated to enhance its practicality and user-friendliness.		
Step 3: Develop the technical specifications of the tool along with an initial offline content (paper prototype of the tool) • Develop the technical specifications of the tool along with a draft or an initial offline content (paper prototype of the tool). This draft / initial offline content (paper prototype of the tool) should include the purpose of the tool, for whom it is designated, the user preferences, the tool functionalities, etc. • The development of specifications along with the initial offline content (paper prototype) of the tool will be based on the outcomes of step 1 and 2 of the consultancy, targeting 1) the self-assessment on energy efficiency providing general recommendations and 2) the quantification of energy demand, specifically tailored for pre-designing solar PV systems with a payback calculator providing specific recommendations for the agriculture sector. • The service provider, and in order to complete the process of the offline tool development (technical specifications and initial offline content/paper prototype), should: o Consult with the advisory committee to ensure a proper development of the tool by receiving proper feedback and recommendations. o Consult with developers and/or IT experts/firms (that develops mobile apps) to deliver "feasible" concepts and proposals for development with estimated costs. • Participate in presentation with actors to introduce the tool and its concept.	**Deliverable 3** • The technical specification of the tool along with the draft/initial offline content (paper prototype of the tool) to be handed over to ILO (with specific guidance on how to operationalize at a later stage in coordination with developers and/or IT experts)	8 June – 1 July 2024

4. TIMELINE

The work is tentatively expected to start on 13 May 2024 and continue until 1 July 2024.

- All the produced documents will have to be submitted in English. The service provider will also submit to the ILO the following materials:

    1) Electronic copies of all data sets

    2) All quantitative and qualitative data (completed questionnaires, recorded interviews, focus groups, etc.)

    3) Any other documents that will be used or collected in the course of the consultancy

5. PAYMENT SCHEDULE

1. **First payment** covering 30% of the full payment, tentatively due by 20 May 2024 upon satisfactory delivery and project approval on the following deliverable:
    - **Deliverable 1**: Workplan with detailed timeline for the assignment and initial plan/concept on the design of the tool

2. **Second and final payment** covering 70% of the full payment, tentatively due by 1 July 2024 upon satisfactory delivery and project approval on the following deliverables:
    - **Deliverable 2 (to be submitted by 7 June):** A progress report containing all information gathered from field assessments, stakeholders' consultation with specific proposal on how to develop the tool. The report should also include all analyzed data on identifying key areas of energy consumptions. The raw data obtained through the assessments should also be included.
    - **Deliverable 3 (to be submitted by 1 July):** The technical specification of the tool along with the draft/initial offline content (paper prototype of the tool) to be handed over to ILO (with specific guidance on how to operationalize at a later stage in coordination with developers and/or IT experts)

All payments are in fresh USD via international bank transfer. A USD account should be available in the name of the service provider for payment transfers.

6. FOCAL POINT (s) AT ILO

The service provider will coordinate with the Project Technical Officer, and with the backstopping of the relevant technical departments involved in the ILO Beirut Office and ILO Headquarters

7. REQUIRED QUALIFICATIONs AND APPLICATION

This call is for service providers, specifically: registered companies, registered institutions, organizations, sole proprietorship with a legal identity.

Individual consultants are not eligible to apply.

To apply for this assignment the service provider should possess the following qualifications:

- Demonstrated experience and knowledge related to the energy sector, including demonstrated experience in energy efficiency audits and assessments.
- At least 5 years of experience in the solar energy sector, including in the design of solar PV systems and solar energy innovation.
- Proven track record of at least two successfully implemented projects related to solar energy applied and if possible, specifically to the agriculture sector, in the past five years.
- Previous experience or familiarity with development of energy offline content of tools / offline prototype of tools is desirable.
- Excellent research and data analysis skills, including proficiency in both qualitative and quantitative research methods.
- The team of consultants in charge of this assignment should have educational background (BA or advanced degree) in a relevant field such as Engineering, Environmental Science, Environmental and Energy Management, or a related discipline.

Application process and Deadline:

Interested service providers are invited to submit a brief proposal of how the assignment will be implemented along with the CVs of the team members, financial proposal and a sample of one previous assignment in the email.

Proposals should be sent to ayalal@ilo.org, obeid@ilo.org and chaya@ilo.org by a maximum of **7 May 2024, 2:00 pm Beirut time.**

Any question should be referred to obeid@ilo.org by 4 May 2024 the latest.

Late applications will not be considered.