TERMS OF REFERENCE FOR INDIVIDUAL CONSULTANTS AND CONTRACTORS

Title: National Consultant for Solarization of Water Supply Systems	**Funding Code:** **SC250356 (ADB) & SM250314 (GoJ)**	**Type of engagement** ☒ Consultant	**Duty Station:** Yangon (Remote/ home-based) with field travels

Purpose of Activity/Assignment:

On 28 March 2025, a powerful 7.7-magnitude earthquake struck central Myanmar, severely impacting the cities of Mandalay, Sagaing, Shan, Bago and Naypyitaw. This was followed by a 6.4-magnitude aftershock, compounding the devastation. The earthquake occurred amid an ongoing humanitarian crisis, with political conflict and armed clashes continuing in several regions, including those affected by the disaster. As a result, communities in these areas face a dual burden—displacement, infrastructure damage, and service disruption caused by both natural disaster and conflict. The compounded crises have significantly increased the vulnerability of affected populations, particularly in terms of access to essential services such as water, sanitation, and hygiene (WASH).

Access to safe water and adequate sanitation remains a critical challenge in Myanmar, especially in conflict-affected and disaster-prone regions. According to recent sectoral assessments and humanitarian reports, many communities lack reliable water supply systems, functional sanitation facilities, and access to hygiene materials. Learning centers and healthcare facilities are particularly affected, with damaged infrastructure and limited resources to maintain safe WASH conditions. The situation is further exacerbated by infrastructure disruption, economic loss and limited resources to respond effectively. These gaps pose serious public health risks, including increased vulnerability to waterborne diseases and poor hygiene practices among children and families.

In response to the urgent needs, UNICEF, in collaboration with counterparts and implementing partners, is leading WASH recovery and reconstruction efforts in earthquake-affected regions. The program aims to restore and improve access to safe water, sanitation, and hygiene services through a multi-sectoral approach. Key interventions include the rehabilitation and reconstruction of water supply systems, installation of climate-resilient sanitation facilities, promotion of hygiene behavior change through community engagement, and restoration of WASH services in communities, learning and healthcare centers. These efforts are aligned with UNICEF's broader humanitarian mandate to support resilient and inclusive recovery for vulnerable populations in Myanmar.

To restore WASH services in earthquake-affected regions, UNICEF is prioritizing **solar-powered** solutions to ensure resilient, sustainable, and cost-effective energy for water supply and sanitation facilities. Solar energy systems will enable continuous operation of boreholes, pumping stations, and treatment units, while reducing dependency on unstable grid electricity or costly fuel-based generators.

The consultant will provide **technical expertise in solar energy systems** to support UNICEF's WASH recovery program. This includes design, installation oversight, testing, and capacity building for local operators to ensure long-term functionality and sustainability of solar-powered WASH infrastructure.

Scope of Work:

The consultant will be responsible for delivering specialized solar technical services across earthquake-affected areas. Tasks include:

1. **Assessment and Planning**
    - Conduct site surveys of damaged and operational WASH facilities to determine solar energy requirements (load analysis, water demand, pump sizing).
    - Review existing infrastructure and recommend integration of solar systems with water supply facilities.
    - Prepare an inception report outlining methodology, work plan, and technical specifications.
2. **System Design and Specification**
    - Develop detailed designs for solar-powered pumping and treatment systems, including:
        - PV array sizing and configuration.

- Pump selection (submersible, surface, hybrid).
- Type of VFDs (variable frequency drive) and capacity
- Control systems and safety mechanisms.

- Ensure designs meet international standards (International Electrotechnical Commission (IEC), Sphere, UNICEF technical guidelines) and are climate resilient.

3. **Installation, Supervision & commissioning**
   - Oversee installation of solar systems at selected sites in collaboration with contractors and local partners.
   - Conduct quality assurance checks on materials, workmanship, and compliance with specifications.
   - Test system functionality, efficiency, and safety prior to commissioning.
   - Commission the system and monitor performance over at least 2 weeks after commissioning to rectify any defects/ challenges
4. **Training & Capacity Building**
   - Train local technicians, community committees, and facility managers on operation, routine maintenance, and troubleshooting of solar systems.
   - Develop user manuals and maintenance checklists tailored to local capacity.
5. **Monitoring & Reporting**
   - Document installation processes, challenges, and lessons learned.
   - Provide periodic progress updates to UNICEF.
   - Submit a final technical report including:
     - System designs and installation records.
     - Performance testing results.
     - Recommendations for scaling solar-powered WASH solutions.

The consultant will undertake field missions across selected project sites. Planned travel locations include Sagaing, Mandalay, Nay Pyi Taw, Shan, Bago and Kayin with an estimated travel of 135 days over the assignment period.

Location	Estimated frequency	Duration of stay (days)	Total days
Sagaing	8	3	24
Mandalay	10	3	30
Nay Pyi Taw	10	3	30
Shan	10	3	30
Bago	5	3	15
Kayin	2	3	6
		Total	135 days

Child Safeguarding

Is this project/assignment considered as "Elevated Risk Role" from a child safeguarding perspective?

☐ YES ☒ NO If YES, check all that apply:

Direct contact role ☐ YES ☒ NO

If yes, please indicate the number of hours/months of direct interpersonal contact with children, or work in their immediately physical proximity, with limited supervision by a more senior member of personnel:

Child data role ☐ YES ☒ NO

If yes, please indicate the number of hours/months of manipulating or transmitting personal-identifiable information of children (name, national ID, location data, photos):

More information is available in the Child Safeguarding SharePoint and Child Safeguarding FAQs and Updates

Supervisor:	**Start Date:**	**End Date:**
Direct supervisor: WASH Officer (Water supply), Yangon Office with support and guidance from WASH Specialist (WASH in Institutions).	1st January 2026	30th November 2026

Deliverables and Payment Terms

Work Assignments Overview	Deliverables/ Outputs	Timeline
Inception Phase The consultant will start with an inception phase to align objectives and methodology. Key tasks include: ▪ Participate in inception meeting with UNICEF WASH team and partners. ▪ Review relevant documents (facility assessments, energy demand data, WASH infrastructure reports). ▪ Conduct preliminary site scoping and prepare an Inception Report detailing: o Methodology for solar system assessment and design. o Work plan, timeline, and site selection criteria. o Technical approach for integrating solar energy into WASH facilities. ▪ Present draft and final inception report to UNICEF for validation.	**Inception Report** ▪ Methodology for solar system assessment and design. ▪ Work plan, timeline, and site selection criteria. ▪ Technical approach for integrating solar energy into WASH facilities. Presentation of inception findings and validation with UNICEF.	30 Jan 2026
Site-Level Deliverables For each of the 40 targeted sites: ▪ Undertake detailed site assessment, estimate energy demand, develop solarization design	**Detailed site-specific assessment and design report each for 40 sites** ▪ Site specific solarisation design and drawings including array	February 2026 to November 2026

including array layout/ orientation; electrical design including specifications including wiring diagrams, control units and fittings. ▪ Undertake pre-installation verification including site readiness, validate array layout/ orientation, mounting structure integrity and check equipment completeness and specifications. ▪ Electrical and mechanical installation supervision including PV modules, mounting, inverter/ VFD /charge controller (as applicable), cabling, earthing and lightning protection; ensure correct terminations, labeling, and workmanship to standards. ▪ Testing and commissioning: Perform necessary pre-commissioning tests run functional performance tests, commission the system, document results. Train operators and community committee on the operation and maintenance of the system	layout/ orientation, energy demand, and wiring diagram **Installation Supervision, Monitoring & Completion Report each for 40 sites** ▪ Completed pre-installation readiness checklist ▪ Solar PV system and electrical installed to specification with as-built updates ▪ Commissioning and test documentation package finalized (test results, configuration settings, performance/ protection checks) **Site-Specific hand-over and practical manual (for operators and community committees) each for 40 sites** ▪ System overview and specifications. ▪ Routine maintenance procedures. ▪ Troubleshooting guide tailored to installed components. ▪ Training records	
Final Reporting and completion phase ▪ Overall compilation of the tasks performed during the assignment ▪ Compile all site-specific documentation including design, installation, commissioning reports and handover documents.	Overall Report covering completed activities, remaining actives to be supported, technical advice for future projects, experience and status of the community before and after provision of systems.	November 2026

Payment Structure

Payments will be based on approved deliverables, not monthly reporting. Each deliverable has a unit cost – Inception report, 40 site specific deliverables, and final report. The number of site visits will depend on programmatic needs, and payment will be made based on the actual number of approved site visits and completion of related deliverables as well as inception and final reports.

Minimum Qualifications required*:	**Knowledge/Expertise/Skills required *:**
☒ Bachelors ☐ Masters ☐ PhD ☒ Other	• **Technical Skills**

- **Education**
  - Diploma or Bachelor's degree in Electrical Engineering, Renewable Energy, Solar Technology, or a closely related field.
  - Additional certifications in solar PV system design, installation, or maintenance will be considered an asset.
- **Professional Experience**
  - At least 5 years of proven experience in solar energy system design, installation, and maintenance, preferably in humanitarian or development contexts.
  - Demonstrated expertise in solar-powered water pumping systems, including load analysis, pump sizing, and PV array configuration.
  - Experience supervising contractors and ensuring compliance with international technical standards and safety protocols.
  - Prior work in conflict-affected or disaster-prone settings is highly desirable.
  - Strong knowledge of photovoltaic (PV) systems, inverters, controllers, and storage solutions.
  - Ability to conduct site surveys, energy demand assessments, and system performance testing.
  - Familiarity with international standards (IEC, Sphere, UNICEF technical guidelines) and climate-resilient design principles.
  - Proficiency in preparing technical drawings, specifications, and user manuals.
- **Soft Skills & Competencies**
  - Excellent communication and training skills to build local capacity for system operation and maintenance.
  - Strong problem-solving abilities and adaptability in field conditions.
  - Ability to work independently while coordinating closely with UNICEF staff and partners.
  - Commitment to UNICEF's values, including child protection, gender equality, and inclusion.
- **Language**
  - Fluency in English (written and spoken).
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Evaluation Criteria (This will be used for the Selection Report (for clarification see Guidance)

A) Technical Evaluation (e.g. maximum 75 Points), B) Financial Evaluation (e.g. maximum of 25 Points)

A) Technical evaluation (75%)

- Relevant Academic Background (10%)
  - Diploma/ Bachelor of Engineering (Electrical Power), Renewable Energy, Solar Technology, or related field.
  - Additional certifications in solar PV design/installation are an asset.
- Professional Experience (25%)
  - Minimum 5 years of proven experience in solar energy system design, installation, and maintenance.
  - Demonstrated expertise in solar-powered water pumping systems and integration with WASH facilities.
  - Experience supervising contractors and ensuring compliance with international standards (IEC, Sphere, UNICEF guidelines).
  - Prior work in humanitarian or disaster-prone contexts is highly desirable.
- Technical Approach & Methodology (25%)

- Quality and clarity of proposed methodology for site surveys, system design, installation supervision, and training.
- Practicality and feasibility of the work plan and timeline.
- Consideration of climate resilience, safety, and sustainability in the proposed approach.

- Capacity Building & Knowledge Transfer (10%)
  - Demonstrated ability to train local technicians and community committees.
  - Development of user manuals, maintenance checklists, and training materials.
- Language & Communication (5%)
  - Fluency in English (written and spoken).
  - Knowledge of Myanmar language(s) is an asset for community engagement.

B) Financial evaluation (25%)

Criteria	Points	Total costs (in USD$)
Sub-total	**25**	The maximum score assigned to the price proposal (i.e., 25 points) will be allocated to the lowest priced proposal. All other price proposals receive scores in inverse order and proportional to the lowest price (i.e. double the price would receive half the score).
Total	**100**	**Maximum 100**