South Sudan Red Cross

The Netherlands Red Cross

Terms of Reference

Solar Water Pumping; Installation, Operation and Maintenance Training

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1. Background

South Sudan Red Cross (SSRC) is implementing a three-year-long DG ECHO funded project under the Pilot Programmatic Partnership (PPP) framework under the title *'Accelerating Local Action in Humanitarian and Health Crises'*. This project, running from 1st May 2022 to March 2025, targets Aweil in Northern Bahr El Ghazal State and Old Fangak in Jonglei State locations. The Danish Red Cross (DRC) are the consortium lead in South Sudan while the Netherlands Red Cross (NLRC) provides technical support on Pillar 2, '*Epidemic, Pandemic Preparedness & Response*'.

Under the NLRC supported Pillar 2 of the project, SSRC has constructed 6 solar powered mini-water yards, with one addition system planned for early 2025. Each of the solar water pumping units is composed of: Crystalline solar panels (8 panels of 200W each), a Submersible pump installation, a remote water pumping monitoring system, a 6m high steel elevated water tower, two 5,000-liter PE water reservoirs, pipe networks including two tap stands and an in-line chlorinator.

In the project's final year, SSRC seeks to implement a robust operation and maintenance framework. This includes:

- Provision of seed stocks for fast-moving spares parts and tools.
- Prepare/develop solar water system inspection, monitoring and routine maintenance plan
- Capacity building for troubleshooting, repair, and installation.
- Development of market linkages for replenishment supplies.

To enhance technical capacity SSRC is seeking external expertise to conduct comprehensive training on the installation, operation, and maintenance of solar-powered water pumping systems.

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2. Objectives

The training aims to build the capacity of stakeholders, including SSRC staff, the State Department of Water, and County Water Departments. This will ensure participants can effectively manage solar-powered water systems. The objectives include:

1. **Technical Skills Development:**
    - Equip participants with the skills to assemble, install, and maintain solar-powered water pumping systems.
    - Provide hands-on experience in troubleshooting and repairing system components.
2. **Operational Understanding:**
    - Enhance understanding of energy fundamentals such as electrical circuits and PV panel configurations.

- Develop knowledge of submersible pump operations, including sizing, assembly, and maintenance schedules.

3. **System Sustainability:**
   - Foster capacity for designing and implementing maintenance schedules.
   - Strengthen linkages to suppliers and service providers for spare parts and system upgrades.

Specific deliverables shall include:

- Five days hands on training covering
  - Basics of solar water pumping systems
  - Field visits to installed solar water pumping units for practical sessions, including dismantling, installation and troubleshooting.
  - Pretest and Post test, including training report for the participants
- Recommendations on components of operation and maintenance toolkit to facilitate procurement of the same for the water departments, SSRC and county departments.
- Development of maintenance schedules and resource lists for system components.

3. Outputs

The training should cover in addition to other topics deemed fit:

- Overall set-up and assembly for solar powered water pumping systems and its components
- Electrical energy basics to include circuit measurements, different types of circuits (serial, Parallel, Mixed)
- PV panel connections; to include introduction, serial and parallel connections of PV panels, maximum power point tracking.
- Reticulation systems for the solar powered systems; installations, troubleshooting mechanisms, the distribution and storage
- Solar-powered water pumps; submersible pumps sizing, pump curves, assembly and dissembling of submersible pumps, borehole casings, mechanical seals, regular maintenance schedules, suppliers/ stock lists.
- Solar charge controllers; to cover the internal circuits, maximum power point tracking, installation and operation.
- Shading to include declination of the sun, forms of shading, cell shading, panel shading
- DC safety (overcurrent protection, arc flashes) and Motor drives DC, AC to cover startup methods and motor protection
- System performance to consider the life cycle, cost calculations and system hydraulics
- Recommended toolkits assembly list for overall components of solar powered water yards; PV panels installation and troubleshooting, Submersible pumps trouble shooting, reticulation plumbing works
- Develop an operation and maintenance schedule for the overall components of solar powered water yards

4. Activities & Itinerary

When	What	Where	Who
Day 1 – Monday	Briefings/ Training preparations	Juba	SSRC/NLRC
Day 2 – Tuesday	Travel Juba to Aweil	Juba - Aweil	SSRC/NLRC
Day 3 – Wednesday	Training in Aweil - Theory	Aweil	Trainers/ Facilitators

Day 4 – Thursday	Training in Aweil - Theory	Aweil	Trainers/ Facilitators
Day 5 – Friday	Practical Training in Field	Aweil	Trainers/ Facilitators
Day 6 – Saturday	Practical Training in Field	Aweil	Trainers/ Facilitators
Day 7 – Sunday	Practical Training in Field	Aweil	Trainers/ Facilitators
Day 8 – Monday	Travel Aweil to Juba	Aweil - Juba	SSRC/NLRC

5. Who will be involved?

People who will be involved:

- Trainers/ Facilitators; 2 people from reputable institutions
- Field teams; State Water Department, County Water Department, SSRC branch WASH staff
- HQ team; NLRC delegate, SSRC HQ WASH staff
- Total participants/ trainees 20

6. Other Details; Changes to the TOR and Submission of Expression of interest

Changes to the TOR

The trainers/facilitators may propose changes to the TOR where they deem fit. However, the changes have to be discussed both with SSRC/NLRC before they are adopted as part of the TOR/ contract. This TOR (including any changes made), thereafter, shall form part of the service contract agreement upon completion of the competitive selection process.

Submission of Expression of Interest, EOI

South Sudan Red Cross, requests submissions from the firms/ reputable institutions, 3-4 page technical and financial proposals as per below guideline.

Technical Proposal

- Provide understanding of tasks as indicated in the TOR.
- Provide a clear time frame, and tentative workplan for undertaking the training.
- Share the Firm or institution profile/ documentation of previous work done as relates to Solar PV operation and maintenance trainings in recent two years.
- Attach relevant documentation as a registered institution/ firm.
- Staffing capacity: provide details especially for the Two trainers/ facilitators to be engaged on the assignment including recent CV.
- Confirm availability to start the tasks as per the TOR as from 1st February 2025.

Financial Proposal

Financial proposal shall form part of the contract agreement/ final signed by both the South Sudan Red Cross and the training institution.

The financial proposal should include all costs (professional fees, external flights where needed, transportation, accommodation, training report, etc.) necessary for the trainers/facilitators to effectively complete the tasks as per the TOR.
Indicate total cost in USD for the task. The table below is as a guide.

#	Description of costs	Unit	Rate	Amount

1.	Preparatory Costs			
2.	Flights (only for international flights), including visas if applicable			
3.	Professional training costs – 5 days, 20 participants			
4.	Training materials – Handouts, practical training items (specify)			
5.	Others – please specify			
	Total			

NB:

- **SSRC will facilitate and cater for all in-country travel costs; airport transfers, UNHAS flight between Aweil and Juba, Aweil field level travels, training venue.**
- **SSRC will cater for accommodation costs, both in Juba and Aweil, within the specified timeframe above.**

Submission

The deadline for submitting EOI will be 15th January 2025. Sealed envelopes should be addressed and delivered to SSRC offices, Tongping Area, Ministries Block, Juba, South Sudan. Soft copies of the application are acceptable and should be sent to vacancy@ssdredcross.org or tender@ssdredcross.org.
Please include the name and telephone number of the contact person for the application.

Interviews may form part of the selection process, if necessary, after analysis of the technical and financial proposals.

For any questions, clarifications or further information regarding the TOR, please contact: David Mitu email: david.mitu@ssdredcross.org

South Sudan Red Cross Society * National Headquarters *