

Terms of Reference (ToR)

Design and Installation of a Solar Energy System for Magareef Water Station wad Alheihew locality – Kassala State, Sudan

Target Location

Magareef Water Station and Associated Infrastructure (serving Villages 10, and 11)

Program

Momentum Integrated Health & Resilience (MIHR)

Implementing Region

Kassala State, Sudan

Background

Access to sustainable and reliable energy remains a critical challenge in rural areas of Kassala State, Sudan. In water-dependent communities such as Villages 10 and 11, inconsistent electricity supply significantly disrupts water systems, affecting public health, livelihoods, and resilience.

The Magareef Water Station, which serves these villages, operates across multiple pumping segments. At present, operations are largely dependent on diesel generators and intermittent grid electricity. This approach is costly, environmentally unsustainable, and prone to interruptions.

In collaboration with the Drinking Water Corporation – Kassala State, and in line with CARE International in Sudan's objectives under the Momentum Integrated Health & Resilience (MIHR) program to strengthen climate-resilient infrastructure, this assignment seeks to design, supply, and install a comprehensive solar energy system to power the Magareef Water Station network, ensuring sustainable and uninterrupted water services.

Project Scope

The water station consists of four segments with significant pumping loads:

- **Albahar Pumping Station** – 80 kW
- **Hafier Pumping Station** – 30 kW
- **Magareef Main Station** – 90 kW
- **Village 10 Booster Station** – 20 kW

The water stations currently suffer from deteriorated infrastructure, relying on aging diesel generators and an unreliable grid, leading to frequent failures and water shortages. Key components urgently need rehabilitation.

Solarization and system upgrades will enhance reliability, reduce fuel costs, and ensure sustainable water access. The project includes system design, installation, commissioning, and training to support long-term operation and local capacity-building.

Objectives

- Provide continuous and reliable water supply to over 10,000 residents.
- Reduce dependency on diesel fuel and grid electricity.
- Strengthen community resilience with climate-smart infrastructure.
- Build local capacity in solar system operation and maintenance.

Expected Outcomes

- Fully operational solar systems are installed across all station segments.
- Reduced fuel costs and carbon emissions.
- Trained operators and technicians managing the system.
- A scalable model for rural water infrastructure in Sudan.

Implementation Approach

The assignment will include:

- **Technical Assessment** – site visits, energy audits, feasibility analysis.
- **System Design & Procurement** – solar PV systems sized to station loads.
- **Installation & Commissioning** – safe, quality-compliant execution.
- **Capacity Building** – training manuals and operator workshops.
- **Monitoring & Evaluation** – KPIs to track performance and impact.

Vendor Selection

A competitive process will select a qualified contractor based on:

- Proven expertise in solar PV design/installation.
- Relevant experience with rural/off-grid systems.
- Qualified engineers, technicians, and trainers.
- Compliance with **IEC standards**, Sudanese regulations, and CARE's procurement policies.

Timeline and Deliverables

Deliverable

Timeline

Inception Report

Within **2 weeks** of contract signing

Assessment & System Design Report

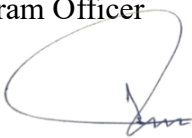
Within **4 weeks**

Installation Phase

6–8 weeks after design approval

Final Report & Handover

Upon completion of installation

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