Solar Lighting Guidance Document for Somalia IDP Sites

Objective

The purpose of this Solar Lighting Guidance Document is to present best practices for the provision of solar lighting interventions in IDP sites. Guidance that is outlined throughout this document includes information obtained from CCCM partner reports, desk review on solar lighting in IDP sites and discussions that occurred during a solar lighting technical meeting which took place on **Thursday November 4th 2021.** It is important to note that there is not a one size fits all solution to solar lighting in Somalia IDP sites. Both the installation of street solar lighting and the distribution of handheld solar lanterns present viable solution for beneficiaries promoting greater access during night hours and enhanced security within the IDP site. However, through the analysis that has been conducted with supported by CCCM partners, it does appear that handheld solar lanterns are the preferred method for providing lighting to IDP sites for reasons that will be articulated within this guidance document.

Stakeholder Analysis for Somalia IDP Sites

There are several stakeholders that are concurrently working to provide ample solar lighting to IDP sites. The following partners are currently engaged within these activities:

Stakeholder Engagement	**Type of Activity**
CCCM Partners	Installing solar streetlighting and rehabilitating existing solar infrastructure
GBV AoR Partners	Distribution of handheld solar lanterns
Shelter Partners	Settlement planning/shelter-level lighting/NFIs
WASH Partners	Solar lighting in/near latrines
Durable Solutions Partners	Installation of solar streetlighting in sites fit for Durable Solutions/development operations
Local Authorities	Installation of solar streetlighting for roads and areas in/near/adjacent to IDP sites

It has been defined by key stakeholders working on solar lighting in Somalia that the intervention of solar lighting remains a critical humanitarian response activity in IDP sites. Regardless of the mode of assistance (solar streetlighting vs. handheld solar lanterns), solar lighting operations provide a short-medium term solution to the informal and unplanned nature of IDP settlements. However, solar lighting has been identified as a pivotal intervention that can spur development-focused electricity integration with support from the private sector, development partners and local authorities. Therefore, it is advised that IDP sites which have access to permanent land or long-term tenure agreements strive for sustainable models of electrical connectivity through durable solutions/development partner support. Additionally, community consultations are required prior to any solar lighting intervention. Such consultations should include additional considerations for women and girls living within IDP sites. These consultations can potentially occur through administering site-level safety audit exercises or through holding gender segregated focus group discussions. The

inclusion of PwDs and other vulnerable groups is advised during solar lighting community consultations.

Solar Lighting Interventions in Somalia IDP Sites

Solar lighting operations in Somalia IDP sites tend to focus on one of three activities at the site-level:

1. Installation of solar streetlighting in communal areas throughout the IDP site;
2. Rehabilitation and maintenance of established communal solar streetlighting within the IDP site;
3. The distribution of handheld solar lanterns at the household level.

CCCM partners since the inception of CCCM initiatives in 2017, have been active in providing support through these three methods. However, CCCM partners through the cluster's strategic objective highlighting site improvements and infrastructure development at the site-level, most CCCM partners have constructed solar streetlights in IDP sites which have garnered mixed results.

Solar Streetlighting in IDP Sites

What are solar streetlights? Solar streetlights are medium/heavy infrastructure that provide static lighting to one designated area within an IDP site, usually targeting areas that receive heavy foot traffic allowing for greater access during night hours. Streetlighting units can either have one individual panel and battery per post, or could be connected to one unified panel as highlighted through ACTED's integrated solar approach. Furthermore, solar streetlights provide reliable lighting outdoors which is critical especially in IDP sites that do not have access to electricity (the majority of IDP sites in Somalia.

Benefits of Solar Streetlighting

- ✓ Solar streetlights provide stationary lighting that promote improved access to communal infrastructure during night hours
- ✓ Once installed, all members of the IDP community and host community have heightened mobility at night (may support commerce and livelihood opportunities)
- ✓ Instils a sense of security for site residents
- ✓ Possibility for authorities to takeover support further encouraging IDP site integration with the host community
- ✓ Integrated solar lighting provides a cost effective and more sustained solution to providing lighting in IDP sites

Challenges of Solar Streetlighting

- ✓ Solar streetlights can have negative protection outcomes such as attracting men to certain areas (latrines) or encouraging individuals to divert power from the solar lighting source
- ✓ Solar streetlights are expensive! Unit costs can run upwards of $700 non-inclusive of labor and equipment rentals
- ✓ Streetlights require constant maintenance! Panels need to be cleaned constantly especially in dry/sandy locations. Batteries are vulnerable to theft by members of the community.
- ✓ Due to the requirement of constant upkeep, there is a need for partners to have contingency funding to ensure lights are maintained following installation
- ✓ The precarious nature of most land agreements in IDP sites create a threat of solar lights being demolished during evictions
- ✓ Solar streetlights can at time be a fire hazard, due to short-circuiting or damage to connections

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Photo credit: Ahmed Dahir, ACTED 2021

Key Recommendations for Partners Installing Solar Streetlighting

1. To mitigate damages that may occur to installed solar streetlights, it is advised that operating partners establish long-term service agreements and/or warranties with vendors prior to administering the construction of this infrastructure. Long-term service agreements guarantee maintenance and upkeep by the vendor which will be essential in case rehabilitation is needed. It is recommended that signed service agreements are put in place with signatures by the implementing agency, vendor, local authorities and community focal points.

2. Assign wardens or focal points from the community that are tasked with protecting solar streetlight infrastructure, reporting any damages to CCCM partners and working to maintain/rehabilitate damaged infrastructure if possible. Wardens can be members of site maintenance committees (SMCs) especially if such individuals live in close proximity to an installed light. Wardens can also be members of the camp management committee (CMC). It is recommended that this task be incorporated within ToRs for SMCs or CMCs.

3. Safety and security of the solar streetlight infrastructure ought be considered as part of purchase and installation and discussed with the community at length. As well as a warden system they may also consider community outreach sessions to educate youth on the importance of street lighting and advocate for the community to actively participate in their close monitoring. Security mechanisms may be considered in the solar streetlight purchase and installation, such as engraving codes into the solar panel steel, locking the casing containing the panels and battery with a heavy duty lock, or erecting a security fence

4. The installation of solar streetlights that are connected to a centralized system is recommended in IDP sites. This means that solar batteries and panels are located in a controlled, centralized area. Solar streetlights that provide motion sensors and/or timers are also recommended for use. Such infrastructure should be installed near latrines or along access roads or pathways that are heavily used by community members.

5. Understand landownership agreements at the site-level! If long-term land use agreements are in place or if land has been purchased by the community or is being provided by authorities, there may be an opportunity to strive for more durable lighting solutions that include formalizing electricity access to established municipal electric networks. If you are operating in a site with long-term land use arrangements, please consult with local authorities, CCCM cluster and private enterprises/development partners prior to installing solar streetlights.

6. Solar streetlights should be installed only after safety audits with women and girls, or solar lighting mapping sessions with female residents of the IDP site.

Solar streetlighting is a viable solution for lighting constraints in IDP sites. **However, as highlighted within the Solar Lighting Technical Meeting, the provision of handheld solar lanterns is the preferred method for providing lighting to IDP sites.** Ideally, if funds are available, an integrated approach where both solar streetlights and handheld solar lanterns are provided to IDP households is the best practice for solar lighting provision at the IDP site-level.

Recommended Solar Streetlight Specifications:

- Integrated 150W street solar light with automatic motion detection/light detection
- Full power lighting time of 12hours with autonomy of 2 days.
- Working temperature of 20degrees below zero, 60degrees above zero.
- 6M height installed stainless steel with 100mm diameter.
- Exposure area is 200m2 with radar induction mode of a distance 6-10m.
- Panels tilted on a 30-40% angle with photovoltaic panel facing the sunniest direction for better charging
- Unit cost; $400-$500 per solar light (not inclusive of additional labor/installation costs)
- Preferably security mechanism such as lockable casings, identification or visibility markings etc.

Handheld Solar Lanterns in IDP Sites

What are handheld solar lanterns? Handheld solar lanterns generally come with a solar panel, handheld lantern that is mobile, and a light bulb that can be used to generate lighting at the shelter-level. Solar panels for lanterns are generally placed during the day on the roofs of shelters, or next to shelters to allow for an ample charge during night hours. Lanterns are used by members of a household to access latrines and other services during night hours while also providing light within the shelter. Within humanitarian contexts such as Somalia, solar lanterns tend to be distributed to households within IDP sites with GBV and protection programming largely targeting women within each household

Benefits of Handheld Solar Lanterns

- ✓ Solar handheld lanterns are affordable based on unit prices. In Somalia, lanterns range from $18-$25 per unit
- ✓ Solar handheld lanterns offer lighting at the shelter-level when solar streetlights do not
- ✓ Maintenance or rehabilitation may be cheaper for the community. It may be possible to replenish lanterns at a rate of every two years. 'Most women and girls kept the handheld solar light; households had an 88% probability of still owning the light after 7 months' (IRC Haiti 2013)
- ✓ Potentially decrease incidents of fires in IDP sites due to limiting the reliance on open flames as lighting sources
- ✓ Some models also allow for USB input allowing households with limited access to electricity to charge their mobile phone, thus reducing their need to visit the market and potentially pay for this service
- ✓ Reduction of use of charcoal for shelter-level lighting, therefore minimizing tree and wood degradation
- ✓ Reduction of the GBV incidents that are linked to women collecting firewood
- ✓ Reduction of expenses used to purchase firewood or alternative lighting options

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Challenges of Handheld Solar Lanterns

- ✓ The threat of theft is still a risk. 'Most women who did not have access to distributed handheld solar lights cited theft as the reason for not having these items' (IRC, Haiti 2013)
- ✓ One lantern per household may limit multiple family members from leaving shelters at once
- ✓ Community members must have lanterns in order to access outdoor areas in IDP sites.

Key Recommendations for Distributing Handheld Solar Lanterns

1. The provision of solar handheld lanterns entails an in-kind distribution requiring beneficiary information capturing and the administration of organized and secure distributions. Partners are urged to follow distribution best practices that have been put forward by the Shelter Cluster ensuring that all participating staff members are aware of appropriate conduct. Fastlane's for women and persons of concerns (PoCs) should always be created during in-kind distributions.

2. Specifications of solar lanterns are critical! Purchasing handheld lanterns that include mobile torch and static shelter-level light bulb are recommended to allow for diverse uses of solar lanterns. Static lightbulbs work to light shelters which may decrease incidents of households using fires to provide lighting at the shelter-level.

3. Community consultation is important to further gauge the collectives desire for solar streetlights versus solar handheld lanterns. For the provision of lanterns, partners should be consulting with members of the community particularly targeting women and girls that reside within the IDP site. Members of the community should be able to articulate what type of specifications and solar lantern amenities they best prefer to ensure greater use of these items.

4. Coordination at the state-level should occur with active GBV partners and with the GBV AoR to map IDP sites that have not received solar lanterns that should be prioritized based on needs.

5. Partners ought, for a limited time, offer a service to assist, replace, or repair any lanterns distributed that are found to be faulty.

Recommended Handheld Solar Lantern Specifications:

- Rate voltage of 9V DC inclusive of 160 lumens
- Light efficiency of 32 LM/w
- Lifetime: 50,000 H
- Unit includes solar panel, mobile chargeable lantern and at least one wired light bulb which is connected to universal battery/panel
- Lanterns include hand grip for movements
- Unit cost; $18-$25 per unit

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Example of Solar Lantern unit viable for Somalia IDP sites