The Role of High-Efficiency Lighting Systems in Meeting Humanitarian Needs in Camps for Refugees and Internally Displaced People

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The US Committee for Refugees reported 13 million refugees and 22 million internally displaced people in 2002, spanning 60 countries.[1] Considering the overarching public policy precept that adequate, safe, and sustainable shelter--and associated food and non-food resources—are basic humanitarian rights, the shortcomings of lighting systems traditionally used in refugee camps must be examined.

Refugee camp at Benako, Tanzania, 1994. © Sebastião

Cegrane refugee camp, Macedonia - May 1999

Acute problems are associated with providing lighting in and around temporary shelters. Direct costs to the relief community include purchasing and airlifting supplies and otherwise supporting the provision and distribution of lighting equipment (generators, lamps, batteries, kerosene, replacement bulbs, etc.). A single kerosene lantern, operated 4 hours per day consumes 60 liters of kerosene fuel each year, or 50 kilograms. For camps with tens to hundreds of thousands of people, this translates into a substantial logistical burden and cost. Important indirect issues include fires and air-quality considerations when fuel- or biomass-based lighting is used. Many individual family shelters (typically tents) have no light at all, which undermines morale and security.

Technological advances in the past two years have opened the possibility for locally assembled, portable, lightweight, solar-powered, white-LED systems that could provide more satisfactory and cost-effective lighting (see Table 1). On an operating-cost basis alone, the added purchase cost can be recovered in less than a year compared to standard lighting. Additional benefits in simplified camp logistics have yet to be quantified.

New Jalozai Refugee Camp — Peshawar, 2001,

[1] U.S. Committee for Refugees. See: http://www.refugees.org/WRS2003.cfm.htm

Table 1. The importance of lighting in camps for refugees and internally displaced persons, and benefits of white LED systems over standard approaches

Relief Objective	Lighting Considerations
Provide adequate and durable shelter solutions	Many activities within a shelter require light; LED systems are longer-lived and less expensive to operate than traditional lighting solutions. LED systems are also more rugged than typical lighting approaches.
Provide adequate administrative, outdoor, and common-area services	Administrative, outdoor, and common areas also require illumination
Minimize reliability on external resource imports	Typical light sources require a stead stream of "imports" to the camp, including kerosene fuel, wicks, batteries, replacement bulbs, etc.
Sustain family and other social cohesion	Social interaction typically requires lighting. Temporary family shelters often have no light.
Provide for schools, places of worship, and play areas for children	Adequate illumination is essential for schools, places of worship, and safe play areas. Flame-based light is inadequate for reading and many other learning tasks.
Preserve individuals' dignity	Individually controlled lighting provides control of privacy
Ensure refugee safety, both inside and outside of shelters	Lighting is an important element of personal safety, especially for women and children. LED systems eliminate fire-risks from kerosene lighting and are easily portable.
Support efforts at re-establishing livelihood	The availability of lighting supports home-based cottage industry after daylight hours
Promote self-sufficiency	PV-powered LED systems require a minimum of externally provided parts (batteries every second or third year) and no fuel.
Minimize vulnerability to disasters affecting camps	PV-powered LED systems are not susceptible to disrupted kerosene or electricity supply lines.
Fortify occupants for future disasters	If camp residents take the LED systems back to their permanent settlements, they will be better prepared for future disasters.
Minimize environmental impacts of establishing, operating, and decommissioning refugee camps	Electric, fuel-based, and (non-rechargable) battery-based lighting entail significant environmental impacts, including generator emissions and noise pollution, fuel spillage, and solid waste production/disposal.
Minimize vector and other disease risks	Illumination in the yellow-red spectrum assists mosquito control, which is a need in many camps. LEDs can be tuned to virtually any wavelength and intensity of light output.
Provide culturally responsive conditions for burial	Some cultures require a period of continual light on the graves of the deceased. LED systems would provide a lower-cost alternative.
Place priority on sheltering disaster victims "in-place", with relocation to remote encampments as a last resort	While not a panacea, pre-disaster distribution of LED systems would support the shelter-in-place goals of disaster response.
Cost-efficiently provide essential relief services	LED systems eliminate the need for camp space dedicated to power production, storage and distribution of batteries, fuel, etc. They also reduce the volume and weight of material requiring air and ground transport.