

## **Giving Lights, Changing Lives:**

### **Data Collection, Social Inclusion and Local Progress in Uganda**

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This paper describes how a solar light outreach, education and distribution program in Uganda is supporting social inclusion and local progress, impacting indicators of Sustainable Development Goals 3, 7, 13, and 17 in impoverished off-grid households. Results of a follow-up assessment of 802 households conducted in early 2016 will be discussed.

Access to safe, modern energy has the potential to broadly impact the 2030 Agenda for Sustainable Development and many of the indicators of the Sustainable Development Goals (SDGs). According to the World Bank, “Analysis of the nexus between energy systems and other key areas of development — water, food, health, and gender — suggests that numerous opportunities can arise from wider cross-sector perspectives and more holistic decision-making in energy.”<sup>1</sup> This paper argues for the incorporation of a basic energy access strategy into existing social service delivery channels in order to accelerate transitions to safe, modern energy services among the extreme poor in off-grid areas of sub-Saharan Africa. According to the findings of Let There Be Light International’s (LTBLI) 2016 Solar Impact Assessment, *Giving Solar – Changing Lives*, increasing energy access among the extreme poor demonstrates a significant multiplier effect and encourages socially inclusive economic stability and growth when implemented as part of an integrated health/education/safety/environmental nexus.

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<sup>1</sup> “Sustainable Energy for All 2015—Progress Toward Sustainable Energy,” World Bank, accessed July 15, 2016, <http://trackingenergy4all.worldbank.org/~media/GIAWB/GTF/Documents/GTF-2015-Summary-Report.pdf>

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LTBLI's donor-driven intervention leverages existing social service delivery channels and the expertise of local leadership to create successful and valued Tier 1 and sub-Tier 1 lighting access interventions in underserved areas of Uganda. LTBLI operates under the premise that full energy access ultimately must be a function of a vibrant market-based economy in a stable social and political environment in which government plays an active regulatory and delivery role. However, LTBLI and our development partners recognize that until widespread and equitable energy access is realized, those living in extreme poverty with identifiable vulnerabilities in off-grid areas will remain marginalized, unable to afford to participate in many market-based solutions. This marginalization, however, can be alleviated through the provision of basic Tier 1 and sub-Tier 1 lighting products approved for low resource settings and purchased in-country through local vendors and wholesale markets. Programs that provide basic lighting to underserved communities can catalyze broad and inclusive educational, health, safety and environmental benefits, while seeding local energy markets and strengthening local supply chains. LTBLI's mission of providing basic solar lighting products to high-risk, low- (or no) income individuals and families acts as an energy bridge in our service areas until the marketplace and government are able to fully realize modern energy access for all, including for the poorest of the poor.

As a member of the Sustainable Energy for All Energy Practitioner's Network and taking its cue from the Secretary-General of the United Nations, LTBLI strives to meet the needs of the "furthest first." In July 2016, Mr. Ban reiterated this principle at the High-Level Political Forum on Sustainable Development when he said: "For the agenda to be fully implemented, those who are the furthest behind will have to be reached first. This will not be possible without data and indicators on all groups, especially those that are often unaccounted."<sup>2</sup> To that end, Let There Be Light International assesses those in greatest energy need, disaggregating by gender, age and a number of other risk factors. Let There Be Light International works with local NGOs to engage a broad range of stakeholders and implements solar lighting interventions utilizing existing social service delivery channels. To further inform our programming, Let There Be Light International collects and disseminates data and indicators of impact from our outreach and educational programs.

The impact assessment report conducted in 2016 by LTBLI and Kyosiga Association for Community Christian Development, (KACCAD), in the Wakiso and Gomba Districts of Uganda indicate that SDGs 3, 7, 13, and 17 are directly impacted by the provision of basic safe lighting to Bottom of the Pyramid (BoP) communities. For instance, the program impacts SDG 3 through the increased health and wellbeing of targeted communities, and SDG 7 is explicitly and integrally addressed through the provision of energy access, modern energy sources and the increased distribution of renewable lighting. The provision of basic renewables to families and facilities currently burning kerosene for lighting also directly impacts SDG 13, by combatting Climate Change and its impacts. And, finally, SDG 17 calls on the international community to strengthen the means of implementation and to revitalize the Global Partnership for Sustainable Development through, in part, increased financial resources for developing countries and the

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<sup>2</sup> Ban Ki Moon, "Statement, High-Level Political Forum on Sustainable Development," United Nations, July 19, 2016, accessed July 27, 2016, <http://www.un.org/sg/statements/index.asp?nid=9895>).

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dissemination and transfer of technology for the realization of the Sustainable Development Goals. Although the provision of a simple pico light to an impoverished off-grid family may seem to be a modest intervention, the assessment report reveals that the multi-sectoral impacts resulting from this intervention are far-reaching and enduring.

Indeed, realization of the Sustainable Development Goals necessitates a critical shift in the way we view and implement development programming. Overlapping goals need not be silo-ed, because in many cases there are existing delivery and intervention channels that can be leveraged to implement SDG-focused cross-sectoral projects. The achievement of the 2030 Agenda for Sustainable Development necessitates increased public, private, and charitable investments. These investments can maximize their efficiency and efficacy through cooperation between and across sectors.

### Background

Energy Poverty is the state of living without adequate safe, modern energy access. Approximately 1.1 billion people live in energy poverty globally, and 620 million people in sub-Saharan Africa have no access to modern electricity.<sup>3</sup> Negative effects of living in energy poverty have been well documented and include significant impacts on health, development, education, safety, and well-being.<sup>4</sup>

In Uganda, approximately 15% of the country's population is connected to the national grid with electrical distribution mainly centered in the urban areas. In the rural areas, where 84% of the population lives,<sup>5</sup> only 7% of the population has access to electricity.<sup>6</sup> Though low, these rates of access may underrepresent the rates of energy poverty, because they only measure the potential of a household to connect to grid-based electricity and do not measure the actual rate of connection. Similarly, they do not measure the reliability and flow of energy to low priority areas and households. More recently, the historical conceptualization of energy access as a binary (access or lack of access) has now been expanded by the World Bank and Sustainable Energy for All to one of a multi-tiered access model. Through this more nuanced access model,

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<sup>3</sup> "Focus on Africa," World Energy Outlook, accessed July 4, 2016, <http://www.worldenergyoutlook.org/resources/energydevelopment/africafocus/>

<sup>4</sup> "Sustainable Energy for All 2015—Progress Toward Sustainable Energy," World Bank, accessed July 15, 2016, <http://trackingenergy4all.worldbank.org/~media/GIAWB/GTF/Documents?GTF-2015-Summary-Report.pdf>

<sup>5</sup> "Uganda, Data," World Bank, accessed July 10, 2016, <http://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=UG>

<sup>6</sup> "Health Facility Needs Assessment-Uganda Country Summary Report, 2015," African Solar Designs and United Nations Foundation, accessed June 6, 2016, <http://energyaccess.org/wp-content/uploads/2016/01/UNF-Health-Clinic-Electrification-Uganda-Country-Summary-Report.pdf>

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measures of connectivity and usage are expanded to include five distinct tiers of energy access with attendant measurements and benchmarks. When tiered access is assessed, full electrification rates often plummet in resource restrained areas.<sup>7</sup>

Safe, reliable energy access is vital for the healthy and productive development of communities and reduces the reliance on burning dirty and dangerous biofuels for lighting. Furthermore, socially inclusive growth must involve all sectors of society including women, children, elders, and the handicapped. The provision of a safe solar light can be the first step on an energy access ladder and has been identified as a low-cost, high-impact intervention in energy poor off-grid areas. Whereas market-based interventions are meeting the demand of thousands off-grid households in Uganda, the extreme poor and vulnerable in many communities remain unable to purchase solar products or to participate in loan-based or pay-as-you-go solar lighting programs. Basic loan-based programs for entry level household solar systems, for instance, can cost \$150.<sup>8</sup> Although the loan and pay-as-you-go terms are favorable for many customers with reliable income streams and other resources, for those households reliant on subsistence agriculture or people unable to work because of disability or age, the cost of these basic lighting systems remains beyond reach. The majority of families targeted by LTBLI and our Distribution Partners live on \$1/day or less and use the savings realized through our programming to purchase basic necessities.

LTBLI's Uganda project was founded in 2013 through a partnership between LTBLI, an aid organization based in the USA, and KACCAD, a local NGO addressing the health and wellbeing needs of several Ugandan communities in the Wakiso District. After investigating the rates of household fires and childhood burns due to kerosene usage in their catchment area, KACCAD implemented the solar lighting program. It began by targeting community members identified as highly vulnerable and currently being served by KACCAD via their community-based social service delivery channels. Field reports indicated that children were often the primary victims of the fires and that a large number of those in greatest need were being left out of emerging market-based solar solutions due to economic insecurity and extreme poverty. Since kerosene is the primary lighting fuel input in the off-grid areas served by KACCAD, the field officers realized that the replacement of the kerosene lights with safe solar lights could have a multiplier effect on the health and wellbeing of their most vulnerable clients.

LTBLI's Uganda Project was initially implemented in the Wakiso District. It expanded in November 2014, to serve the rural district of Gomba, located approximately 85 kilometers from

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<sup>7</sup> "Beyond Connections: Energy Access Redefined, 2015," World Bank, accessed May 20, 2016, [http://www.worldbank.org/content/dam/Worldbank/Topics/Energy%20and%20Extract/Beyond\\_Connections\\_Energy\\_Access\\_Redefined\\_Exec\\_ESMAP\\_2015.pdf](http://www.worldbank.org/content/dam/Worldbank/Topics/Energy%20and%20Extract/Beyond_Connections_Energy_Access_Redefined_Exec_ESMAP_2015.pdf)

<sup>8</sup> "PAYGO: Solar Distribution through Pay as You Go Business Models in East Africa," Development in Practice Impact Paper 16, International Development Advisory Services, accessed July 29, 2016, [http://www.kpmg.com/eastafrica/en/services/Advisory/Development-Advisory-Services/Thought\\_Leadership\\_at\\_DAS/Documents/Development\\_in\\_practice\\_2015.pdf](http://www.kpmg.com/eastafrica/en/services/Advisory/Development-Advisory-Services/Thought_Leadership_at_DAS/Documents/Development_in_practice_2015.pdf)

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Kampala, Uganda's capital city. The solar light distribution program raises awareness about energy poverty and distributes individual solar lights to vulnerable people living in energy poverty. LTBLI's Uganda program targets orphans and vulnerable children, widows, the homebound elderly people, female-headed households, new mothers, people living with disabilities, and those impacted by HIV/AIDS. The program began with three core activities.

1. To conduct baseline assessments of lighting needs in targeted off-grid areas.
2. To conduct inclusive community outreach and educational programs in areas where kerosene and candles are the primary lighting fuels to disseminate information about and access to safe, renewable lighting products.
3. To provide individual solar lights and follow-up lighting support services to highly vulnerable, impoverished at-risk individuals and families identified by local leadership and social service organizations.

To-date, LTBLI has funded and facilitated the distribution of 2,500 individual solar lights in Uganda and Malawi, directly impacting more than 12,000 people. LTBLI also works with District Health Ministries to identify un-electrified rural health clinics and to provide complete solar lighting systems for the health clinics and their staff quarters. To-date, nine off-grid rural health facilities in Uganda have received solar lighting systems, directly and indirectly impacting more than 60,000 people in the nine catchment areas.

LTBLI's programming engages local community development organizations as distribution partners and utilizes established social service delivery channels to identify and target solar light recipients, creating practical solutions for getting started on achieving SDGs 3, 7, 13, and 17. To refine programming and inform donors, LTBLI and our distribution partners collect pre- and post-distribution data including: individual and community lighting need; demographic information; health, safety, economic, and wellbeing indicators; recipient knowledge about renewable energy in general and solar lights in particular; and satisfaction levels relevant to lighting. Field Officers are recruited from local communities and trained and supervised by our local Distribution Partner, KACCAD, under the terms of a solar lighting grant program.

### **Giving Lights, Changing Lives - Follow-up Assessment Results**

A follow-up solar lighting impact assessment was created and funded in 2015 by LTBLI and implemented in 2016 by KACCAD. The assessment sought to establish what, if any, impact LTBLI's solar light distribution program had on recipients and their family members. The assessment asked questions about demographics, household access levels to the solar light, economic impact and stability, indicators of health status improvement, indicators of improved academic performance, changes in fire safety and risk, perceptions of safety at night, and efforts made to publicize or educate others about the competitive advantages of solar lighting.

The assessment was conducted in two areas via local delivery channels in the Wakiso and Gomba Districts of Uganda over the course of eight weeks. Five field workers were hired and trained from local communities to administer the survey. Targeted solar light recipients were identified as meeting all three of the following criteria:

1. Living in extreme poverty
2. Living in off-grid or under-electrified households
3. Vulnerable, as defined by one or more of the following categories - handicapped; elderly; orphaned; HIV/AIDS positive; new mother; student; community leader/community resource.

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Specific data collected included:

- Demographic profiles and recipient categories of those using the solar lights disaggregated by gender, age, employment status, HIV/AIDS status, and geography
- Frequency of use of the solar lights by individuals and households and the frequency of use for educational purposes, including the perceived impacts on academic performance among families with school-aged children
- Frequency of solar light usage for chores and the frequency of solar light usage for income generation activities
- Rates of usage of solar light for safety
- Greatest perceived benefits of solar lights
- Durability of the solar lights over time
- Perceived health benefits of using solar lights and the perceived impact of solar lights on household fire safety
- Level of use of other lighting sources by households before and after receiving solar lights
- Level of monetary savings due to the reduction in lighting expenditure after receiving solar lights by households and how lighting expenditure savings currently are reallocated by solar light recipients
- How frequently solar light recipients engage in solar light outreach and education activities with other community members not currently included in LTBLI's solar light distribution programs
- Potential outreach and educational multiplier effects of the program

A total of 802 recipients in two districts participated in LTBLI's follow-up assessment. Field officers and KACCAD staff conducted the assessment interviews and administered the surveys in a combination of local languages. Field officers and KACCAD staff received training on interview techniques and employed a standardized survey tool provided by LTBLI. The tool captured both quantitative and qualitative data. All solar lights distributed by LTBLI and KACCAD are approved for off-grid distribution in low resource settings by Lighting Global, a World Bank project<sup>9</sup> and were purchased in bulk through vetted vendors in Kampala, Uganda.

### Results

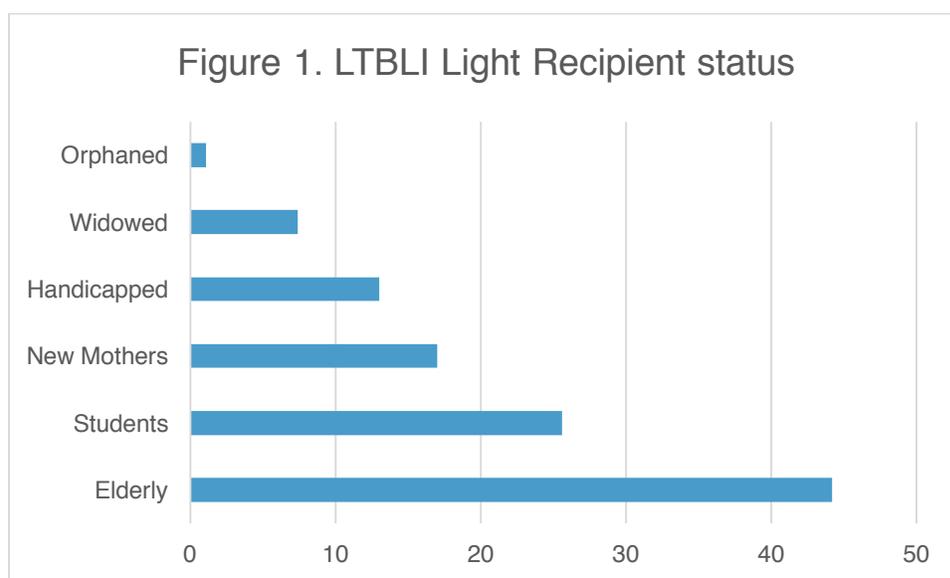
One major expectation was that the project would reduce energy poverty and overall poverty among poor, marginalized families, often headed by adults with limited opportunities. Of the 802

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<sup>9</sup>"Products," Lighting Global, accessed August 1, 2016, <https://www.lightingglobal.org/products/?view=grid>

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solar light recipients interviewed, 465 (58%) were from the Gomba District of Central Uganda, and 337 (42%) were from the Wakiso District. Among the respondents, 505 recipients (63%) were female and 297 (37%) were male. As illustrated in Figure 1, 355 recipients (44.2%) were elderly and 206 (25.6%) were students. 136 (17%) were new mothers, community leaders, teachers, or others. 105 (13%) recipients were handicapped. 60 (7.4%) were widows and 9 (1.1%) were orphans. A total of 69 recipients were found to belong to more than one recipient category.



Many recipient households had some modest income but did not have the funds to front the market cost of lighting. 400 (49.9%) recipients were unemployed. 402 (50.1%) were employed. The occupation of most recipients who reported employment was subsistence farming during the growing season and/or occasional day laborer. Data on total annual income appeared too unreliable for use in this project.

Data suggest that the solar lights were both durable and valued by recipients. 781 (97%) recipients indicated that they had the lights in their possession, while the remaining 21 (3%) recipients no longer have them. Those who no longer have the solar lights reported that theirs had been stolen (4 cases of theft reported by 4 elders) or had broken (17 cases). Those with broken solar light recipients were waiting for replacements. The cases of non-functioning lights were due to accidental breakage, for example, panel breakage after being blown from roof tops by strong winds, wires chewed by rats, and panels broken by children while playing. The high overall retention rate underscored by frequent comments, (e.g., “I was able to take my child to the hospital, when he fell sick in the night.” and “It has protected my children from fire and reduced our household expenditure.”), reflect the value attached by recipients to the solar lights.

The lights are not only valued but heavily used by the recipients. 789 respondents (98.4%) reported using the light 7 nights/week, while 13 respondents (1.6%) were using the light less than 7 nights a week. Looking closer, the respondents using the lights less frequently were those whose houses had been connected to the electric grid after the receipt of a solar light. Nonetheless, these few recipients who were subsequently connected to the rudimentary grid continued to use their solar lights when power blackouts or brownouts occurred. Recipients are using the solar lights for an average of 3 or more hours/night. Children were found to be the

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most frequent users of the solar lights among household members. The results indicate that the vast majority of recipients are heavily dependent on their solar light for daily lighting needs.

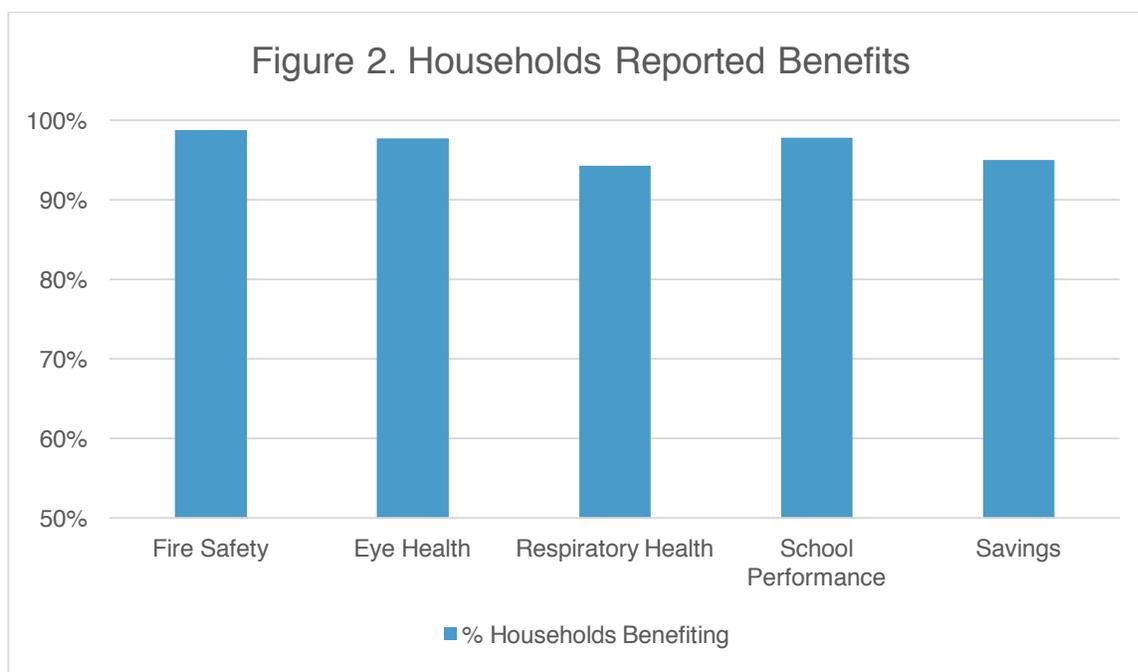
Most recipients report a significant reduction in spending on lighting and increased resources available for other needs after receiving a solar light from LTBLI. Prior to receiving a solar light, 434 respondents (54.1%) reported spending up to \$.90 per week on lighting. 175 respondents (21.8%) reported spending up to \$1.50 per week, 89 (11.1%) reported spending up to \$2.25 per week, and 100 (12.5%) reported spending more than \$2.25 per week. After receiving a solar light, 536 (66.8%) recipients no longer spend any money on lighting. 112 respondents (14%) are spending less than \$1 per week. 27 people (3.4%) are spending \$.75-\$1.50 per week. 50 (6.2%) are spending \$1.50-\$2.25 per week, and 77 (9.6%) are spending more than \$2.25 per week. The high number of recipients who no longer spend anything on lighting (66.8%) is an important marker. Furthermore, when asked whether they were spending less per week on lighting than before receiving a solar light, 773 (96.4%) recipients said yes. For the 3.6% recipients who reported that they had not reduced their expenditure on lighting, most were recipients who were waiting for replacements for faulty lights. Savings realized through reduced expenditure on lighting are being used for school fees, food, medicine, basic necessities such as salt and soap, and rent. A small number of recipients continue to use other forms of lighting. Those still using kerosene and/or candles for lighting are large families with lighting needs unmet by the provision of a single light.

(It should be noted that many households targeted for a solar light distribution live on less than the \$1.25 per day per capita threshold for extreme poverty, and that the average household size of the targeted recipients is 5.4 people. Thus, in a household with 5.4 people and an income of \$1.25 per day, the per capita income may be less than \$.25 per day).

On both surveys and open-ended interview questions, recipients cite a variety of benefits spanning health, education, household finances and the environment. The primary benefits of using their solar light cited by recipients in the interviews are: bright/strong light; clean, safe and reliable light; reduced risk of fire; improved respiratory health; reduced expenditure on lighting; and improved literacy. Many recipients cited reduced eye strain, reduced indoor pollution, ability to conveniently feed babies at night, increased ability to do household chores at night, scaring away pests and preventing bites from rats, snakes and bugs, and improved general health. There were no cases of burns reported, and all recipients felt that their homes were at a reduced risk of fire now that they were using solar lighting.

The follow-up survey results suggest nearly universal improvements in targeted areas, with women, children and the elderly as the primary beneficiaries. The greatest reported benefits of using the solar light by solar light recipients as illustrated in Figure 2 are: improved health, improved safety, increased educational indicators, improved air quality, and increased knowledge about renewable energy.

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LTBLI expected that many recipients would use the money saved on lighting and their solar lights to generate increased income and/or use their light for business purposes. In fact, only 2% of recipients report using the money saved for business purposes, and 3.5% use the solar light for income generating activities. The majority of the money saved is being used for basic needs such as food, medicine, school fees, and soap. The majority of LTBLI recipients continue to struggle to meet their basic needs.

The overall conclusion of the follow-up assessment is that the solar light distribution program has fostered limited but meaningful socially inclusive programming through local development channels and positively impacted indicators of SDG 3, 7, 13, and 17 in energy poor communities in the districts of Wakiso and Gomba. Findings include: the improvement of self-reported health and perceptions of well-being; the enhancement of economic stability; the support of educational outcomes; and the increased safety of recipients and their families.

The specific conclusions are:

- There has been a marked and sustained reduction in the usage of dangerous, dirty and polluting forms of lighting energy such as kerosene and wax candles.
- There is enhanced economic stability among households, as recipients are spending less on nonrenewable lighting and are using the savings to meet other household needs.
- The program is supporting the education of students in recipient households, improving self-reported measures of academic performance.
- The program has impacted perceived health outcomes as measured by self-reports of improved respiratory and eye health.
- The household safety of solar light recipients has benefitted, as household fires and childhood burns are prevented and pests and thieves are deterred.

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Historically, a dominant argument for expanding energy access is the economic development theory that posits that access to safe, reliable energy inputs results in direct socioeconomic development. Among the extreme poor, however, economic growth indicators were weak and secondary to health, wellbeing, safety, indoor air pollution, and awareness about solar technology.

### **Program Modifications**

The overall recommendation is that the project should consider several program modifications in order to maximize programmatic outcomes and to positively impact solar light recipients.

Specific recommendations are:

- There is a need to increase the outreach and educational campaigns in targeted communities to address the proper handling and care of the lights.
- The program should consider the distribution of lights with integrated solar panels and without external wires to eliminate the breakage caused by broken or destroyed wires, especially in low-resource settings where rats chew through external connection wires.
- Large families should be given more than one solar light (depending on family size) to meet their greater lighting needs and to reduce their reliance on unsafe and polluting lighting fuels.
- Advocacy should be intensified during outreach to encourage the increased adoption of solar lighting in low resource settings where the rate of childhood burns from unsafe lighting inputs remain high.
- Local vendors should be encouraged to accompany LTBLI's Distribution Partners to the field in order to meet lighting need in the broader community.
- Before the solar lights are distributed to the targeted recipients, expanded baseline information should be captured to enable the follow-up assessment to make comparative analyses when determining levels of impact of the project. Baseline data collected should include: weekly lighting expenditure; hours studied per night; academic grades of children; rates of burns; rates of house fires; and rates of respiratory and eye disease.

### **Conclusion**

Energy Poverty is an important cross-sectoral issue impacting all levels of global poverty including health, education, safety, jobs creation, human rights, and the environment. Replacing dirty, dangerous and expensive open flamed kerosene lights with pico solar lights among the extreme poor in off-grid areas of sub-Saharan Africa can promote health and wellbeing, increase access to affordable and clean energy, catalyze climate action, and build professional partnerships and capacity, broadly impact the 2030 Agenda for Sustainable Development and specifically targeting SDGs 3, 7, 13, and 17. In addition to meeting basic entry-level lighting need in the short-term, providing solar lights to the extreme poor living in off-grid areas have a multiplier effect.

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Findings indicate that community awareness of renewables beyond the individual household level may spur greater uptake and acceptance of other and broader renewable energy solutions. As part of the Follow-up Assessment, Solar Light Recipients were asked the following two questions: “Have you explained the benefits of your solar light to others in your community?” and: “Would you recommend the purchase of a solar light to a friend or family member based on your experience?” Nearly all respondents, (98.4% and 99.7%, respectively) answered “yes” to the above questions.

LTBLI argues that the outreach and educational components of aid-based pico distributions are undervalued as a preliminary step toward achieving the SDGs in impoverished off-grid areas of sub-Saharan Africa. Furthermore, LTBLI advocates leveraging existing social service delivery channels to target and distribute solar lighting products to highly vulnerable, off-grid populations as an interim anti-poverty measure, as the global community mobilizes to achieve the full range of SDGs by 2030.

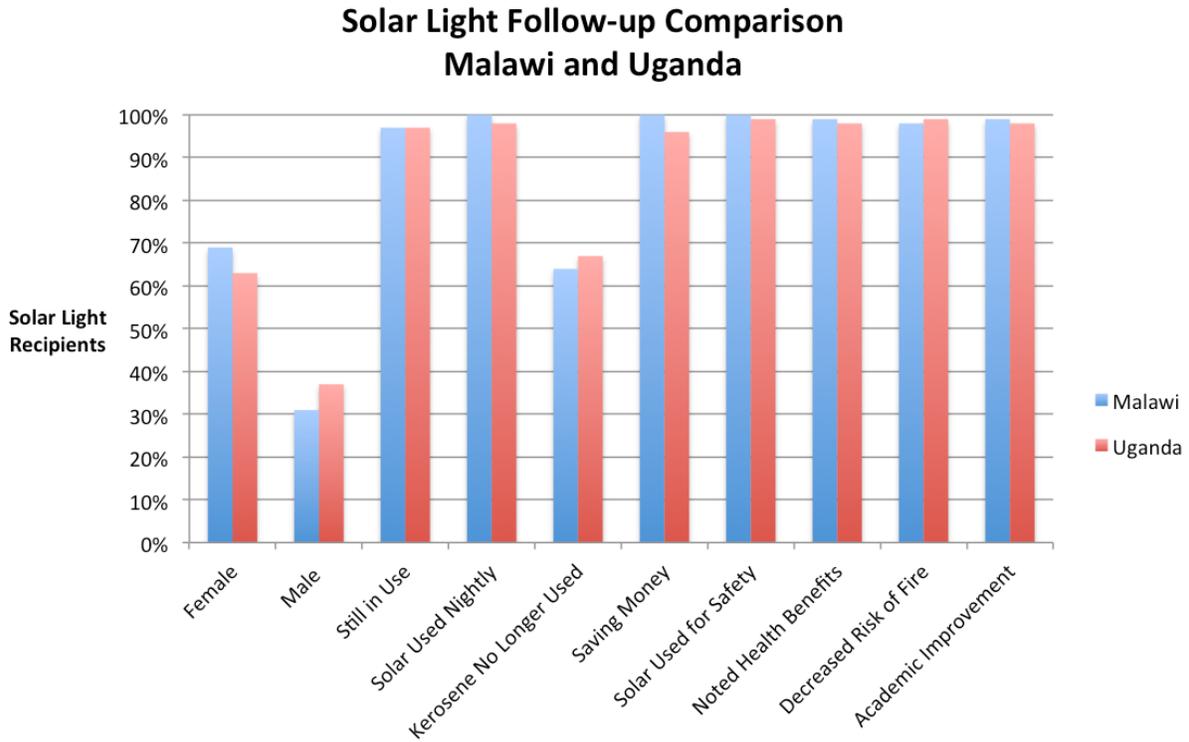
While there are methodological limitations to the follow-up study, the high rate of self-reported improvement is both common-sense and compelling. Further data collection refinements to inform socially inclusive development programming include the expanded training of local partners and the launch in late 2016 of tablet computers to be used by field workers for data collection and solar light tracking in remote off-grid areas.

A recently published follow-up survey of 100 Solar Light Recipients in Malawi<sup>10</sup> using LTBLI’s standardized assessment tool reports nearly identical findings to the larger study in Uganda. Results from the two independent studies (Figure 3) confirm that the vast majority of solar lights are still in use after 6 or more months with an average of 5.4 people per household and 10-14 members in some households. Solar Light Recipients across the two studies report numerous and overlapping benefits of using their solar lights, including health, safety, educational, and economic impacts. Families across the two studies use their solar lights for an average of 3.5 hours nightly with some elders using their solar lights for up to 12 hours a day. 100% of Ugandan and Malawian Solar Light Recipients would recommend the purchase of a solar light to others, and 99% of Solar Light Recipients have explained the benefits of using solar lighting to their friends and neighbors. The consistency across these two assessments reflects the potency of the reported impacts.

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<sup>10</sup> “2016 Solar Impact Report, Malawi,” Let There Be Light International, accessed July 10, 2016, <http://preview.tinyurl.com/h5ccpoc>

Figure 3.



The international community is in general agreement that aid will play a role in achieving the Sustainable Development Goals by 2030. In the energy sector, however, there remains a disproportional focus on market-based solutions as the sole input in achieving SDG 7. Whereas market-based solutions and government infrastructure projects will provide the key to long-term universal Tier 5 energy access, existing social service delivery channels can be used immediately to provide low-cost, high-impact entry level lighting to the extreme poor, impacting multiple SDGs, including SDGs 3, 7, 13, and 17. Since 2014, LTBLI and KACCAD have demonstrated how a solar light donation program can enhance socially inclusive development through a replicable, basic energy access intervention.

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