



THE IMPACTS OF TDB GROUP INVESTMENT IN OFF-GRID SOLAR ELECTRICITY SOURCES

SUMMARY OF KEY FINDINGS OF THE MONITORING VISIT

TDB GROUP

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Introduction

With the objective of contributing to increased access to electricity by rural households, the TDB Group supports off-grid activities by investing in off-grid solar electricity sources. These activities assist families who have no access to electricity to be able to benefit from improved energy sources. TDB Group extended facilities to d.Light in Kenya, Uganda and Tanzania. To understand further its contribution in these areas, TDB Group undertook a monitoring visit to one of its partners, d.Light and visited its customers in Western region comprising of Kisumu, Kakamega and Vihiga Counties. The monitoring visit took place during the month of April 2024. During the visit, the team interacted with d.Light staff, customers, sales agents and distributors.

d.Light is a global leader in making transformative products available and affordable to low-income families. Founded in 2007, d.Light has sold nearly 30 million products, including solar lanterns, solar home systems, TVs, radios, and smartphones. Globally, d.Light has positively impacted over 172 million lives and offset 38 million tons of CO₂ emissions. Most of the customers served by d.Light do not have access to reliable power or financing, and d.Light removes those barriers. For instance, d.Light facilitates access to reliable power through its solar energy solutions and through financing with the Pay-As-You-Go technology. As co-lead arranger, the TDB Group arranged for d.Light a facility of up to USD 50 million, with TDB Group participation of USD 20 million. The funds were utilized to support d.Light's launch of up to 15 million solar devices and provide access by targeted households and individuals in Kenya, Uganda and Tanzania. In East Africa and through TDB Group's support, d.Light has served about 130,000 households and more than 1.3 million individuals by end of 2023 in Kenya, Tanzania, and Uganda, providing access to energy for economic and social development. The project promotes green energy, reduces reliance on diesel generators, and targets the off-grid market, crucial for achieving SDG 7 by 2030.

The monitoring visit to d.Light, its customers and beneficiaries highlighted some of the benefits realized by the beneficiaries. Key benefits are discussed below.

The households visited had 5.71 members with 51.8% of household members being females. About 11% of the households were female headed. The interaction with customers revealed that solar home systems were more likely to serve households while solar lanterns were serving individuals mainly fishermen, security personnel, businessmen, motorcycle (boda boda) operators, and pastoralists. The effects of these products in the households were varied as discussed below:

Effect of solar products on climate change

The customers fully transitioned away from kerosene for lighting purposes resulting in measurable reductions in household air pollution. This contributes into reduction in CO₂ emissions hence cleaner environment. This significant improvement in lighting quality has been a primary motivator for individuals and communities to acquire solar systems.

Job creation

The investment supports direct job creation and sustainability of existing jobs to ensure the smooth running of investment operations. Both full-time and commission-based jobs have been supported. Additionally, the solar products have also enabled businesses to continue with their activities during evening hours thereby ensuring sustainability of those businesses. The businesses supported included selling groceries, operating kiosks, milling and trading in the markets.

Dividend of time

The use of SHS and improved cooking stoves has facilitated a reduction in time spent by women on house chores (saved 1.9 hours per day), particularly those related to energy procurement such as fuel collection. This freed-up

time has empowered women to engage more in income-generating activities, boosting household economics and women's financial independence. The impact of using SHS enabled customers to extend their home lighting by an additional 4.17 hours every day. Those in businesses have been able to extend their productive hours into the evening, allowing them to continue with income-generating tasks and other productive activities. For students, the study hours increased by 2.17 hours per day and thereby improving their educational outcomes.

Health and Safety Benefits

Up to 71.4% of the respondents reported SHS to have positively impacted their health. Positive effects mentioned included less pain on the eyes (66.7%), less fumes in the house (55.6%), improved indoor air quality (54.3%), reduced kerosene related accidents (33.3%), less injuries caused by lack of light (33.3%), improved knowledge on health-related issues (22.2%), and less injuries caused by burning (11.1%). The complete replacement of kerosene with SHS has led to the elimination of kerosene-related accidents, enhancing household safety. In addition, the adoption of SHS has led to a noticeable improvement in health outcomes, as families using these systems experience fewer respiratory and related health issues typically caused by the fumes from kerosene lamps. This reduction in illness directly translates to decreased medical expenses for these households.

The study found that a significant proportion (i.e. 80%) of the respondents had either experienced kerosene-related accidents at home before buying SHS or were aware of such incidents occurring in other households. Out of those who had reported accidents related to kerosene in their households, 78.6% reported kerosene spilling on food, 50% had kerosene burning household items and another 50% had fires started by kerosene. On a positive note, all participants reported that since acquiring the SHS, no similar incidents, like the kerosene-related accidents previously mentioned, have occurred in their households.

Economic Impacts

By switching to SHS, households have reported a notable decrease in energy expenses, with a 70% reduction in costs previously allocated to traditional electricity. Households that transitioned from using candles for lighting recorded 58% to 72% savings on a daily basis compared to SHS costs. This cost efficiency is one of the primary advantages of solar adoption. Households save significantly on expenses previously dedicated to purchasing fuels like kerosene and candles. These savings contribute directly to household budgets, allowing for increased financial security and potential investment in other areas.

The availability of reliable and efficient solar-powered lighting extends productive hours into the evening, which has significantly increased the time users can dedicate to income-generating activities, effectively increasing their daily productive time and potential earnings. The study highlighted significant economic benefits for the majority of respondents, with 60% experiencing positive income-related effects. Participants reported increases in their income, significant savings on money, fuel savings, and more time available for income-generating activities.

Impact on women

The introduction of SHS has particularly benefited women, with 82.9% indicating an increase in comfort by women while performing household tasks. This is mainly attributed to better lighting conditions, which also reduced the time required for daily chores such as fetching kerosene, cooking and collecting firewood. Consequently, women have more time for other productive and social activities.

Through adoption of SHS, the survey found that 31.4% of the respondents noted a decrease in the women workload suggesting that SHS reduces tasks or made them more efficient. By using SHS and improved cooking stoves, the women were able to save about 1.9 hours on activities related to traditional housework chores such as cooking and collecting firewood as well as fetching of kerosene or lighting materials (time saved by using SHS).

The businesswomen indicated that the lighting provided by the SHS allowed them to operate their businesses, such as grocery kiosks, for extended hours into the evening. This additional lighting allowed them to extend business hours to serve customers after dark.

Impact on education

About 83% of households had school going children. Importantly, SHS contributed to an average increase of 2.17 hours per day for school children in respective households. When asked about the effect of SHS on education, 89.3% of respondents said it had a positive effect on their children's education. The positive effects included more study hours (89.3%), improved performance by those students (28.6%) and reduced illnesses due to kerosene for school children (3.6%).