

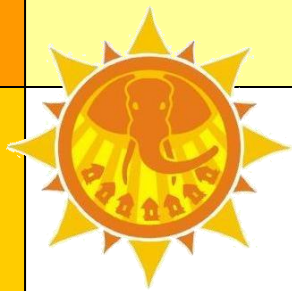
**2009**

# **ELEPHANT ENERGY**



## **CAPRIVI SOLAR LIGHT PROJECT SUMMARY & OPERATIONAL REPORT**

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# ELEPHANT ENERGY

## CAPRIVI SOLAR LIGHT PROJECT SUMMARY & OPERATIONAL REPORT

June 2009 – December 2009

### EXECUTIVE SUMMARY

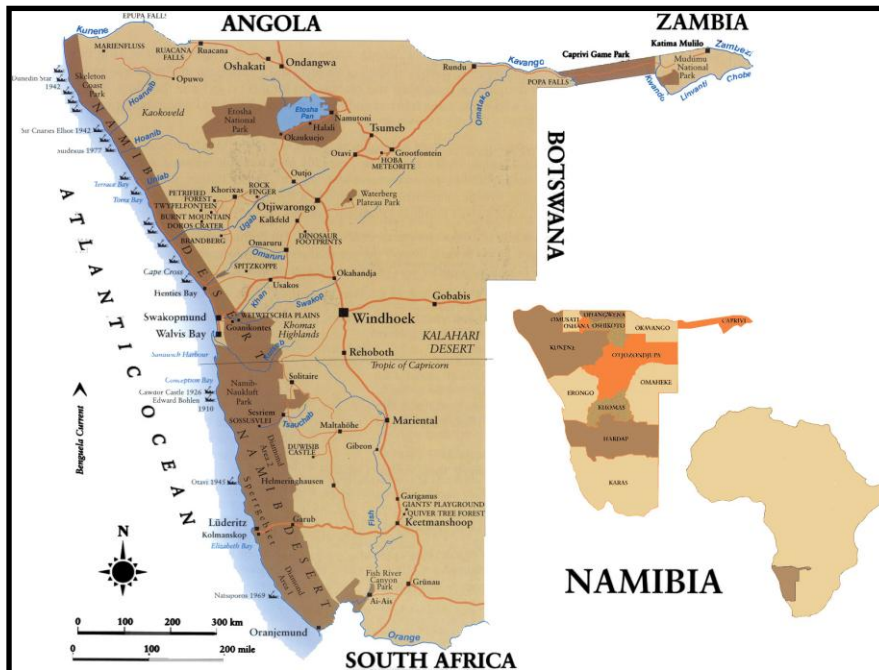
In 2009, Elephant Energy piloted its first two solar-powered light (“torch”) distribution programs, partnering with community-run wildlife conservancies to provide solar torches to people without access to electricity in the Caprivi Region of Namibia. Elephant Energy sold over 500 solar-powered torches at a price equivalent to the amount a family spends on candles in one month to people in rural conservancy areas in the Caprivi, reaching over 2,000 people. The first pilot project at Sobbe Conservancy was based on a “torch distribution” model, where 100 torches were sold directly to the conservancy, which distributed the torches among its members and conducted a monitoring program to determine the benefits provided by access to light. The model was altered in the second pilot project at Wuparo Conservancy, where over 400 torches were sold directly to conservancy members identified by conservancy managers during a “torch sale.” Follow up surveys and focus groups confirmed the impact that these torches had on people’s lives. People avoided dangerous wild animals in the night; children studied into the evening; women felt more secure when traveling; and US\$7.00 was saved each month because candles were unnecessary. There is a huge demand for these life-changing torches in Caprivi and incredible potential for an expansion of Elephant Energy’s activities there in the future.

### INTRODUCTION

Elephant Energy is a non-profit organization based in the United States. Its mission is to promote rural development and nature conservation in Africa through the dissemination of appropriate and low-cost renewable energy technologies. Specifically, Elephant Energy works hand-in-hand with community-based nature conservancies in the Caprivi Region of Namibia to provide these technologies to rural communities, while also working to provide institutional support to the conservancies themselves.

Rural communities throughout Africa suffer from a lack of energy. It is estimated that only 24% of the population in Sub-Saharan Africa has access to electricity. The majority of the population must rely on burning biomass and wood for cooking, illumination and heating. In Caprivi, many people also rely on costly paraffin candles for indoor lighting and expensive batteries for simple luxuries like radio service. Rural Caprivi residents also face the challenge of charging their cell phones, which provide





vital communication links, without adequate access to energy.

In 2001, the Namibian government identified 2,855 rural localities in its Rural Electricity Distribution Master Plan. 87.1% of these communities were not electrified, including large swaths of Caprivi. The government lacks funds to effectively move forward with its plans to extend the nation's electricity grid

to these remote locations. As such, the Namibian Ministry of Mines and Energy recently adopted its Off-Grid Energisation Master Plan for Namibia. The Plan identifies context-appropriate renewable energy technologies as the solution to rural Namibia's lack of energy access. Elephant Energy has since moved to create partnerships with the Namibian Ministry of Mines and Energy, The Polytechnic Institute of Namibia, local renewable energy suppliers and other non-governmental organizations in order to take advantage of synergies and realize the goals of the Plan.

Elephant Energy's first pilot project in Namibia, the Caprivi Solar Light Project, began in June 2009. The Caprivi Solar Light Project aims to address the lack of much needed

energy in Caprivi by partnering with community-run wildlife conservancies in the region. In 1996, the Namibian government introduced legislation granting the right to local communities to organize themselves as conservancies. If approved by the government, these conservancies gain the ability to manage wildlife and natural resources at the local level, while also creating financial and other benefits for conservancy members. Funds that the conservancy generates through its activities must benefit the conservancy membership. Conservancy



leaders and members develop benefit distribution plans each year. That is, they meet to decide how conservancy funds are to be allocated. Often conservancies decide to distribute modest cash benefits to individual members or households, while some conservancies opt



to support specific projects such as building school and clinics or supporting agricultural activities. In most conservancies, revenue is generated through private partnerships with wildlife lodges and trophy hunters or by operating campsites, traditional villages or craft centers frequented by tourists.

In Caprivi, there are currently ten registered conservancies, plus many more emerging conservancies, where communities are in the process of gaining formal recognition from the national government. Elephant Energy chose to partner with two of these conservancies for the initial phase of the Caprivi Solar Light Project: Sobbe Conservancy and Wuparo Conservancy. These conservancies were chosen based on initial scoping meetings conducted at each conservancy, the degree of interest and capacity



demonstrated by each conservancy and recommendations from local non-governmental organizations, notably Integrated Rural Development and Nature Conservation (“IRDNC”) and the World Wildlife Fund (“WWF”).

Each conservancy was used to pilot a different model for distributing BOGO Solar-Powered Flashlights (see [www.bogolight.com](http://www.bogolight.com)), referred to as “solar torches” by Caprivians. Both models were market-based, requiring

the purchase of solar torches rather than a donation. However, in both cases, the cost of the torches was subsidized to ensure affordability based on anecdotal pricing data. Torches were sold for 50 Namibian dollars (approximately US\$7.00) even though each torch actually costs approximately \$170 Namibian dollars (approximately US \$22.20) when factoring in the product price and shipping costs to Namibia. Additionally, detailed baseline energy surveys were conducted to sample for energy use, energy needs and the ability to pay for improvements to energy access. See Appendix 1, Baseline Energy Survey & Appendix 2, Rapid Energy Survey (Silozi). Focus group interviews were later organized to confirm survey results and collect additional qualitative data. Finally, a monitoring program was established at each conservancy to collect ongoing information about torch use and product performance. See Appendix 3, Solar Torch Event Book & Appendix 4, Solar Torch Monitoring Form.

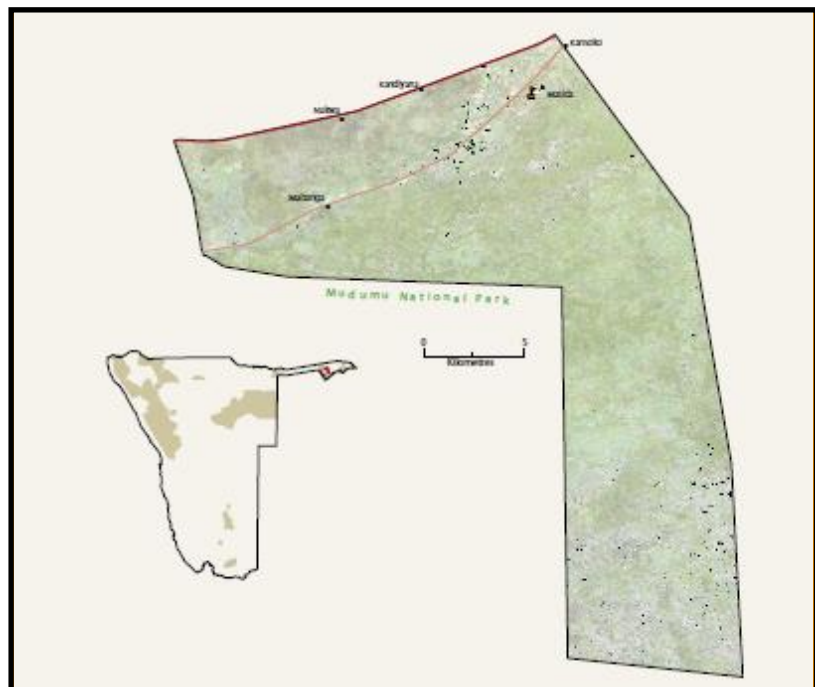
At Sobbe Conservancy, the conservancy was required to play a significant role in organizing and coordinating the sale of torches. In fact, the conservancy itself used its own funds (\$5,000 Namibian dollars) to purchase 100 torches, which it then distributed to conservancy members. At Wuparo Conservancy, the model was significantly simplified to reduce the role of the conservancy in most matters except communications and logistics. The conservancy did not purchase torches for distribution, but rather helped facilitate direct sales to conservancy members.

## **SOBBE CONSERVANCY: THE “TORCH DISTRIBUTION” MODEL**

### **1. Elephant Energy and Sobbe Conservancy: An Overview**

Sobbe Conservancy was registered in October 2006. Its boundaries cover an area of 404 square kilometers with a population of approximately 2,000 people. However, only 661 of these people were registered members of the conservancy in 2008. The conservancy is further divided into six administrative areas: Sitanta, Kansoko, Sabelo, Masida, Kapani, and Taulo. Sobbe Conservancy generates most of its revenue from trophy hunting, although it does make additional modest income from small-scale business enterprises such as craft sales, bee keeping and the cultivation of devil's claw (used in homeopathic medicines) for the international market. In 2008, Sobbe Conservancy brought in nearly \$300,000 Namibian dollars and distributed nearly \$55,000 Namibian dollars among all its members as cash payments. Each member received approximately \$83 Namibian dollars (US\$ 11).

Elephant Energy held an initial meeting at Sobbe Conservancy to discuss the Caprivi Solar Light Project. After expressing significant interest in participating, Sobbe Conservancy met with Elephant Energy again to discuss the details of the pilot project. Due to supply limitations, Elephant Energy could only provide 100 solar torches. It was decided that the conservancy would purchase all 100 solar torches



at a cost of 50 Namibian dollars each. The conservancy would then choose 100 of its members to receive torches, with the stipulation that the choices be made fairly. Specifically, Sobbe would distribute 16 to 17 torches in each of its six administrative areas to ensure that all areas were being served. No torches were to be distributed to conservancy staff or their family. Additionally, the funds to pay for the torches would be paid out of the conservancy's benefit distribution plan. That is, the torches would be paid for from the funds earmarked for community benefits. Finally, the conservancy also agreed to provide six torch monitors to monitor and record both quantitative and qualitative data about torch use. These monitors were each provided with one free solar torch in exchange for agreeing to visit each torch recipient once a month for one year in order to collect information.

Past studies have suggested that many conservancy members feel they do not receive many tangible benefits from conservancies, and that conservancy staff abuse their power for self enrichment. Thus, the torch distribution model chosen would be used to provide a tangible benefit to communities, while ostensibly generating support for conservancies at the local level and limiting abuse by conservancy staff. The entire model was referred to as a “torch distribution.” The agreement was memorialized in a memorandum of understanding (MOU) that spelled out roles and responsibilities for both Sobbe Conservancy and Elephant Energy. 100 solar torches were then provided to Sobbe Conservancy. The conservancy handled all matters associated with the actual distribution



of the torches, having agreed to make a lump sum payment to Elephant Energy in October 2009. Sobbe Conservancy did pay \$5000 Namibian dollars for the torches, as promised, albeit more than a month after the payment date of October, 2009.

Following the torch distribution, Elephant Energy conducted a baseline energy survey with almost every person who received a torch. This survey helped to define energy use and energy needs at Sobbe, as well as other relevant

parameters. Elephant Energy also confirmed the results of the survey through follow-up focus group interviews, and began to work with torch monitors to ensure that accurate and adequate monitoring data was being collected. Torch monitoring is ongoing and more data will be available in the future.

## **2. Data Collection at Sobbe: Baseline Energy Surveys, Focus Group Interviews, and Monitoring**

### **a. Sobbe Baseline Energy Survey**

A baseline energy survey was conducted at Sobbe Conservancy approximately three weeks after solar torches were distributed. The survey was conducted by Elephant Energy with the help of torch monitors to act as interpreters. Elephant Energy was able to sample 98 of the 106 total people that received torches. While only 106 total torches were provided, respondents reported that 426 people were actually benefitted through the Caprivi Solar Light Project since each person who received a torch also shared the torch with other members of his or her household. This number is likely higher since eight torch recipients were not interviewed.

**Table 1: Sobbe Conservancy: Reported main source of energy by activity**

Energy Need/Activity	Electricity (Grid)	Electricity (Generator)	Electricity (Battery)	Electricity (Solar)	Batteries	Wood	Charcoal	Candles	Kerosene	Dung	None	Other
Lighting Inside	0	0	0	0	0	0	0	95	1	0	1	1 - Solar panel which charges car battery
Lighting Outside/Torches	0	0	1	1	0	26	0	19	1	0	49	1 - Cell phone, 1 - Solar panel which charges car battery 1 - Grass/Sticks
Cooking	0	0	0	0	0	97	0	0	0	0	1	
Water Heating	0	0	0	0	0	96	0	0	0	0	2	
Home Heating	0	0	0	0	0	15	0	0	0	0	82	1 - Reeds
TV	0	0	0	0	0	0	0	0	0	0	0	
Radio	0	0	0	0	0	0	0	0	0	0	0	
Other	0	0	0	0	0	0	0	0	0	0	0	

No respondents were connected to the electricity grid, and only one had access to a solar panel that provided electricity for a radio, television, and light bulbs. Most people did not heat their homes or use lighting outside. However, the vast majority of respondents – 97% – used candles for lighting indoors. Furthermore, 99% of respondents used firewood for cooking and 98% did so for heating water. This is significant in two respects. First, while most people reported that they obtained firewood free of charge, people still spent an average \$43 Namibian dollars a month on candles, with some spending as much as \$250 Namibian dollars every month. This is a substantial amount of money for an impoverished rural community. Second, while firewood may not place significant financial burdens on residents, it does cause other problems. Anecdotally, many people reported that they had to travel farther and farther every day to find adequate sources of firewood. The use of firewood also results in deforestation and environmental degradation locally, which negatively impacts ecosystems, wildlife, and livelihoods.

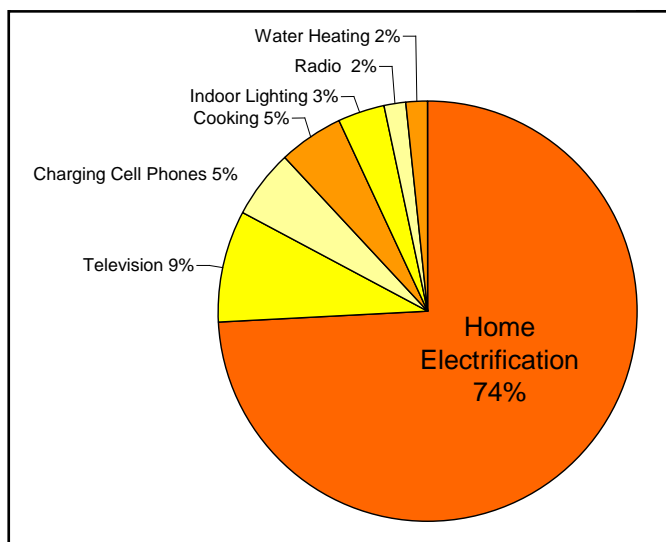
**Table 2: Sobbe Conservancy: Reported Expenditures on Energy (Average)**

	Electricity (Grid)	Electricity (Generator)	Electricity (Car Battery)	Electricity (Solar)	Wood	Charcoal	Candles	Kerosene	Dung	Other
Average Amount Spent	N\$0	N\$0	N\$0	N\$0	N\$5	N\$0	N\$43	N\$0	N\$0	N\$0



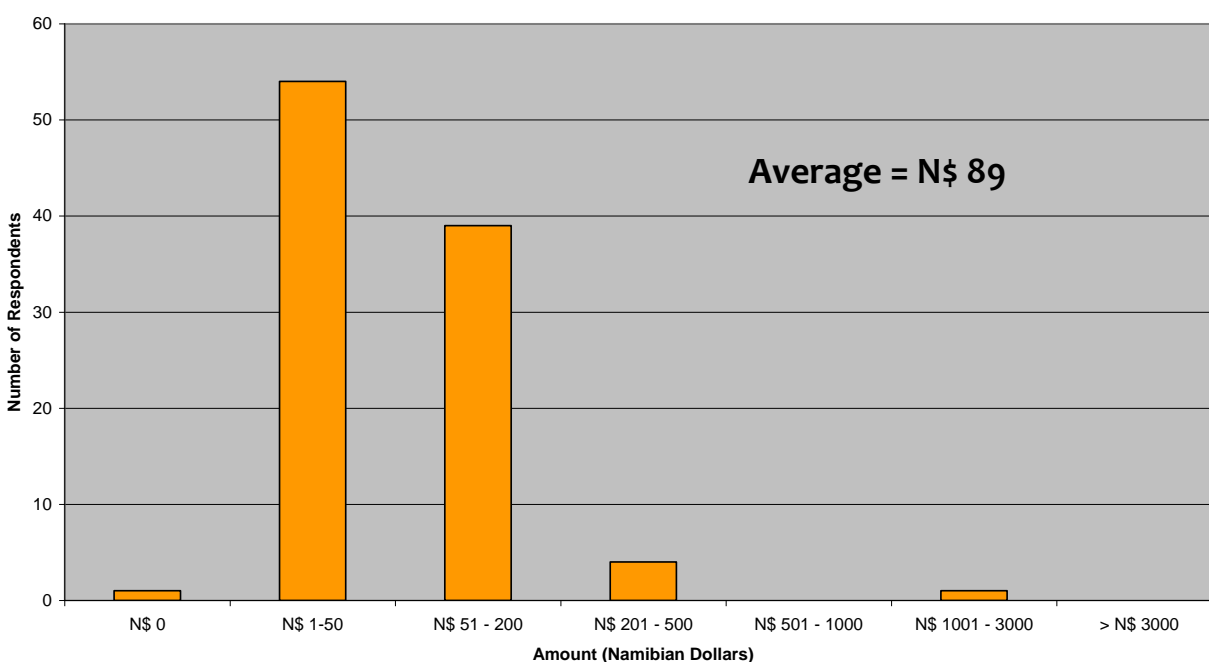
Those surveyed by Elephant Energy overwhelmingly illustrated that their current and future energy needs are not being met. 99% of respondents answered that they would like to have more energy access for things like indoor and outdoor lighting, as well as general electrification in their homes. A full 100% indicated that they would like improved access to energy technologies for cooking, home heating, water heating, charging cell phones and to power appliances like televisions and radios. When asked to prioritize why they needed a better supply of energy, 74% indicated a first preference for total home electrification. This indicates a desire to have flexibility in meeting energy needs rather than a desire to meet appliance-specific needs.

**Figure 1: Sobbe Energy Priorities**



After having indicated their energy needs, respondents were then asked how much money they could spend in order to satisfy these needs. They were asked how much they could spend upfront to make a one-time energy technology purchase, as well as how much they could spend each month should a payment plan be available. They were not asked

**Figure 2: Amount Sobbe Respondents Can Spend on Energy (Monthly)**

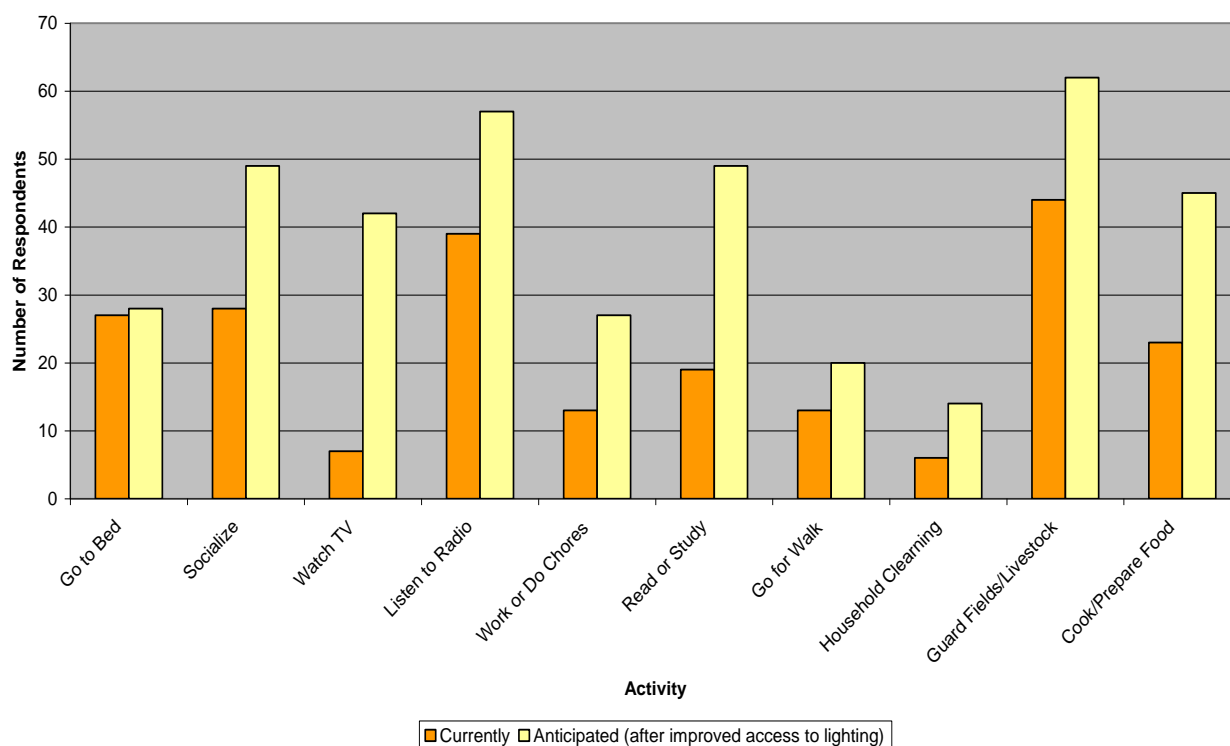




these questions with regard to any particular type of energy technology. On average, respondents said they could spend about \$184 Namibian dollars upfront and \$89 Namibian dollars every month.<sup>1</sup> When broken into categories, most respondents felt they could spend between \$50–200 Namibian dollars upfront and \$1–50 Namibian dollars on a monthly basis.<sup>2</sup>

Sobbe respondents were also queried about lighting needs in particular. They were first asked to indicate what their normal nighttime activities included. Secondly, they were asked to anticipate what activities they would participate in if they had better access to lighting technologies. If a respondent already received a torch, he was asked to answer as if he had not yet received it. The results indicate that respondents anticipated to increase their nighttime activity with improved lighting, particularly with regard to socializing, preparing food and reading and studying. Interestingly, respondents also indicated that with improved lighting, they also expected to increase their use of radios and televisions. This may indicate a problem with the survey as there is no apparent need for lighting in order to use radios and televisions.

**Figure 3: Current/Anticipated Nighttime Activities Based on Lighting Access**



<sup>1</sup> Note that not all respondents surveyed provided a specific numerical value, instead opting to provide only a range of values. These averages were calculated from those who responded with a specific numerical value. N=40 for upfront expenditure sampling and N=49 for monthly expenditure sampling.

<sup>2</sup> Note that all respondents surveyed provided responses that could be categorized as such, thus explaining slight discrepancies between the average results and categorical results.

## **b. Sobbe Focus Group Interviews**

Approximately three months after providing torches to Sobbe Conservancy, and approximately two months after completing the baseline energy survey, Elephant Energy conducted a follow-up focus group meeting. The purpose of the focus group meeting was to meet with groups of conservancy members to confirm the baseline energy survey results, collect more qualitative data about energy needs and find out how members perceived the project. The conservancy was asked to organize two groups of 12–15 people to participate in guided interviews and open discussion, one group of people who received torches and one group of people who had not received torches. 12 people who received torches actually participated, while only six people who had not received torches did so. The interviews were conducted in English with the assistance of a Silozi interpreter.



In general, those who received torches were overwhelmingly satisfied with the products provided. All participants wanted Elephant Energy to provide more solar torches, as well as other products, as soon as possible. Discussion revealed that the participants' greatest energy needs related to indoor lighting and cooking. Most prioritized access to efficient, affordable cook stoves in terms of desirable technology. However, when queried as to specific types of products that would interest them, many indicated an interest in brighter indoor lighting (than the solar torches), as well as cell phone chargers, cook stoves, and solar panels for home electrification. With regard to cell phones, however, only about 17% of those in attendance actually had a cell phone.

With regard to expenditures, participants reported spending approximately \$100 Namibian dollars on candles each month. This is substantially more than the \$43 Namibian dollar average indicated in the baseline energy survey. Furthermore, this suggested that people might be able to spend as much as \$400 Namibian dollars upfront in order to satisfy their energy needs, and \$50 Namibian dollars monthly, compared to the baseline survey average of \$184 Namibian dollars upfront or \$89 Namibian dollars monthly. After the interviewer pointed out that, for example, purchasing something like a solar torch would eliminate the need to spend money on candles, participants revised the latter figure to \$100 Namibian dollars monthly. However, many of those who received a solar torch were hesitant to answer this payment question in the general sense. They wanted to know the type of product in question before indicating how much they could spend.

Notably, every participant who received a torch reported that they had since stopped using candles, and they were using the torches for an average of eight hours per day for reading, studying, cooking and bathing. This parallels the baseline survey results with regard to how nighttime activities were expected to change with more lighting. Furthermore, participants expected to use the torches even more once the agricultural season began.

With regard to the “torch distribution” model used, people who did not receive torches were not satisfied. They felt that they were not notified about the distribution, nor were they notified as to why only some people received torches and others did not. Respondents voiced a general opinion that the conservancy did not organize a transparent or fair distribution, and that the conservancy only benefits a select few instead of the membership at large. These opinions parallel a general consensus confirmed in other studies and anecdotal reports. However, most significantly, participants complained that there simply were not enough torches offered. Those who did receive torches were far more positive. They said that the conservancy adequately communicated information about the program and how the torches operated, although they did not know the underlying purposes of the program. Those who did receive torches were still unhappy with the total number of torches provided and wanted Elephant Energy to provide more to the communities.

### **c. Sobbe Monitoring**

Solar torch monitoring is still being conducted by the six designated torch monitors in Sobbe Conservancy. However, some monitor and user event books forms have been returned. These forms illustrate the duration of torch use each month, the activity the torch



was used for and how well the torch functioned. An initial review of these forms shows that the lights are used for a variety of activities, including cooking, indoor lighting, checking on animals at night, washing clothes, reading and bathing. It is common for the torch to be used every day for between 1-4 hours. Some problems were reported with the torches, mainly short run-times when torches were not charged at all or were only placed in the sun for a short period of time (note: those torches that broke

within 60 days were replaced). More information will be available following the conclusion of Sobbe Conservancy torch monitoring in July 2010.

### 3. Refining the Model: Lessons Learned at Sobbe Conservancy

- Providing a limited amount of torches created jealousy between those who received torches and those who did not. There is a huge demand for torches among the community members, but Elephant Energy must work to ensure that it has enough torches to offer in each area or jealousy will persist.
- Allowing conservancy staff members to decide who received the limited torches exacerbated feelings in the community that conservancy staff use their positions for self enrichment. Many torches made it into the hands of conservancy staff, their friends, or family. In the future, a “torch sale” model should be used to allow all conservancy members the chance to receive a torch.
- Despite their initial interest in the project, Sobbe Conservancy staff members did not follow through with setting up meetings or payments. In the future, Elephant Energy must conduct more extensive due diligence prior to working with a conservancy.
- Many problems were encountered because the conservancy did not understand what was expected, or they had excuses to say that they didn’t understand some aspect of the project. Elephant Energy must communicate with the community more clearly with the help of a Silozi interpreter and by putting everything in writing.
- Conservancy staff did not follow through with their monitoring commitment. In the future, Elephant Energy should pay monitors for their services. In addition, a “chief monitor” should be designated to manage the other monitors and ensure accountability. Finally, surveying torch recipients in their individual villages was costly and time consuming. Surveying must be more focused in the future.
- Many people reported broken torches, and returned those torches, when in fact the torches worked. Elephant Energy must have more direct contact with individual recipients to train them on the use of the torches.
- One of the main goals of the project was to strengthen the conservancy by demonstrating how conservancy profits could be used to benefit the community. However, due to a general lack of transparency in Sobbe Conservancy, this goal was not achieved. In the future, Elephant Energy must conduct meetings in all conservancy areas to ensure that people are informed. In addition, Elephant Energy must attend the conservancy Annual General Meeting to encourage conservancy members to devote resources to torch distribution projects. Following the AGM, Elephant Energy must work with the conservancy committee and conservancy staff to ensure that funding is set aside for torch projects in the conservancy budget.
- While not all of those that wanted a torch received one, the torches that were distributed are working well and the torch recipients are satisfied with the product. Elephant Energy must work to provide torches to all conservancy members that would like a torch in future conservancy distributions/sales.

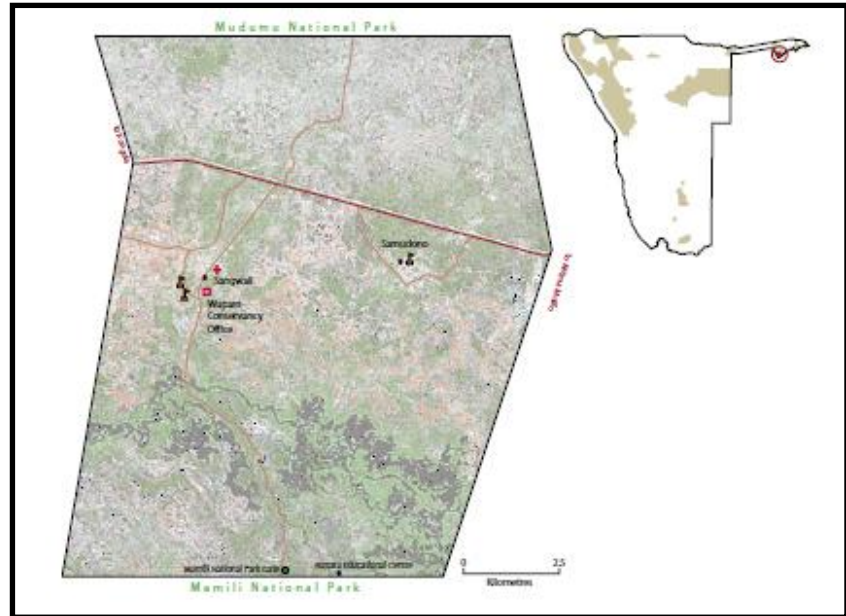


## **WUPARO CONSERVANCY: THE “CONSERVANCY TORCH SALE” MODEL**

### **1. Elephant Energy and Wuparo Conservancy: An Overview**

Wuparo Conservancy was registered in December 1999. It covers 148 square kilometers divided into three different administrative areas: Sangwali, Samudono, and Samalabi. Its population is approximately 2,100 people. Of these, nearly 1,200 are registered members as of 2008.

Wuparo generates its income almost exclusively through trophy hunting, resulting in over \$400,000 Namibian dollars of income in 2008. That year, it distributed nearly \$50,000 Namibian dollars in benefits to members. However, unlike Sobbe, Wuparo divides its community benefit funds among its three administrative areas. Community leaders and residents in each area then decide what to do with the



money, not the conservancy. Thus, in 2008, people living in different areas received varying cash payment amounts, while funds were also donated to local schools, veterans, and traditional authorities.

Wuparo Conservancy was chosen for the next pilot project because of the community's interest in the torch sale and the conservancy staff's hard work and organization. In Sobbe Conservancy, providing only 100 torches to the entire conservancy created jealousy among the conservancy members and exacerbated the feeling that conservancy staff abuse their positions for self enrichment for themselves, their friends and their families. For this reason, a direct sale was a simpler and fairer alternative for the pilot project in Wuparo, dubbed the “conservancy torch sale” model. Instead of selling torches to the conservancy itself, torches were sold directly to conservancy members. Torches were provided to anyone who wanted one at \$50 Namibian dollars per torch, for consistency with the prior sale in Sobbe. The conservancy still helped to coordinate the sale, but played less of a role. In this way, the organizational problems of dealing with conservancy staff were minimized.

Coster, Wuparo's Chairman, counted the number of people who wanted to buy torches in Wuparo, registering 350 torch orders. Next, Elephant Energy held a meeting with Coster and two other conservancy staff members to set the dates of the torch sale for November 10-13, 2009, with one day at each area (Sangwali, Samudono, and Samalabi) and the last day at the conservancy office. Meetings to inform the public of the sale and to

demonstrate the product were set up in each area, and a meeting with the Chief was tentatively set, all one month before the conservancy sale.

Because of the lack of communication by the conservancy staff to the conservancy members about the torch distribution in Sobbe Conservancy, Elephant Energy decided to hold public meetings to communicate directly with the public about the torches and the sale in Wuparo. In October, Elephant Energy met with people in each of the three areas in Wuparo to demonstrate how the torches work and inform the conservancy members about



the upcoming torch sale. At the two larger villages, around 30-40 people attended the meeting, while at the smaller village, about 15 people attended. Representatives of local traditional authorities were also invited to attend and did attend these meetings, though the Chief was unable to meet with Elephant Energy due to a funeral. At each area meeting, the product features of the torch were demonstrated and, as a marketing tool, one torch was also given away. The upcoming torch sale was further advertised with flyers and signs and area representatives were instructed to inform their communities.

For the sale, a tent was set up at each area, along with signs, both in Silozi and English, explaining how the process to buy the torches worked. There were three stages in the process for buying a torch. First, the conservancy member approached the first station, where their name on the list of people who ordered a torch was verified. Second, the conservancy member filled out a one page energy survey, under the supervision of Joseph Ziezo. Third, the conservancy member paid for and received a torch, ziplock bag and an instruction sheet in Silozi. See Appendix 5, Torch Instruction Manual (English). As in Sobbe, the torches were guaranteed for 60 days after the date of sale. Monitors were also trained to visit each household with a torch monthly to record duration of torch usage and type of usage.

The conservancy torch sale in November was a success, with overall sales of around 400 torches. Elephant Energy sold about 150 torches in Sangwali area on November 10, 80 torches in Samudono area on November 11 and about 25 torches in Samalabi area on Nov 12. Over 100 torches were also sold on the last day of the sale at the conservancy office. A few weeks after the sale, more than 30 additional torches were sold in Wuparo.

#### 4. Data Collection at Wuparo: Baseline Energy Surveys, Focus Group Interviews, and Monitoring

##### a. Wuparo Baseline Energy Survey

In Wuparo, a short survey was conducted at the time of the torch sale, in contrast to the Sobbe sale, where the surveys were conducted a few weeks after receiving the torches, and each survey lasted approximately 30-45 min. Because the survey process in Sobbe Conservancy was such a time-intensive process, and because, in Wuparo, more than 400 torches were expected to be sold, the surveys were streamlined. The survey was shortened to one page, and translated into Silozi so that the torch customers could fill out a survey on their own before they received their torch. At the time of sale, each person who bought a torch filled out a “Silozi Rapid Energy Survey form.” See Appendix 2, Rapid Energy Survey. Not everyone who received a torch filled out a form, however, because some conservancy members bought torches for family members or friends, who could not attend the sale. More than 300 rapid surveys were completed. The data included in these rapid energy surveys has not yet been analyzed, but will be available shortly.



##### b. Wuparo Focus Group Interviews

A focus group was held with conservancy members in Wuparo Conservancy about one month after the conservancy torch sale. The purpose of the focus group was to find out



more about the conservancy members' spending ability, interest in other energy technologies, perceptions of the torch sale and insights into the use of the torches. The focus group was conducted as a guided discussion with the help of Joseph Ziezo, who translated between Silozi and English. The focus group consisted of about eight people (other conservancy members were joining and leaving the discussion at times), seven of whom received torches during the initial torch sale. One person did not have a torch at

the time of the focus group, but bought one immediately after.



Conservancy members in the focus group reported spending an average of \$45 Namibian dollars (approximately US\$6.00) per month on candles before the torch sale. When asked what they could spend per month to get electricity if it were available to them, they agreed that they could spend about \$100 Namibian dollars (approximately US\$14) per month. When asked about their most important energy needs, they unanimously agreed that indoor lighting is their greatest need, and cook stoves are their second greatest need.



They reported that they could spend \$130 Namibian dollars (approximately US\$18) at once to get these products.

Five of the eight people surveyed had cell phones, and they reported spending an average of \$500 Namibian dollars (approximately US\$67) on cell phones. The amount they were able to spend on a cell phone suggests that at least some community members could actually save up to spend more than the amount they reported earlier (\$130 Namibian dollars) to buy a product they really desire. Participants also commented that they can save up money if they know in advance of a product they would like to buy.

Participants reported using the torches mostly for indoor lighting. They also reported using the torches for walking at night and finding snakes. In general, participants reported that the torch sale

went well. They had no complaints about the way things were run and could think of no problems. Overall, they were very happy with the products and the torch sale and expressed their appreciation for Elephant Energy's work with a round of applause.

### **c. Wuparo Monitoring**

Three monitors are monitoring all the torches sold at Wuparo Conservancy on a monthly basis. There is one torch monitor for each area in Wuparo (Sangwali, Samudono and Samalabi). The torch monitors visit each household monthly to record how many hours per week the torch is used and what activities the torches are being used for. More information on the effectiveness of the Wuparo torch sale will be available on a rolling basis, and a full report will be available in December 2010 after one year of torch monitoring.



## 5. Lessons Learned at Wuparo

- The direct sale to the Wuparo Conservancy members was very effective and eliminated the problems of conservancy staff self-enrichment encountered in the pilot project at Sobbe Conservancy.
- A list of conservancy members requesting a torch was necessary in Wuparo because there were a limited number of torches available. However, if more torches are available in the future, creating lists of buyers prior to the sale will not be necessary.
- Although the direct sales model worked well, it will not be feasible financially to sell all the torches for \$50 Namibian dollars in the future, since the real cost of a torch, including import duties and shipping costs, is around \$170 Namibian dollars. More creative ways to subsidize the torches should be pursued as well as sales for the full torch price to those that can afford it.
- Shipping torches through Livingstone, Zambia created additional customs, visa and administrative costs. The torches had to be imported into Namibia at considerable expense. In the future, Elephant Energy must work to develop a more sophisticated supply chain so that rush orders do not have to be sent through Zambia.
- Conservancy members can probably afford to pay more than \$50 Namibian dollars for the torches. \$75 Namibian dollars (approximately \$10 US dollars) would likely be affordable, especially if the sale is timed after pay days or after the conservancy cash distribution.
- Having people fill out a short survey at the time of the sale worked well. However, survey results have not been analyzed yet, so whether the information is helpful must be determined at a later date.
- Spending an entire day at each conservancy area for the torch sale was unnecessary. Everyone who ordered a torch appeared between 8-10 am on the day of sale, and the rest of the day was quiet. Spending only a half day in each area would be sufficient.
- The “torch sale” model confirmed that EE should simply sell the torches like any other merchant. Elephant Energy should establish an Energy Shop in Katima and one mobile shop, with the latter used to conduct sales/repair/replacement visits to individual villages. The conservancies can continue to help organize and communicate information about Energy Shop sales. However, Elephant Energy should not limit its operations to conservancies alone, as all rural Caprivians lack access to torches and other energy technologies.
- Conservancy members at Wuparo are satisfied with the product and are very appreciative of Elephant Energy. Elephant Energy must expand its operations in the future.

## **FUTURE PLANNING**

There is enormous potential for Elephant Energy in Caprivi and elsewhere in Namibia in the future. There is substantial demand for the solar torches among conservancy members, as well as other people living in rural areas. The torches are tremendously helpful to people who do not have access to electricity. Members of other conservancies are eagerly awaiting their chance to buy a torch.

The greatest challenges for Elephant Energy in the future will be the logistics of importing large numbers of torches into Caprivi, due to shipping and customs issues, and more importantly, selling the torches at a price that people in the conservancies can pay.

Shipping is an issue because it is difficult to ship goods directly into the Caprivi. Goods can be shipped into Livingstone, in Zambia, or into Windhoek, 15 hours drive from Katima Mulilo. Shipping into Livingstone, about 2 hours away from Katima Mulilo, creates additional customs, travel and visa costs. Shipping torches through Windhoek avoids the extra costs for Zambian customs and visas, but adds additional travel costs. No matter what, Namibian customs duties will be a considerable cost, at around \$2 U.S. dollars per torch, since there is no exemption for the products Elephant Energy is importing. A solid supply chain must be created to keep an adequate stock of torches available in Namibia. Elephant Energy must also work to establish a relationship with Namibian customs and work with the Namibian government to lower import duties for small-scale renewable energy products.

The greatest challenge that Elephant Energy faces is financing the discounted torch sales. Although there is an incredible demand for torches, Elephant Energy will not be able to afford to subsidize selling the torches for \$50 Namibian dollars (approximately US\$7.00) to every conservancy member in the future. There are a few options for financing the torch sales to the conservancy members, including opening an Energy Shop in Katima Mulilo and using the profits to subsidize the torch sales in the conservancies, fundraising through Buy-One-Get-One (BOGO) programs in the US or in Namibia and partnering with lodges and conservancies that could pay for half of the torch costs or more.

First, opening an energy shop in Katima Mulilo would provide quality alternate energy products to people in the Caprivi region, while helping to raise money for the rest of Elephant Energy's operations, including the discounted torch sales in the conservancies. Elephant Energy could set up a booth in the market in Katima Mulilo to sell solar torches, as well as solar cell phone chargers, energy efficient cook stoves and other appropriate and affordable energy products. These products could be marketed to tourists and affluent Caprivians. In addition, Elephant Energy could establish a "traveling salesman" model, where a representative of the Energy Shop would travel to rural areas on specific days of the month to sell small-scale renewable energy products.

Second, Elephant Energy could use BOGO programs to fundraise for its operations. Elephant Energy has used BOGO programs in Colorado to finance some of its operations. However, there is huge potential to use BOGO programs in Africa to cover costs as well. There are numerous upscale lodges in Namibia, including some in the Caprivi. Many of these

lodges have “Curio” shops for tourists. A venture with lodge owners, where the tourists could buy one torch and donate one to a local community member without access to electricity, would likely be effective. This model could potentially be expanded to outdoor and camping shops throughout Namibia and South Africa due to the huge “overlander” camping industry in the region.

Third, Elephant Energy could partner with lodges that donate money yearly to the conservancies. This would work especially well in a conservancy like Impalila Conservancy, where numerous lodges are still negotiating joint venture agreements with the conservancy. Given the feeling by lodge owners that the money they donate is not used for useful purposes, the opportunity to contribute money to a more tangible project would be attractive. If a lodge agreed to pay \$100 Namibian dollars per torch (about \$13 US Dollars), Elephant Energy could charge the conservancy members \$75 Namibian dollars per torch (about \$10 US Dollars) and cover the cost of the torch and import duties.

With Elephant Energy’s success in its 2009 pilot projects, the organization must work to expand its efforts to additional Caprivi conservancies and other areas of Namibia. The basic energy needs of communities far from transmission lines can now be met at a reasonable cost using the BOGO light and numerous other revolutionary small-scale renewable energy devices. Meeting the energy needs of people in conservancy areas will benefit the environment by reducing wood consumption, minimizing human-wildlife conflict and promoting education and economic development. After only six months of hard work on the ground, Elephant Energy has revealed one fundamental truth in 2009: There is no reason for Namibians to live in darkness.

