

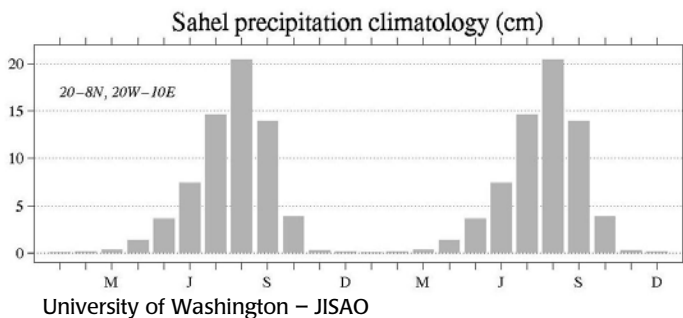


Solar Electric Light Fund

Powering a Brighter 21st Century

Benin's Arid Land

Western Africa's dry season wreaks havoc on the lives of millions of people year after year. The 104,000 people living in Benin's Kalalé District are particularly hard hit as 95% of them rely on subsistence farming as their primary means of survival. For most, farming is limited to the rainy season by the lack of accessible water for irrigation. During the dry season people suffer from poor diets, little income, and the necessity of buying expensive food from the tropical areas of the country. For half the year, a lack of farm work causes community dislocation as many families migrate to squalid, overcrowded urban areas in search of employment.



This chart illustrates the almost total lack of rain falling in much of West Africa from the months of November through April for two consecutive years. Nearly 65% of Africa experiences a tropical savannah climate where there is a pronounced dry period of 3-8 months per year. More than half of Africa receives less than 20 inches of rainfall per year.

Kalalé District's dry season typically extends to six months a year. During this time, crops are only grown in the very limited areas near rivers or lakes. In these more fortunate villages, water is commonly moved through the laborious and time-consuming method of filling containers by hand and slowly watering individual plants. This labor-intensive process severely limits the amount of land that can be cultivated during the dry season.

There have been limited attempts to irrigate Kalalé's farmland with pumps powered by gas or diesel engines but these attempts have been short-lived due to maintenance difficulties and the high cost of fuel in the region. In addition, the national electric grid has not reached Kalalé District. Currently the only electrical generation is supplied by small, local generators sparsely disbursed throughout the region.

Over 80% of Kalalé's villages do not have a source of surface water and virtually nothing is grown during the dry season. During this time, families live on a combination of stored grains and expensive food brought up from the tropical southern part of the country. Prices for basic vegetables (tomatoes, onions, peppers, etc.) almost double during the year from rainy season prices to dry season prices. The lack of availability and high prices combine to severely limit diets during the dry season and malnutrition is prevalent.

In addition to a lack of water for crop production, many villages in Kalalé also suffer from a lack of clean water for drinking and domestic use. Those without clean water suffer from various water-borne illnesses while those with wells spend a great deal of time fetching water from a limited number of hand-pumps which are often not working.



This is an area desperately in need of a sustainable solution that will offer economic benefits as well as improvements in the health and well-being of the people in Kalalé District.

"One of the growing concerns of the international community is the persistent energy poverty that is seriously impeding socio-economic development, particularly in sub-Saharan Africa," United Nations Secretary-General Kofi Annan.

SELF's Solution

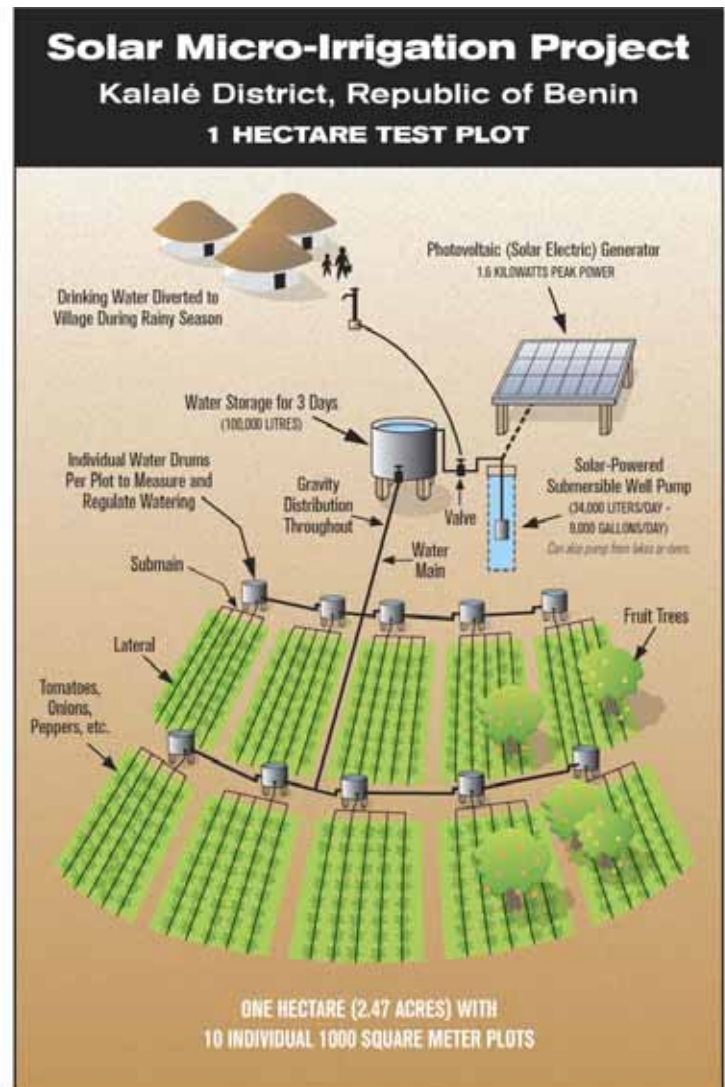
Solar Electric Light Fund (SELF) will work with Association pour le Developpement Economique, Social et Culturel de Kalalé (ADESCKA), a local NGO, to install low-cost micro-irrigation and solar water pumps in two villages in Kalalé District. This will create a reliable and economical means of irrigation and enable families in these villages to grow crops during the six month dry season for significant improvements in family income and nutrition. At least 20 families (100-200 people) will directly benefit from the solar-irrigation project and approximately 4,500 people living in two communities will benefit from the added supply of clean water during the rainy season.

Solar-irrigation will provide the following outcomes:

- Participating families will more than double their annual income.
- Participating families will at least double their consumption of fresh vegetables during the dry season thus reducing malnutrition.
- Project villages will at least double the harvest of fresh vegetables during the dry season.
- Project villages will gain at least an average of 6,000-8,000 gallons per day of clean water during the rainy season.
- A plan will be developed to replicate the project in the remaining 42 villages of Kalalé District.

Because the wells and solar pumps will only be used for irrigation during the dry season, the community will benefit greatly during the rest of the year from the nearly 5,000-8,000 gallons per day of solar-pumped well water. The laborious and time-consuming task of collecting water in small containers from faraway wells will be effectively eliminated.

While both solar pumping and micro-drip irrigation schemes have had wide-spread use, they have seldom been used in combination with well-documented results. In this project we will establish the "best practices" for combining these technologies and more importantly, we will establish a "how-to" format and dissemination plan so that this technology can be used to help the millions of people in Africa and elsewhere that are limited in growing food by the absence of water.



Beyond providing a cleaner and quieter local environment in comparison to diesel pumps, solar pumping in this project models a productive end-use powered by a carbon-free and sustainable energy source. As 1.8 billion people in the world without electricity look for energy solutions to improve their lives, projects such as this show that the targeted use of solar energy can raise living standards and still preserve fragile environments already under stress from overuse and climate change.

SELF'S Mission

The Solar Electric Light Fund (SELF) helps rural communities in developing countries power a brighter future for their people and the planet through innovative uses of solar energy. SELF's projects address vital needs including household lighting, water pumping and purification, vaccine refrigeration, microenterprise, and modern communications. In every action, SELF seeks to honor the integrity of indigenous cultures and to respect the delicate balance of the local and global ecosystem.