

# EFFICIENCY FOR ACCESS RESEARCH AND DEVELOPMENT FUND: INNOVATOR SERIES

## Unlocking Climate-Smart Farming In Rural Areas



**A solar water pump system being installed in Tanzania**

If farmers are to weather the impacts of climate change, they need climate-smart practices and irrigation solutions to ensure that their crops get vital water during dry spells or drought. While solutions exist, they are often not powerful enough, or in the case of solar water pumping, are unaffordable without financing.

Simusolar and others have developed Pay As You Go (PAYG) technologies to securely control and finance their systems. These technologies allow many farmers to cost-effectively irrigate in rural locations, as well as monitor pump use and disable them in the case of theft or illegal use. However, they depend on cellular network coverage to communicate.

Although mobile network coverage has greatly expanded in the past decade, many rural areas and farms still lack reliable or any coverage. This lack of connectivity makes it difficult for these areas to access PAYG financing, which relies on the ability to remotely manage and control equipment. Many of the smallholder farmers are women, making them particularly vulnerable in an already challenging situation faced by impoverished communities.

With support from the Efficiency for Access Research and Development Fund, Simusolar sought to support these off-network farmers, with an emphasis on reaching and serving women farmers.

### DID YOU KNOW?

Less than 6% of land in Sub-Saharan Africa is irrigated<sup>1</sup>.

### SIMUSOLAR

In Tanzania and Uganda, Simusolar works as a last mile service provider, catering to the needs of the rural economy. They offer a range of productive use assets, including water pumps, solar generator replacements, fishing and security lights, and cold chain solutions. By working with diverse manufacturers, Simusolar sources tailored solutions for each specific use case. They also ensure accessibility and affordability through proprietary PAYG technology applicable to any size of productive use equipment, and their ability to finance assets.

<sup>1</sup> [Sustainable Expansion of Groundwater-Based Solar Water Pumping for Smallholder Farmers in Sub-Saharan Africa, Efficiency for Access, August 2021.](#)

Simusolar's project partner, the International Institute for Environment and Development (IIED), is one of the world's leading independent policy and action research organisations. Alongside over 350 partners in more than 60 countries, IIED generates evidence and builds capacity in order to drive change in policy and practice.

### SIMUSOLAR

"With support from the Efficiency for Access Research and Development Fund, Simusolar were able to develop a solution to finance and serve the most rural customers, who are both off-grid and off-network. Our innovation, designed for no-connectivity requirements, took a gender disaggregated and crop-specific market approach."

**Lawrence Peter, Technology Manager,  
Simusolar**



**A farmer using her first smartphone, used to control the solar water pump**

### CONNECTIVITY INNOVATION

Simusolar created its next generation controller, which uses a phone to connect solar water pumps in no- and low-coverage areas to cellular networks off-farm. A farmer receives a phone with their pump, which controls it when on-farm and transmits pump use information when the farmer goes to an area where there is cellular connectivity, typically the nearest town. This controller allows Simusolar to offer financing in low-connectivity areas where the lack of coverage would normally limit equipment control and monitoring, which are requirements for obtaining financing for assets.

The solution makes solar irrigation more affordable for a wider range of people. It also provides farmers with an extra useful tool: a smartphone. With a smartphone,

farmers can learn about effective farming techniques, join communities where they share farming information, stay updated on market prices, and overall, be more connected than before.

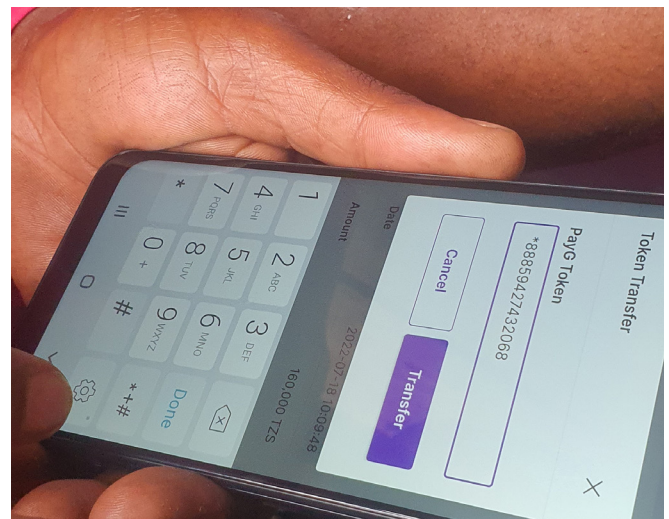
The software of this offering goes beyond programming. Simusolar and IIED mapped out the existing body of knowledge on gender differences in farming, surveyed communities across a large region of Tanzania, provided customised offerings using IIED's Energy Delivery Model, and designed new approaches to ensure the offering reached disadvantaged audiences. This project included testing on a small group of clients providing proof-of-concept.

### WHAT WERE THE RESULTS?

The goals were delivered through PAYG Bridge, an IoT controller designed for no-connectivity environments. This enabled off-network farmers to receive the same affordable, lease-to-own opportunities that previously only farmers with cellular coverage could receive. The solution was easy-to-use and reliable, with client phones communicating with the cloud when cellular network was available, then later updating their pumps when on-farm.

This outcome is important for Tanzania, but even more so for the many markets who have less cellular network coverage. In some settings, the majority of farmers work off-network. With PAYG Bridge, they will be able to receive services from asset providers.

"The phone was valued, though for divergent reasons. The benefits included greater connectivity (of the pump), access to news, access to agricultural information, easier self-service (checking the balance) and a nice camera. When asked about the benefits of the total package, communication was mentioned by 86% of users. A similar percentage recommended the package." Prince Kanigwa, National Sales Manager.



**A smartphone transferring a payment token to the pump control unit**

### KEY LEARNINGS

The Simusolar team navigated several challenges throughout the project, including the disruptions caused by Covid-19 travel restrictions and supply chain issues, such as microchip shortages. It was a difficult period for this type of pioneering.

As a result, they were both pleased with the technology and market solution design, and disappointed that they were unable to launch it earlier in the project in order to have 18 months or more of adoption. Reflecting on this, they realised starting piloting the market adoption strategies earlier without the completed PAYG Bridge would have been more beneficial, separating hardware development from market interventions. While there is crossover between them where coverage is poor, market adoption should be secured prior to adoption.

While not implemented in the project, the market research involved in the design phase revealed insights that deeply affected how Simusolar is tackling the market, with a focus on specific value chains (e.g. avocado, grapes) and developing strong relationships with communities, buyers, and stakeholders to serve their needs.

They also found that reaching more women farmers requires a marketing approach that considers their needs and preferences, and how gender influences their interactions and decisions.

### WHAT'S NEXT FOR SIMUSOLAR

Simusolar is preparing to launch a broader pilot to test this technology at scale. PAYG Bridge will become their standard control box, extending coverage and improving connectivity. Enhanced features will also be added to the mobile application, moving beyond the basic pilot version. Additionally, all pumps will have an optional phone offer for users.

Simusolar is committed to making their solutions more inclusive, aiming to address both income and gender disparities. They plan to continue refining strategies to reach underserved groups, focusing on value-chain marketing and tailored gender-based approaches. These targeted strategies will be integrated alongside other key marketing initiatives as Simusolar expands its reach.

### GET IN TOUCH

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**A farmer receives his first smartphone, used to control his solar water pump and his farming activities**

