SMART VILLAGES

New thinking for off-grid communities worldwide

The Rural Development Global Challenge

770 MILLION
People lack access to electricity

663 MILLION
People lack access to safe water

3 BILLION
People lack safe, 'clean' cooking facilities without polluting fuels

Smart cities are on everyone's lips, but this sole focus on cities is also worrying.

Half the world's population do not live in cities, and that includes **more than 70% of the world's poor.**

We believe people in remote villages in the developing world deserve the same opportunities as everyone else.

Our Innovative Approach

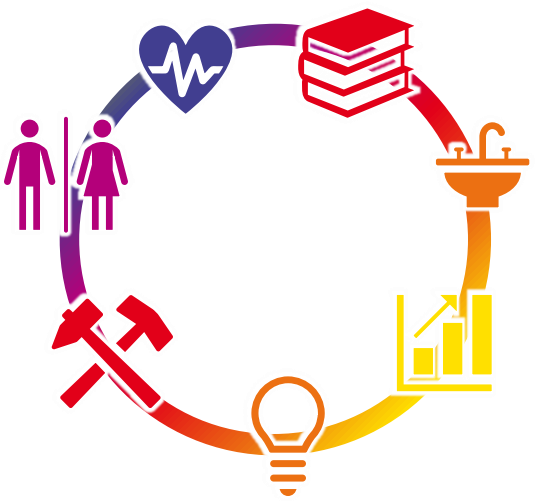
Developed from a 7-year long grassroots research program, to understand why development projects fail

1. Working **Across** the **Sustainable Development Goals**

2. Focusing on **Community Needs and Priorities**

3. Using **Energy** as a **Catalyst**

4. For **Sustainable, Lasting Impact**



Whilst the traditional approach focuses on a single technology or development goal, our **holistic model** maximises impact at little extra cost, developing systems for, and with, target communities, for lasting benefit. Through energy access and a carefully selected suite of complementary technologies, our 'Smart Villages' enable provision of good **education** and **healthcare**, access to **clean water**, **sanitation** and **nutrition**, the growth of productive **enterprises** to boost incomes, and enhanced **security**, **gender equality** and **democratic engagement**.

Find out more at www.e4sv.org

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10 Projects

5 Countries

12 International Partners

1 Vision

Sustainable Offgrid Education Technology in Rural Schools

Innovate Access to Healthcare in Remote Communities

Developing Interactive Community Energy Modelling Toolkits in Somaliland

Developing Low Cost, Locally Appropriate Cold Storage Solutions for Rural Uganda

Innovative Community Energy Monitoring, Control and Reporting Technology

Innovating Farmers' Enterprise Centres for Wealth Generation and Energy Access in Rural Communities

Foster Community Environmental Stewardship by Removal and Recycling Plastic Waste from Rivers in Kenya

Second-life battery solar system for rural schools in East Africa

Smart Integrated Energy in Northern Community Tanzania

Smart Sustainable PV Minigrids as an Alternative to Grid Extension in Lesotho

Our current projects, coupled with **rigorous monitoring** and **evaluation**, aim to **validate the Smart Villages Approach** to universal energy access and rural development, whilst **developing** and **testing innovative technologies** to deliver these integrated development objectives.

Help us make a lasting impact

As an R&D and innovation-led, impact-oriented SME, we rely on external funding to make our projects possible, though often this funding does not cover 100% of costs for us and our partners. Recent cuts to the UK Overseas Development Aid budget have also severely impacted several of our projects.

Without additional funding we will be **unable to achieve all our initial project objectives**, and in turn, inevitably **disappoint the communities** with whom we have been working over the past year.

We need your help to fill this funding gap.

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Developing Low Cost Locally Appropriate Cold Storage Solutions for Rural Uganda

In Proud Partnership with

ecolife FOODS

SMART VILLAGES

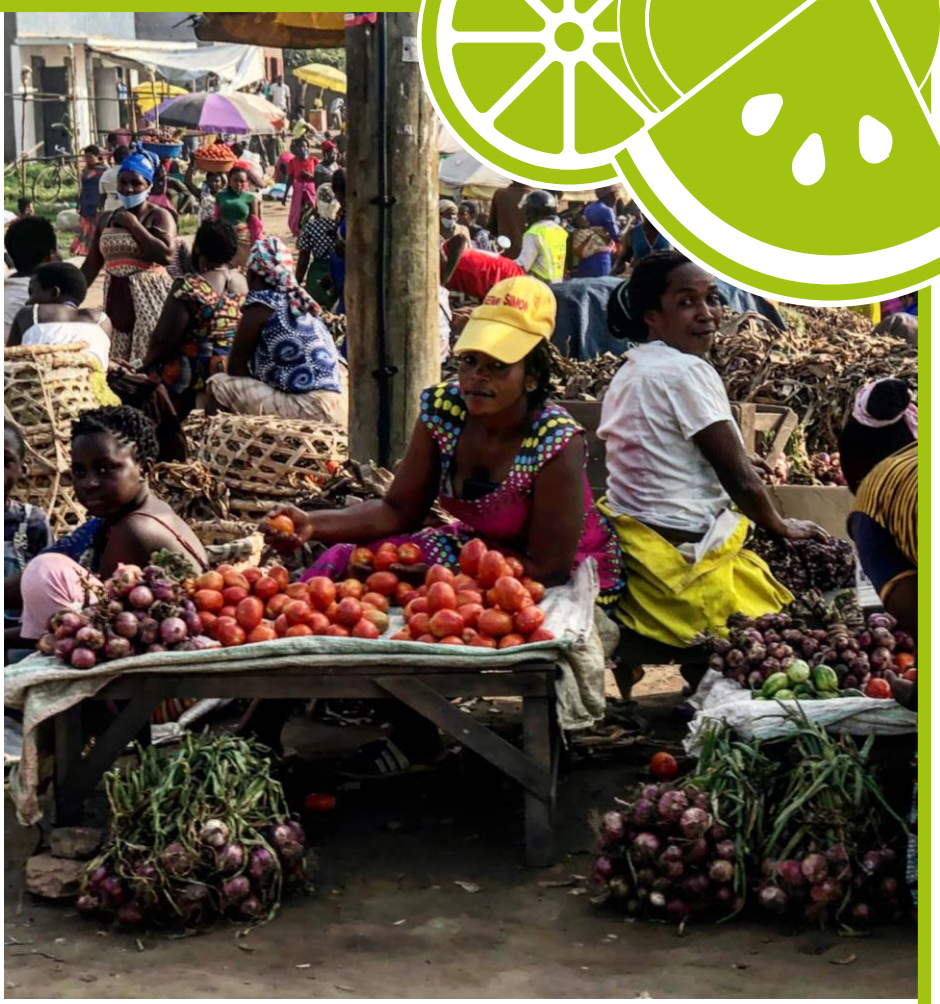
In Partnership with ecolife FOODS

Developing Low Cost Locally Appropriate Cold Storage Solutions For Rural Uganda

The Challenge

Post harvest losses for rural farmers are huge – up to 50%. Without adequate storage, farmers unsold produce is left to rot, or sold off at unfair low prices.

Existing cold-store solutions are expensive to buy and run, and generally need to be imported.



Our Goal

A **low cost** solution to **reduce post-harvest losses** for off-grid farmers and in turn:

- Make them more resilient to climate change and poor harvests
- Increase their bargaining power over intermediaries to obtain fair prices for produce

Presenting...

Providing a **cold storage facility** for farmers, keeping their crops fresh for longer post-harvest

Built using innovative **interlocking stabilised soil blocks** – cheaper, stronger and more eco-friendly than traditional bricks which require large quantities of wood/charcoal and cement

Solar powered chillers, not reliant on grid power

...the Off-Grid Cold Store

Low Cost
Eco-Friendly
Local Materials & Equipment
Simple Technology & Techniques

Rice husk cavity wall insulation, re-using locally available waste material that would otherwise be burnt

Waste heat from chillers productively used to **dry crops**, adding value

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Developing Low Cost Locally Appropriate Cold Storage Solutions For Rural Uganda

In Partnership with ecolife FOODS

Development Progress

1 Methodical testing of **thermal properties** of potential cavity wall insulation materials

2 Perfecting **manufacture** of interlocking stabilised soil blocks and **training** community

3 Construction of pilot cold store with rice husk cavity wall insulation.

4 Installation of appropriately sized solar power and chillers

Where we are now

Conducting performance evaluation, with use-case analysis from farmer engagement.

Developing business model for rollout in rural, off-grid villages

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Innovating Farmers' Enterprise Centres for Wealth Generation and Energy Access in Rural Communities

In Proud Partnership with

ecolife FOODS and KIIMA FOODS

In Partnership with

SMART VILLAGES

Innovating Farmers' Enterprise Centres for Wealth Generation and Energy Access in Rural Communities

The Challenge

Minigrids are vital in providing power for businesses in off-grid communities, and yet **few are commercially sustainable**.

Communities are unable to pay the high repayment costs, and there is a lack of investment from donors & governments, leading to equipment falling into disrepair.

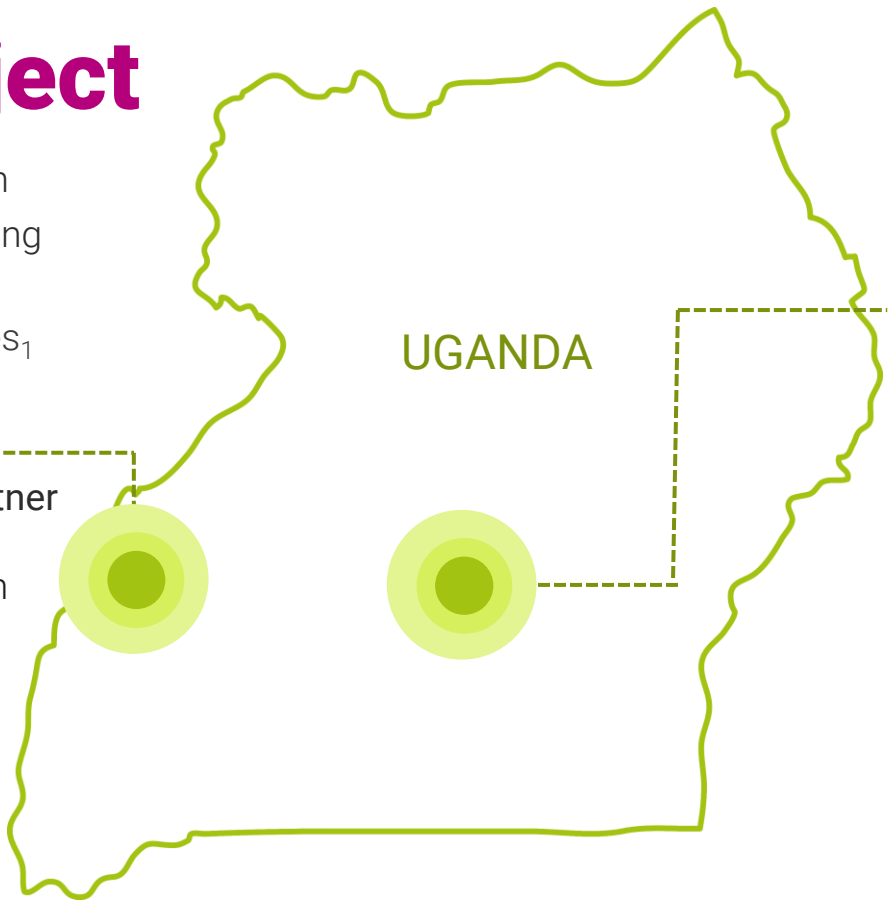
The Opportunity

An **anchor load** (a significant industrial use) makes minigrid operations more financially and technically viable, whilst reducing the unit cost of electricity. If an anchor load can also bring money into the community, this increases people's ability to pay for electricity.

We propose installing a **cold store** and **farmer's enterprise centre (FEC)** as an anchor load, to improve farmers' incomes and minigrid performance long-term.

The Project

Validating our model in
3 Rural Off-Grid Farming Communities, and
3 Control Communities[1]



Western Uganda
Working with local partner Kiima Foods

- **2** communities with minigrid and FEC anchor load
- **1** community with minigrid only

Central Uganda
Working with local partner Ecolife Foods

- **2** communities with minigrid and FEC anchor load
- **1** community with minigrid only
- **1** control community with no power

We work closely with each community to tailor the design of any installed minigrid and FEC to their needs, encouraging the growth of new businesses and increasing commercial sustainability.

Our detailed monitoring and evaluation strategy will provide clear evidence to evaluate the benefits of our anchor load model, upon project completion

1: Once the impact of each approach has been validated, a FEC will be installed in each control community, so all communities may benefit equally

Find out more at www.e4sv.org

In Partnership with

SMART VILLAGES

Innovating Farmers' Enterprise Centres for Wealth Generation and Energy Access in Rural Communities

Project Progress

- ✓ Careful selection of farming communities for minigrid success
- ✓ Extensive community engagement to identify needs and priorities for appropriate system design
- ✓ Baseline survey conducted in all villages for monitoring and evaluation purposes
- ✓ Partnerships formed with village leaders and repayment models agreed
- ✓ FEC designs completed, and preliminary business models defined for real-life validation

Where Next?

- Installation and commissioning of FECs, with farming technologies tailored to each community
- Distribution of solar power from FECs to surrounding households, schools, churches and businesses (minigrid installation)
- Community training in best-practices for use of newly installed technology
- Continuous monitoring and performance evaluation as communities adapt to new systems and electricity provision
- Second impact survey to measure effects of system implementation
- Report on learnings from project, enabling large-scale roll-out across rural farming communities

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Innovating Farmers' Enterprise Centres
for Wealth Generation and Energy Access
in Rural Communities

In Partnership with

ecolife FOODS

KIIMA FOODS

Introducing...

High Street with shops

Mbata Village Trading Centre

Grain store

Women's focus group

COVID precautions

Men at work

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Innovating Farmers' Enterprise Centres for Wealth Generation and Energy Access in Rural Communities

In Partnership with

ecolife FOODS

KIIMA FOODS

Introducing...

Mbata Village Trading Centre

Location:
- The mountains of Western Uganda
- 50km from Kasese

Population:
- 1500 inhabitants
- 300 households
- Average age 24

Livelihoods *(Many people have multiple livelihoods):*
- 61% Farmer
- 34% Student
- 21% livestock husbandry
- 11% Casual manual labour
- 13% Unemployed
- 6% Small business owner

Challenges:

Access - Situated in the mountains, the road is long and treacherous becoming impassable during the rainy season

Electricity - Mbata has no grid electricity, nor is it likely to be connected in the next 30 years due to its challenging location

Phone Signal -The community is cut off from any phone network, making communication with the outside world impossible

Village Strengths
- Excellent fertile farmland
- Highly entrepreneurial youth
- Great community spirit

Help us bring sustainable development to this mountain farming community

Ninety solar panels are needed for the farmers enterprise centre. One panel costs £99.

For just £45 we can wire up a nearby household to the solar array, providing one household with light and electricity.

For £60,000, we can buy the equipment needed for one farmers enterprise centre, helping farmers preserve and add value to their crops, and ensuring they get a fair price for their goods.

For £1000 we can wire up all the houses, shops, the health clinic, churches and schools around the farmers enterprise centre, giving them access to electricity, and benefitting over 400 individuals.