Energising Change

Demonstrations of Productive Use Technologies for Sustainable Agriculture

Cooling

Horticulture

Innovation Fund

Dairy

endev

About This Document

Sustainable Energy for Smallholder Farmers (SEFFA) project was a pioneering initiative to support innovative and scalable business models for using renewable energy technologies and services in the agricultural sector to improve livelihoods of smallholder farmers, increase their resilience to climate change and contribute to GHG emissions reduction. The project focused on dairy and horticulture sectors in Ethiopia, Kenya and Uganda and the project period was from 2021 to june 2024.

In the SEFFA project, a technology demonstration is an instrument to assess viability of a business case and is used in two main ways:

(i) As a pilot for new technologies to determine effectiveness, suitability, impact on production levels, cost-savings of end users, etc. and collect this data to inform whether a business case would be viable within the given context alongside additional factors.

(ii) To install established, proven technologies to generate demand for the product by end-users, i.e. by inviting interested officials, farmers, investors, etc., thereby supporting companies to access a wider market for their product.

This document provides an overview of SEFFA's experiences in demonstrating the uses of cooling, drying and irrigation technologies to enhance agricultural outputs and incomes, highlighting key learnings, successes, and challenges encountered during implementation.

Quick Facts

Ethiopia, Kenya, Uganda

SWP, Dryers, Cooling

SNV, GIZ

Ministries of Energy, NGOs, private sector

To test the technical feasibility of irrigation, cooling and drying productive use technologies in varied smallholder farming contexts within dairy and horticulture value chains.

Achievements until 2024-06

SWP
- 24 SWP Demos installed in Ethiopia, Kenya and Uganda
- 66 Farms impacted
- 88 Acres irrigated with SWP
- Farm Sizes 0.1 – 4.5 HA
- 80% sites transitioning from diesel powered irrigation

Solar Dryers
- Over 2,000kg drying capacity installed

Cooling
- 1,500 L small scale cooling capacity installed over 6 unique sites
- 5,300 L Bulk Milk Cooler

Technologies and Case Studies

Recognising the need to test technologies in real world working conditions, the technology demonstrations provided a preliminary understanding towards developing a concrete business case for PUE in small scale agriculture. Overall, SEFFA worked with one production techology (solar water pumps) and four post harvest technologies: solar drying, solar cooling, solar milk machines and solar rice processing. Here we focus on demonstrations relating to Solar Water Pumps, Solar Drying Systems and Solar Cooling.

Most food crops are produced by an estimated 33 million smallholder farmers (SHFs) with 0.5 to 5 ha of land, yet yields in the region are the lowest in the world and poverty is directly associated with rural smallholders. Irrigation can provide farmers with increased yields, yet the market for SWP for smallholders is only starting to scale in Kenya, nascent in Uganda, and in a very early stage of development in Ethiopia. Conserving agricultural produce and products by cooling or drying contributes considerably to income increases for smallholders, as up to 70% of fresh produce like fruits and vegetables (e.g. mangos or tomatoes) perish without treatment and figures from Uganda suggest up to 50% of milk goes to waste. SEFFA tech demos set out to find viable business cases for post harvest technologies for SHF.

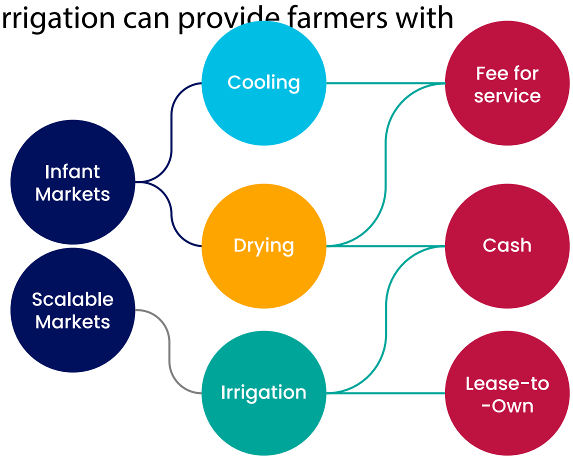


Figure 1: Technology Maturity and Business Models

Irrigation

SEFFA introduced SWPs to SHFs through various modalities and in highly diverse farming conditions. Figure 2 shows the types of water sources across the demo sites and Figure 6 (page 4) shows the locations of the sites. There were two approaches to increasing access to SWPs:

- Introducing SWPs to replace manual irrigation.
- Transitioning from diesel or fossil fuel-powered irrigation to solar-powered irrigation (see Figure 3).

Depending on the farm needs and the brands available in the country, both surface and submersible pumps from various manufacturers were used (see page 5). SWPs were financed with innovation fund grants in all 3 countries to help prove the business case for SWP usage[1]. Individual ownership, group ownership and fee-for-service models were trialled at the demo sites, estimated utilisation rates for the pumps under different ownership models can be seen in Figures 4 and 5.

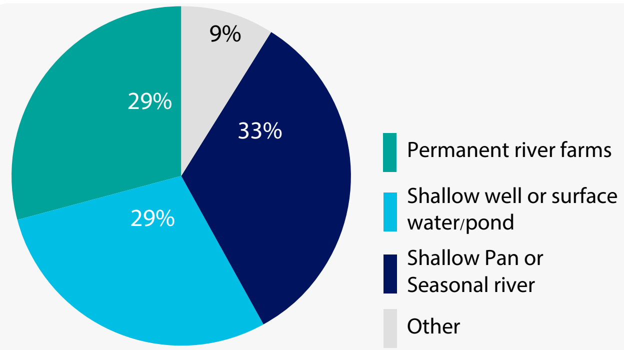


Figure 2: Types of Water Sources on the Farms

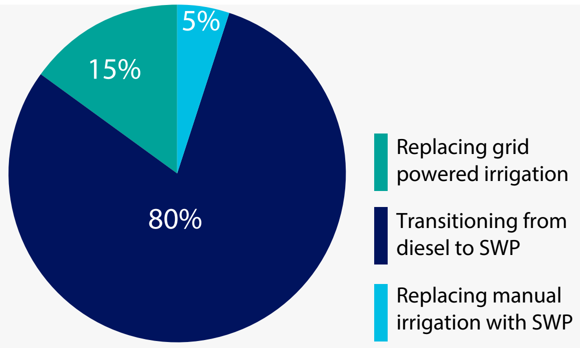


Figure 3: Types of SWP Projects

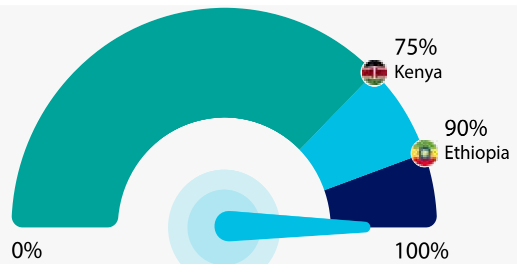


Figure 4: % Utilisation of SWPs - Individual Ownership

Figure 5: % Utilisation of SWPs - Group Ownership Model

[1] Note that SWPs adoption was incentivised by SEFFA through RBF offered in Kenya and Uganda to stimulate demand among SHFs, however these are not considered part of the demonstration sites.

Crops

Maize, pawpaw, bell peppers, pigeon peas, green leafy vegetables, sweet potatoes, maize, yams, and citrus fruits, collard greens, beans, green maize spinach, mangoes, tomato, onion, garlic, ettc

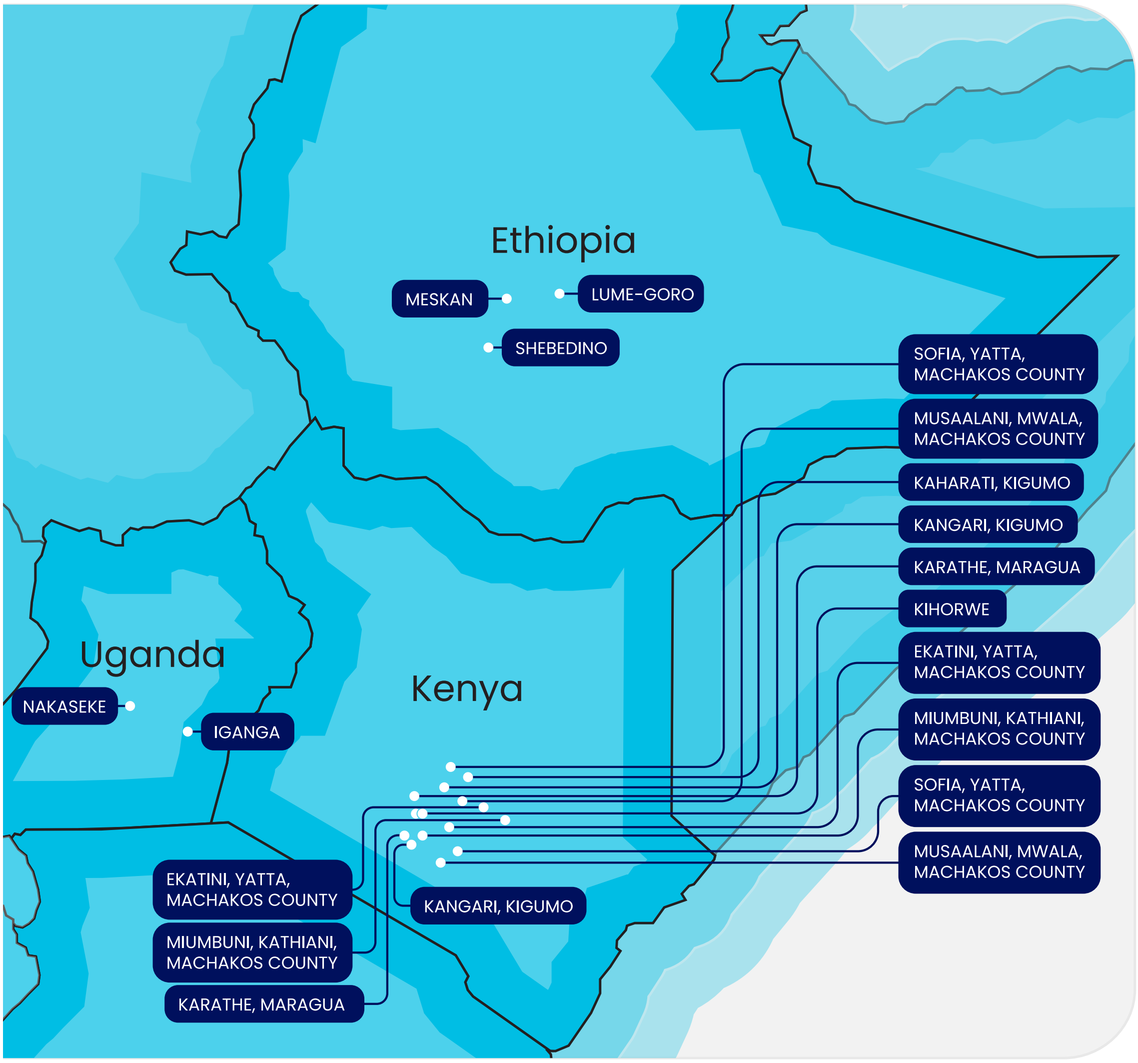


Figure 6: SEFFA SWP Demo sites in Ethiopia, Kenya, and Uganda

Along with cost savings in fossil fuels, a key indicator for irrigation technology is the ability to make more efficient use of a sparse water supply. The use of drip, sprinkler or pipe irrigation techniques provides significant water savings compared to furrow (flood) irrigation and through the project SEFFA was able to study the water use savings (see Figure 7).

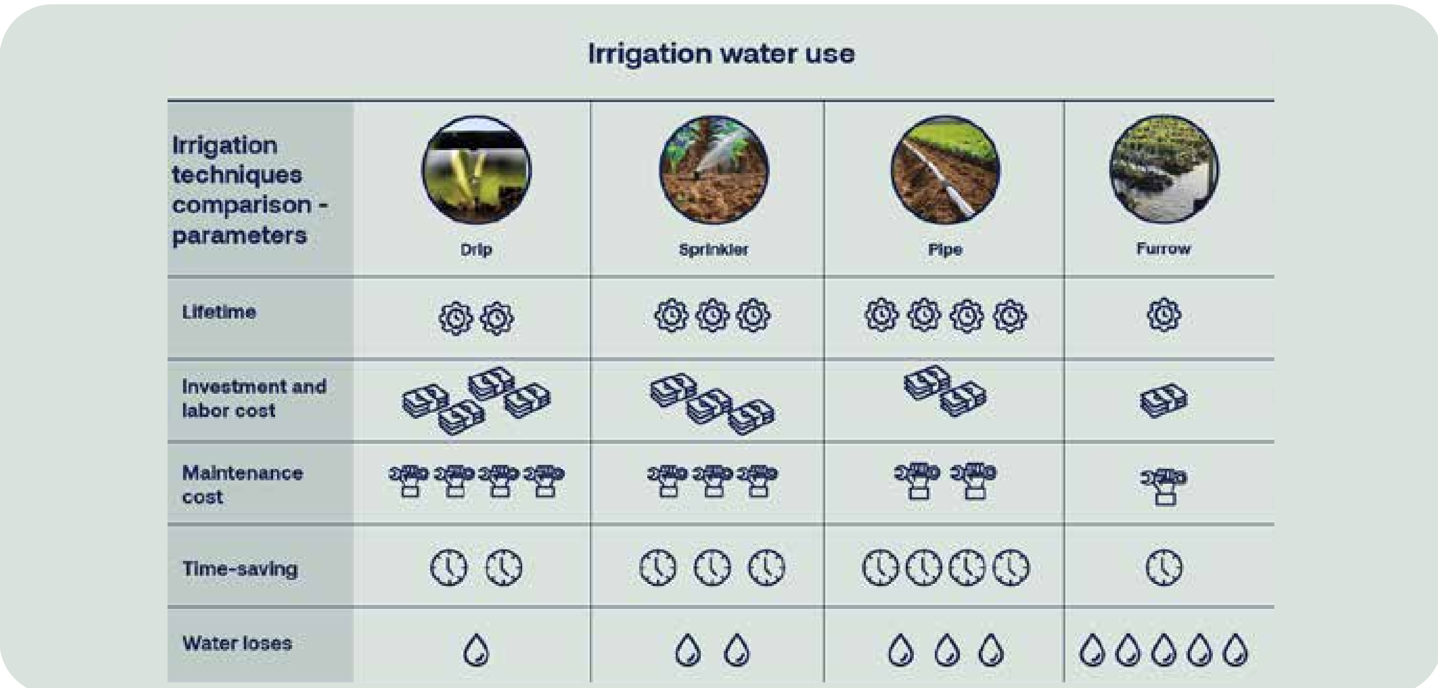
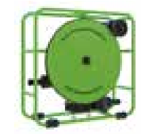
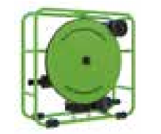
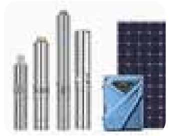


Figure 7: Comparision of Irrigation techniques for SHFs based on SEFFA Ethiopia findings

Types of Pumps used in the projects

Dryer Technology	 Ennos SWP Bluetooth enabled	 Ennos Sunlight pump (KE - SNV)	 Rainmaker Solar Pump RM2C and RM25	 Future Pump SF2 SE1	 Future Pump SF2 (KE -SNV)	 RainMaker 2S + Climate Smart Direct (KE - SNV)	 Difful
Solar Modules	415 Watts Solar Panel	475W Solar Panel	310W Roof Mounted Solar Panel or 160W Portable Panel	60W	120W	340W Panel	325 WP
Prices	1,579 USD 280 USD Drip irrigation systems	1,338 USD	880 USD	550 USD 8mx1” inlet/suction hose	953 USD	1800 USD	24,400 USD
Type of Pump	Surface	Surface	Submersible	Surface	Surface	Submersible	Submersible
Head Size	20m	40M	15M	15M	15M	15M	18M
Capacity Litres per hr/min	520 L /min	24 L /min	10,000 L /day	21,000 L /day	2 L /min	13 L/min	567 L/min
Supplier	ennos turns sunrays into savings	Epicentre Ltd	SunCulture	Future pump	D&S DAVIS & SHIRTLIFF know HOw through experience	SunCulture	Meseret Mare Gebre Solar Importer

Case Study: Supporting tomato irrigation in Kenya

Consumer Credit | Kenya | Tomato | SWP | Farm Size: 3-4ha

Problem Statement

Use of diesel generators for irrigation require expensive purchases of petrol, this project aimed to replace these with clean energy visa SWPs.

Learning Contribution

The pilot showed that the SWP was easily adaptable compared to diesel pumps (lighter).

Innovative partnering with Taifa SACCO meant that farms could benefit from a loan product for the SWP. On a SWP of 1,000 USD, loans are available with interest rate of 12 % per annum and the SACCO can finance up to 100 % of SWP costs with requirement of fulfilling SACCO membership & loan guarantee requirements.

Featured Tech

Surface water pump, 20 cubic meters capacity

Demo Type

Demand Generation

Case Study: Solar irrigation for tomato production among leaseholder farmers

Irrigation | Uganda | Tomato | SWP | Farm Size: 1- 1.5 acres

Problem Statement

Tomato farmers face two major obstacles: (1) high irrigation costs and unpredictable access to water during the dry season and (2) financial burden of reliance on gasoline water pumps costing approximately 132,000 Ugandan shillings per week to irrigate a one-acre tomato garden

Featured Tech

0.5 HP Ennos Sunlight Surface water pump

- 2*300Wp panels
- Pumping distance of max 100m
- 1.5 acre garden max
- Cost of 7,000,000 UGX (including pump, panels and drag hose)

Learning Contribution

- Successful trial of group ownership use of SWPs among multiple smallholder farmers with different gardens
- Cost reduction in irrigation and reduction in water usage among participating farmers
- SHF trained in agronomy and irrigation practices

Benefits & Impacts

- Proven savings of between -120 170 EUR shown when using solar water pumping rather than gasoline powered or manual irrigation
- Farmers are able to fully operate and maintain SWP as well as practice proper tomato agronomy

Demo Type

Pilot for shared solar water pumps

Key Indicators for Irrigation

- Water source : Surface ponds
- Land under irrigation : 0.4 – 0.8 HA

Solar Dryers

Summary

Product drying is an energy-intensive process meant to improve the storability of various types of agricultural products and substantially reduce weight and volume. Solar drying is achieved by direct sun radiation plus the greenhouse effect and also drying via PV panels. Although drying is dependent on the sunshine hours, weather, atmospheric clearness, and location, the potential to replace conventional methods is significant and high. With the use of solar dryers in horticulture applications, depending on the produce/crops, a reduction in drying times of 40% to 70% is achievable (from 15 days drying time to 2-4 days).

The technology was introduced via awareness events and funded with innovation fund financing. Good acceptance of the technology was observed in all projects, however, limited proofed designs and finance options due to a lack of understanding/business cases for solar drying were encountered with the use and scale of the dryers.

Crops	Vegetables, f ruits and s eeds	Pepper	Chilli Pepper	Onions, avocado	Pumpkin, beetroot
Dryer Technology	 Dehytray	 Bubble Dryer	 Solar Biomass Hybrid Dryer	 Custom Designed Prototype Dryer	 Centralised Dryer
Power Source	Solar radiation	Solar radiation + Solar Pv 40WP	Solar Pv 400WP	Solar radiation	Solar Pv 50WP
Drying Capacity Installed	4 kg	200 kg	750 kg	900 kg	500 kg
Drying Times	1 - 4 days	3 - 4 days	1 - 3 days	Not Applicable	Not Applicable
Drying Time Reduction	1 – 2 days	11– 12 days	3 – 6 days		
Demonstration Sites	Ethiopia	Ethiopia	Uganda	Kenya	Kenya

Case Study: Assessing Solar Dryer Feasibility in Ethiopia

Drying	Ethiopia	Horticulture	Farm 0.25 – 0.4 ha

Problem Statement

A 2017 review[2] indicated that 15 to 70% of yields from horticultural crops in Ethiopia are lost post-harvest. Post-harvest losses can be limited with improved harvesting, packaging, and marketing, but also with appropriate and feasible agricultural techniques for reducing transport spoilage and extending shelf-life. Foodstuffs are commonly dried in the sun, but the application of solar dryers is negligible.

Featured Tech: Dehytray and Bubble/Tunnel dryers

Demo Type: Technology Pilot

Learning Contribution

The solar drying technologies piloted were efficient, cost-effective, and controllable, protecting the product from deterioration during the drying process. The drying process can also negatively impact the physical and nutritional qualities of the products unless proper methods are employed.
To check the viability of dryer technologies at the smallholder farmers' level, SEFFA partnered with four universities to pilot the selected dryer technologies (Dehytray TM and Grain Pro TM Bubble). By using the technology, the beneficiaries managed to reduce the drying time by 50 - 75% and found they were user-friendly. Furthermore, three Dehytray dryer technologies were provided to seed producers which are members of the Vegetable Business Network organised by the Veggies for People and Planet (V4P&P) project (IKEA Foundation financed). The beneficiaries were trained on technology usage and practiced by drying pepper and kale seeds and were impressed by the performance of the dryer technology.

Target Area

Tech Demos at 4 sites Wondogenet (Sidama region), Bahirdar Zuriya (Amhara region), Mareko (SNNP region), and Arbaminch (SNNP region).

Benefits & Impacts

Some benefits of the dryer as listed below:

- High reduction in drying time.
- Hygienic drying method as it reduces contamination considerably.
- Improve the quality of the dried produce.
- Portable and user-friendly.
- Protect against birds, fowl and other animals accessing the produce.

In general, through surveys and interviews, valuable insights were gathered regarding the attitudes of users towards the technology. The results were promising, revealing a high level of interest and willingness among farmers to adopt the new technology, indicating strong market potential. Partnering with the Universities showed benefits in working together, sharing ideas, and making a positive impact.

Note: Affordability and accessibility at the smallholder farmers' level is an issue to be addressed.

[2] Banjaw TD. 2017. Review of Post-Harvest Loss of Horticultural Crops in Ethiopia, its Causes and Mitigation Strategies. J Plant Sci Agric Res. 2017, 2:1. (http://www.imedpub.com/articles/review-of-posthav-est-loss-of-horticultural-crops-in-ethiopia-its-causes-and-mitigation-strategies.php?aid=20233)

Key Indicators for drying	Crops	• Pepper, tomato seed, banana.
	Power source	• Dehytray: Solar radiation. • GrainPro Bubble Dryer: Solar Radiation supported by solar PV to operate the fan.
	Total Drying Capacity	• Dehytray up to 4kg • Bubble Dryer for pepper drying 200kg
	Drying Time Required	• Dehytray: 1-2 days • Bubble Dryer: 3–4 days
	Space Required/ Footprint	• Dehytray: 41cm X 84 cm • Bubble dryer: 15 m X 2m
	Temperature	The dryer can produce temperatures of double the ambient temperature.

Case Study: Solar powered drying in partnership with emrich aggregator

Drying | Uganda | Horticulture | Farm Size: 0.5 and 2 acres

Problem Statement

Horticulture farmers in Iganga, Eastern Uganda, report approximately 20% post-harvest losses, especially during peak production seasons. This issue was particularly severe for farmers selling raw chilli peppers to Emrich Farms Ltd., an aggregator, leading to significantly low returns for farmers.
Additionally, Emrich Farms experienced reduced profitability when selling raw chilli peppers during periods of peak supply. To mitigate these challenges, GIZ, in partnership with Emrich Farms, proposed a value-addition strategy: solar drying the chilli peppers and processing them into chilli oil, a product with a higher market price.

Featured Tech: Semi-automated solar-biomass hybrid dryer

Demo Type: Pilot

Learning Contribution

- The technical and financial viability was tested and validated.
- The technology is technically viable assuming proper operation and maintenance with an estimated lifespan of 10 years.
- Financial viability is calculated as follows:
  - Total system cost: 15,800 USD
  - Financing assumption: 50% Equity and 50% debt.
  - 2-year agricultural loan at a 17% annual interest rate.
  - Net present value: 85,260 USD
  - internal rate of return: 53.6%
  - Discounted Payback Period: 2.3 years
- Utilisation of technology (case of chili pepper): Phased at 25%, 50% and 100% in year 1, year 2 and year 3. Utilisation is expected to increase gradually with the growth of the market for processed chilli oil.

Benefits & Impacts

Adopting the dryer has allowed the aggregator to offer higher prices per kg of fresh chilli, bought from farmers directly increasing farmers' income and providing better compensation for their produce.

Enhanced production capacity and efficiency due to the dryer have enabled the aggregator to absorb more produce, reducing post-harvest losses and expanding market access for farmers.

Key Indicators for Drying

Crops	Chilli pepper, banana.
Power source	Solar thermal, Solar PV, biomass
Total Drying Capacity	Up to 750Kg per drying batch depending on the type of crop dried.
Drying Capacity Used	Up to 180kg of the capacity is used for chilli pepper.
Drying Time Required	1-3 days on solar alone depending on weather condition. 1 day only when biomass is used to back up solar during cloudy conditions and at night.
Space Required/ Footprint	60 Square Metres
Temperature	40-65 C°

Solar Cooling

Summary

Cooling shows high promise in East Africa in terms of increasing farmer incomes by getting products to market in better conditions and allowing for a longer time in the supply chain before spoilage. In one business SEFFA supported, for every 300 kgs of herbs produced, about 10 to 20 kgs would be rejected due to failure to keep optimal cooling conditions. Despite some early successes with cooling, challenges related to technology readiness, market acceptance, and scalability were observed.

The evidence that off-grid solar cooling or hybrid solar grid-tied cooling devices will increase value along the chain for farmers and processors in horticulture is rated as medium and investment in the technology and maintenance are high. Therefore, cooling projects are dedicated to high-value products like fruits and vegetables. Dairy shows more promise because of the need to maintain the cold chain for food safety in milk and dairy products.

Technologies Used

Solar PV cooling can be realised in multiple system configurations, and PV-driven compression technologies in self-consumption mode are also beginning to penetrate the market. The first solar PV-driven AC units able to adjust cooling capacity to the availability of electricity produced from solar panels were commercialised in 2018. Generally, the types of cooling support by SEFFA were:

- Batteryless ice based chillers (160 L)
- Small-scale cooling (150- 450 L)
- Large-scalecapital cooling (up to 5,300 L)
- Hybrid solar-diesel powered coolers: The system cools milk for 6 hours using solar after full charge with a diesel generator used when the weather conditions are not favourable cloudy or rainy season.

	Dairy	Horticulture
Cold Store Capacity Installed (total)	160 L Ice-based chiller: batteryless technology using daytime solar to form ice and a heat exchange system to cool a cold room. 250 L deep freezer • 150 L deep freezer: DC deep freezer • 240 WP solar panels • 150 AH battery • Charge controller • 5,300 L bulk milk cooling (uGanda) 64 X 150AH Battery Bank; 30KVA Inverter • Charger System cools milk for 6 hours using solar after • full charge with diesel generator used when the weather conditions are not favourable, cloudy or rainy season.	160 L Ice-based chiller “Self Chill”: batteryless technology using daytime solar to form ice and a heat exchange system to cool a cold room. Sun transfer supplied Self-Chill Solar Powered Cooling: batteryless technology using daytime solar to form ice and a heat exchange system to cool a cold room. The system is designed to cool horticultural, fish, and dairy produce. Walk-in solar cold room (fabricated in the country by Earthly Energy).`
Solar PV	19.72KWP solar hybrid (diesel) energy system powering 5,300 L bulk milk cooler.	

Case Study: Dairy cooperative switching to solar hybrid diesel cold storage

Drying | Dairy | Uganda | Coop Size: 80

Problem Statement

- Lack of sustainable PUE technologies for bulk milk cooling.
- Address milk spoilage challenges and loss of business due to running unreliable diesel generators.
- High business operational costs on fuel, generator repairs and servicing.

Featured Tech
Mueller Bulk Milk Cooler with 19.72KWP solar hybrid (diesel) energy system.

Demo Type
Pilot

Benefits & Impacts
Reduced operational costs by about 67% from 30 L to 10 L of diesel per day on average.

Key Indicators for cooling
Capacity installed 5,300 L

Learning Contribution
The Akajumbura Cooperative is composed of 80 members with 35 youth and employs 5 staff. The cooperative bulks between 5,000 – 5,300 L (wet season) and 2,500 – 3,000 L (dry season) per day.

The technical and economic feasibility of the hybrid system was proven.
Economic Case:
- Total system cost: USD 52,400
- Loan of USD 16,780 at an interest rate of 1% per month for 3 years.
- Fuel cost reduction 34%
- Return on Investment 46%
- NPV: $55,442

Payback Period (years): 2.1 years

Case Study: Increasing Revenues for a Dairy Cooperative with Solar Cooling

Milk | Ethiopia | Fee-for-Service | Cooling

Problem Statement

Farmers were not able to sell milk from the evening milking to the cooperative because collections happened only in the morning and products spoiled overnight.

Featured Tech

Lydetco Self Chill system
Ice storage, i.e. with solar power ice is produced, which cools the water baths which house 4x40L milk cans. Natural refrigerant R600a (Isobutane).

Other equipment: Insulated box for ice-storage; insulated box for milk-can cooler; 8 x 40 L Milk Cans

Key Indicators for cooling

Capacity 160 L

Revenue gain: increase in farmers income by 25-30% from the extra milk sales to the cooperative

Demo Type

Pilot

Benefits & Impacts

The cooperative has the option to offer a charging service for mobile phones or torches – a second revenue stream that will help to pay off the investment in the milk cooling system.

Learning Contribution

Technical feasibility of the solution has been shown

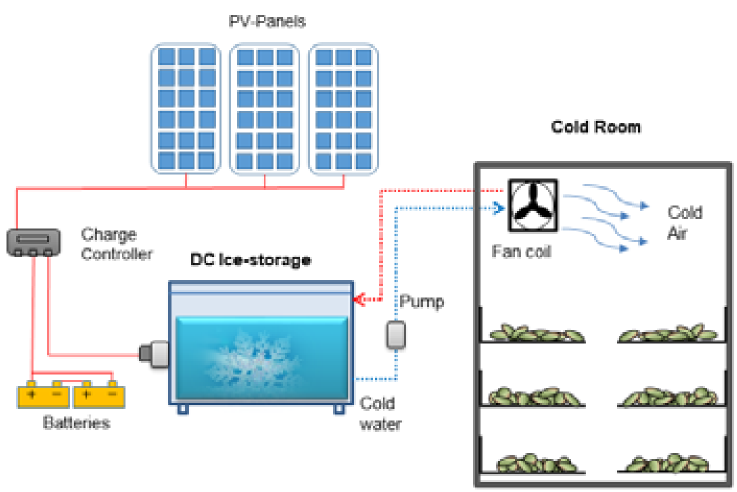


Image source: selfchill.org

Lessons Learned

The SEFFA project's experiences with cooling, drying and irrigation provide valuable insights into the potential and limitations of PUE for sustainable agriculture. Moving forward, looking at technologies' place in the value chain of agricultural products will be essential for achieving lasting impact in this field.

SWP

- The market potential for SWPs is highly dependent on individual on-site conditions: water sources, water abstraction methods, number of irrigation zones/areas or the level of dependence on rainfed agriculture, water-use control bodies affecting how farmers have access to water or irrigate their farms, agriculture practices and access to markets affecting farmer incomes and purchasing power, pumping distance and land typology.
- SWPs in the market are not able to directly replace the use of petrol/diesel pumps, especially in horticulture value chains where high water quantities are used. SHFs commonly use flood irrigation which requires huge volumes of water, which are easily handled by petrol/diesel pumps albeit with high fuel maintenance costs and poor water use efficiency. However, SWPs that could match this water requirement are not readily available locally and would be very expensive to acquire. Thus, in Kenya SWPs are bundled (and promoted) alongside water storage options and efficient irrigation methods such as sprinkler or drip irrigation.
- Limited information on SWP technologies, feasibility, financing mechanism, limited product options and substandard products in the market.
- The group approach to SWP ownership was used successfully to address affordability problems. Irrigation as a service shows promise.

Dryers

- Solar driers are expensive farm assets with long idle capacity.
- There is a viable business case for many value chains (not all).

Cooling -Dairy

- Higher degree of demand/need for cooling as the milk market is suffering from weak market linkage and spoilage.
- The absence of commercial providers and lack of ability to provide solar cooling technology due to low awareness about the business potential is slowing adoption. Additionally, Ethiopia has FOREX issues.
- Demand for small-scale solar deep freezers is largely from businesses (vendors) and dairy processing groups rather than smallholders at the farm level where proximity to the milk chilling plants is the key factor.

Cooling-Horticulture

- Market acceptance for CaaS was not shown for local market traders as it requires a significant change in the business operations for local traders and because their customers cannot maintain the cold chain after purchase.
- This market is in a pilot stage, resulting in prolonged setup time due to the testing of new business models and technologies.
- Limited availability of cooling and drying solutions locally and customis ation is required as cooling needs differ among value chains and business cases.
- Conducting technical assessments before project implementation will prevent sizing and product mismatch problems.

Key Takeaways

The SEFFA project's experiences with cooling, drying and irrigation provide valuable insights into the potential and limitations of PUE for sustainable agriculture. Moving forward, looking at technologies' place in the value chain of agricultural products will be essential for achieving lasting impact in this field.

Project Design

- The active involvement and support of the district local government at both political and technical levels played a crucial role in the success of project activities.
- Combining awareness creation, product demonstrations, water management, and behavioural change education is necessary to promote the full acceptance and adoption of SWPs.Therefore, there is a need enhance collaborative partnerships with actors in the energy, water, and agriculture sectors.
- Design and customisation of cooling technology is essential, hence the project design needs to incorporate time for this.
- Local technology manufacturers and suppliers are limited, especially for the large cold room systems, hence there is a need to factor in timelines for procurement and the cost implication for sourcing for technology abroad.

Overcoming Farmers' Barriers

- Site selection should be representative of the type of farming in the location where the technology is installed.
- Using model farmers/ influential individuals is essential.
- Farmers need to be actively practicing farming as a business and willing to invest in technology for improvements.

Overcoming Value Chain Specific Barriers

- Cooling for dairy has good potential: Commercial pilot recommended for Ethiopia, with focus on establishing market linkages and awareness creation.
- Cooling for horticulture should focus on larger commercial and export-oriented supply chains where the cold chain can be maintained until final consumption.
- For commercial farms and well-developed value chains or developed markets, solar cooling will work very well. Further extensions to offer energy service a business to SHFs to store their perishable produce may be possible in future.

Understanding the Context of SEFFA: Farmers' experience

Several layers of barriers to the adoption of PUE technologies.

Key Takeaways

Overcoming Technology Specific Barriers

SWP

- Possibilities to address the issue of affordability either through group sharing or renting models: the pump has the highest cost out of the whole system. While each farmer installs their own reservoir, drip irrigation and the solar panel, the pumps could be group owned.
- Proper sizing of SWP needs to be developed, products need to fit the farming needs of SHF.
- Need to integrate agronomical support (high value crop, diversification, access to market) to enhance farming productivity and ensure return on investment for the SWP.
- Need for a holistic on-ground technical support and user education that guarantees farmers' expectations are met, and they can safely use their SWPs.

Dryers

- Design and prototyping for multipurpose and commercial driers is needed.
- Including research institutions & private sector in development and prototyping contributed to its success in SEFFA.

Cooling

- There is a need for research & private sector involvement in development and prototyping.
- Most cooling solutions, especially the large cold room, are very expensive for individual SHF, hence need to pilot group model or CaaS model.

Iconography

Financial Instruments

- Result-Based Financing
- Innovation Fund
- Fee-for-Service
- Consumer Credit
- Lease-to-Own

Types of Barriers

- Farmer
- Logistics
- Technology Related
- Financial
- Value Chain Related

Agriculture Chain

- Dairy
- Horticulture

Technologies

- Irrigation
- Cooling
- Drying

Other

- Total Budget
- Farm Size

Location

- Ethiopia
- Kenya
- Uganda

About SEFFA

The Sustainable Energy for Smallholder Farmers (SEFFA) in Ethiopia, Kenya and Uganda project was designed by leveraging over 15 years of practical experience of EnDev. The strategic partnership identified lack of modern energy access as one of the critical development barriers in rural areas since it undermines agricultural productivity, exacerbates pre- and post-harvest loss, and makes it challenging to store and process produce. The IKEA Foundation has provided an €8 million grant to support EnDev's efforts. Learn more about the project here.

About the IKEA Foundation

The IKEA Foundation is a strategic philanthropy that focuses its grant making efforts on tackling the two biggest threats to children's futures: poverty and climate change. It currently grants more than €200 million per year to help improve family incomes and quality of life while protecting the planet from climate change. Since 2009, the IKEA Foundation has granted €2 billion to create a better future for children and their families. In 2021 the Board of the IKEA Foundation decided to make an additional €1 billion available over the next five years to accelerate the reduction of Greenhouse Gas emissions.

Learn more at: www.ikeafoundation.org or by following them on LinkedIn or Twitter.

About EnDev

EnDev improves the lives of the most vulnerable by providing access to sustainable energy in 20 countries worldwide. Currently, EnDev is funded by Germany, the Netherlands, Norway, and Switzerland and coordinated jointly by GIZ and RVO. The strategic partnership is working with experienced implementers, with the SNV being one of the most prominent partners. Learn more at www.endev.info or by following them on LinkedIn.

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german cooperation
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Co-financed by:

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Coordinated and implemented by:

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Netherlands Enterprise Agency

SNV