INTEGRATING FARMERS WITH RENEWABLE ENERGY

By Titus Kakembo

PHOTO BY IBRAHIM RUHWEZA



Solar-powered irrigation scheme set up at in Kirungu sub-county, Rubirizi district. Renewable energy is reshaping Uganda's agribusiness by reducing vulnerability to climate shocks enabling compliance to quality standards of modern markets

Uganda's agricultural transformation is no longer defined only by improved seeds, fertile soils and dependable rainfall. A new frontier is emerging that connects farmers to renewable energy, strict quality standards and sustainable markets.

Across rural districts, solar panels are rising beside banana plantations, poultry houses and dairy sheds. Energy-efficient dryers are replacing the practice of drying produce on bare ground and biogas systems are powering small processing ts.

The message from the Harvest Money Expo 2026 at Kololo Ceremonial Grounds in Kampala that happened on February 27 and March 1, was clear. Renewable energy is no longer a luxury in agriculture. It is an essential input for productivity, value addition and market competitiveness.

CLEAN ENERGY TECHNOLOGIES

During a business-to-business panel hosted at the Pelum exhibition stall, institutions working with government agencies explained how clean energy technologies are helping farmers reduce losses and meet quality standards.

Regina Nakawuki, the executive director of the Centre for Research in Energy l Energy Conservation (CREEC), described energy as the missing link in agricultural productivity.

"Farmers lose income not because they lack produce, but because they lack reliable energy. Without proper drying, cooling or processing, value is lost before products reach the market," Nakawuki said.

To mitigate this, CREEC is promoting solar-powered irrigation pumps, solar fruit and grain dryers and energy-efficient cookstoves designed for agro-processors. These technologies are reducing operational costs while lowering post-harvest losses.

THE COST

On display were small-scale solar irrigation pumps suitable for one to two acres priced at sh4m-sh8m depending on system capacity and water depth.

Solar dryers for fruits, herbs and grains were priced from shı.5m to sh6m depending on size and design.

"Renewable energy stabilises production. When farmers control water for crops or livestock and improve



Regina Nakawuki the executive director of CREEC

processing conditions, they control hygiene, product quality, and ultimately income," Nakawuki said.

SOLAR IRRIGATION BENEFITS

Reliable irrigation is transforming productivity in areas with erratic rainfall. In the districts like Kiboga and Nakaseke, solar water pumping is enabling year-round vegetable production. Youth groups and farmer co-operatives can supply markets consistently.

Estimates indicate that traditional biomass still supplies more than 80% of Uganda's total energy consumption.

This reliance contributes to deforestation and carbon emissions. Solar drying and biogas technologies help reduce dependence on firewood and improve processing efficiency.

ORGANIC AGRICULTURE

Adopting renewable energy also complements Uganda's growing organic agriculture sector, according to Chariton Namuwoza, the executive director of National Organic Agricultural Movement of Uganda (NOGAMU).

He said organic farming is about working with nature, and renewable energy aligns with that philosophy.

Uganda is one of Africa's leaders in certified organic production. Demand for chemical-free coffee, cocoa, sesame and fresh fruits continues to grow in international markets such as the European Union, the United Kingdom and the Middle East.

However, maintaining quality from farm to consumer is a major challenge. Solar dryers are becoming common among organic farmer groups because they protect produce from dust, pests and rainfall.

MEETING QUALITY STANDARDS

While renewable technologies improve efficiency, market access still depends on meeting quality standards. Abubakar Bakulumpagi, the spokesperson of Uganda National Bureau of Standards (UNBS), urged farmers to treat quality assurance as a business investment.

Bakulumpagi said energy-efficient equipment improves product quality, but standards guarantee market acceptance locally and internationally.

UNBS continues to train agro-processors on labelling, packaging, hygiene and product testing. Farmers using solar dryers or milk cooling systems must maintain consistent temperatures, hygienic handling and proper storage.

Renewable energy adoption and standards compliance reinforce each other. Solar-powered milk coolers allow dairy farmers to maintain storage temperatures below four degrees Celsius. This reduces spoilage and helps co-operatives supply formal processors.

"When you solarise production, you reduce contamination risks. But compliance with moisture limits, packaging rules and labelling requirements remains critical," he said.

GOVERNMENT EFFORTS

Government policies are also encouraging renewable energy adoption. Uganda's National Climate Change Policy and Renewable Energy Policy promote cleaner energy solutions that reduce emissions and improve resilience in sectors like agriculture. The Ministry of Energy and Mineral Development has supported solar irrigation pilots and agricultural modernisation strategies promote value addition through improved processing technologies.

Financing is critical to accelerating adoption. Centenary Bank and development partners, such as Heifer International have supported farmers investing in renewable energy.

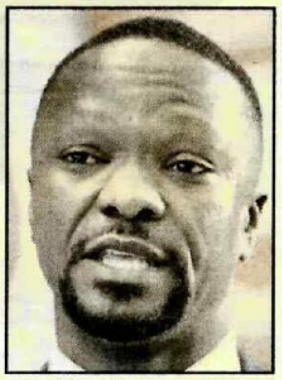
Despite progress, there are gaps, such as lack of reliable suppliers and technicians in several rural areas.

Many smallholder farmers cannot raise initial capital and some remain sceptical of new technologies.

STAKEHOLDER'S VIEWPOINT

Chariton Namuwoza, the executive director of National Organic Agricultural Movement of Uganda (NOGAMU), says controlled drying preserves colour and enhances shelf life. These factors are critical for export markets.

"Today's sophisticated consumers demand traceability and sustainability. If your crop is organic, but your processing depends on polluting energy sources, your sustainability story becomes weaker," Namuwoza said.



Chariton Namuwoza, the executive director of NOGAMU

