

From Diesel to Sunlight: How Solar Irrigation Transformed a Laikipia Farm

Agriculture employs 65–70 percent of the African workforce, supports the livelihoods of 90 percent of Africa's population, and accounts for about a quarter of the continent's GDP (African Development Bank, citing OECD and FAO, 2016; World Bank, 2016). Much of that output could go further with reliable irrigation, something solar energy is well suited to provide, given how much sunlight the continent gets.

Yet despite having some of the highest solar irradiation levels in the world, the region has been slow to put that energy to work on farms. High upfront costs, limited awareness, weak financing options, and a shortage of technical support have kept adoption low, and many farmers are still stuck paying for expensive diesel or petrol to run their irrigation.

That's especially true on the dry leeward side of Mt. Kenya, where rainfall has grown more unpredictable by the year. For smallholder farmers here, a planting season isn't just about whether the rains come, it's about whether they can afford to pump water when the rains don't. Irrigation can mean the difference between a harvest and a failed crop, but powering it has long been one of the biggest costs standing in the way of profitable farming.

Fuel prices keep climbing, and every increase eats further into already thin margins. For many farmers, expanding the farm or investing in anything new takes a back seat to just keeping the pump running.

George Gichuki knows that cycle well. He farms 2.5 acres of fruit trees, vegetables, and cereals in Solio Village 5, Laikipia County. The land is dry enough that irrigation isn't a nice-to-have. It's what keeps the farm alive. For years, that meant a routine he couldn't get out of: every few days, driving 16 kilometers to buy petrol just to keep the pump running.

"We had to buy fuel seven days a week, thirty days a month just to irrigate the farm," George recalls. "It was costing me an average of 250,000 Kenyan Shillings monthly. At that rate, I could only afford to water part of the farm. The rest had to wait."

Turning a profit under those conditions was almost impossible. Whatever he earned had a way of disappearing into the next fuel run.



Figure 1: Dried water pan that was used for irrigation before installation of the solar irrigation system

Things started to shift when George joined farmer training sessions under the DREEM Programme, run through KCIC's Spoke Partners: the Kenya National Farmers' Federation (KENAFF), the Dairy Training Institute (DTI), and AGILE Consulting. That's where he first heard about using solar energy for irrigation. He wasn't sold on it right away.

"I was skeptical," he admits. "Could solar really work here? Would it be affordable? Would the investment actually pay off?"



Figure 2: Farmer training at Solio Dairy Cooperative in November 2025

What changed his mind was seeing it for himself. On a peer learning visit to Solio Ranch Settlement, George watched solar-powered irrigation systems running on real farms, not in a brochure. Technology providers walked farmers through how the systems worked, what they cost, and what it took to maintain them. But what stuck with George most was talking to other farmers who'd already switched over.

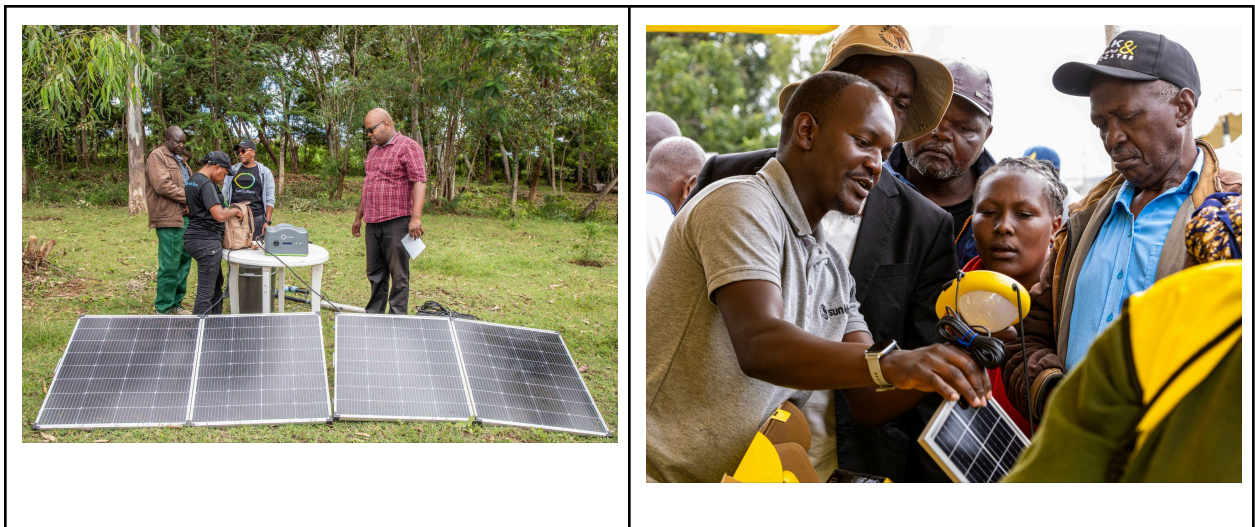


Figure 3: Farmers visiting exhibition booths at a peer learning events

"After seeing how the solar system worked and learning from other farmers who had adopted it, I realized it was something I could also do," he says.

By February 2026, he'd made up his mind and installed a solar-powered irrigation system on his farm. It wasn't a leap of faith anymore. He'd seen the numbers work for other people first.

The results came fast. His monthly irrigation bill went from 250,000 Kenyan Shillings to nothing. For the first time, he could water his entire 2.5 acres year-round (fruit trees, vegetables, maize) without doing the mental math on fuel costs every week.

"I no longer worry about fuel prices or whether the pump will start," he reflects.

"The investment has given me real confidence in planning farm operations."



Figure 4: Installed solar-powered irrigation system at George's farm

The benefits didn't stop at George's fence line. His neighbor Nancy Rose, who grows potatoes, now draws water from his farm too. Her yields have gone from 100 to 130 fifty-kilogram bags per acre, and she can plant through the dry season instead of waiting it out.

"The community has realized that solar is achievable," George notes. "People see it works, and that it's affordable and reliable."

He's also taken on two workers to help manage the farm now that there's more to manage.

The money he used to spend on fuel is now going back into the farm. For George, that's the real shift: not just lower costs, but proof, sitting right there on his land, that solar irrigation works. And in a place where farmers have been burned by big promises before, seeing it work on a neighbor's farm carries more weight than any pitch ever could.



Figure 5: Solar irrigated vegetables growing on George's farm