



Connected precision agriculture uplifts generations

SunCulture

Kenya



On a recent sunny day in Matanya, Kenya, a small-scale farmer named Maggie beams. Goats and chickens nibble greenery on her 1-acre property, and cabbages grow around her. She recently installed a solar-powered irrigation system to regularly water her crops. Instead of fetching and moving water 20 liters at a time by hand, the irrigation system nourishes her crops and livestock efficiently.

SunCulture provides these irrigation systems (and financing for low-income farmers to buy them) in Kenya. The company is partnering with Microsoft and its [Airband Initiative](#) to make them even more powerful—and bring precision agriculture to populations who could otherwise not access these technological opportunities. SunCulture is piloting a tailored internet of things (IoT) platform co-created with Airband that will bring the irrigation systems online and connect to Microsoft Azure's machine learning tools. What's more, SunCulture is extending its services by leveraging TV white spaces (TVWS) technology that expands high-speed internet access to underserved areas.

21%

The percentage of internet penetration in Africa, according to research from the Internet Telecommunications Union

6%

The percentage of farmers in Africa who irrigate their farm, according to the International Food Policy Research Institute

10x

The increase in annual income of the average SunCulture customer

300%

The percent increase of crop yields for the average SunCulture customer

17 hours

Hours per week of manually moving water the average SunCulture customer saves

The intersection of these technologies has the power to transform the lives of farmers and their families for generations, says Samir Ibrahim, SunCulture co-founder and CEO. "The combination of artificial intelligence, cloud services and connectivity with our solar-powered irrigation system makes sure farmers like Maggie don't have to spend 17 hours a week moving water—and so they have the money to send her kids to school," he continues. "Yes, they will increase their income by ten times. But they'll also gave their families something that's harder to quantify: dignity."

AI feeds farmers real-time data

In collaboration with Microsoft, SunCulture is building an IoT platform that collects, analyzes and disseminates information to empower even the region's poorest farmers to use today's most sophisticated precision agriculture tools.

SunCulture's Rainmaker water-pumping system measures things like soil moisture, pump efficiency, solar battery storage and other factors from connected devices. This data is analyzed along with weather forecasts in Microsoft Azure's cloud environment. Using Azure machine learning tools, the IoT platform creates hyper-local recommendations (to, say, irrigate for an extra three minutes on a hot day, or reposition a solar panel that's not capturing as much energy as it should) that are automatically pushed out via texts, phone calls or app alerts.

"The IoT platform allow us to give tailored advice anywhere because we're using real time data," Ibrahim says. "We're bringing precision agriculture to the most marginalized areas of the world."

Collaboration extends connectivity—and opportunity

Although many Kenyans are connected to the internet, some of the remote areas SunCulture serves are off the grid and far from cellular networks for mobile devices. So SunCulture is working in tandem with [Mawingu Networks](#), the internet provider that is extending high-speed internet to Kenyans on TVWS signals. When Mawingu brings a community online by emitting broadband signals over unused TV frequencies, SunCulture can offer farmers there the opportunities provided by precision agriculture.

"By leveraging TV white space, which is affordable, long-range and working well, we are providing the services and knowledge necessary for smallholder farmer households to move up the productivity ladder," Ibrahim says. "A farmer doesn't have the resources to diagnose exactly what she needs to manage external risks like the weather, but we can do that remotely with the cloud."

As SunCulture fine-tunes its IoT platform and partners with organizations expanding broadband access, Ibrahim sees the potential to scale beyond Kenya. "We're already seeing how this technology can move the poorest people off rain-fed agriculture, where they're one bad rainy season away from financial ruin. Once we have this platform built and figure out how to share data across borders, we can scale anywhere in the world."

"We're bringing precision agriculture to the most marginalized areas of the world, to people in the poorest economies because they deserve it, they need it, and we can do it with this technology."

- Samir Ibrahim, co-founder and CEO of SunCulture

SunCulture empowers smallholder farmers in Kenya to save more time, raise better quality high-yield crops and make more money through affordable and solar-powered precision agriculture solutions.

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