



Esther Wanjiru Kimani, a computer science expert who has developed a disease detection device through her Farmer Lifeline Technologies, that helps farmers to get ahead of pests and pathogens by enabling timely detection of crop pests and crop diseases. Photo Credit: Farmerlifeline Technologies

Young Kenyan techie gets farmers ahead of pests and diseases

By Zablun Oyugi

IN the wake of climate change challenges, the enemies of farmers are increasing and resurgent.

Experts say there is emergence of new pests and diseases that many farmers, especially smallholders, might not be aware of and are complicating farming activities for the growers.

The United Nations' Food and Agriculture Organization (FAO) estimates that, annually, up to 40 percent of global crop production

is lost to the pests and that each year, plant diseases cost the global economy over \$220 billion and invasive insects at least \$70 billion.

However, technology is bringing about some hope for farmers through innovations of new methods aimed at combating the menace.

One such innovation is a disease detection device developed by Farmer Lifeline Technologies, a Kenyan agritech startup that helps farmers to get ahead of pests and pathogens by enabling timely detection of crop pests and crop diseases.

Behind this revolutionary innovation is Esther Wanjiru Kimani who is also

a computer science expert. She hails from Aberdare area in Nyandarua County.

Driven by the passion to transform marginalized smallholder farmers lives using technology, the trailblazer in the AgriTech space, says she was inspired by the need to find a solution to the prevalent destruction of crops by either pests, pathogens or delayed treatment of diseases prevalent in her birthplace.

"When I was growing up I saw my parents struggling to produce enough food from the small farm we had as a result of pests and diseases which could destroy up to 47 per cent of the crops," said Esther.

The device leverages on artificial intelligence (AI), data analytics and machine learning and has multiple small camera modules interfaced to a computer system.

It comes with a camera that is solar-powered and can operate even in rainy seasons and has a power retention capacity of 48 hours making it effectively detect crop diseases and pests over a 730-metre radius.

“The camera system is programmed to capture images of the crops in the field periodically and process the images using advanced computer vision algorithms to determine the nature of the infection or infestation, any pests or pathogens,” said Esther.

How the proprietary disease detection device works

The device which is solar-powered is mounted in a farm, at the centre of it where once it is set it has the capacity to scan the farm by rotating and taking pictures frequently.

The scanning using a camera can cover a 730-metre radius with an aim to identify if there could be any pests or diseases in the farm.

In case a pest is recognized or disease identified, the data is sent to an analytic dashboard for analysis and

results sent to the farmer through an SMS for action.

“In this,” says Esther, “farmers are able to realise early detection of crop pests and disease in a bid to maximise their yields and prevent post-harvest losses.”

The device also recommends locally sourced, carbon-negative, and health-friendly fertilisers and farm chemicals to address the identified crop pests or diseases.

According to the young innovator, the cutting-edge technology promotes sustainable farming practices and helps smallholder farmers adapt to climate change by encouraging behavior change.

“By suggesting the use of farm chemicals and fertilisers with minimal greenhouse gas emissions, the device empowers farmers to take a more environmentally friendly approach to agriculture,” she said.

Among the problems that this technology seeks to address are delayed identification of crop diseases and pests’ infestation, use of wrong chemicals and pesticides due to inaccurate identification of crop disease and pests and application of wrong fertilisers due to incorrect predictions of crop diseases.

The company plans to commercialise the data generated by the devices to governments and non-governmental organisations to support in policy making. It will also sell or lease the devices to farmers and farmers groups.

So far, the innovator has acquired patents for the technology.

Esther says that the technology has gone a series of tests and proven effective by a majority of smallholder farmers within Kenya and outside the country.

“I am happy that many women who account for over 60 percent of farmers and who have used the device have been able to reduce losses in their farms by more than 40 percent meaning that they have improved their livelihoods and narrowed economic inequality gap between them and men,” she said.

The company has also collaborated with a Canadian NGO to run a test among 400 farmers in the country of which 360 who used the technology recorded 40 per cent production increase and 30 per cent reduction in losses.



*The disease detection device has the capacity to scan the farm by rotating and taking pictures frequently.
Photo Credit: Farmerlifeline Technologies*



To reduce cost implications for small-scale farmers, Farmer Lifeline Technologies partners with manufacturers to make the devices affordable. Photo Credit: Farmerlifeline Technologies

“Our technology has so far had recommendations by governments, non-governmental organizations and AGRA among others and we are encouraged by this,” said Esther.

To reduce cost implications on the targeted small-scale farmers, Farmer Lifeline Technologies partners with manufacturers to make the devices usable anywhere in the world at a low cost saying that “we want to see farmers improve their earnings and livelihoods.”

The company leases the device to farmers or farmer groups at \$1 for a period of one month with a guarantee to give cash back for any farmer who buys or leases the device and does not get 30-40 per cent farm harvest increase within the first 4 months.

The innovation has seen the company recognised, featured and won several awards that include COMESA Award, African Agrihack,

TotalStartUpper, 2022 GoGettaz competition and AWIEF African among others.

“We also scooped an award under YouthAdapt at the UN Conference of Parties (COP27) Egypt 2022 thanks to GCA, AFDB, and CIF for support,” said Esther.

She has also recently received the prestigious 2024 Africa Prize for Engineering Innovation from the Royal Academy of Engineering on June 13 in Nairobi, Kenya.

Established in 2014 by the Royal Academy of Engineering, the Africa Prize for Engineering Innovation supports scalable and sustainable engineering solutions to African challenges.

In this, Esther was awarded £50,000 to further develop her innovation, marking the largest prize amount in the history of the Africa Prize in honour of its 10th anniversary.

With the knowledge that food insecurity remains a significant challenge in Kenya, Kimani is keen to steer Farmer Lifeline Technologies into covering 15 Kenyan counties by the end of this year and scaling to five African countries by 2026 with an aim of impacting over 250,000 farmers by 2027.

“Our goal is to increase their agricultural productivity by at least 45 percent and ensure that all the people, especially the most vulnerable farming communities, have access to safe, nutritious, and sufficient food throughout the year.”

Banking on the fourth generation revolution technologies such as AI to end hunger and poverty among marginalized smallholder farming communities in the African rural areas, ether aims to help farmers produce sufficient food to meet their dietary needs and practice sustainable agriculture.