

Drones Over Africa

The hum of drones overhead is a welcome sound to people in Benin interested in improving agriculture and reducing poaching. The sound, and the relief it could potentially bring, come courtesy of UK doctoral student and native son, Abdelaziz Lawani.

Benin is a small, sub-Saharan country in West Africa with an abundance of natural diversity. Within its borders are coastal plains, mountains, valleys, mangrove fields, and lagoons. Its people primarily rely on subsistence farming and growing cotton for export.

A couple of years ago, Lawani came up with an idea: use drones to keep up with animal numbers and to track poachers within the WAP, a complex of protected areas, the W, Arly, and Pendjari, that covers three West African countries, Burkina Faso and the Republics of Benin and Niger. It is home to a number of species that have disappeared completely from other areas of West Africa and boasts the largest population of elephants in the region. But poaching, agricultural encroachment, over-fishing, and illegal harvesting of trees still take place within the preserve and are taking their toll. The elephants, in particular, are in danger of extinction within our lifetimes, if poaching is not controlled.

“One thing we noticed when we were working with drones for conservation is that people who are poachers are farmers. One of the reasons they rely on poaching is because the farming activity is not successful,” Lawani said.

That discovery sparked another idea.

“If we can provide the state with drone services and help (farmers) improve productivity, they will be less likely to depend on natural resources,” he said.

From the flyover, Lawani and his team can create a map using multispectral sensors technology. The maps give them better information about crop health and actions the farmer needs to take to increase yield.

“We are giving them information about the land and the crops,” Lawani explained. “Basically, at this point, we can



PHOTO PROVIDED BY ABDELAZIZ LAWANI

Abdel Lawani examines water-sensitive papers while testing the efficiency of drone-sprayed pesticide vs. manual spraying.

only give them information about the stress the crops are facing. The stress can be related to water, it can be related to disease or pests, or it can be related to the lack of nutrients.”

Lawani has been training locals to use the drones, and in the process, he has formed a new business, Global Partners, to keep up with the demand.

The Technical Centre for Agricultural and Rural Cooperation is working with Lawani’s company to provide these services to Benin’s farmers. Lawani is also working with Airinov, a French company that is a leader in providing farm services to European farmers. The project has also benefited from the support of UK’s Department of Agricultural Economics, the UK Student Sustainability Council, Development Initiatives Inc., Clinton Global Initiative, IdeaWild, GIZ, the Pendjari park administration, and the Beninese National Centre for Management of Wildlife Reserve.

Lawani said the technology is not limited to farmers in developing countries; it can also be applied in the United States. A Kentucky farmer with a few thousand acres in crops could get an aerial view of their entire operation, evaluate the size of the biomass, learn what fields might need extra help, and monitor protective barriers in wetlands. Lawani said the technology has many applications.

“A lot of countries depend on agriculture. It’s a major contributor to the gross domestic product. We think if we can help farmers, it’s not only going to help them increase their livelihoods, but it’s also going to help the countries.”

Lawani is currently working with Michael Sama, assistant professor in the college’s Department of Biosystems and Agricultural Engineering, to compare the efficiency of remote pesticide application by drone versus manual application.

“We think, if we can apply the pesticide by drone, it will lessen farmers’ contact, which will decrease the harmful effects they may suffer from the (pesticide) solution,” he said.

Lawani, who graduated on May 4, said, “My objective is to keep working on this after I get my degree, because it has such a great impact on people’s lives.”

—Carol Lea Spence



PHOTO PROVIDED BY ABDELAZIZ LAWANI

Lawani’s company in Benin, Global Partners, has trained more than 300 local rangers, students, and teachers to use the drones.