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Nomadic herders go high-tech

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High-tech herding programs in Afghanistan, Kenya, Ethiopia, and Tanzania are helping herders take better care of their livestock.

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- High-tech program seeks to aid herders in Afghanistan
- Computers predict and forecast vegetation growth for livestock
- Herds' manure studied using a spectrometer
- Other programs in Mongolia, Kenya, Ethiopia, and Tanzania

By Marsha Walton
CNN

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COLLEGE STATION, Texas (CNN) -- Satellites, cell phones and spectrometers: Probably not the first things you think of when you picture sheep and goat herders in Afghanistan. But those modern tools may soon make the lives of nomadic families a little more stable.

Afghanistan is the latest location for projects coordinated by the University of California-Davis and Texas A&M University, to provide early warning systems about animal health and to help pinpoint the location of the healthiest grazing areas.

A \$4.4 million grant from the U.S. Agency for International Development's Mission to Afghanistan will fund the effort for four years.

"Agriculture is so fundamental to helping people become economically self-sufficient," said Elsa Murano, dean of Agriculture and Life Sciences at Texas A&M University in College Station, Texas. ([Watch nomadic herders get a feel for 21st century technology](#) )

"And the economic stability that comes from being able to sell your

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goods, produce your goods, and get an income from that is a stabilizing force like no other," she said.

Texas A&M research scientist Jay Angerer, who worked with herders in Mongolia, says there is a mixed reaction when he first explains the tools and how they might help.

"I think that they're welcoming in the sense that they're glad that someone is concerned about their issues and problems, and I think they're very curious and interested," said Angerer.

But he says it is also important to respect the understanding they have gained from generations of tending sheep, goats, cattle, and horses. In addition to the natural disasters of drought and dust storms, herding families in east Africa and Afghanistan have also had to survive civil wars and unstable governments.

"I always tell people that I train that this shouldn't be the only tool that you use to make a decision. There's lots of information out there," said Angerer.

The U.S. researchers are often joined by scientists and college students from the region to collect and analyze plant samples. That data about forage is added to information about climate and precipitation, some from satellite information, and some from ground reporting stations.

Computer models then predict how those plants will grow, based on soil conditions and rainfall. The researchers can then forecast where the richest vegetation will be, especially if drought or other crisis conditions exist.

"By giving that information you could provide the herder the information to know whether they need to sell animals, buy supplements or to make a decision that, 'I'm going to cope with this drought by hanging on just a little bit longer'," said Angerer.

Analyzing manure

The livestock experts also gain important clues about animal health from the herds' manure.

"We're using a very convenient product, manure, to determine what the animals were consuming, what their diet was, which tells us, are they healthy? Are they going to gain weight? Are they going to meet their reproductive demands?" said Kris Banik, lab manager at the Grazingland Animal Nutrition Lab at Texas A&M.

At that Texas lab, samples from farms and ranches are carefully dried and pulverized before they are analyzed with a Near Infrared Reflectance Spectroscopy machine, or NIRS. The device provides a biochemical snapshot of the organic material, indicating how much protein and other digestible organic matter the animals have consumed.

But shepherds and herders, often on the move in mountains or deserts, do not have the luxury of a nearby lab. So researchers developed a tool to take to their turf.

A portable spectroscopy unit can accomplish the same thing, with almost instant results that can provide early warning to herders of

their animals' health.

"If we can go out in the pasture in real time and be able to take a scan of that sample, and then be able to give an answer right then, we'll cut five days off that decision-making process," said Doug Tolleson, director of the Grazingland Animal Nutrition Lab at Texas A&M. "If you had a rapid onset of a drought, that could make a lot of difference."

When scientists arrive in a new region, one of the first tasks is to seek input from local experts.

Professor Robert Kaitho, an animal nutritionist at Texas A&M, has helped coordinate programs in Kenya, Ethiopia, and Tanzania.

"I am trained in the region, and before I joined this project I had worked under the agriculture resource system for more than 20 years," said Kaitho.

"In the communities we are constantly providing them advisories. They were able to move the animals to areas where there was forage during drought, and were able to minimize their losses," he said.

And Kaitho says technology now goes beyond just keeping animals healthier. It can help families get a better price for their animals, through a cell phone, or any Internet connection. Sending a text message to a cell phone number will get within a couple of minutes the current market prices for livestock.

"They are able to get information otherwise that was only limited to middle men, and those who had connections in the cities," he said. "Now, the common people have access to that same information."

"We don't see it as our role at all to change their lifestyles," said Professor Paul Dyke, research scientist at the Texas Agricultural Experiment Station at Texas A&M in Temple, Texas.

"It's to go in and try to give them information to really try to apply some of this, what seems to be and is fairly high-tech science and apply it down into what we generally think is the poorest of the poor. They are in very fragile lands, very marginal lands, and they face a lot of problems in knowing when to move and when to reduce herds," said Dyke.

"We have always been trying to push good science down to the level that it really makes a difference, and if we don't reach the people that it affects on a day to day basis, then as far as I am concerned, then we have missed our objectives," said Dyke.

In nearly three decades of global efforts, the academic teams also have worked with nongovernmental organizations including Mercy Corps, and various other international humanitarian aid agencies that work at the grassroots level.

"These are programs that have existed for 27 years, and what we have done is build strong partnerships with our local collaborators, in a way that they are involved in all the decision making about the design and implementation of these projects," said Montague Demment, professor of plant sciences and director of the UC Davis-based Global Livestock Collaborative Research Support Program.

In Afghanistan, the scientists will be working with the Afghan Ministry of Agriculture, and Kabul University.

"We not only have to understand the biology and the ecology, but you also have to understand the political and social context. Our folks on the ground have learned to become part of the local landscape," said Demment.

"One of the biggest mistakes you can make is to think that you understand all the answers to questions before you go into these situations. So in a sense, it takes some time on the ground to learn about the constraints, the cultural issues, and to be able to do this in an effective manner," said Demment.

So how do the herders feel about scientists from other countries bringing in their new tools to a very established lifestyle?

Michael J. Jacobs has been in Afghanistan for two months as the project coordinator for the Afghanistan Pastoral Engagement, Adaptation and Capacity Enhancement (PEACE) project.

He says he visited Policharkhe, an area where Kuchi tribespeople spend a few months between their summer and winter grazing lands.

Through a translator, Jacobs talked to one sheep and goat herder. At one point the translator started to chuckle. Jacobs asked him what the herder had said.

The translator said: "He is asking what took you so long to help them."

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