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African farmers to get NASA, NOAA data on their phones

Molly Brown of NASA's Goddard Space Flight Center had an epiphany when she met a representative of a Ghana-based agricultural organization in Washington, D.C.

Brown had been working on satellite-based assessments of food security for years in her role as a vegetation index specialist. In front of her on this day in 2013 were representatives of a nongovernmental organization called the Alliance for Green Revolution in Africa, or AGRA. The group was in direct contact with farmers in 17 African countries and was known for distributing critical information, such as where to buy fertilizer. Rather unbelievably, Brown thought, the alliance had little or no access to environmental data that NASA and university researchers routinely cull from satellite observations.

Brown realized: "I have the data, they have the network," she told me in an interview.

The result was a collaborative effort between Goddard and AGRA, called "ACCESS for AGRA mFarms," to develop a computer program that will deliver processed information on rainfall and crops to African farmers via the simple cell phones many of them carry.

"This is the first time the data will

be delivered to farmers via cell phone and text message upon demand. That's the innovation," Brown said.

Geographically specific information will be processed from a host of satellite data sets. The Moderate Resolution Imaging Spectroradiometers on NASA's Terra and Aqua satellites will provide spectral images. NOAA Rainfall Estimates, which are derived from the Meteosat spacecraft operated by NOAA's counterpart, EUMETSAT, will be incorporated in the data set. So will readings from the Tropical Rainfall Measuring Mission instruments and Advanced Very High Resolution Radiometers on NOAA's polar orbiting weather satellites. Soil moisture data will be added from NASA's Soil Moisture Active Passive satellite, or SMAP, scheduled for launch Jan. 29.

This data, along with computer modeling of the expected effects of weather on crop yields, will be tied to specific locations by scientists at the Climate Hazard Group of the University of California in Santa Barbara. The end product will be a grid of environmental data tied to specific latitudes and longitudes, updated every five days. This will be distributed to farmers who subscribe to the service via AGRA's network.

"The information [will be] sent out once every six days to the farmers through a text message or through a voice messaging system in multiple languages. There are many farmers who can't read and write, so AGRA also has a voice messaging system where they can sign up for voicemail where the information is spoken aloud in a local language," said Brown.

AGRA's network currently serves 80,000 farmers in West Africa, and the non-governmental organization is actively recruiting more subscribers. The hope is to reach 100,000 farmers across different regions in Africa in the next two years, said Brown.

The mFarms team is also developing a smart phone app that will deposit this data directly to a farmer's Android or iPhone, something that isn't very useful at the moment since most farmers in Africa have older mobile phones that can only receive text and voice mail. Brown expects that to change in the near future. "In the next five years or so, we fully expect inexpensive smart phones to massively expand there and when it does this system will be in place and those same farmers will get images and graphs and interpreted products. We need to set up those networks now so we're ready for that innovation," she said.

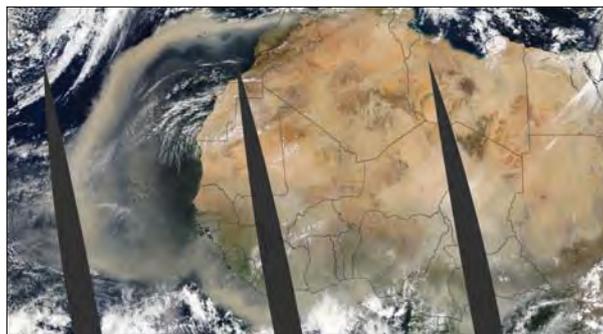
AGRA sees benefits to farmers and also a broader U.S. mission. "On one side, you have a worldwide known organization — NASA — well equipped with a lot of biophysical and weather data on various countries in Africa. On the other side, AGRA, an African based and African led alliance is working to improve the food security and income of farmers across the continent. Information available at NASA will be useful for their strategy to [help populations] adapt to climate change. This is the perfect synergy," said Matieyedou Konlambigue, AGRA's program officer for markets access for West Africa, in an email.

For Brown, it's a breakthrough that's long overdue. "I do think this is a very important first step in getting this data that has been around for 40 years into the hands of people who really do need it," she said.

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A large dust storm over central Africa was captured by the Moderate Resolution Imaging Spectroradiometer in a series of consecutive overpasses of NASA's Aqua satellite. Data from MODIS and other NASA instruments will be made available to African farmers via cell phone.



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