Food and Agriculture Organization of the United Nations

e-Agriculture
Promising Practice
aWhere's agronomic and weather-based tips for smallholder farmers

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Location specific and timely advice to improve productivity and climate resilience among smallholder farmers
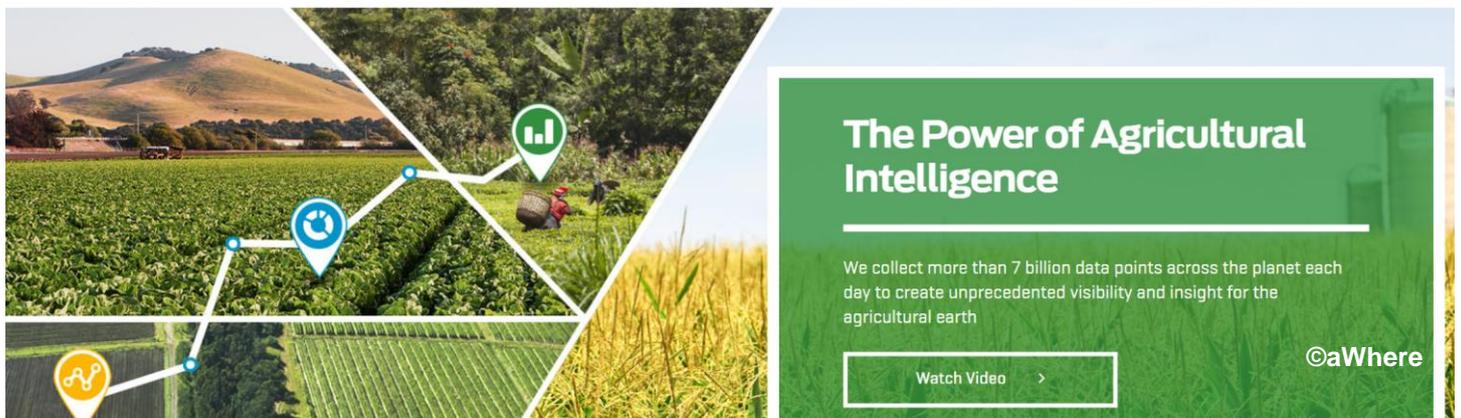
Key facts

- **Location:** Global with projects in Ghana, Philippines, Uganda, Kenya and India

- **ICT used:** big data, satellite and ground radar, automatic weather stations, RESTful API's

- **Area of work:** agriculture

- **Target group**: smallholder farmers

- **Stakeholders:** farmers, agri-businesses, extension services, mobile network operators, governments, NGO's, etc.

- **Timeframe:** Active for over 3 years

aWhere delivers agricultural intelligence to farmers, farm managers, crop consultants and researchers all over the world. The company aims at making agronomic and weather data available to farmers through intermediaries such as research centers, governments, information companies, mobile network operators and non-profit organizations which can integrate the data into their own information systems.

Thanks to the data and the information that was collected, analyzed and shared, farmers can more easily adapt their practices to variable and extreme weather conditions and they are more aware of the new technologies they can adopt to perform better under the changing climatic conditions.

This promising practice focuses on the current projects in Ghana and Kenya with Esoko and iShamba.

Context and problem addressed

Big amounts of data are collected in an often-uncoordinated way and even if the data are available, they are not necessarily made available in the form of useful information. The agricultural sector around the globe faces the same issues regarding the data that are crucial to information sharing with smallholder farmers, to help them increase their productivity, be more resilient to shock and improve their livelihoods. There is a strong need to be able to bring together different data sets such as for example weather data and market prices and to see how they interact with each other, to predict the impact they can have on the lives of farmers. Global issues will have a certain impact on local decisions that need to be made: for example how will my crop adapt to climate change over the next decade? And what variety can be recommended to anticipate the changes?

Founded in 1999, aWhere collects and analyses billions of data points from around the globe each day to create unprecedented visibility and insight known as agricultural intelligence, critical decision making from farm level through to national policy. Research-centers, agro-businesses and smallholder farmers use this daily information and insights to drive better results.
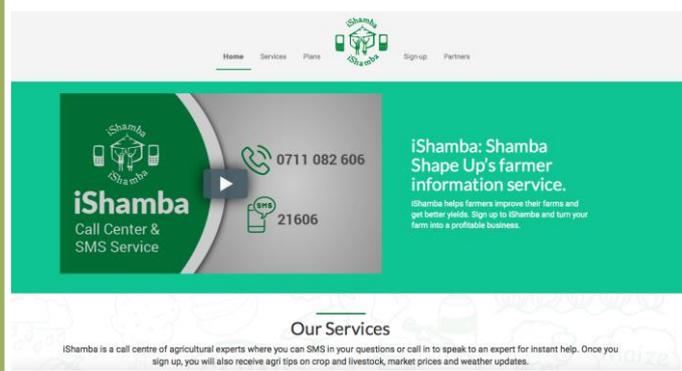
aWhere incorporates crop models, crop planting data, and real-time weather information to deliver customized, geo-located information services, aligned to the cropping calendar, to smallholder farmers based on current weather conditions. These tips and advice enable smallholder farmers to adapt to variable and extreme weather as well as adopt new technologies that should perform better under changing climatic conditions. Farmers can use this information to optimize production activities, input applications, and irrigation schedules to reduce environmental impact and increase farmer return on investment.

The company first started supporting **Esoko** and **iShamba** with their information services providing basic weather forecast information and call center dashboards in 2014. Both organizations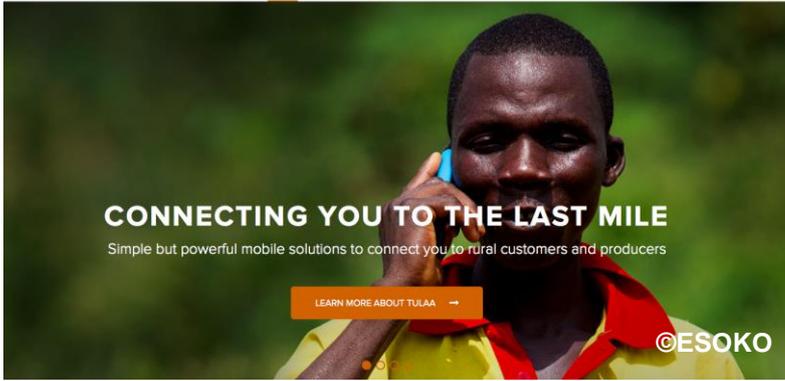 became aware of the service and platform through business development activities in which aWhere was engaged in Africa. The Application Programming Interface (API) platform was predominantly developed for commercial agriculture-technology solutions in the United States, but aWhere also had a long history of working in Africa and sought to extend elements of these services to the emerging market and smallholder context. Being a Benefit Corporation, this aligns with aWhere's impact goals. During these engagements, the platform was refined for specific ICT4Ag needs and developed the **Farm Insight Dashboard**, which is integrated to the Esoko business model to provide agronomists at local call centers in Ghana additional agronomic insights to complement the information that was sent to the farmer via SMS. After the positive feedback received during these engagements aWhere has focused on scaling and extending these ICT4Ag-weather services.

Esoko (www.esoko.com) is an information and communication service for agricultural markets in Africa. It leverages the explosive growth of mobile phone services across the continent. The company provides advice to farmers (market prices, weather forecasts, and growing tips) to help them increase yields and profits as well as solutions to businesses (marketing products, monitoring activities, and sourcing goods) to help them connect with farmers.

iShamba (www.ishamba.com) was created as a support service for farmers related to the hit farm makeover TV show Shamba Shape Up that airs in East-Africa. Today, aWhere and iShamba reach over 400,000 smallholder farmers, providing weather tips that help farmers plan critical processes such as spraying, harvesting and weeding.

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Esoko agronomists use data and information provided by aWhere to answer questions they receive from farmers at the local call center

The development of the ICT used

Ag-Weather Data Platform

aWhere's key asset Is a high resolution, contiguous, global, 10+ year historical observed weather data set. This data, combined with NASA Earth observation data and other social data, offers powerful insights to derive new techniques to better track and predict food security risk. In addition, model outputs can be tied to on-the-ground recommendations and enable a feedback loop that can be used to calibrate and refine models.

Multi-source, satellite and ground station blend

aWhere uses satellite radar such as the NASA Tropical Rainfall Measurement Mission (TRMM) for the 10-year historical data set in addition to the latest product from NASA, the Global Precipitation Measurement (GPM) system, all of which is blended every day into the aWhere platform. These satellite radar sources are combined with weather stations and ground radar (when available). Other weather variables are modeled spatially across the landscape using different techniques, such as using elevation models in combination with weather station temperature measurements to create a continuous temperature surface. This is a unique blending technique and product, and it is available across the entire globe in near-real time throughout the day so that the information is available through the API hours after midnight local time.

Esoko and iShamba users/employees access information through aWhere's API, as well as through the **Farm Insight** application. Each respective initiative sends forecast information, as well as tips and recommendations, to individual farmers via SMS messages. I

At Esoko, agronomists are staffed in local call centers. The farmer has an option to call a number, received on the SMS message, which directly links him/her to the call center. The agronomist has access to the Farm Insight application, as well as to all the API content, in front of him/her on their screen in the call center. The agronomists can then give additional advice and insights to the farmer.

Both initiatives are currently funded by grants, but aWhere is in discussions on how to continue building towards a more sustainable business model that does not require grant funding.

Impact

Through Esoko, aWhere's data reaches nearly 100 000 farmers in Ghana via SMS text messaging services. An independent study found that over 89 percent of users received texts at least once a week and found the information meaningful. They agreed they experienced positive changes in their lives thanks to the information.

Through iShamba, aWhere's data reaches over 250 000 smallholder farmers in Kenya. The program has a drop-out rate of only 0.45percent. In Kenya, farmers saw a 50 percent increase in yield for potato farmers, 80 percent increase in output, and 63 percent reported having changed their practices thanks to the information provided through the services. Additionally, farmers reported they are more likely to grow a new crop when using the service

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In the longer term, more profitable farm systems and trust in decision support that drives data driven decisions could be expected.

Innovation and factors of success

aWhere approached this from a global perspective providing backend products and services to support local implementers as opposed to being an end to end solution. This enables the corporation to focus on quality content at scale, while the local organizations do the outreach work towards the final mile customers of information such as farmers, crop consultants, and policy makers, NGOs etc.

Challenges and constraints

The initiatives face constraints, related to lack of capacity in technical and agronomical fields. Additionally, successful and sustainable business models can be difficult to realize.

Lessons learned

aWhere has learned through several experiences that it is critical for its success to have local partners engage with the local farmers and local players. The solution provided is a global solution that applies to a wide variety of use cases and therefore the company needs to rely on local partners to contextualize and drive the service according to the needs of the local users.

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It was also found that it is important to have incentives aligned in order to successfully implement and maintain sustainable services for farmers. As such, while NGO support is at times very important, engaging with private businesses and government programs appears to be critical.

Sustainability

The practice is sustainable and is not intended to be a cost to the farmer. It is intended to be an added value from an input provider, microfinance institution, farm management tool, etc. In addition to aWhere being a business-to-business (B2B) model, it also operates with a B2B pricing model in that it is not to be a direct cost to the farmer.

The practice allows for better insight into what is happening in the environment, and therefore it is highly beneficial to environmental sustainability. When a farmer or an organization is equipped with better information about his or her field or area of practice, better land management practices can be implemented.

Replicability and upscaling

There are a number of pilots underway to replicate this practice and there have been significant studies done by groups such as GSMA on the benefits and value of agri-services for other market participants to replicate.

Testimonies

Testimonies from the Esoko project:

" I am now educated on how to plan properly, because of he weather updates I get. I have been educated, so I have planted fruits and vegetables. Through this I am able to sell my produce in the market and my children's life had been changed for the better." – Jenevah Muthoka (Ghana)

"The tips I got on the weather helped as I got to know the best time to plant, which saved my crops from destruction." – Angelus Mwihuri Gichuki (Ghana)

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About the author:

Stewart Collis is the Cofounder and Chief Technology Officer at aWhere Inc. He has over 20 years of experience in software, information services, Application Programming Interface (API) development, Business Intelligence (BI) platforms, crop modeling and big data predictive analytics related to agriculture. Collis has an education in Geomatic Engineering with a focus on spatial information systems and remote sensing and applied experience in agricultural research science and natural resource management applications. He has developed platforms for use and distribution in both developed and emerging countries and has worked on a variety of agriculture specific software and database development projects with various enterprises (small and large) including foundations, donors, universities, international research organizations, NGO's and in-country government departments, startup and corporate enterprises. More recently his focus has been on leading the aWhere team to deliver the best and most comprehensive agricultural information and insight every day across the globe.

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Resources

- aWhere: www.awhere.com
- Esoko: www.esoko.com
- iShamba: www.ishamba.com
- aWhere: www.awhere.com
- aWhere YouTube (https://www.youtube.com/channel/UCUsK8R8ARbiBTBajabxm7zg)
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