Speeding up the dissemination of results: AgShare.Today's mobile survey apps and data visualization tools

Sweet potato virus researcher Dr Richard Echodu reviewing newly uploaded data on the AgShare.Today platform
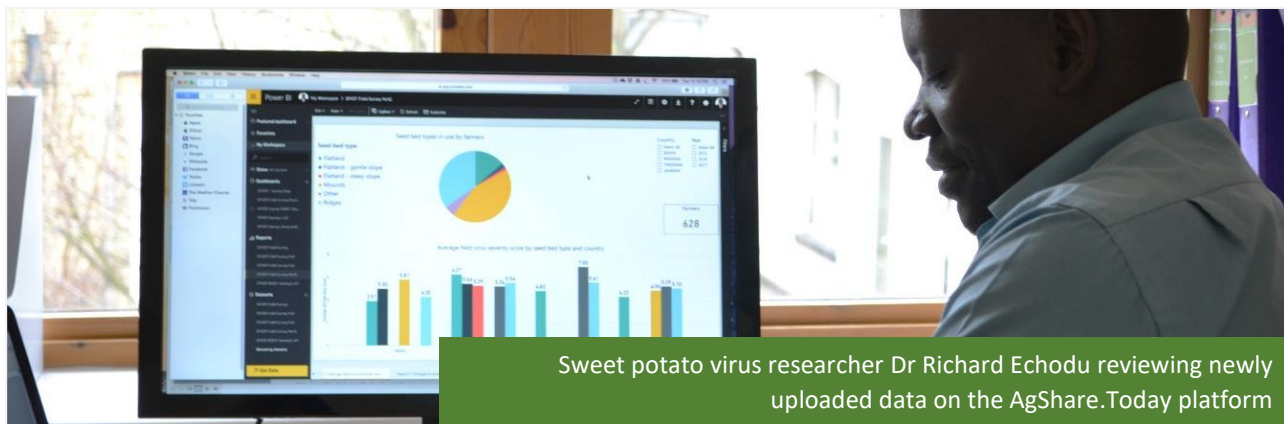
Overview

AgShare.Today is a Bill & Melinda Gates Foundation (BMGF)-funded programme that is helping other BMGF-funded projects to find better ways to manage and share their results and data. This work includes developing mobile survey apps to standardize data gathering and helping projects to curate and explore clean data online – using a platform that provides databases and data visualization tools. This work is then supported by workshops and support with journal article writing. The ultimate aim is to ensure that project results are available for use as quickly as possible.

A good example of the success of this approach is the work that AgShare.Today has done with the Sweet Potato Virus Detection Tool (SPVDT) project, to help the SPVDT team to gather and visualize survey results and then produce journal articles based on those results.

SPVDT: East Africa survey

Led by Dr Richard Echodu (Gulu University, northern Uganda), the BMGF-funded SPVDT project is working to develop a new tool to detect and characterize sweet potato viruses in East Africa.

As part of this work, the SPVDT team had to conduct a variety of surveys – including farmer-focused surveys (to identify farming practices and farmers' knowledge of diseases) and field surveys (to identify disease rates). Samples of diseased plants were also gathered for laboratory analyses to identify specific pathogens.

Data management issues

The ambitious nature of SPVDT's survey work across Uganda, Kenya, Rwanda and Tanzania presented the project team with a variety of issues. These ranged from how to ensure that no errors occurred when results were recorded, to how to ensure that the project reviewed its data

efficiently in order to disseminate results as quickly as possible.

Linking AgShare.Today and SPVDT

Recognizing the issues that they faced in terms of gathering and curating data, early in 2016 SPVDT's Team Leader approached the AgShare team to discuss how AgShare could help his project. The AgShare team proposed a three-step methodology:

1. **Capture the data using a mobile app:** AgShare would provide the app and work with the SPVDT team to standardize the surveys.

2. **Curate, visualize and analyze the data using AgShare's data analytics tools:** AgShare would back up the data from the app safely in the cloud, then build dynamic reports to help SPVDT visualize and explore the data.

3. **Publish the data according to a defined publications plan:** AgShare would work with

the Team Leader (Dr Echodu) to plan journal articles that could be produced from his data and to support him in writing and publishing those papers.

Mobile apps for data capture

Gathering clean data

To help SPVDT gather clean and accurate data, AgShare worked with the project to build a mobile app that would allow them to input data offline – when the researchers were working in the field with no internet connection.

Using the app meant that the team could control the quality of the data being input. So, for example, a team surveying in a specific district could not accidentally give geo-location information outside that district, and location names were always correctly spelled.

This use of validation functions within the app meant that clean, error-free data was gathered, saving a lot of time at the analysis stage. It also meant that questions could not be missed – which is often an issue in survey data collection.

Later discussions with the team leader for SPVDT confirmed that the use of the app had greatly reduced costs and the amount of time spent in the field, as well as improving the quality of the data gathered.

Cleaning data that had already been gathered

Seeing the quality of the data produced, Dr Echodu decided to use the app to clean an earlier set of data gathered using a paper-based survey – as the Excel sheets it was transferred to contained various transcription errors. Cleaning was done by re-entering the data from the hard-copy surveys into the mobile app to standardize responses.

Visualizing and analyzing data

As soon as the tablets used with the mobile app were connected to the internet, the data was automatically sent to the AgShare project management platform. This data was then used to populate a series of pre-built dynamic reports (groups of charts, maps and figures) that compared the variables requested by SPVDT. As more data was added by later surveys, the charts

and figures automatically updated to provide a more powerful data set.

This meant that SPVDT had a set of curated, master data stored safely online that could then be quickly reviewed and interrogated by project scientists.

Publishing from the data

Because the clean data was available within hours of his team running the last survey, analysis of the data and production of journal articles from it could begin very quickly. Dr Echodu was therefore able to come to AgShare's UK offices for a three-week writing retreat and have access immediately to the latest data from his team in the field.

With access to the experienced writers and data scientists in the AgShare office, Dr Echodu was then able to review his data and draft three articles ready to send to his co-authors – giving him a considerable head start in the publication process. These articles were then submitted for publication to peer-reviewed journals through the Bill & Melinda Gates Foundation's Chronos platform.

Impact and capacity building

In 2018 Dr Echodu confirmed that he was carrying these methods of working over to a new project he was helping to deliver for a different donor.

Lessons learned

- Use of a mobile survey app allows even small teams to quickly gather large amounts of accurate data.
- Use of cloud technology allows the secure storage of data – data which is expensive and time-consuming to collect.
- Use of data intelligence and visualization tools extracts significant extra value from data gathered from agricultural research.

Find out more: Email enquiries@agshare.today