



SANDER MUIILERMAN

Sharing local knowledge

Researchers now use ICTs to gather information more effectively from the field. ICTs also give them the possibility to help share knowledge in local communities.

Agricultural research and ICTs

Agricultural researchers are getting to the point where the advantages of using paper are no longer outweighed by the disadvantages of using advanced technology in a rural setting. The logistics of printing and distributing questionnaires, for example, can be time and resource intensive. Once the questionnaire is out

in the field it becomes very difficult to make any changes or corrections to it, making it a rather rigid research tool, especially when managing unexpected outcomes.

Digital survey

Smartphones and tablets are now used frequently in agricultural and rural research. However, in rural development settings simple and appropriate solutions are still recommended, according to Sander Muilerman, who works for the Institute of Tropical Agriculture (IITA) in West Africa. IITA did a baseline survey on occupational health and safety in 2012 among 420 adult cocoa farmers in Ghana without using paper. A parallel impact study using the same digital questionnaire targeted another 225 trained cocoa farmers.

No paper forms were used, only basic phones (and one GPS-enabled phone) equipped with a third-party Java application by three enumerators and a supervisor, with training on occupational safety and health. All phones were equipped with a special data SIM card, normally used in USB sticks for mobile broadband. This kind of SIM card only allows outgoing data connections, thereby effectively preventing misuse of credit by enumerators for calls or SMS messages.

Open questions

The enumerators were trained to focus on the farmers' answers and not on the predefined categories as such. For most questions respondents were asked to answer freely on an open question, after which the enumerator would not need to fit the answer exclusively under one

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or more of the pre-defined answer categories. Answers that would not (fully) fit the predefined categories were recorded under the 'other' category and were subsequently recoded and introduced into the questionnaire through daily live updates, in order to improve speed and efficiency. The questions were never changed – only open-answer categories were added.

'This technique that allows open questions is very dynamic,' explains Muilerman, 'and at the same time kept the questionnaire's complexity down to a minimum for the enumerators in the field, who did not have to flip back and forth through a complex paper questionnaire, but could simply follow the flow of questions they were presented with.' All data were received by the lead researcher the same day.

An alternative approach is Computer Assisted Personal Interviewing, a similar methodology that uses laptops, netbooks or tablets as an interface during the interview process. With relatively highly trained enumerators this allows for even the most complicated and in-depth (multi-hour) household surveys to be administered with a maximum amount of support for the enumerator. It can, however, be rather complex to set up and manage, and is not advised in areas where electricity cannot be guaranteed. Whereas these kinds of interviewing techniques are mainstream in industrialised economies, they are generally ill-adapted to rural environments.

Mixed method research

Mobile phones can also be used because of other features and sensors available on smartphones: photos, GPS, multiple languages, audio, video, password, surface area measurement, compass reading, barcode, QR code, automated calculations, signature, slope, altitude and digital sketch. But it is not only technology that counts, according to Muilerman. 'Researchers need to think more about how to engage with farmers. Technology allows for more interactive and mixed method research – including with pictures, audio and video.' This is important for understanding agriculture as a complex system which, besides economic and ecological factors, also includes the social context of rural farming communities. Therefore, ICT projects in agriculture cannot be unidirectional or they may effectively devalue the traditional knowledge held by the farmers.

Using the same notion, scientists from the University of Plymouth in the United Kingdom, the Zurich University of the Arts in Switzerland, the University of Dar Es Salaam in Tanzania and the Swiss Federal Institute of Technology started a project in a village near the town of Bagamoyo in Tanzania. Their aim was to establish an open and participative research process in which local farmers use smartphones and a web platform to document their environment and the effects of climate change, and thus create a collaborative knowledge base that is useful for farmers, extension workers and researchers.

The project is called Sauti ya wakulima, "The voice of the farmers" in Swahili (www.sautiyawakulima.net). Five men and five women from the community take turns to share the two available smartphones, by exchanging them on a weekly basis. Whenever a farmer's turn to use the phone comes up, he or she has the task of using it to contribute content to the knowledge base. Farmers use messages, pictures and voice recordings to document their environment. A special application running on the smartphones makes it easy to capture the multimedia elements. It also integrates geographical information into the message, allows the addition of one or more keywords and sends all the elements to a web server, bundled together as an email message. By using pictures and voice recordings, farmers can portray a wide variety of objects, situations and persons, and complement visual evidence with their own spoken narrations.

Community archive

Farmers not only got together to exchange the phones but also to see and discuss the pictures and voice recordings that the group had uploaded during the week. There, they accessed the project's web page using a laptop computer with a mobile broadband connection. Juanita Schläpfer, from the University of Plymouth and Zurich University of the Arts, is one of the scientists on the project. 'Farmers used the smartphones mostly to interview other people. In these interviews, fragments of knowledge and even manifestations of creativity such as the invention of a shelling machine or experimentation with intercropping were revealed,' she says. The phones were also used to provide visual evidence of problems such as pests,

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plant diseases or the scarcity of water, and to advertise products or services.

The farmers found that documenting their practices and problems through interviews could lead to the creation of a shared, audio-visual knowledge base, which they could use for various purposes including learning, consulting of farming practices, promotion of farming inputs and even extending their social networks. 'They see the website's potential as a community archive, recording change over time,' says Schläpfer. The appropriation of the technology by the farmers has enabled them to generate their own content allowing them to become active producers rather than just consumers of media. This format has also allowed them to create a picture of their practices over a long period of time, something impossible for researchers to do unless they are living in the community.

The project's outcome, according to Schläpfer, shows how important it is for researchers, extension workers, local government and farmer communities to work together to face the challenges of producing food. 'By using ICTs, farmers should be encouraged to not only become users of mobile networks, but also to reshape their use to best suit their needs. This effort requires adequate training and the design of platforms that embrace open-source values,' she says. Therefore research projects based on ICTs should be designed in such a way that farmers are equally engaged to define the goals and to share outcomes together with scientists. ◀

Researchers today are using ICTs frequently to gather information. The logistics of printing and distributing questionnaires, for example, can be time and resource intensive. On top of this ICTs give them the opportunity to engage in innovative ways with local communities and help share their knowledge.

