

Can modern ICT engage farmers' experiences in agricultural advisory services?

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Challenge

Modern information and communication technologies (ICT) have been introduced to agricultural extension systems in the last years. But many applications follow a top-down transfer-of-technology approach. Local, temporal and farming system-specific adaptation of information is difficult, often leading to limited impacts on farmers' decision-making.

Opportunities

ICT can be more than just one-way dissemination tools: Through systematic two-way communication, farmers may provide valuable knowledge that can, in turn, improve the disseminated advice. ICT could capture farmers' experiences in two ways:

Research activities · Prototyping a two-way agricultural information system

KilimoLine · Through participatory design in Kenya and Tanzania, we created the automated *KilimoLine* hotline. An interactive voice response (IVR) menu allows choosing and listening to short audio messages about agricultural topics (see Fig. 1), recorded by extension agents, researchers, and experienced farmers.



After listening to the "agro-podcasts", farmers may leave comments about their own experience, or add further questions to the topic. These are recorded and stored.

Ushauri.info · Comments or questions sent by farmers are assigned to the local agricultural extension agent and appear in an online dashboard at *ushauri.info* (Fig. 2). Here, advisors can record answers and send them as automated calls to farmers.

Advisors attribute keywords to questions, comments, and answers, enabling systematic analysis of the feedback, e.g.:

- Topics that frequently appear in questions suggest needs for new advisory audios or even further research.
- Advisors can listen to other advisors' answers about difficult questions (advisor-to-advisor learning).
- Farmers' stated experiences with the advice may suggest adaptations and improvements of the advisory contents.
- Farmers' narrations (comments from experience) can also be made available to other farmers (farmer-to-farmer learning).



Simple feedback · Up- and down-voting, "liking" or rating of advisory messages through USSD or IVR technologies. Alternatively, sending short verbal comments. Linking this feedback with spatial, temporal, or socio-economic data may lead to better-targeted advice in the future: What advice was (dis)liked by which farmers, at which locations? Which follow-up questions were asked? What positive and negative experiences did farmers share?



"Big" usage data · ICT applications can track which farmers access which type of information, at which time and location. Patterns in this interaction data may reveal farmers' day-to-day farming experience, highlighting information priorities and future research needs: Which topics did which farmers access at what times?

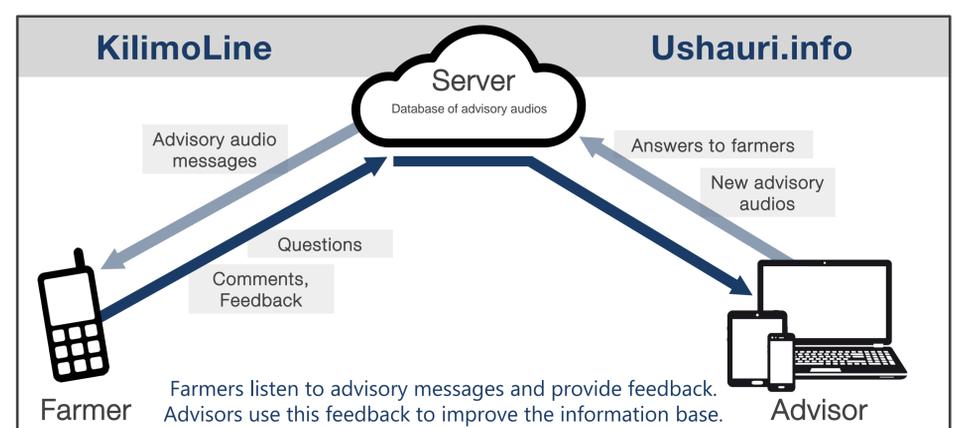


Figure 1: Architecture of the two-way information system

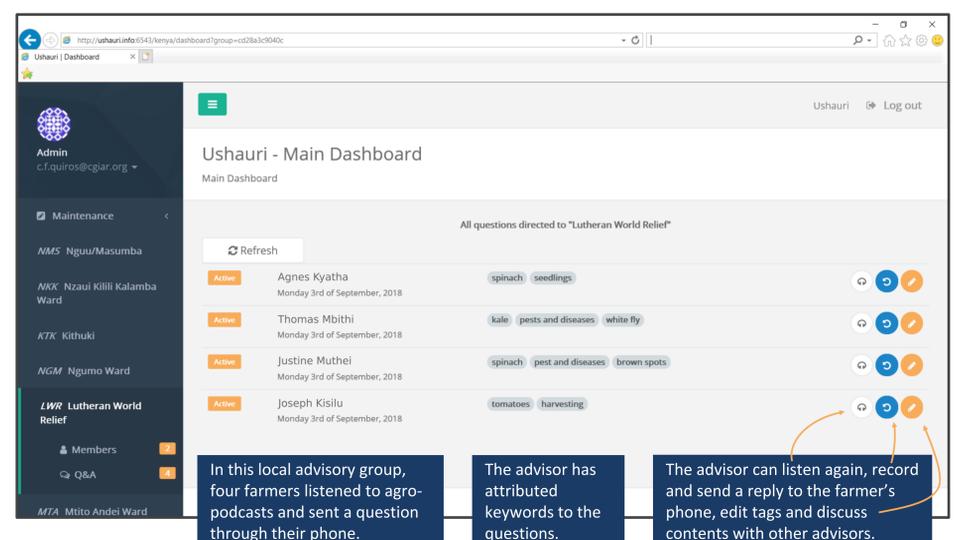


Figure 2: Screenshot of an agro-advisor's personal dashboard at *ushauri.info*

Pilot implementations · In both Kenya and Tanzania, 150 farmers and 10 agricultural advisors are currently testing the telephone-based information system, initially including at least 9 audio messages. We are evaluating farmers' feedback and usage data to determine future information needs.