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Quality of content in agricultural extension

Remco Mur, Lisanne Oonk and Verena Bitzer

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Can agricultural extension[1] systems deliver quality services to smallholder producers, often in remote areas? Yes, there is evidence that this is achieved in some developing and emerging economies. But this is by no means common practice, and many extension systems continue to struggle with weak performance. This series of six papers seeks to understand the patterns behind extension system performance by looking at the different factors that either drive performance or constitute yardsticks to assess performance: governance of extension systems (paper 1); quality of content in extension (paper 2); monitoring and evaluation for accountability and learning (paper 3); ICT in extension (paper 4); assessing performance through cost-benefit analysis (paper 5); and incentives for enhanced performance of extension systems (paper 6). All papers explore emergent practices, showcase promising illustrative examples, and identify potential pitfalls that hinder improved system performance. The objective is to provide state-of-the-art reviews and build the foundation for an informed debate on potential pathways for transformation of agricultural extension systems.

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[1] Extension services are understood as encompassing all intangible services to farmers, including information, knowledge, brokering and advice, on issues such as production, inputs and technology, credit, nutrition, processing, marketing, organisation and business management.

1 Quality of content in agricultural advisory and extension systems

Agricultural extension services can perform better if they are well-managed and accountable to farmers, and if they meet the needs of diverse farmers who engage in varied and complex farming systems. The goal of service delivery is to enable smallholder farmers to make better informed decisions related to improving their agricultural practices and livelihoods. As a part of this challenge, there is a pressing need to identify, sort and match expectations, needs and existing technical knowledge and skills of farmers, extension workers, agricultural researchers and other actors (Birner and Anderson, 2007; Del Castello and Braun, 2006). But how to formulate such an 'offering' to farmers that matches their demand and need for 'quality content' of extension services?

We consider quality content as content that is:

1. **Relevant** (addressing user needs, applicable, affordable, contextual, tailored to socio-economic and agro-ecological contexts, timely, and rendering itself to further experimentation and adaptation)
2. **Understandable** (clear, concise)
3. **Reliable** (accurate, locally validated, complete, consistent, transparent) (CTA, 2006; Knight and Burn 2005).

It is generally recognised – although commonly not practiced – that farmers and other stakeholders are not passive users of content but are active actors who process, interpret, develop and use information based on their ambitions, abilities, interests and experiences. As farmers' interactions and strategies shape content (Sumberg et al., 2003), knowledge is not linearly transferred but rather co-created in processes that include different actors, including extension workers, private-sector, NGOs, and farmers within local or nearby communities (MEAS, 2015). Farmers (and other stakeholders) have different learning styles, implying that the way in which they process and use content can be very different across farmers and socio-cultural contexts. They also operate in a dynamic context which indicates that their need for and interpretation of quality information changes over time.

However, offering quality content – or, more accurately, co-creating such content with farmers – has proven to be a significant challenge in practice. On the one hand, old paradigms of linear knowledge transfer rather than participatory approaches are deeply entrenched in extension practices in many countries, particularly in public sector services. On the other hand, lacking finances, capabilities and other resources, again often on the part of public sector services, impede the proliferation of demand-driven extension services.

This paper summarises key issues, challenges and lessons derived from literature, case studies and practice concerning the quality of content in extension services. It elaborates on recurring issues and describes innovative experiences and emerging practices that are enhancing the quality of content provided to farmers. The paper concludes with a set of recommendations on how quality content can contribute to enhancing the performance of agricultural extension systems.

2 Changing paradigms on extension and quality content

New visions on and approaches to agricultural advisory and extension services that emerged over the last decades have the potential to contribute to the improvement of the quality of content in terms of relevance, clarity and reliability (see Table 1).

Linear transfer of technology and knowledge. In conventional advisory and extension systems, information and new technologies were considered to be sets of objective data that could be transferred from one person to another (Leeuwis, 2004: 321; Pyburn and Woodhill, 2014: 20). This idea of information dissemination as a linear process with a one-way direction was reflected in the 1960s and 1970s technology transfer models, which took as a starting point scientists passing down knowledge to extension agents and then to 'uninformed' farmers. Technology-driven agricultural extension methods such as Training and Visit (T&V) left limited space for participation and initiative of farmers. As a result, uniform packages of information and knowledge based on externally developed ideas were disseminated and often appeared to be invalid or irrelevant to large groups of farmers.

Towards Agricultural Knowledge and Information Systems (AKIS). In the 1990s growing awareness that knowledge is socially constructed questioned the validity of information provided by scientists and extension workers as a static package of data to be delivered to farmers. Instead, increasing emphasis was placed on the process of interpretation (by farmers and intermediaries such as extension workers and other service providers) that gives meaning to this data in such a way that it serves their needs and ambitions. The recognition that content should be tailored to local contexts, taking into account not only agro-ecological factors but also socio-economic, institutional and cultural dimensions, and the diversity among smallholder farmers and their consequent needs, ambitions and preferences has led to the emergence of more hybrid and participatory and learning-oriented models of information provision, through which content is co-created, rather than simply delivered. Farmer Field Schools (FFS) and Participatory Technology Development (PTD) are examples of AKIS models that emerged in the 1990s.

The rise of Agricultural Innovation Systems (AIS). The role of farmers was further recognised with the rise of the AIS perspective in the 2000s, which aimed to move beyond research and technology development as main ingredients for innovation and highlighted the importance of different types of complementary innovations arising from the interactions

Table 1: Shifts in perspectives on agricultural development, extension and innovation

Characteristics	Transfer of technology	Agricultural Knowledge and Information Systems (AKIS)	Agricultural Innovation Systems (AIS)
Era	From 1960s	From 1990s	From 2000s
Scope	Productivity increase	Farm-based livelihoods	Value chains, holistic systems perspective
Core elements	Technology packages	Joint production of knowledge and technologies	Shared learning and change, demand articulation
Drivers	Supply push from research	Demand pull from farmers	Responsiveness to changing contexts; collaboration and co-learning
Role of farmers	Adopters	Experimenters	Partners, entrepreneurs, innovators
Intended outcomes	Technology adoption and uptake	Co-evolved technologies with better fit to livelihood systems	Adaptive and innovative capacities of farmers

of diverse actors with different knowledge sources (Biggs, 2007; Klerkx et al., 2012). Farmers are critical in this process as active users and contributors to knowledge development, experimentation and innovation within a dynamic environment, who interpret information based on their experiences, and combine it with other bodies of information accessed by them. More emphasis is put on facilitating farmers' decision making by facilitating learning and availing information on different options rather than 'making decisions for them' and assuming what type of content they require. This shift is expected to contribute considerably to the relevance of information provided to/co-created by end users and to contribute to a deeper level of understanding of participation. It is also suggested that the voices of the poorest and marginalised farmers are better represented, leading to an increased attention for socio-cultural issues (e.g. gender) and overall recognition of the diversity among needs and ambitions of farmers (Pyburn and Woodhill, 2014; Chipeta et al., 2006).

Implications for extension officers. The shift in thinking described above also led to the emergence of an additional role of extension officers as facilitators or 'innovation brokers' (Klerkx and Leeuwis, 2009; Leeuwis and Aarts, 2011). Such a role includes bringing together actors and facilitating their interaction, so as to co-create knowledge and innovation. This expands the function of extension officers from that of an intermediary between research and farmers to that of an intermediary that creates and facilitates many-to-many relationships (Klerkx and Gildemacher, 2012).

From theory to practice? The concept of demand-led extension whereby information, advice and other services are tailored to the needs and demands of the farmers has become well accepted among scholars and practitioners. However, to a large extent, both participation and demand-led services appear to be institutionalised in rhetoric only (Rivera and Sulaiman, 2009; Devaux et al., 2009). In reality, there are still many programs that provide information derived from other stakeholders' assumptions of farmers' needs, instead of being based on what farmers themselves express. Paternalistic delivery methods and prescriptive structures abound. Participation is often merely seen as an instrument instead of a guiding principle that underpins all activities (Muraleedharan, 2005; Pyburn and Woodhill, 2014), which constrains the development of quality content. At the same time, even when extension officers aim to make service delivery more inclusive and demand-driven, they may not be able to do so because they are accountable to their supervisors and not to farmers (and hence, the view of the supervisor is more important than the farmers' satisfaction with their services; see also Paper No. 3), and/or because of pressure to deliver quick results. For instance, as many extension services are delivered through donor-funded projects, sound governance structures and project rules have been found to take precedence of farmers' innovation needs (Chowdhury et al., 2014).

3 Emerging practices to improve quality of information

Related to the above-mentioned changes in paradigms, new approaches to extension have emerged during the last decade. Much emphasis has been placed on more demand-driven ways of developing and communicating knowledge – mostly in the context of concrete projects and often driven or pioneered by NGOs and researchers. Surprisingly, little evidence of the actual impact of these factors on the quality of the content is available. In the following sections, experiences with different approaches to extension and the innovative use of new channels that have impacted (positively or negatively) on the quality of content are presented. It must be noted that, given the emphasis on co-creation, it is difficult to separate approaches to extension (i.e. ways to work with and reach farmers) and the quality of the information created/disseminated.

Demand-driven content: IFAD, Uganda

In Uganda, there has been an increasing recognition that services need to be adapted to the realities of farmers. Some farmers aim to focus on boosting the yields of their crops whereas others are looking for markets to sell their produce. The District Livelihoods Support Programme (DLSP), funded

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by the International Fund for Agricultural Development (IFAD) and the Ugandan government, is an example of a program in which content and services are adapted to farmers' needs. For the poorest households it offers food-security grants and technical agricultural advisory services. For those farmers who are shifting from subsistence to market-oriented agriculture, it provides enterprise grants and business-development services (Wongtschowski et al., 2013: 50-53).

Participatory content development: Canadian Foodgrains Bank, East Africa

The Canadian Foodgrains Bank (CFGB) is implementing a project to promote Conservation Agriculture (CA) in East Africa in collaboration with its local partners. In previous projects, CFGB promoted a number of pre-selected CA practices through establishing demonstration plots at model farms. In

this way, technical information was disseminated to a limited number of farmers with the assumption that other farmers would follow the good example. In a new project that started in 2015, CFGB uses an approach in which the local partners facilitate a process through which farmers and other stakeholder jointly experiment with different CA-related options, while simultaneously addressing organisational and institutional challenges that are related to applying and scaling these options. In this manner, information is created and adapted locally and goes beyond technical information only. Applying such an approach is demanding for the implementing organisation. It requires specific knowledge, a different set of skills and a different attitude.

Experimental content development: Farmer Field School roll-out in Rwanda

In Rwanda, the Belgian Technical Cooperation (BTC) is supporting the Ministry of Agriculture (MINAGRI) to improve the extension system. An important element of the programme is introducing Farmer Field Schools (FFS) as one of the main approaches to frontline extension service. The Farmer FFS approach is a participatory approach developed by FAO using methods of non-formal adult education in which selected farmers are trained to become facilitators of their groups of farmers. The programme has trained more than 2,500 facilitators in 12 crops & livestock modules. The facilitators come from all 30 districts of the country and are intensively trained by qualified FFS Master Trainers. In the Rwandan case, facilitators work with one or more FFS farmer groups where they facilitate the experimental 'learning by doing' process and supervise season-long experiments in the FFS field plot of the group. Groups of farmers are in charge of their own sub-plot of the learning field. They compare species, varieties, agronomic practices, etc. Every week they monitor the plants and analyze progress and results. Based on a sound analysis, they take their decisions and act accordingly.

Content development through partnerships: Messica Irrigation Pilot Project, Mozambique

The Messica Irrigation Pilot Project (MIPP) aimed to demonstrate that sustainable and pro-poor smallholder irrigation can be developed cost-effectively at a large scale by means of an innovative approach to irrigation development.
The consortium implementing the project consisted of a mix of organisations from Mozambique and the Netherlands; Royal Haskoning and Resiliência Moçambique (innovating engineering companies), ETC Netherlands and Caritas Messica (NGOs with ample experience in rural innovation and farmer empowerment) and Wageningen University and ISPM (research and higher educational institutes). The combination of irrigation development with action-research, capacity building and farmer mobilisation creates synergies that are an essential aspect the participatory approach to irrigation.
The local NGOs, the public extension and the engineering companies all worked together with local communities in developing an action plan, based on the local needs and interests; leading to advice on design of (improved) irrigation systems. This means that the engineers and NGO workers did not only draw the project and 'explain' it to local constructors and farmers. They engaged in a process of discussion with farmers on their own opinions and preferences. The content (i.e. the design and execution of an irrigation plan) was co-created. For that, they were much more often in the field than they would usually be, and established a trusted relation with local authorities.

Expert-led content development: African Soil Health Consortium

An example of an initiative that has encountered challenges in developing quality content is the African Soil Health Consortium (ASHC) led by CABI International. The project aims to contribute to the understanding and use of Integrated Soil Fertility Management (ISFM) techniques in sub-Saharan Africa. During the first phase of the project, ASHC and its partners have developed about 130 information materials on various crops, ranging from texts and audio-visuals to radio programs. There has been a strong focus on content development during this process with materials being generated mostly by experts. Only a few of these were generated together with local partners. In order to prevent the development of irrelevant materials with information that is not validated by practice on the ground, the Consortium concluded that a mechanism to assess and validate the quality of content with the involvement of local actors was needed (Klein and Posthumus, 2015).

Co-created content through facilitated dialogue: CORAF, West and Central Africa

Agricultural Innovation Systems thinking is based on the assumption that innovation results from interaction among stakeholders and that content is co-created. Facilitating stakeholder interaction can catalyse technological, organisational or institutional innovation. Many research organisations have integrated Agricultural Innovation Systems (AIS) approaches to Agricultural Research for Development (AR4D). Innovation Platforms (IPs) is one of these approaches. They have been a key part of the Dissemination of New Agricultural Technologies in Africa (DONATA) of the West and Central African Council for Agricultural Research and Development (WECARD). In Burkina Faso, a national agricultural research organisations INERA initiated platform, brought together producers and processors. They agreed on a contract through which producers would sell their maize to the processors for a fixed price. However, the producers thought the processor was making big margins and was paying too little to the producers. Producers reacted by selling their maize to foreign buyers. The focal point called for a meeting during which the problem was put on the table: to-

gether the producers and processors calculated the margins gleaned by different chain actors. In the end, all agreed that the price paid by the processor to the farmers was, in fact, fair. This transparency allowed trust between producers and processors to be restored. For the following season, a new contract was established based on the joint calculations. The contracts allowed the possibility for adapting prices to reflect actual market prices, which would be monitored by both parties. As such, making local knowledge and information explicit has contributed to more efficient and transparent value chain operations (Sanyang et al., 2014).

ICT- facilitated content development: Esoko

During the last decade, many organisations have piloted the use of ICT in extension. ICT can potentially contribute not only to better access to information for many farmers, but also to increased relevance and validity of content. E-Soko is a communication tool for businesses, projects, NGOs and governments to connect with farmers in ten African countries. Through different applications farmers and other stakeholders can send messages on market prices, weather or best practices in agriculture to farmers. E-Soko also contributes to quality of content as it solicits and incorporates farmers' and other stakeholders' feedback, information and ideas. Through SMS, internet platforms or interactive radio farmers can become part of the information flows and thereby contribute to quality of the content (CTA, 2006). Comparable initiatives that use ICT for improved content delivery include M-farm (Kenya), and Digital Green (South Asia and Africa).

Video-based content development: Sustainable Tree Crop Program

Recent initiatives with the use of video for promoting farmer-to-farmer learning processes are based on the idea that participation and input from farmers leads to more relevant and reliable information. The Sustainable Tree Crop Program, which was a public-private partnership innovation platform hosted by the International Institute of Tropical Agriculture, developed a program for Video Viewing Clubs (VVC) for cocoa producers. Groups of between 20 and 25 farmers met on a weekly or biweekly basis for a period of several months. The groups were led by a trained facilitator who showed selected videos multiple times during the sessions, followed by a facilitated discussion on production practices. Just like the farmer field schools, the VVC's focus is on experiential learning. Information shown in the video is being discussed, assessed, validated and adapted to the local context (Nathaniels, 2005; David and Cobbah, 2008).

Synthesis of cases

All the cases show innovative elements in terms of how extension services can work with farmers to jointly develop content based on local needs and taking into account the divergent demands of heterogeneous farmers. The cases confirm key insights from the AIS literature (e.g. Sterk et al., 2013):

- Quality content is co-created with farmers. This process can take a variety of forms and be stimulated through different approaches and methods, including ICT.
- Focusing on technology development alone cannot significantly expand smallholders' opportunities, and scientific knowledge needs to be combined with other types of knowledge, including local knowledge.
- Quality content needs to create concrete opportunities for farmers (such as market access, seed distribution, access to fertilisers, etc.)

As the cases highlight, opportunities abound for discontinuing the common practice of assuming what constitutes quality content for farmers. However, it should also be noted that many of these new approaches may be expensive and may increase the pressure on already constrained extension budgets. Facilitation, for example, is an extremely costly practice. Further research on the impact and cost-benefit ratio of such cases is thus needed to facilitate decision making by managers and policy makers on how to allocate scarce resources so as to have optimal effect.

4 Principles and processes that strengthen quality of information

The previous section has highlighted several emerging practices that aim to enhance the quality of content. The following processes strengthen the quality of content provided through agricultural extension services:

a Careful goal and priority setting for demand-driven and participatory approaches

One of the weakest aspects of many extension services is the available information on the constraints and opportunities faced by different categories of smallholder farmers. Gathering information is expensive, but is essential for any significant impact and might be cost-effective compared to programmes and services based on wrong assumptions (Röling, 2004). Developing demand-driven and participatory approaches also requires the existence or formation of functional mechanisms that allow demand articulation by farmers, such as farmer organisations, stakeholder forums, etc.

b Facilitating co-creation of content among stakeholders

Knowledge is co-created through interactive processes among stakeholders, including extension workers, researchers, private-sector, NGOs, and/or farmers (MEAS, 2015). Quality information and knowledge can only be developed when there is effective communication among stakeholders and when this communication takes place in the form of a dialogue

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(Del Castello and Braun, 2006). Interactive approaches to extension through which meaningful dialogue can significantly add to the relevance and validity of information. Facilitating this dialogue between farmers, researchers and extension workers and feedback to from farmers on the usefulness of information being provided and co-created becomes an important mechanism to ensure the quality of information. Radio and ICT can play an important role in linking users and owners of content.

c Going beyond technological content and production

For innovation to happen, combinations of different types of change are required. A singular focus on technological change and production is often not sufficient, especially in complex settings. However, there is an increasing need for information that allows farmers to become more entrepreneurial. This includes information related to post-harvest handling, storage, credit and savings, business planning or marketing.

But also organisational and institutional changes are part of the solution. This means the content of extension is not reduced to new practices or technologies (i.e. seeds, tractor, herbicides), but it also focuses on how they can be adapted, applied. It encompasses issues such as organisation of farmers and supporting farmers in bringing key points for discussion with policy makers.

d Developing baskets of options

Farmers' communities are highly diverse and farmers' decision making is complex. Prescriptive (one-size-fits-all) solutions do not exist. The function of extension is rather to support farmers in making the best decision(s) for their particular situation. Providing multiple options that afford farmers choice is therefore seen as more useful. So is providing farmers with potential criteria for decision making, by for example supporting them in calculating what a new practice costs, and the return it brings to the family.

e Strengthening knowledge and information networks

The foregoing also implies a need for more focus on strengthening local knowledge networks / systems and linking these systems to other bodies of information (including big data), contributing to more relevant and reliable information. This

also allows farmers to verify information from different sources. Information (content, suitability, applicability) needs to be validated and adapted locally through a process of co-learning, including joint experimentation and adaptation of new practices. This implies the need for facilitative capacity to support local stakeholders to identify, share, explore and value relevant information in a process of co-learning. ICT has the potential to play an important role in this.

f Capacity building and incentives for extension officers

Extension officers often lack opportunities for training and capacity development. However, assuming a facilitating and brokering role to co-create knowledge with farmers is challenging and can only be done if extension officers are properly trained. Incentives should promote more structural collaborations between extension officers, farmers and other actors and encourage multi-directional flows of knowledge formation. This also requires attitudinal changes of extension officers who oftentimes carry with them into the field a mentality of being an 'authority' to teach farmers (Kibikwa et al., 2009).

5 Implications for gender

In many developing countries, women perform keystone tasks in agricultural production, such as . However, advisory and extension systems have traditionally been male-dominated and focused on male farmers, thereby rarely reaching women farmers with new information knowledge or technology.

'Engendering' agricultural extension requires the recognition of differences in power, roles, responsibilities, and capacities. As a result, women have different needs related to content. The content provided by extension services does not necessarily take into account these different needs. Many extension programmes are geared towards improving improve market access and the improvement of cash-generating activities, whereas women often focus more on the production of food crops for home consumption (GIZ, 2013). Extension services specifically targeting women are often related to home economics, ignoring women's contributions to the production and harvesting of food and cash crops (Manfre et al., 2013).

In addition, women face particular social and cultural constraints and often lack access to education and training, rendering them unable to make decisions and articulate their needs and aspirations. For agricultural extension services to deliver quality content, it is important to recognise the different expectations and needs, and to establish a well-organised and efficiently-managed, effective, and accountable system that is able to address these needs. Content of extension services needs to be tailored on the basis of an assessment of the current activities and preferences of different content users. It places a greater responsibility on service providers to continually renew their understanding of clients' needs in order to meet the evolving activities, preferences, and demands of men and women farmers (Manfre et al., 2013).

Closing the gender gap in agriculture requires a broader set of demand-led, supportive services in addition to technical information (Ibid). There is a need for convergence of efforts by different stakeholders at all levels for the provision of technical, managerial, organisational and entrepreneurial support to women (GIZ, 2013; Jafry and Sulaiman, 2013).

6 Key lessons and recommendations

Quality of content influences the overall agricultural extension system's performance as quality information is a prerequisite for making informed decisions and support improving livelihoods. Nevertheless, we need to acknowledge that there are many other factors shaping the ways in which farmers use information and make decisions, which do not necessarily connect to the availability of quality content – for example trust and social capital, motivation and willingness, social and political environment, financial means, and socio-economic power.

The purpose of agricultural advisory and extension systems has long been the promotion of certain technologies that were designed to enhance agricultural production. Agricultural research was regarded as the main source of new information and thus equivalent to quality content. These models were based on the assumption that objective information could be passed on from one actor to another. This has resulted in linear models of extension, providing uniform packages of information to heterogeneous smallholder producers. Anno 2015, this linear extension model is still dominant and it seems that all too often extension services simply assume what is quality content – without any prior diagnostic studies and, fundamentally, without adequate farmer involvement.

Nevertheless, there are promising initiatives based on more recent insights recognising the diversity among smallholders and emphasising the importance of supporting smallholder farmers' decision making and innovation. As it is increasingly acknowledge that positive change for farmers results from collaboration among stakeholders, participatory approaches involving multiple stakeholders have emerged during the last decades. In these approaches, smallholder farmers are not regarded as passive receivers of content, but as active co-creators operating in a dynamic environment. Information is no longer seen as neutral and static, but as something that can be questioned, negotiated and contextualised.

Extension content therefore needs to be demand-driven, context-specific and participatory. Recent approaches highlight the benefits of engaging different actors from the agricultural knowledge and information system in co-creating content.

Strengthening local networks or the agricultural knowledge and information system becomes an objective itself. Such a learning process requires sound facilitation for which capacity needs to be created.

Content related to technical practices is in many cases only one part of the solution. New organisational and institutional arrangements, such as access to credit, new value chain mechanisms, are equally important and should be considered important elements of content. Content thus needs to link to or create opportunities for farmers that are relevant for their livelihoods. Addressing the 'content gap' in isolation is insufficient for addressing the constraints to agricultural development as part of the co-learning process.

Access to different sources of information supports smallholder farmers (in all their diversity) to make well-informed decisions. New initiatives need to be geared towards developing pluralistic advisory and extension systems, allowing farmers and other stakeholders to tap into different sources. ICT, including radio and video, can support these initiatives.

Extension workers can help local stakeholders to access and adapt quality content, i.e. content that is relevant, reliable as well as understandable. There is a need to recognise and address the different realities, priorities and needs of women as well as the social and cultural constraints they face.

Finally, agricultural advisory and extension systems should be able to facilitate the collaboration among stakeholders, generating, adapting and disseminating quality content adapted to the local context, and taking into account the great multitude of farmers engaged in diverse and complex farming systems.

The foregoing implies that the roles of extension service providers need to change considerably. To allow them to do so, they need to develop capacities to facilitate processes and link stakeholders rather than deliver ready-made results. They should be able to understand farmers' realities and choose from a large variety of 'solutions' with farmers and other stakeholders to find out what works best. This implies that content has to offer this variety and be process oriented.

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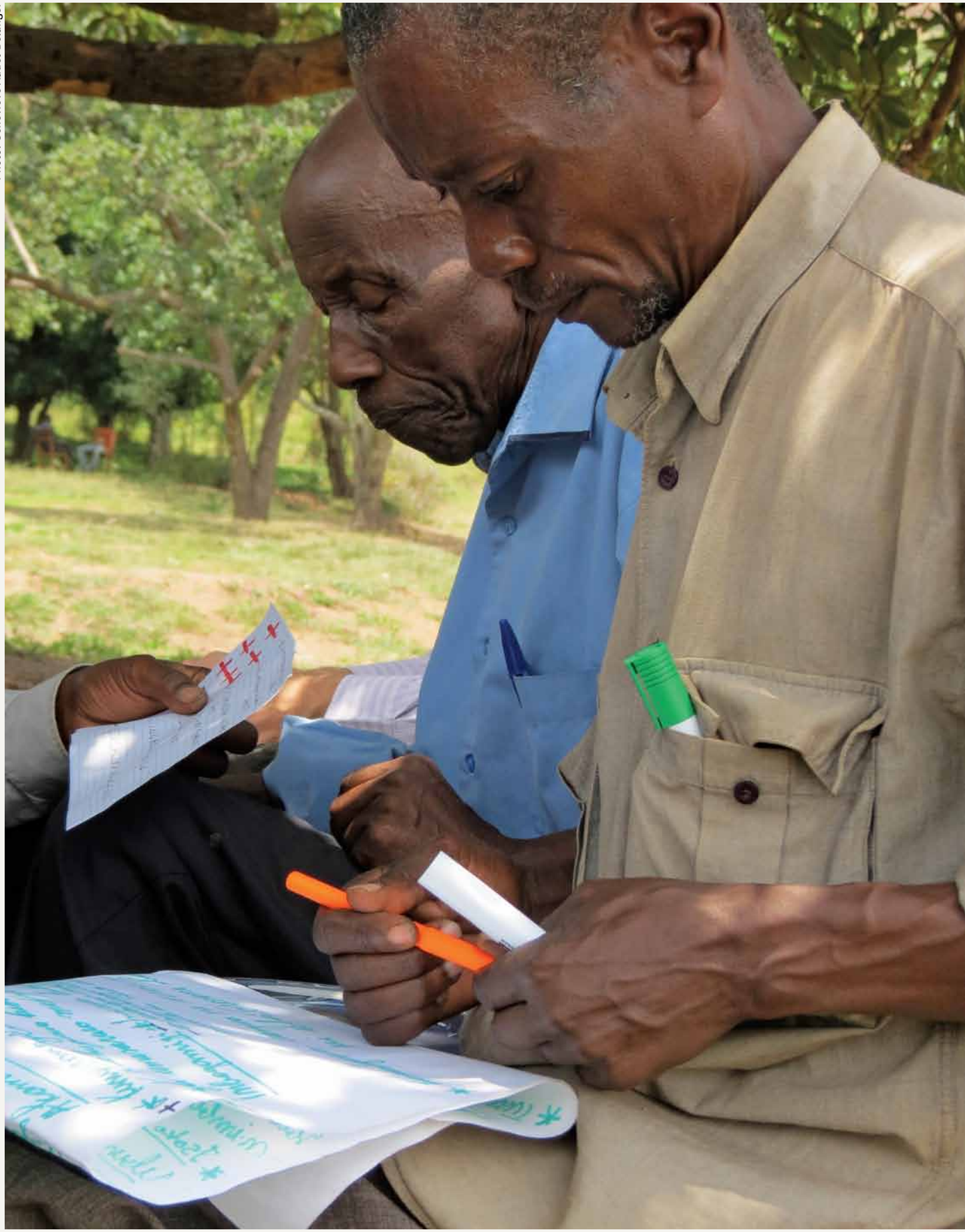
Photo: Geneviève Audet-Bélanger



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