19 Walking the impact pathway

CIALCA's efforts to mobilize agricultural knowledge for the African Great Lakes region

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CIALCA

The Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA) is a collaborative agricultural research-for-development platform operating in the Great Lakes region of Central Africa, specifically in Burundi, Rwanda and North and South Kivu provinces (also Kisangani and Bas-Congo) in the Democratic Republic of Congo (DRC). It was founded in 2006 by three international agricultural research centres (IARCs): Bioversity International, the Tropical Soil Biology and Fertility Institute of the International Center for Tropical Agriculture (CIAT-TSBF) and the International Institute for Tropical Agriculture (IITA).

Across the three countries, CIALCA operates in ten 'mandate areas', which represent reasonably similar terrains in terms of agro-ecology, poverty profiles and ease of access to markets. Mandate areas each have an estimated population of between 300,000 and 1.2 million people and are subdivided into multiple 'action sites' and 'satellite sites'. In action sites, CIALCA and its partners devise and test – jointly with farmers – promising agricultural technologies.

The translation of the logic of the Consortium's structure from paper into reality is not straightforward. With three IARCs implementing project subcomponents in three countries, managing effective communication can be a challenge. Yet the segmented nature of the Consortium also has clear benefits, particularly in terms of being more adaptable and responsive to the unique institutional and partnership landscape in each country (Cox 2011).

Achieving impact

CIALCA has an explicit focus on valorizing new, farmer-validated agricultural innovations. Specifically, CIALCA intends to deliver science-based agricultural knowledge to farming households in the mandate areas. The approach attempts both to engage farmers in technology development, as well as to act as a coordination mechanism for the diffusion of innovations for realizing development impact. For CIALCA, impact is defined as a direct and measurable change in farmers' livelihoods attributable to the Consortium's research and development interventions, where an assessment of the change in livelihood status is largely provided by *ex-ante* and *ex-post* impact assessment studies. These studies adopt the Sustainable Livelihood Framework (Scoones 1998; DFID 1999, 2000, 2001) as a tool for assessing changes to livelihood parameters.

Achieving impact in the mandate areas through scaling out (and, to a more limited extent, by seeking to influence policy) has been the focus of CIALCA's activities in the second phase. The conceptual framework for achieving impact is based on an 'impact pathways' model.

Impact pathways

In the simplest sense, impact pathways can be thought of as a series of causal linkages that need to be put in place for research to result in the intended benefits (Briones *et al.* 2004). It is desirable that these linkages are made explicit *ex-ante*, because researchers and stakeholders are required to develop hypotheses about the 'route' between research and impact, to define the changes that need to be realized at each step and to describe how the linking process works (Springer-Heinze *et al.* 2003).

The impact pathway model of Briones *et al.* (2004) fits closely with what CIALCA aspires to achieve in the action sites (Figure 19.1). Basic ideas and frameworks for new agricultural technologies are conceived by scientists in IARCs aligned with the Consortium, but these are introduced at an early stage to development partners (National Agricultural Research Systems (NARS), farmers' organizations) for testing and feedback. Suitably refined innovations are validated by farmers and the final product is distributed by outreach partners for farmers to adopt (and subsequently to adapt).

Impact in the satellite sites

Satellite sites are geographic areas that have been selected by CIALCA for the dissemination of technology options developed in the action sites. Only suitably refined innovations that have been validated by farmers are delivered to extension partners for dissemination. Activities in satellite sites are led by development partners, usually non-governmental organizations (NGOs) or community-based organizations, and public extension providers such as the Rwanda Agricultural Board (RAB). The balance between each type of outreach

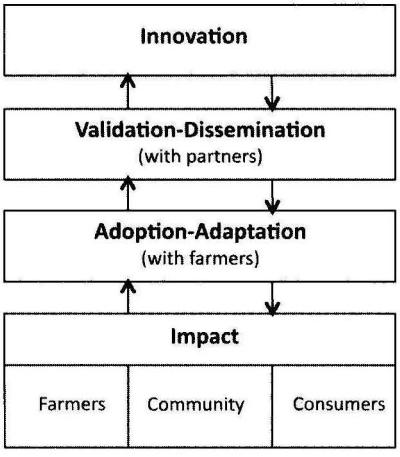

Figure 19.1 CIALCA's impact pathway schematic (source: adapted from Briones *et al.* 2004).

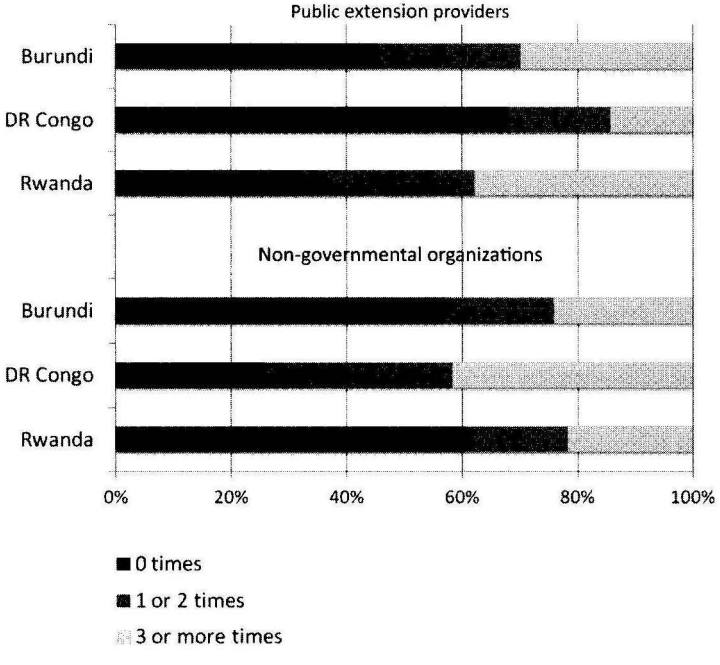

Figure 19.2 Frequency of contact with agricultural information providers in the last 12 months.

partner varies with the country, depending on the institutional and policy setting.

In 2011 CIALCA implemented a comprehensive impact assessment among 913 households in action, satellite and control sites in the focus countries (Macharia *et al.* 2013). The study included questions related to the provision of agricultural information. The data from the CIALCA impact assessment indicate that public extension providers are relatively active providers of information in Burundi and Rwanda, whereas in DRC (North and South Kivu) NGOs play a much stronger role (Figure 19.2).

Impact and behaviour

Achieving project impact means realizing a change in farmers' behaviour. A novel technology may be scientifically rigorous, field tested and partner-validated, but if it fails to convince farmers to adopt it – and thus change their behaviour – the technology is useless. The terms 'information' and 'knowledge' are frequently used in a manner that suggests that once farmers are empowered by them, the farmers' behaviour will change. This presumption ignores the basic principles of behaviour change. Actual behaviour is tangible and measurable, but the reasons for this demonstrated behaviour are not. According to van Woerkum *et al.* (1999), behaviour change is a function of how knowledge is influenced by individuals' attitudes, personal effectiveness and their subjective norms. An individual's attitude reflects how a certain action or behaviour is perceived, which can be positive (stimulates adoption of the behaviour) or negative (inhibits adoption). Subjective norms are social pressures encouraging or constraining certain behaviours. Personal effectiveness is the subjective perception of the chances of success in realizing an intended result by way of a change in behaviour (Ajzen and Madden 1986).

The provision of new, relevant information to farmers can be a key driver of learning and behaviour change. Data from the CIALCA impact assessment show that for all three countries combined, the percentage of respondents that had received information about new crop varieties in the past 12 months was higher in the action sites (70 per cent) and satellite sites (71 per cent) compared with the control sites (63 per cent). For new knowledge on crop pests and diseases, a higher percentage of respondents in the action sites indicated that they had received information in the past 12 months (57 per cent) when compared with the satellite sites (47 per cent) and control sites (48 per cent). These results suggest that the areas in which CIALCA operates either directly or through development partners have a higher level of information penetration.

The CIALCA Knowledge Resource Centre

At the meeting to launch the second phase of CIALCA in 2008, it was agreed that there was a need for both research and extension partners to increase

the level of integration with CIALCA's activities and staff (CIALCA 2008). One of the agreed actions was to implement a regional Knowledge Resource Centre (KRC), with a communications specialist to facilitate the knowledge flow between CIALCA and the partners. The KRC became operational in October 2010, based in Bujumbura, Burundi. The KRC aims to provide information and communication support for the needs of partner organizations for technical information. It does this by translating and repackaging technical information and knowledge in various client-specific forms, supporting the scaling-out of research results and monitoring the impact of improved communications. To achieve this, a range of appropriate tools and approaches is used to share knowledge.

Communication channels and content

CIALCA's outreach strategy is largely based on cascade training (or training-of-trainers; ToT) with interested partner organizations operating in the mandate areas. But there is also a strong desire to reach a much larger audience, both within and beyond the mandate areas. This is done by leveraging mass media tools to help create awareness and stimulate demand for CIALCA's agricultural innovations. Table 19.1 illustrates the range of communication channels typically available to disseminate agricultural messages, along with their relative strengths and weaknesses in terms of reach (how easily audiences over large areas can be informed), depth (the level of complexity that can be addressed using the communication medium), knowledge durability (how well the message 'sticks' and the ease with which the message can be seen or heard again), facilitation and learning (how much external input or interaction the channel requires) and the potential depth of learning as opposed to the level of interactivity or feedback, the relative cost in financial terms and the level of accessibility of the message to farmers.

The results from CIALCA's impact assessment may be compared with Table 19.1. In this impact study, respondents were asked about their main information channels for new knowledge on a number of agricultural topics. Figure 19.3 presents the main sources of information for respondents who indicated they had received information on crop pests and diseases and/or new crop varieties in the last 12 months. Due to the high level of accessibility of radio and farmer-to-farmer interaction, these channels have a high penetration rate and are clearly important in this setting. However, investing in information dissemination via the television and newspapers is not justified, with very low levels of information penetration.

Cascade training

CIALCA has developed many partnerships with development organizations (both local and international NGOs), public extension providers and farmers' organizations. The agricultural technologies developed by the Consortium

Table 19.1 Communication channels and their relative strengths and weaknesses

	ToT/ cascade	*Autonomous diffusion (farmer to farmer)*	*Factsheet/ poster*	*Video/TV*	*Radio*	*Internet/ online*	*SMS*
Reach	Low to medium	High	Low	Low to high	High	High	High
Depth (level of complexity able to be conveyed)	High	?	Low to medium	Medium	Low	Medium to high	Low
Knowledge durability (per intervention)	Low	Medium to high	High	Low	Low	High	Low
Facilitation/learning	High	Low to medium	Low	Low to medium	Low	Low to high	Low
Interaction/feedback	High	Low?	None	None	None (unless interactive radio)	Medium to high	High
Cost	High	None	Medium	Medium	Low	Low to high	Low
Accessibility for farmers	Low	High	Low	Low to medium	High	Low	Medium to high

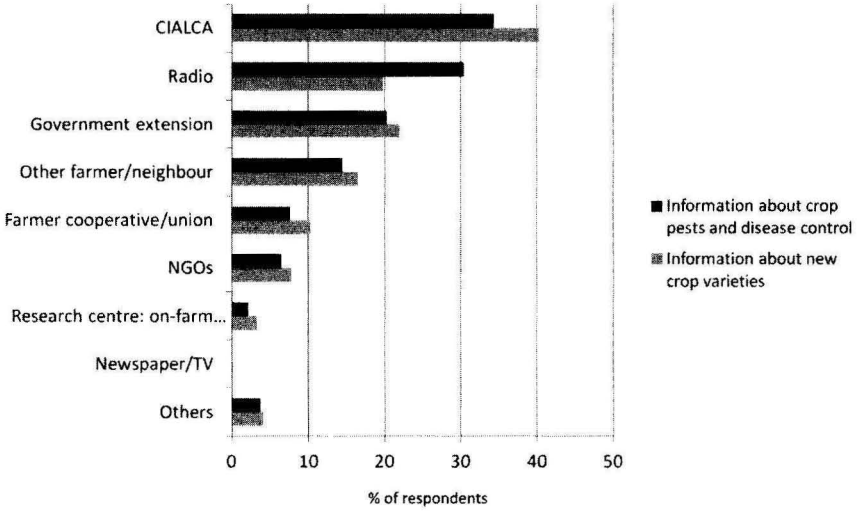

Figure 19.3 Main sources of information for respondents that received new agricultural information in the last 12 months.

resonate with these partners' visions and objectives and so they receive training from CIALCA on how best to implement these technologies with their beneficiaries. The training is most often done by way of interactive cascade training. A small number of agronomists or other suitable members of staff from the organization receive intensive training from CIALCA's staff, usually agronomists but also socio-economists for entrepreneurial and business training. These 'master trainers' are then expected to train others, thus yielding a potentially significant knowledge reach. Follow-up surveys tentatively indicate that the number of beneficiaries reached through secondary training (and beyond) lies between 48 (for a small NGO) and more than 1,000 for some of the larger NGO partners (Macharia *et al.* 2013). Knowledge materials for the initial training facilitated by CIALCA are often used to support the subsequent training and for future reference to improve the durability of knowledge. These are usually packaged so as to be context-specific and in an appropriate local language. Print materials are always made available to partners in digital form for further reproduction, if desired.

Although resource-intensive, cascade training facilitated by CIALCA's staff is likely to provide the best chances of the desired change in behaviour and adoption of technology. The communication lines are short, providing an ample opportunity for follow-up, feedback and the rectification of teething problems. This outreach approach is superior for the communication of technically complex messages, such as the progressively complex knowledge required for advanced integrated soil fertility management (ISFM).

Farmer-to-farmer diffusion

Horizontal spread via autonomous diffusion through the social networks of farmers is perhaps the best indicator for the appropriateness and acceptability of CIALCA's innovations. CIALCA's trainings are an important motivator for further information spread via farmer-to-farmer contact, farmers' organizations and cooperatives, on-farm trials and NGOs. The results from the impact assessment indicate that, on average, 16 per cent of the respondents receive information from other farmers about crop pests and disease control (17 per cent) and about new varieties (15 per cent), and another 9 per cent receive the same information via farmers' organizations and cooperatives (10 per cent for crop pests and disease control and 9 per cent for new crop varieties). Although these figures are moderately high, there is a significant further potential for farmer-to-farmer dissemination of information (particularly given its low cost yet large reach). As well as continuing to invest in the training of trainers, additional efforts should be invested in helping farmers and their organizations to build and strengthen their local networks for an improved exchange of information and the broader impact of innovations.

Video and television

In the past, video has not been a favoured platform for extension messages, with more attention being devoted to radio. This is despite the fact that video has a huge potential to promote learning among farmers, because the visual element is very powerful, particularly when combined with audio in a local language (Van Mele 2010). The limited availability of television sets and programming in rural locations in the focus countries suggests that the best way to introduce farmers to video is through DVDs to support in-field training. This is supported by data from impact assessment, as none of the respondents indicated that they rely on television as one of their main sources of agricultural information.

CIALCA has developed 11 short, technical extension videos on topics related to banana production, with six more in development on various subjects. Some of these videos have been translated and repackaged by partners, notably by RAB in Rwanda and FAO in Burundi. CIALCA anticipates several forthcoming projects that foresee a much greater reliance on the available videos to support the adoption by farmers of CIALCA's innovations. It is recognized that group discussions and additional facilitated learning will be needed to complement viewing sessions for extension messages to be adequately understood.

Rural radio

Radio has been used successfully in many parts of the world as an agricultural extension platform. CIALCA has used rural radio programming in Burundi

and eastern DRC, mostly for the purposes of creating awareness about encroaching banana diseases. This is reflected in survey data, in which radio is rated the second most important channel for information on crop pests and disease control; 48 per cent of Burundians and 24 per cent of Congolese (North and South Kivu) cite radio as one of their main sources of information on crop pests and disease control.

Radio has a relatively wide reach, with many poor farmers owning a radio set or a mobile telephone with an FM receiver. Despite this, relying on radio for encouraging technology adoption may be challenging. Van Mele (2010) contends that this is partly because many radio broadcasters do not have a background in agriculture and the fact that agricultural technologies are difficult to explain orally. Despite limited experience so far with rural radio, the KRC intends to leverage its key benefits (wide reach and low cost) to further explore opportunities using this medium of communication, particularly for awareness-raising purposes, or for training farmers in relatively basic agronomic or pest management techniques.

Internet and web-based tools

In CIALCA's first project phase, a website was developed to keep stakeholders updated on developments and interesting news items, and to provide an online resource portal for access to relevant information resources (technical reports, fact sheets, posters and brochures). The website remains, for now, a simple non-'social' platform, and content is obtained by information pull (demand) rather than push. Online information-seeking behaviour appears limited in Central Africa. This is revealed both by website metrics and anecdotal discussions with partners and stakeholders. In 2011 www.cialca.org received a monthly average of 691 visitors, who each viewed an average of 3.6 pages on the website. The geographic location of visitors is highly skewed towards Europe, North America and Kenya. At least a part of this is explained by the 'digital divide' – the inaccessibility or high cost of internet and information and communication technologies. For the time being, it is apparent that web-based tools have only limited value for the dissemination of CIALCA's agricultural technologies in the focus countries.

Conclusion: communicating complex knowledge

Since its inception in 2006, CIALCA has made a positive impact on the livelihoods of poor farmers in Burundi, Rwanda and DRC by improving household nutrition and increasing income (Macharia *et al.* 2013). The pathway for impact appears to be well established and key CIALCA technologies are of major interest to the target population. CIALCA has become a widely known information source on agriculture throughout the mandate areas, and three in four individuals are aware of CIALCA and one or more of its technical products. But adoption of new technologies by farmers lags behind.

As CIALCA refocuses some of its future efforts on agro-ecological intensification and ISFM, the Consortium must reflect on why crop productivity and the adoption of some technologies have been limited in CIALCA's interventions to date. Outreach approaches and the supporting knowledge-sharing tools and channels need to be evaluated to address weaknesses and identify new options for reaching (and convincing) farmers. One of the hurdles will be how to clearly convey increasingly complex knowledge to farmers that wish to progressively adopt the complete portfolio of ISFM innovations (improved germplasm + fertilizer + organic resource management + local adaptation). This will be very likely to require a concerted outreach effort with partners, supported by mixed-media learning content. Campaigns may be needed to create awareness and demand (rural radio will be likely to provide a suitable platform), followed by the intensive training of farmers supported by print materials and video. There are face-to-face training approaches that may be better suited than cascade training for promoting the learning and understanding of complex agro-ecology, such as farmer field schools (Godtland *et al.* 2003; David and Asamoah 2011).

Finally, there are novel and innovative communication approaches that could be explored to drive a new demand for innovations, such as the 'social marketing' of CIALCA's technology. This approach, successfully championed by organizations in the public health sector,[1] combines effective communication to achieve a change in behaviour with the low-cost pricing of important items such as mosquito nets and iodized salt. It could be of great interest to learn whether a suitably adapted approach could also work for seeds and fertilizer.

Note

1 Social marketing for public health is an approach that combines effective communication with the provision of important products to motivate the adoption of desirable practices and behaviour. Products are subsidized but not distributed free of cost to the end user, leveraging local supply chains to market and sell branded, affordable products. This approach has been used with success by the NGO Population Services International (among others) to reduce malaria and HIV/AIDS transmission, improve mother and child health and to promote other life-saving products and clinical services (PSI 2009).

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