Rural Innovation Institute

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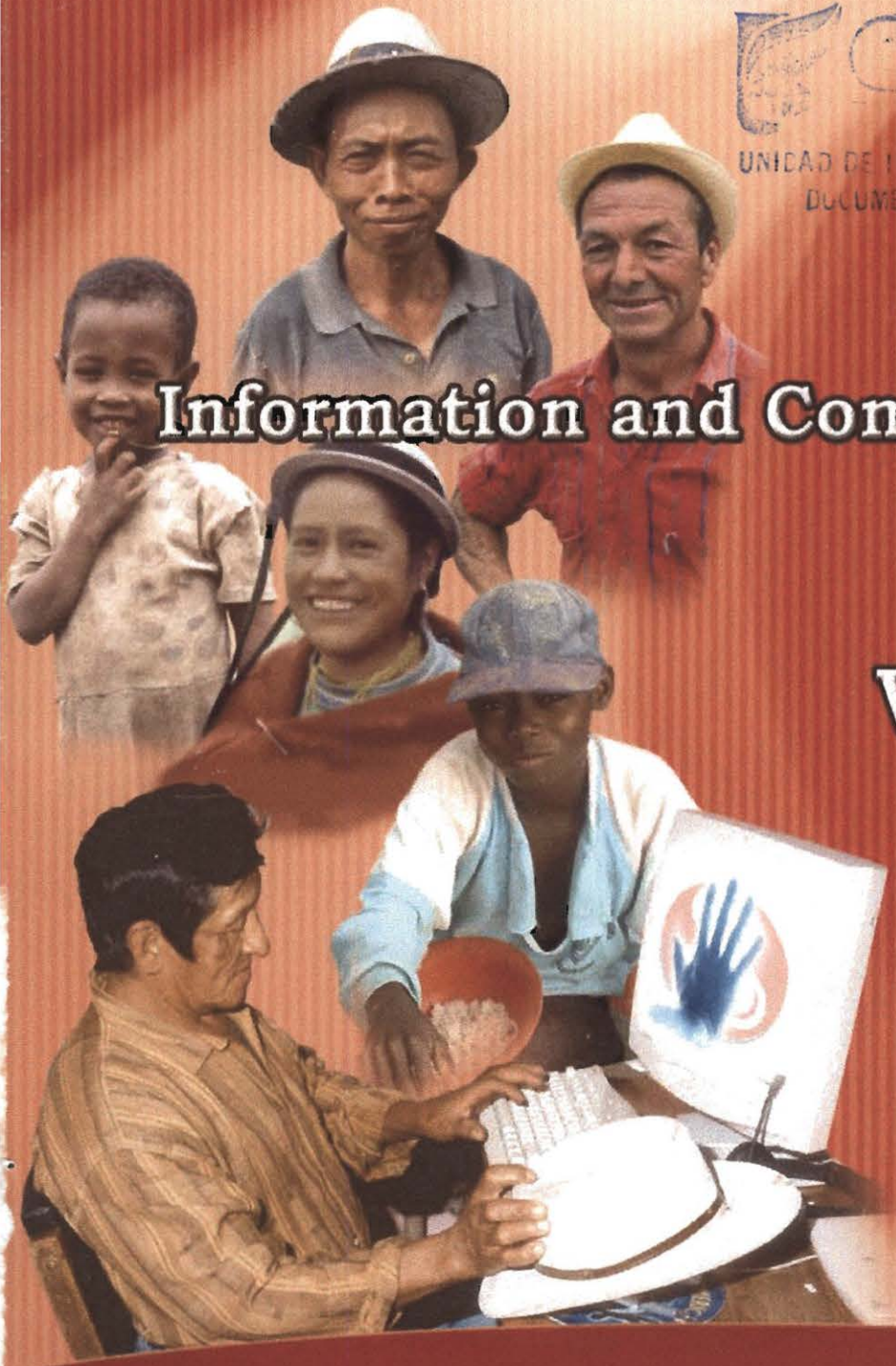

Project SN-4: Information and Communications (InforCom)

VOLUME III

Annual Report 2005

Rural Innovation Institute

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Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture

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Introduction

Having focused on new project development in 2004, InforCom took important steps toward consolidating its research program and publishing results during 2005, while boosting efforts to secure donor support.

In keeping with new guidelines for the preparation of CIAT's *Medium-Term Plan*, InforCom redefined its outputs around the middle of the year, as follows:

1. Methodologies and principles for building dynamic knowledge-sharing communities in and among R&D organizations
2. E-learning programs that help development professionals boost their knowledge and capacities
3. Methodologies and principles for enhancing information networks in the rural sector, so that they reinforce processes such as rural planning and enterprise development

The main change was to combine previous outputs dealing with community telecenters, information intermediaries, and local content development into a single output dealing with two types of rural information networks, which merit special attention: first, those centering on agricultural supply chains for higher value products and, second, those influencing rural development planning, from the municipal to national levels.

The InforCom Project works on the basis of several key assumptions in relation to its three outputs. First, enhanced knowledge sharing, or KS, can lead to improved teamwork and broader participation in decision-making, and these in turn can contribute to better performance, learning, and innovation in R&D organizations. A second assumption is that, e-learning (i.e., computer-supported collaborative learning), especially when linked to R&D activities in the field through partnerships, is an effective way for CIAT and other international organizations to build partners' capacity for stimulating innovation in rural communities and in the organizations that serve them. Finally, we believe that CIAT's partners, by supporting information intermediaries in the creation, use, and exchange of relevant local content (using new information and communications technologies, or ICTs, as well as conventional communications media), can strengthen rural people's participation in local development and thus help create conditions that are more conducive to technological and social innovation.

This year we completed a partial test of the first assumption through the Knowledge Sharing Project of the CGIAR's ICT-KM (Information and Communications Technology – Knowledge Management) Program. Coordinated by CIAT and carried out in collaboration with three other CGIAR centers, the project undertook four pilot initiatives, one in each center, aimed at examining the potential of major meetings for stimulating knowledge sharing among staff. These experiences largely bore out the project's hypothesis that major events are an effective entry point for KS, permitting large numbers of staff to gain experience and capacity in the use of KS techniques and creating positive attitudes toward KS on the part of both staff and leadership. We published a case study reporting partial

results of the pilot initiatives in the second issue of the *KM4Dev Journal*, which was guest edited by the "core team" of the KS Project.

The pilot initiatives were complemented by other activities, including workshops on the facilitation of group decision-making, the creation of an online KS toolbox, and a study on human resource policies with respect to KS and institutional learning in six CGIAR centers and an equal number of other organizations regarded as KS leaders. These activities, together with the KS pilot initiatives, were presented at the CGIAR's last Annual General Meeting and are reported in a publication entitled *Knowledge Sharing Solutions for a CGIAR without Boundaries*.

InforCom undertook the KS Project in collaboration with other international centers, based on the belief that knowledge sharing, like charity, must begin at home. In a possible second phase of the project and through other projects now under development, we will shift our attention more to KS in selected R&D partnerships to which CIAT and other CGIAR centers belong. We will also work to identify the "impact pathways" by which enhanced KS, teamwork, and participation in decision-making might lead to improved performance, learning, and innovation within those partnerships.

On InforCom's second main front, that of e-learning, we conducted a thorough evaluation of CIAT's first e-learning venture, completed in January 2005, which focused on ex situ conservation of plant genetic resources. The evaluation results are summarized in this report and will be presented in more detail in a co-publication with the International Plant Genetic Resources Institute (IPGRI), which was a partner in the course.

Building on this successful first effort, CIAT's Information and Capacity Strengthening (InforCap) Unit, which contributes importantly to InforCom, has entered into an exciting e-learning partnership with the University of Florida (UF) in the USA. In collaboration with two eastern African universities, CIAT researchers based in the region will provide on-site coaching and mentoring for local students enrolled in UF's distance education program, and they will serve on the students' thesis advisory committees. This arrangement provides an ideal platform for knowledge sharing between CGIAR researchers, universities of the North and South, and local research institutions, enhancing the relevance and impact of research, strengthening institutional capacities, and reinforcing learning and change processes (for more information, see www.ciat.cgiar.org/inforcap/strengthening.htm).

In addition, InforCom staff worked throughout the year with the International Fund for Agricultural Development (IFAD) and numerous partner organizations to develop projects that will offer an e-learning course entitled "Managing Innovation," accompanied by face-to-face training and support for field implementation of concepts and methodologies presented in the course. As a result of this and the other e-learning initiatives reported here, CIAT is now able to explore the potential of e-learning in relation to all three of the Center's research-for-development challenges, covering agrobiodiversity, agroecosystem management, and rural innovation.

Of course, the real value of our efforts to stimulate learning and innovation in partner organizations depends on their ability to translate newly acquired attitudes, knowledge, and skills into stronger capacity for innovation in rural communities. With the aim of providing partners with new tools for achieving this purpose, InforCom continued exploring, through

six projects in four countries, the potential of participatory communications and the use of new ICTs for helping promote technological and social innovation.

Three years ago InforCom decided to focus much of its work in this area on producers and other key actors in supply chains for higher value agricultural products. In doing so we wished to demonstrate the value of information and communications to a relatively new line of work in CIAT and in the CGIAR generally, which holds much promise for raising the incomes of rural people and helping them build sustainable livelihoods. Specifically, we set out to determine whether, by improving communications capacity within supply chains, it is possible to strengthen the links of chain actors to markets, to one another, and to organizations; enhance their capacity to develop and share innovations; and ultimately better enable them to compete in markets.

In order to design effective communications interventions within supply chains, one must first gain a better understanding of information flows and other aspects of the relationships between chain actors. For this purpose we began exploring the potential of social network analysis (SNA) as a diagnostic tool and as a means of helping chain actors form a shared vision of themselves as interdependent members of networks. Having begun this work in Cauca, Colombia, we were able to strengthen it considerably through a project begun in Bolivia during 2004, with funding from the UK's Department of International Development (DFID). Within the framework of this project, we are supporting a Ph.D. student from Imperial College London – Wye Campus. Her research centers on a social network approach for helping producer organizations understand and improve supply chain information flows, with the aid of new ICTs. Here we report on progress in developing a methodology for SNA in supply chains, and we summarize the results of its application to the chili, peach, and coffee chains in Bolivia.

Colleagues in CIAT's Land Use Project contributed importantly during the early stages of our work on SNA in Bolivia, mainly because of their interest in the potential of this approach for addressing issues in natural resource management. Staff of the Center's Participatory Research Project are also working on SNA, as reported in another section of this report, and InforCom is collaborating and sharing experience with them in connection with our research in Bolivia and Colombia.

In both those countries, we have developed methodologies for improving communications and ICT use in supply chains, and these are described in two articles below. The methodologies center on enhancing the capacity of information intermediaries (referred to as *gestores de comunicación* in Colombia and *promotores de información y comunicación* in Bolivia) to develop and share useful content, using ICTs and a variety of communications media.

To better demonstrate how improved communications can contribute to rural innovation, InforCom has worked hard in the last year or so to integrate its work with that of the other projects belonging to CIAT's Rural Innovation Institute. This is one reason why we chose to align our work on information networks with the efforts of the Agroenterprise Development Project to strengthen agricultural supply chains. It is also the reason for our collaboration with the Participatory Approaches Project in SNA and for our interest in determining whether improved communications within social networks can enhance the effectiveness of participatory research methods.

Rather than explore separately the potential of our respective approaches for stimulating rural innovation, we would do better to examine them together in a coherent fashion. Toward this end InforCom developed a project this year, funded by the W.K. Kellogg Foundation, in which our three projects are working with four national partners, two in Bolivia and two in Peru, to devise an integrated approach for promoting rural innovation – one that uses participatory research and communications to help rural people build the new knowledge and skills they need to compete in markets. Here we present a preliminary report on the project's progress in building the partnerships from which an integrated approach should emerge.

Whether supply chains become more competitive and rural people derive more benefits from them depends not just on the decisions and actions of chain actors, nor even on market forces alone, but also on development policies and strategies in the territories where chain actors operate. To explore the possibilities for shaping those factors in ways that favor rural agroenterprises and other development initiatives, such as improved management of water, biodiversity, and other natural resources, InforCom staff in Bolivia, Colombia, and Senegal are conducting research on the planning, monitoring, and evaluation of rural development. Specifically, they are seeking ways to broaden stakeholder participation in those processes by strengthening the information networks that link national R&D organizations with local actors in rural development. Here we present recent progress and research results from Colombia, Bolivia, and Senegal.

We trust that readers will find the articles that follow interesting and useful, and we welcome any feedback on our approaches, results, and conclusions.

Dynamic Knowledge Sharing in R&D Organizations

Knowledge Sharing for a CGIAR without Boundaries

Simone Staiger-Rivas and Nathan Russell

Summary

Scientific organizations that manage an increasingly broad agenda of multidisciplinary research need to become more adept at sharing their knowledge through collaborative learning processes. In search of better ways to accomplish this, managers and staff of four centers supported by the Consultative Group on International Agricultural Research (CGIAR) embarked on four pilot initiatives to explore the potential of knowledge sharing (KS) tools and techniques as means to foster collaboration. The pilot initiatives centered on high-profile events, which are an essential tool by which the centers plan and review their work. They also present excellent opportunities for testing and demonstrating the value of KS approaches.

This paper, based on the authors' experience and participants' evaluations of the pilot initiatives, outlines the approaches developed by two of the four initiatives, describes the challenges they faced, and draws some conclusions about future directions.

Background

Economic globalization, environmental pressures, and other forces are rapidly altering the face of tropical agriculture, placing new and changing demands on the 15 centers supported by the Consultative Group on International Agricultural Research (CGIAR) and on their many national partners. Through a broad agenda of multidisciplinary research, these organizations are creating a wealth of knowledge that can contribute to sustainable agricultural development. But they need to become more adept at sharing this knowledge through collaborative learning processes that steadily improve researchers' performance in helping rural people in developing countries solve problems and seize new opportunities.

Efforts to foster collaboration among centers and partners have tended to focus on better management of information flows and on the capture of codified knowledge resulting from agricultural research. In doing so these initiatives have dealt more with information management than knowledge sharing. They have tended to lie on the left side of the Knowledge Management (KM) Spectrum Model proposed by Binney (2001), along with transactional KM applications (such as help desks), analytical applications (e.g., data warehousing), and asset management applications (e.g., document management). Though necessary and important, these activities are not sufficient for helping scientists deal with the complex challenge of effective multi-stakeholder collaboration.

Other initial efforts have concentrated on the development of comprehensive KM strategies and other top-down measures, such as changes in human resource policies, exposure of senior managers to external KM champions, and training in knowledge sharing (KS) techniques. Those and similar initiatives, often criticized as "the latest management fad" (Wilson 2002), have not proved effective for fostering collaboration in the CGIAR. It is thus time for the centers to shift their focus from data to people, thus moving to the right side of

Binney's KM Spectrum, featuring measures that are process oriented (i.e., based on lessons learned) and developmental (dealing with staff competencies and learning) and foster innovation and creativity through collaboration and community building.

People-oriented, practical approaches (Collison and Parcell 2001; Davenport and Prusak 2000; CIDA 2003) could contribute more effectively to desired changes in behavior and organizational culture through a more gradual, bottom-up, and participatory process of experimentation, capacity building, and learning-by-doing. This process could benefit from external facilitation and support, but it should be "home-grown and evolutionary," to borrow a phrase used by the chair of the CGIAR at its 2003 Annual General Meeting to describe the desired process of change and reform.

In an effort to improve the effectiveness and impact of our work, four centers embarked in 2004 on a new collaborative initiative, coordinated by CIAT, to improve knowledge sharing, or KS. The project was funded by the World Bank through the CGIAR's ICT-KM (Information and Communications Technology – Knowledge Management) Program.

Objectives

The initiative reported here pursued an approach that involved incorporating KS principles and techniques into important center events. A central objective of this work was to:

> Create opportunities for CGIAR center management and staff to experiment with KS approaches and thus demonstrate the value of those approaches as means of facilitating organizational change and research collaboration.

Methods

The project worked toward that objective mainly through four pilot initiatives, one each at CIAT, the Center for International Forestry Research (CIFOR), International Maize and Wheat Improvement Center (CIMMYT), and International Water Management Institute (IWMI).

This paper reports the results only for the CIAT and CIFOR initiatives, both centered on their annual staff meetings, as these illustrate particularly well the project's main thrust. Like most other CGIAR centers, CIAT and CIFOR have a tradition of annual meetings of professional staff. The format has typically focused on plenary sessions, in which researchers deliver formal PowerPoint presentations, followed by questions and discussion. In addition, time is usually allotted for project teams and other groups to review on-going activities and plan future work.

Many center staff feel the time spent in annual staff meetings is not used as well as it could be. Too many hours, they say, are consumed by formal presentations, with little in-depth discussion of "burning issues." There are few opportunities for the more or less 100 people who participate in these events to get to know each other and establish the collegial relationships that are essential for creative scientific collaboration.

In an effort to address those concerns, KS Project staff and their collaborators proposed to CIAT and CIFOR management a major overhaul of their annual staff meetings. The idea was to try an alternative formula that would help staff share knowledge, broaden communication, stimulate dialog, and strengthen personal relationships.

At each center a coordination team, with strong skills in KS, communications, and monitoring and evaluation was established to plan and carry out the meeting. Both teams included a senior program officer from Canada's Bellanet International Secretariat, which was a key partner in the project.

One of the coordination teams' first and most important tasks was to help management define the meeting's objectives. The team then met with a range of other staff – in face-to-face meetings at headquarters and via telephone with outposted staff – to check the relevance of the proposed objectives and get reactions to alternative meeting designs.

Next, the coordination team meticulously planned the meeting. Observing the fundamentals of good agenda planning (Kaner 1996), they defined the desired outcome for each objective and then selected relevant KS approaches and participation formats to achieve those objectives.

Below are brief definitions of some of the main techniques employed. Exactly how these and others were applied is described under "results."

Open Space—This is a highly democratic method of group agenda setting, followed by small-group discussion, reporting, and preparation of action plans.

Peer Assist—This technique brings together a small group of individuals to share their experiences, insights, and knowledge to help one person solve a specific problem.

Knowledge fair—These are exhibitions on a given theme, which give participants great flexibility as to how they will present and gather knowledge and experience.

Each of the pilot initiatives was evaluated through After Action Reviews as well as formal surveys, as described below for each case.

Results of Case 1: A New Formula for CIAT's Annual Staff Meeting

At CIAT a major objective of the annual meeting was to plan how the Center should operationalize three major new Center initiatives referred to as "research-for-development challenges."

An Open Space session on new initiatives—The session designed to address that issue was held in an expansive open-air setting: the covered patio that forms the northern side of the CIAT campus quadrangle. With about 85 staff sitting side-by-side in a large ellipse, the facilitator invited the group to set the agenda for the 2 days of discussion. All those with an issue, idea, or question they felt should be aired were asked to write down their topics on cards and then advance, one by one, to the center of the circle to introduce the topic. The one condition imposed by the facilitator was that each person suggesting a topic be prepared to lead a discussion group and arrange for the preparation of a short report.

The agenda-setting exercise captured 20 topics for discussion. These ranged from operational issues, such as impact assessment, to human resources needs, such as integrating national staff into the research-for-development challenges and building the necessary base of skills.

The scheduling allowed for each person to attend up to two of the 19 resulting breakout sessions, each of which lasted 90 minutes. By the end of the day, 19 written reports had been compiled for review by all participants on day 2.

To end the first day's proceedings – or, in the lingo of Open Space practitioners, "to close the circle" – each person shared with the group a word or phrase that captured her or his impression of the day's work. Here is a sampling of results from passing the microphone from person to person: "provocative ... multifaceted ... confusing ... unbounded ... challenging ... frank ... social ... fresh ... energetic ... hard work ... diversity ... listening ... learning ... opportunity ... intriguing."

On day 2 of the Open Space session, participants began their work by reading the discussion reports prepared the previous day and prioritizing them through ballot voting. Eight of the 19 topics/reports were selected for further discussion and conversion into seven action plans.

Voting again, this time with their feet, participants sped off to find the nooks and crannies where their 2-hour action-plan meetings were to take place. Each discussion leader was armed with an action-plan guideline sheet to ensure a measure of consistency across the seven discussions and reports. Among the guiding questions: What do you want to do now to move forward? What are the actions to get there? Who else do we need to enroll? After the meetings, a rapporteur from each group recorded the action plan and in the afternoon presented the plan in plenary.

During the closing plenary session on day 2, participants commented on the extent to which the 2 days of Open Space meetings did or did not contribute to operationalizing the three research-for-development challenges. Some of the comments were positive, as illustrated by the following:

- Change requires participation. The Open Space sessions provided for a good experience in that regard.
- "I appreciated the experimental, novel approach."

In addition to this type of generally positive comment, there was, nevertheless, a recurring message: Despite the progress made in formulating action plans, there was still considerable confusion about how CIAT's work should be integrated under the three research-for-development challenges.

A Knowledge Fair on research-support services—A Knowledge Fair was used to address the meeting's second objective, namely that of integration between CIAT's headquarters and regional staff. The fair was organized in the form of a 5-hour-long exhibition of support services available within CIAT. It was a bottom-up exercise: Support staff designed the displays and were present to answer visitors' questions and provide services on the spot. The Knowledge Fair focused specifically on support services because of a perception that staff based outside of headquarters, many on other continents, have particular difficulty in accessing these services and in knowing who is doing what.

One senior staff member from Asia reported having an enormously productive tour of the stands. At the Information Systems stand, staff helped him solve a computer problem; at

the Human Resources stand a contract was finalized; and at the Finances stand, a financial difficulty was successfully resolved.

Peer Assists for regional and headquarters integration—The Peer Assist method was used as a further aid to headquarters/regional integration. Managers and staff members were invited to present problems that they personally had experienced, related to relations between headquarters and the regions. Seven individuals were selected to present their problem in a small-group setting. Examples of the problems include:

- What to do when you (a regional staff member) find out that a project has been developed at headquarters and now you're supposed to implement it?
- What to do (if you're the research director) when someone comes to your office to complain that they should have been, but weren't, involved in the development of a project that has now been approved?

Like the Open Space technique, the Peer Assist encourages interaction, in that participants present a problem of their choosing and others may offer advice or analysis as they see fit, on the basis of their personal interest and experience with similar situations. Those who present the problem benefit from the collective wisdom of the group. Others frequently benefit from the interactions, as they realize they possess knowledge and experience of use to others.

Staff evaluation of KS week—Whether center staff find KS approaches helpful and begin incorporating them into other activities depends obviously on the effectiveness of these approaches. The coordination team employed two techniques for gauging the utility of KS Week and identifying ways to improve it.

First, a "barometer team" – consisting of five headquarters staff, four outposted staff, the meeting facilitator, and one other communications consultant – was formed to monitor the week's activities and recommend ways to make future meetings more effective. Meeting three times during KS Week, the team made 48 recommendations related to the event's strengths and weaknesses directly observed by team members or reported to them by other participants. In a particularly significant observation on the Open Space event, the barometer team recognized that many CIAT staff did not grasp the development challenges in sufficient detail to be able to design action plans. "We should have done a better job of determining whether people understood the topic well enough to discuss it," commented one team member.

The second approach for judging the usefulness of CIAT's KS Week was a formal evaluation, carried out during the final session of KS Week. Most KS Week participants surveyed were positive about it and felt the meeting had improved communication and relationships and demonstrated the value of KS techniques. While it is difficult to assess the usefulness of specific KS tools, apart from the usefulness of the sessions in which they were used, most participants indicated they had found the Peer Assist, Knowledge Fair, and Open-Space approaches useful. They also expressed interest in using these approaches in the future and felt they should be incorporated into CIAT projects. Moreover, they suggested that special attention should be paid to involving nationally recruited staff members more fully in KS activities.

When asked to compare KS Week with previous annual meetings, participants responded that the communication and interaction were more effective than in other years. They also appreciated not being confined to closed, dark rooms for lengthy PowerPoint presentations. Nonetheless, one aspect of previous meetings that participants preferred over KS Week was the exchange of scientific information on work in progress, results, and impacts. They suggested that some mechanism be found to facilitate the exchange of such information, but without returning to the previous format of nonstop presentations with limited discussion.

In his closing remarks, CIAT's director general alluded to the many practical lessons learned during KS Week. "This has been an experiment. Like any experiment, some things worked well and some not so well. Now we can take the best of what we've learned this week and apply it in the future."

Results of Case 2: Working Together to Make a Difference – CIFOR's Annual Meeting

"We're going to give you space and an opportunity to talk about the things that really concern you, that you are worried about, that excite you," explained CIFOR's director general, in his welcoming speech to the more than 100 people who gathered in the lobby at center headquarters in Bogor, Indonesia. During the last 2 years, many CIFOR staff had commented that the institution was becoming increasingly compartmentalized, with scientists working mainly within the orbit of their own programs. At the same time, CIFOR's process of decentralization had made it more difficult for staff to have face-to-face discussions. A new approach to conducting the Center's week-long annual meeting was designed in an effort to change all that.

A Knowledge Fair focused on collaborative research—On Monday a Knowledge Fair featured workshops, presentations, poster displays, and videos relating to research conducted by CIFOR and its partners. Parallel workshops in the morning covered three topics: the center's draft Latin American strategy, the role and potential of forests for improving livelihoods, and forests and water. During a short break after the workshops, everyone was encouraged to visit the information booths in the Knowledge Market Place. This was followed by three short presentations, again held in parallel, exploring staff recruitment, illegal logging in Cameroon, and forest conflicts in West Africa. The afternoon followed a similar pattern, with workshops and presentations, before culminating in a 2-hour workshop on CIFOR's partnerships.

It was clear during the opening day that there was a significant "bottom-up" element to the meeting, with the intellectual agenda being set not so much by the management team as by the staff themselves. In the weeks and months leading up to the annual meeting, individuals took it upon themselves to promote ideas and agreed to run workshops or give presentations.

Open Space sessions on biodiversity and more—Tuesday was the first of 2 days devoted to Open Space sessions. After an explanation of the technique, 27 people came forward with 29 separate topics, ranging from the managerial to the scientific, from the broad and philosophical to the very specific. There were two sessions before lunch and two after, with an hour allocated for each. For each session there was a choice of at least five

different topics. While some groups attracted relatively few people, others attracted more than 30.

The meeting on biodiversity research, to take just one example, attracted 18 people, including many of the senior staff and the director general. One participant provided a historical overview of CIFOR's biodiversity research, and everyone was invited to say why they had decided to attend this meeting. The director general outlined five main areas of biodiversity research in which CIFOR has worked, suggesting where the organization has succeeded, and where it has not.

Afterwards, the acting regional director for eastern and southern Africa suggested that the session was useful. "The meeting helped us develop a framework for people working on biodiversity and created synergy between different researchers," he said.

In the afternoon participants reconvened for a brief plenary session "to close the circle." Already, the windows of the Amazon room were plastered with reports from a dozen groups.

Participants reconvened on Wednesday morning. The head of Human Resources opened the circle, explaining the order of the day. First, everyone took time to read the 27 discussion reports that had been collated overnight. In comments from the floor, many participants expressed concerned with the issue of inter-program cooperation and integration – or the lack of it.

The first to speak commented as follows: "I enjoyed the discussions and participatory agenda-setting yesterday, but the programs still seem to be working in a parallel way." Two other staff pointed out that they had managed to establish good relationships with people from other programs in a spontaneous way, through discussions over meals, during meetings in corridors, and at social events. "So let's be individually more proactive," suggested one of these staff. The other commented, however, that CIFOR needs a structured system of communication between the programs as well.

In the next stage of this Open Space session, the facilitator invited participants to come forward to initiate the morning's discussions, which dealt with four topics. The one that attracted the largest number of people was "Does CIFOR need a new strategy?"

During the closing session, many national staff who turned up in the morning were absent, and there were many empty seats. Perhaps those who did not come were simply attending to administrative and other business, which they felt they could no longer neglect.

The four initiators of the morning discussions briefly reported back. The facilitator suggested that everyone spend a few moments reflecting on what they had learned during the morning. She passed round the microphone, inviting anyone who wished to say something.

One participant said she usually hates annual meetings but had enjoyed this one. Another felt that the innovative introductions this year had much to commend them, but she believed that next year there should be a mix of the conventional and the innovative.

Peer Assist and closure—Only 40 participants reconvened on Thursday morning. The facilitator explained the nature and purpose of the Peer Assist process. Five CIFOR staff

explored their problems under the heading "Highlighting and Addressing Regional and Global Issues."

Reactions to the process were positive. One participant – his question was "How do you live up to the expectations of national partners?" – said that, although his group did not come up with anything he had not already considered, he liked the exercise. "I would like to try this process with a scientific problem next time," he noted. A member of the Center's Environment Program said he found the Peer Assist process very exciting and that this may at times be a better way of solving problems than through one-to-one conversations.

Afterwards, the director general and other staff answered questions about the forthcoming External Program and Management Review (EPMR). Organized as a "Chat Show," the meeting was well attended and expertly hosted. The wrap-up session consisted of a short video of the week, a slide show, and a session of "Speed Dating," at which everyone had 10 minutes to talk to as many people as possible about what they had liked (or had not) about the event.

The director general gave a brief address before banging a gong to wind up the day's meeting. "This week, there has been big progress on a lot of little things," he said, "and a little progress on a few big things." The intention now, he explained, is to provide leadership that will help open up more space – "so that you can all contribute to the sum of what we're doing."

Evaluating the annual meeting—At the end of the fourth and fifth days of the meeting, participants were asked to complete an evaluation form, and a total of 72 did so. Most responded positively to the meeting, giving it an average rating of 4.1 on a scale of 1 to 5, with 5 indicating excellent.

With respect to meeting objectives, participants noted that it had contributed to a better understanding of CIFOR's global programs and regional strategies. They especially appreciated the opportunities, open to all staff, for engaging in discussion and knowledge sharing. Some felt, though, that less progress was achieved in reaching a shared understanding of the center's future direction, vision, and values. For almost all participants, the "mix, mingle, and have fun" objective was definitively achieved.

When asked to comment specifically on the KS approaches, most participants said they found the Open Space sessions to be innovative and useful, and they expressed interest in using this approach in the future. Responses to the Knowledge Fair and Peer Assist were similarly positive, with some mentioning that they would like to apply the latter method to scientific issues. Participants reserved especially high praise, though, for the informative session, using the Chat-Show method mentioned above, on CIFOR's upcoming EPMR.

To improve future annual gatherings, participants suggested that (1) program meetings should be scheduled in such a way as to allow more discussion of cross-program issues, (2) more time should be allowed for in-depth discussions, and (3) there should be a sharper focus on action planning.

Conclusions

On the basis of the two cases reported here, we can draw some tentative conclusions about major meetings as entry points for KS in R&D organizations. The four pilot initiatives developed under the KS Project were based on the hypothesis that high-profile events can be an effective entry point for promoting the adoption of alternative KS approaches (Staiger-Rivas et al. 2005). The experience of four CGIAR centers seems to bear out this hypothesis. Through these events large numbers of staff gained direct experience with KS, and when asked to evaluate that experience, the results were largely positive. All the meetings made significant progress toward their individual objectives, and many staff expressed enthusiasm about the new style of conducting meetings.

Even so, it is also clear from the experiences presented in this report that our organization and planning of such events can be improved. Toward this end project staff began a process of identifying lessons learned from the pilot initiatives, which culminated in a 3-day workshop in September 2005 encompassing all four of the initiatives.

Some of the lessons we have drawn from the experience so far may seem rather obvious. For example, the CIAT pilot underscored the importance of involving as many staff as possible in planning the event. We thought we knew that, but evidently we did not put it into practice very well.

In reflecting on the Open Space session, we realized that many of the outposted staff did not have enough information about the research-for-development challenges to participate effectively in planning their operationalization, a key objective of the meeting. Broader consultation with outposted staff may have brought this obstacle to light at an earlier stage and prompted us to organize the Open Space session differently.

In the course of such consultations, it is important to remain alert to individuals and teams who show special interest and are prepared to invest time in experimenting with new ways of working with groups. These teams are potential KS "champions," and their support is vital for organizing and conducting individual events and for achieving acceptance of KS approaches. Time and resources should be devoted to building their confidence and capacity.

That approach was especially successful at CIFOR, where a champion was identified to organize the event. As a result, the planning process was more inclusive, and CIFOR was able to build a strong team around its pilot initiative. Particularly noteworthy was the fact that national staff played an active role and took ownership of many aspects of the event, contributing to extremely high staff participation.

Of course, we will never achieve flawless execution of KS events. And we must bear in mind that these events are only part of an integrated effort to improve collaboration. Our experience shows that they arouse considerable interest among large numbers of staff. But to achieve wide use of KS approaches in center activities, staff will need to acquire new skills, gain reliable sources of continuing support, and perceive clear incentives to pursue their interest in KS.

For future KS initiatives in the CGIAR, it is important for each of the centers involved to devise their own action plans for promoting KS and for further developing in-house

capacity to implement those plans. Another crucial step is to foster development of the emerging community of KS practitioners in the CGIAR, expanding it to involve professionals from all areas of the centers' work, including research, capacity strengthening, support, and management.

Finally, as King and McGrath (2004) have put it, "there is a serious danger that knowledge sharing will be seen as an irrelevant luxury if it is not more visibly and genuinely addressed to Southern knowledge needs and challenges." To avoid that danger, we need to begin applying KS approaches in our increasingly complex partnerships with a growing array of national, international, and local partners. The most important impacts of KS are likely to come from its beneficial effects on collaborative arrangements. Recent experience at IWMI and CIAT in sharing KS approaches with research partners is quite promising. As center staff realize the value of those approaches in facilitating research and development collaboration, we believe they will become more committed to incorporating them into the day-to-day activities of their centers and in the CGIAR generally. Once KS approaches become normal practice in our organizations, they will have a profound effect on the way we contribute to learning and innovation through research partnerships.

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E-learning Programs for R&D Professionals

An Evaluation of CIAT's First E-learning Course and Subsequent Steps

Edith Hesse

Summary

Over the past 10 years CIAT, the International Plant Genetic Resources Institute (IPGRI), and the National University of Colombia have jointly organized numerous capacity-strengthening activities. In recent years, though, it has become difficult to obtain funding for traditional training courses. Given the continued high demand for training, we decided to explore jointly the potential of distance education for reaching broader audiences, including those at remote locations. To embark on this new and innovating learning venture, we established a strategic partnership with the Network of Institutions Dedicated to Teaching Agricultural and Rural Development Policies for Latin America and the Caribbean (REDCAPA), a provider of computer-supported collaborative learning (CSCL) with more than 10 years of experience.

The results of an evaluation of this learning approach indicate that CSCL has considerable potential for strengthening individual and institutional capacities. Based on these results, CIAT's Information and Capacity-Strengthening (InforCap) Unit, which contributes importantly to the Center's InforCom Project, is undertaking further collaborative learning initiatives, and we to encourage others to do likewise.

Background

Latin America's 230 gene banks hold more than 200,000 samples of plant species of economic and ecological importance. But many of these gene banks are unable to fulfill the most basic conservation functions due to a lack of financial resources and to poorly trained staff. In an effort to address this problem, CIAT, the Americas Office of the International Plant Genetic Resources Institute (IPGRI), and the National University of Colombia (Palmira Campus) have collaborated over the last 10 years or so in various genetic resource initiatives, and they have jointly organized three international training courses for professionals and technicians working in gene banks, botanical gardens, arboreta, and crop diversity projects. Given that funding for conventional training is limited, we decided to examine the alternative of distance education. To embark on this new venture, we established a strategic partnership with the Network of Institutions Dedicated to Teaching Agricultural and Rural Development Policies for Latin America and the Caribbean (REDCAPA), which has more than 10 years of experience in computer-supported collaborative learning (CSCL) or e-learning.

Objectives

The work reported here centered on an ex situ e-learning course dealing with ex situ conservation of plant genetic resources. Its overall purpose was to determine whether multi-institutional e-learning approaches effectively complement other mechanisms for sharing the wealth of knowledge generated by the centers of the Consultative Group on International Agricultural Research (CGIAR) in collaboration with their partners in developing countries. A more specific aim was to strengthen institutional capacity through an innovative, multi-

partner e-learning approach as well as the capacities of professionals and technicians working in gene banks, botanical gardens, arboreta, and crop diversity projects in Spanish-speaking countries.

The following learning objectives where jointly defined for the course by a coordinating committee, with representatives from all partner institutions:

- Contribute to institutional capacity strengthening through training.
- Improve ongoing conservation efforts in participating countries.
- Promote wider use of knowledge about conservation.
- Strengthen the creative and analytical capacity of gene bank personnel.
- Contribute to the creation of a critical mass for gene bank management.
- Promote knowledge sharing among gene bank personnel.
- Provide a platform for continuous learning and knowledge sharing.

Methods

Identification and selection of the target audience—REDCAPA announces its courses via a newsletter that reaches more than 10,000 people. For this course, however, we decided also to contact the curators of 230 gene banks included in a database maintained by IPGRI. As a consequence, a surprisingly high number of people (110) filled out the application form, which requested detailed information about the applicant's experience and interest in conservation. Based on this information and on clear selection criteria, 28 applicants from 12 countries were selected and accepted for the course.

Although the course was initially meant for technicians, most of the participants held professional and/or postgraduate degrees and had several years of work experience. For this reason,the initial course content had to be adjusted to fulfill the expectations of a more demanding group. To be admitted to the course, each student had to make a deposit of US$100; the organizers indicated that they would seek funding to reimburse those students who successfully completed the course.

Formation of a community of practice—To create a common understanding of the objectives and processes involved in a multi-institutional distance education project, it was necessary to familiarize subject experts from CIAT, IPGRI, and the National University of Colombia with concepts and issues related to distance education, with the idiosyncrasies of online communities, and with the software platform of REDCAPA. In addition, a training expert and an adult education advisor guided the group through the process of collaboratively developing course objectives and content as well as designing and structuring the content in a way suitable for online learning. Given the innovative nature of the project, most subject experts started this new online learning experiment with enthusiasm and made constructive contributions to the process. They all gained a better understanding of the implications of converting expert knowledge into online learning materials and of the personal and professional commitments required for effective teamwork.

Development and adaptation of course content—Due importance was given to collaborative development of course objectives and content, particularly as university professors initially had different ideas about what content should be emphasized in the course. Through an iterative negotiation process, an agreement was reached between professors, researchers, and gene bank technicians from all three institutions.

Although a number of teaching materials were available from previous courses, they had to be re-written and re-structured to fit the requirements of the online learning environment. In this process it became clear that a glossary of concepts was needed, which was developed by the main tutors of the course. In addition, IPGRI prepared a detailed bibliography on plant genetic resources, with many key publications in full text. With due recognition of copyright regulations, this information was made available on CD-ROM and in REDCAPA's virtual library.

Creation of the learning environment—REDCAPA uses a learning management system (LMS) called "First Class" for all online courses. A dedicated workspace ("virtual class room") was created on this platform exclusively for the ex situ conservation course, where tutors posted course materials and facilitated discussions. Students in remote areas could access this workspace from any computer connected to the Internet, at any time (for a few minutes or several hours), and from any place (telecenters, cybercafes, etc.). They could participate in the asynchronous or real time (via "chat") discussions, or they could download assignments, reading materials, and emails and then read them off-line. When finished they would log on for a few minutes again and upload their assignments and responses already written off-line. A "virtual cafe" for non-work related conversations as well as for posting of CVs and photos of students and tutors helped them get to know each other and build trust, which is an essential prerequisite for efficient knowledge sharing and the formation of communities of practice (COP).

REDCAPA provided technical support to students and tutors for any computer or connectivity-related problem, particularly at the start, but also at any time during the course.

Three tutors accompanied the students during the whole course: a professor from the National University of Colombia, the head of the pathology laboratory of CIAT's Genetic Resources Unit (GRU), and an advisor for adult education from CIAT's InforCap Unit. Together, they finalized all learning modules and lectures, which were reviewed by the head of CIAT's GRU to ensure high quality and relevance. Each tutor spent at least 1-2 hours per day providing feedback on students' assignments, answering questions, and facilitating the discussion among fellow students. Rather than take traditional exams, tutors had to figure out an assessment method that would be acceptable to all three institutions. They agreed on an assessment scale of 1-10, and they included at the end of each lecture/module one or two questions, which could be properly answered only if the student had read and understood the material. Other assignments consisted in the description of cases relating to the student's working environment.

Evaluation—An evaluation panel made up of representatives of the four partner institutions provided guidance to an external evaluator on key research questions and evaluation methodologies. Throughout the course experiences were documented and assessments made of the following aspects: (1) students' level of understanding upon finalizing each lecture (through questions at the end of each lecture, to be answered by students and assessed by tutors); (2) the relevance and quality of the course; (3) students' perceptions of the overall online learning experience (through a detailed questionnaire filled out by all students at the end of the course); and (4) the supervisors' perception of behavioral changes seen in their staff (via a Survey Monkey questionnaire followed by telephone interviews by the evaluator).

Results

One of the most striking results was the exceptionally high completion rate. Of 28 students selected, 6 withdrew at an early stage in the course because of unexpected travel, change in work plans, and health reasons. All the others – 11 males and 11 females from Argentina (1), Bolivia (1), Colombia (6), Costa Rica (2), Ecuador (1), Spain (2), Guatemala (1), Mexico (3), and Peru (5) – met all requirements of the course and consequently were reimbursed their course fees. This result is particularly encouraging, as e-learning courses tend to have high dropout rates.

Other results of the learning venture were analyzed using Kirkpatrick's (1998) methodology, which analyzes four levels of impact:

1. ***Reaction*** – Students' satisfaction with the new learning mode.
2. ***Learning results*** – Students' sharing of concepts and learning materials.
3. ***Behavior*** – Changes in attitude as a result of the course.
4. ***Tangible and intangible institutional results*** – The intended audiences for the evaluation results were CGIAR management and staff as well as others interested in the potential of CSCL methods.

Reaction—Based on a detailed course evaluation carried out via a questionnaire filled out by all students, the following was noted. Students expressed great satisfaction with the overall results. They gave high ratings in response to questions regarding the relevance of the acquired knowledge for their daily work (over 90 percent of students). They also highly appreciated the quality and quantity of materials made available through the virtual campus. The opportunity to share knowledge with peers from 12 countries over an extended period was another component they highly valued. Their initial perceptions regarding ex situ conservation issues had changed considerably as a result of the course (77 percent of students). This can be seen as an indicator of fulfillment of the major course objectives, namely strengthening human resources involved with conservation issues in the region. Most students considered the contributions of fellow students as essential value-adding components to the learning process, and they felt confident about sharing their own experiences. This points to a well-facilitated process, which contributed to the formation of a community of learners (Brown 2001). The unanimous request by all participants to open a group workspace that would allow them to continue sharing knowledge after the course confirms similar findings on adult education (Lehtinen et al. 2002), namely that knowledge shared by peers is considered one of the most important benefits of the learning process.

Learning results—Ninety percent of the students indicated that they had acquired new and relevant knowledge. Of the six course modules, the one on germplasm conservation received the highest rating (96 percent of the students rated it high or very high), followed by the gene bank module (91 percent). Students also indicated that they had become more confident in using e-mail and the Internet on a routine basis for a variety of new tasks. Both students and tutors emphasized that they had gained a better awareness of intellectual property rights in general, and copyright issues in e-learning contexts in particular. One hundred percent of the students agreed that this method of online learning can be seen as an efficient complement to traditional face-to-face courses.

The tutors indicated that the initial challenge of dealing with new information and communications technologies, or ICTs, constituted an important learning experience for

them. For both students and tutors, this was their first experience with CSCL, and it enabled them to experiment with new and creative ways of sharing knowledge, motivating students, and assessing students' learning processes and achievements.

Behavior—Three months after the course, a survey was carried out via "Survey Monkey" with supervisors, followed by several telephone interviews. Nearly all supervisors (87 percent) noted that their colleagues who had taken the course showed greater confidence in taking decisions in their day-to-day work. They also noted that these colleagues had become more efficient in planning and organizing their work and had shared many lessons learned during and after the course. The fact that several components in the organization of the course required the attention of the supervisors helped to create stronger awareness and interest in this innovative learning approach. For instance, students had to discuss with their supervisors whether course fees could be charged to official budgets, whether office computers could be used for online course work and for downloading and printing course materials, and how much official work time could be used. One supervisor indicated that he instructed his collaborator to download all materials for later use in their department and that he planned to use them particularly for visitors to his gene bank. Another supervisor commented that having one collaborator participating in the e-learning course resulted in tangible benefits for his entire team. He reported that the e-learning student regularly informed him and his team about topics of relevance to the group but also requested from them real data and case studies to comply with course assignments. When receiving feedback from her tutors and fellow-students on these assignments, the student shared and discussed this information with her team, leading to an interesting learning dynamic throughout the 6-month course and thus contributing to the goal of strengthening organizational knowledge and promoting change (Horton et al. 2003).

Intangible and tangible institutional results—Given that most supervisors of course participants were closely involved in the experience, it was possible to get a fairly good assessment from them regarding the actual and potential institutional impacts of this type of capacity strengthening. Most supervisors indicated that this type of learning has potential to make considerable contributions, not only at the personal and institutional levels but also at the country level, as sustainable change must start at the bottom with well-trained, self-confident individuals. All supervisors (100 percent) reported that their colleagues had proposed new ideas regarding conservation strategies and processes as a consequence of the course, including the number of seeds to be conserved, seed viability tests, better work processes, improved documentation, and so forth.

Opinions regarding how much work/personal time should be used for this type of learning varied widely. Close to 60 percent of supervisors agreed that between a third and half the time required to complete course work could be during office hours, while less than 30 percent of supervisors said they would deny their colleagues the right to use office hours for this purpose. Regarding the duration of the course, some felt that 6 months was too long and suggested courses of 3-4 months.

Conclusions

The results of the evaluation of the learning venture presented here are encouraging and indicate that CSCL has considerable potential for strengthening individual and institutional capacities. Researchers, technicians, and tutors showed strong interest in this new collaborative learning approach as a means of fostering horizontal knowledge exchange and

effective handling of course content. Through this joint venture, inter-institutional partnerships were strengthened, and expert knowledge was exchanged in easy and informal ways. Some institutional routines were changed as a consequence of the mutual learning process, thus contributing to improved gene bank operations as well as other desired institutional learning and change processes.

Although the time and effort invested in distance education ventures seem high – usually higher than for traditional face-to-face courses – the benefits for students, tutors, and participating institutions are also high and diverse.

Given the success of the pilot venture and the continuous high demand for capacity strengthening, we expect to refine the course materials, enrich them based on comments received from the pilot student group, and to offer the course again in 2006. In addition, we are seeking funds to adapt course materials for use in Africa; among other adjustments, this will entail translating the materials into English and perhaps French and Portuguese. It will also be necessary to seek interested university partners for co-tutoring as well as for leading the process to include the course in their curricula.

The approach presented in this paper offers the CGIAR centers, working in collaboration with university partners and other public and private entities, an effective way to share information and knowledge with broader and more remote audiences and in this way to help strengthen capacities through learning and change.

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Enhancing Information Networks in the Rural Sector

A Social Network Approach for Understanding Information Flows in Agricultural Supply Chains in Bolivia

Louise Clark

Summary

This article presents a summary of results from research conducted by the RedCampo Project, which CIAT cooordinates in Bolivia. The purpose of this work is to adapt and apply social network (SNA) analysis as a methodological tool to characterize supply-chain information networks, identifying information access, flows, and demands in three different supply chains. The theoretical framework for this work underscores the importance of a network approach to understanding information flows and supply-chain relationships. Within that framework a methodology was developed to map communication networks. The process is described here step-by-step, highlighting the problems faced and key considerations when using SNA in rural development contexts. Sociograms or network maps from the chili, coffee, and peach supply chains are presented to demonstrate the versatility of the tool in creating a visual representation of relationships and information flows in supply chains. Methodological lessons learned and recommendations for future research are then discussed, focusing on the potential of network mapping as a diagnostic tool to help identify key actors in supply chains and better plan project activities to enhance information flows between different groups of actors.

Background

This report presents results from work conducted in Bolivia to adapt and apply social network analysis (SNA) to help understand how information flows through supply chains. This research corresponds to the InforCom Project's interest in developing methodologies and principles for enhancing information networks in the rural sector.

SNA was used to characterize supply chain networks, with a particular focus on the analysis of information access, needs, flow paths, and blockages, in three different supply chains located in three agro-ecological regions of Bolivia. InforCom coordinates a project there called *RedCampo* (also referred to as FIT 3), which forms part of the Facilitating Innovative Technology (FIT) Program funded in Bolivia by the UK's Department for International Development (DFID). Begun in 2004, the program presented InforCom with an exciting opportunity to develop and test methodologies related to its strategic outputs in areas where CIAT had no prior experience or influence. RedCampo also presented new challenges. Early on, the project had to develop mechanisms with which to identify existing information networks, not only to inform project interventions but also to enable the project team to understand the local institutional context in which they would be working.

Objectives

The project team hoped to convince local project partners of the importance of information network analysis when developing supply chain interventions. We also aimed to develop a working methodology, which could be shared with partners and adapted to a wide range of

situations. Though still a work in process, the methodology has produced interesting results, which this article summarizes. InforCom is currently producing a manual provisionally entitled *Network Mapping as a Diagnostic Tool*, which will be further tested and refined over the coming year to validate the utility of applying SNA to supply chain information flows. The experience that led to the creation of this manual, the methodological lessons learned, and considerations for future research are presented below.

Methods: An Introduction to Social Network Analysis

Theory of network information flows—SNA is a rapidly developing methodology within the social sciences. It has been applied in diverse ways across a number of disciplines, including health care, psychology, and business organization. SNA focuses on the relationships between different actors in a specific social context, with the aim of better understanding how actors' network position influences their access to resources, such as goods, capital, and information.

Resources can be considered as embedded in networks, meaning that all economic activity is intrinsically connected to social structures (Granovetter 1985). One resource embedded within network structures is information, and SNA has been used to study information exchange. This has been done to identify blockages and tailor specific information to the needs of target groups by examining how different content is exchanged between actors, depending upon their relationship and network position (Haythornthwaite 1996). As actors form ties with others in an attempt to gain access to these resources, clusters are created, with the best-positioned actors belonging to a number of different clusters. They can exploit these to gain access to resources from one cluster, which may not be available in another (Wellman 1997). Actors who carry information from one cluster to another are known as "brokers." They serve as a "bridge" and control the flow of information from one social group to another (Burt 1992). As network ties are rarely symmetrical, resources flow neither randomly nor evenly, creating hierarchical networks. So, an actor's position determines her/his ability to access the resources embedded in a network (Wellman 1997).

Networks do not just provide access to information but also to those in the network who have the ability to use this resource. Information in itself has little value unless it can be utilized, suggesting that actors can actively structure their networks to maximize benefits from information opportunities (Burt 1992). Actors who invest in their social relationships so as to gain access to and mobilize resources within a network to generate market returns are building social capital. Social capital has three critical components: first, how resources are embedded in society; second, how actors use their networks to gain differential access to resources, and, finally, how access to resources can be mobilized for gain (Lin 2001).

The importance of social capital in supply chains has been widely documented (Fafchamps and Minten 2002; Lyon 2000; Murphy 2002). Much experience suggests that using a network approach is helpful for understanding how information flows through supply chains.

Networks and supply chains—The network approach has added a new dimension to our understanding of supply chains and particularly the relationships and information flows between different supply chain actors. Classical economic theory explained exchange relationships in terms of markets or hierarchies dominated by vertical relationships

(Williamson 1975). This view hardly seems relevant in a network society, in which the advent of information technology has had a profound impact on organizational structures (Castells 2000; Powell 1991).

The focus now is on how new forms of organizational relationships emerge in supply chains, highlighting the interplay between vertical and horizontal ties, from which a new breed of "pooled interdependencies" emerge (Lazzarini et al. 2001). For the the sizable number of small to medium enterprises in agri-food chains, awareness of changes in competitive and market environments is a key to success and survival, highlighting the importance of building network relationships and trust with all potential customers and suppliers. Increasingly, competitive advantage in supply chains will depend upon access to online information systems (Besember et al. 2003; Fritz and Schiefer 2002), enabling instantaneous communication and coordination of horizontal and vertical relationships.

The literature discussed above focuses on information as a key element in improving industrial efficiency and the competitive advantage of entire supply chains. This experience has obvious implications for smallholder farmers in the South who produce high-value crops for international markets. Although high-value crops can help reduce poverty and encourage development (CIAT 2005), they also make farmers increasingly susceptible to price fluctuations in international markets, extreme weather conditions, and attacks from new diseases and pests (Thrupp 1995). To better manage such risks, farmers will need information on prices, market tendencies, early forecast systems, pest and disease management techniques, and other topics.

The increasing focus on information for supply-chain efficiency presents an obvious challenge for CIAT's InforCom Project. We must help develop mechanisms for helping small farmers access up-to-date, reliable, and inexpensive agricultural information to improve their network position in high-value supply chains. The project's decision to apply SNA to supply chain information flows is a direct response to the literature on the digital divide. It suggests that, in order to integrate ICTs into rural communities successfully, it is important to have a clear idea of the existing situation regarding information access and the use of communications media (Girard 2003; Heeks 1999; Legesse 2002). As more has been learned about elements contributing to the success and failure of ICT interventions in development, initiatives have shifted their emphasis away from the technologies and have recognized the importance of the people involved, their information needs, and their capacity to use the technologies. In other words they have moved away from a diffusionist approach towards communication focused on participation and empowerment.

Towards a Working Methodology

Survey design—One of the principle challenges of planning any survey is defining exactly what information is required and what questions will prompt people to provide that information. The design of a social network survey is no exception, and it is further complicated by the scarcity of literature providing guidance on survey design (Cross and Parker 2004).

Given this limitation, the RedCampo team resorted to the only methodology that was at that stage available to them – trial and error. A pilot survey was designed, which aimed to combine a more traditional survey structure with SNA, and it was tested during field activities in November 2004. During these preliminary field trips, the project team ran a

series of participatory workshops to present the project's aims, to gain a deeper understanding of producers' perceptions of the supply chain and of their level of trust in other chain actors, and to carry out a preliminary demands analysis. Taking advantage of the visit to pilot a survey was extremely beneficial, highlighting serious weaknesses in the survey design and generating data with which to start experimenting with different social network software. As a result, when the project team met again in February 2005 to design a baseline survey, they had a much clearer idea of how social network data could be both collected and analyzed.

The baseline survey was divided into three sections. The first focused on the profile of the different actors in each of the supply chains to gain an understanding of their role, influence, and type of information managed. So, the first section of the survey was tailored to distinguish between producers, associations, traders, and support services. The second section was designed to identify actors' position within the supply chain network; the same format was applied to every interviewee, regardless of their profile. The final section, which was also applied to all informants, dealt with data on information demands. This format recognized that every actor in the supply chain is a potential information source, while simultaneously having specific information demands.

As the aim of the SNA study was to analyze the level of communication in the supply chain, we chose to focus on three key variables: the actors, information content, and communications media. Information was also collected to qualify and quantify communication by grading variables, such as frequency of communication, timeliness and relevance of the information received, and the level of trust and cooperation between different actors. While SNA proved extremely versatile in mapping the relationships between actors, content and media added very little to our analysis. Asking too many questions compromised the quality of the responses, demonstrating that, while SNA has significant potential, it also has limitations, and the most important consideration in planning an SNA survey is to keep it simple.

Fieldwork–Survey data were collected during field trips made in March 2005 to the three project sites: Caranavi, Monteagudo, and Vallegrande. At Monteagudo and Vallegrande; the team contracted local technicians to assist in conducting the producer interviews, because of local sensitivity to outsiders and the small size of the project team. In the case of the coffee supply chain in Caranavi, the project team encountered an entirely different situation, making visits to different cooperatives each day and conducting the producer interviews in person.

The different social networks inherent in each of the supply chains are reflected in the number of interviews with each group conducted, as seen in Table 1.

Table 1. Actors interviewed in the different supply chains.

	Chili	**Coffee**	**Peach**
Producers	30	28	30
Associations	2	11	2
Traders	6	4	3
Support services	20	13	5
Total	58	56	40

It is important to note that the number of interviews conducted with each group reflects limitations in the financial and human resources of the project team. For this reason the results do not permit an exhaustive study of each of the different types of actors in each of the supply chains. This may be seen as a weakness in the study, but on the positive side it has influenced the direction of our interest in SNA. Given the limitations of the RedCampo baseline studies, we cannot claim that they are definitive studies of the coffee, chili, and peach supply chains. Nontheless, some interesting results emerged.

Results: Data Analysis

During data analysis the advantages of SNA over more traditional interview methods became clear. For each of the supply chains, transferring the data from the surveys to an Excel spreadsheet took approximately 2 hours. This information was then fed into Pajek[1], which instantly produced sociograms relating to each supply chain, giving us an image of information flows between the different actors. Though the original sociogram was only a first approximation, representing the relationships in their crudest form and not attempting to break down the data in any way, it was nevertheless extremely satisfactory to have an instant result. In contrast, the first section of the survey was analyzed using SPSS. Data entry took over 2 months to complete and yielded very little information about the supply chain that we did not have already.

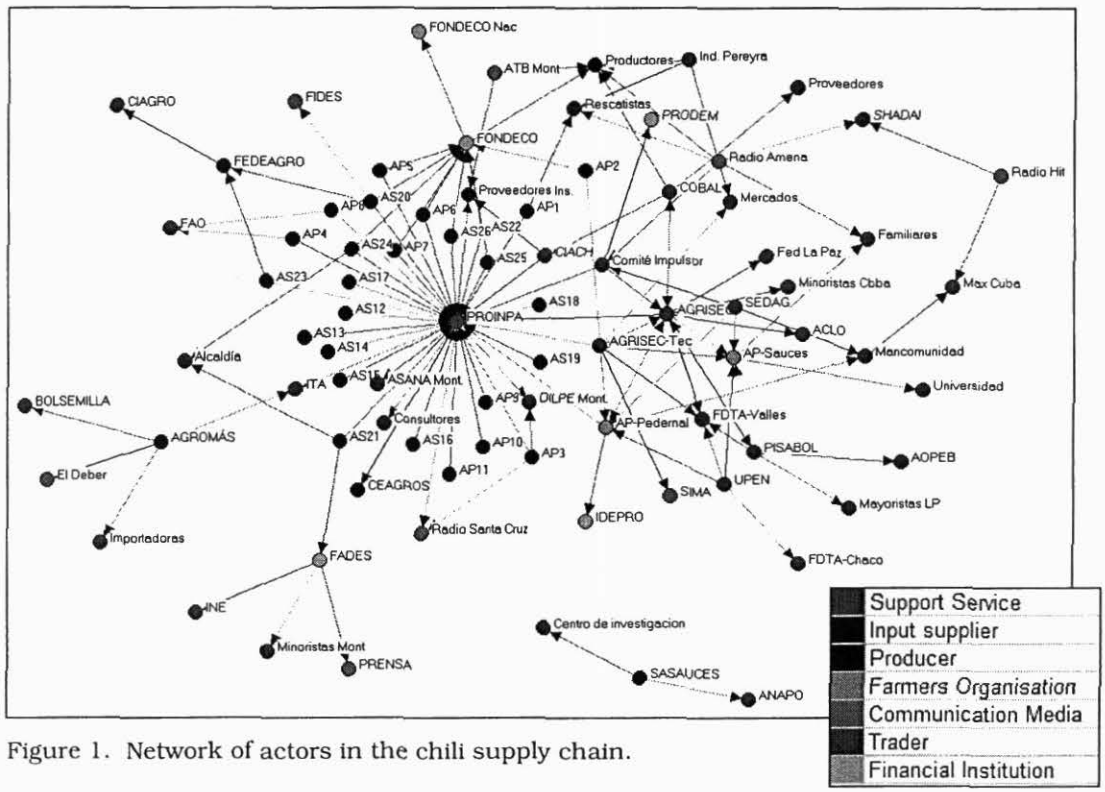

Figure 1. Network of actors in the chili supply chain.

Despite initial successes with Pajek, attempts to go into a more detailed analysis of the data proved frustrating, and alternative software packages were considered. We succeeded in making a more thorough analysis of the data, using Ucinet© and its accompanying

1. This program can be downloaded for free from http://vlado.fmf.uni-lj.si/pub/networks/pajek/

visualization software Netdraw©[2]. This is currently the most commonly used package for SNA, and we felt that following the mainstream would give our methodological developments credibility in the wider academic circles involved in developing SNA techniques.

The visual impact of the sociograms or graphs is immediately apparent. No previous experience with SNA, the region, or supply chain being studied is required to identify the most influential actors.

Chili—In the chili supply chain, Fundación PROINPA (Promotion and Research for Andean Products) is clearly the most influential actor and point of reference for all the producers interviewed. These data are not entirely objective, since the producers interviewed were involved in a PITA (Applied Research Technology Project), in which PROINPA supplied technical assistance. On further analysis we see that there are few direct links between producers and traders; the two associations do not play an important brokerage role, as they have not been named by any of their associates, and input suppliers are seen as information providers in only a few cases. Given the notable centrality of PROINPA and the marginal position of the other actors, it is interesting to look at how the structure of the network changes if we remove PROINPA.

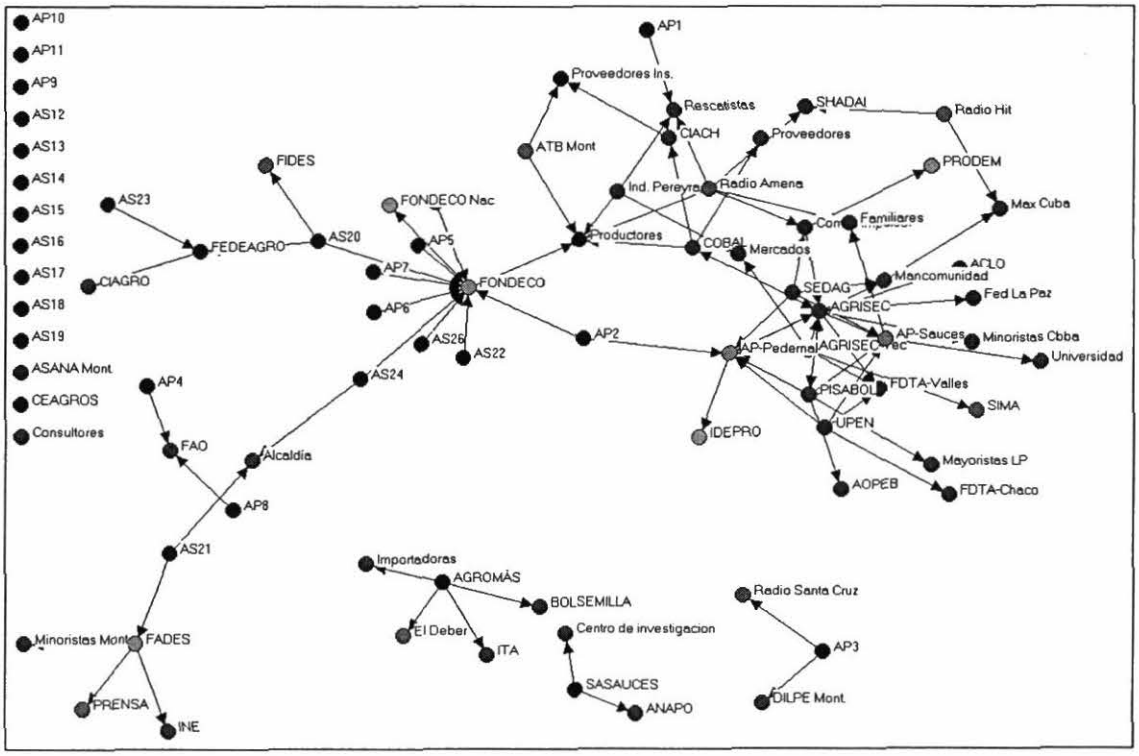

Figure 2. Chili supply chain without most central actor (PROINPA).

As can be seen in Figure 2, removing PROINPA leaves a lot of isolates with no other connections in the network. Of these isolates 11 are producers who have named PROINPA as their sole source of agricultural information, while the other 3 are sources of information for PROINPA, which have no other channel through which to flow into the network. We can also

2. These programs are available at http://www.analytictech.com/. Ucinet is licensed software, while the accompanying visualization program Netdraw can be downloaded for free.

see that the secondary source of information for producers is FODECO, a financial institution. While recognizing the importance of accessing information on financial services, this also suggests a void in terms of production and marketing information. We also see that removing PROINPA does not affect the relationships towards the right of the sociogram. This suggests that mechanisms to create links between producers and this cluster of actors could help strengthen information flows in the chili supply chain at Monteagudo.

Coffee—This was by far the most complex supply chain studied due to the large number of organizations, NGOs, and traders involved. There is a marked difference between regional-national supply chains and those linked with international markets. A first glance at the sociogram in Figure 3 reveals little about relationships in the coffee chain at Caranavi. This is an important point, suggesting that there are limits to the versatility of this tool in terms of visualizing complex networks.

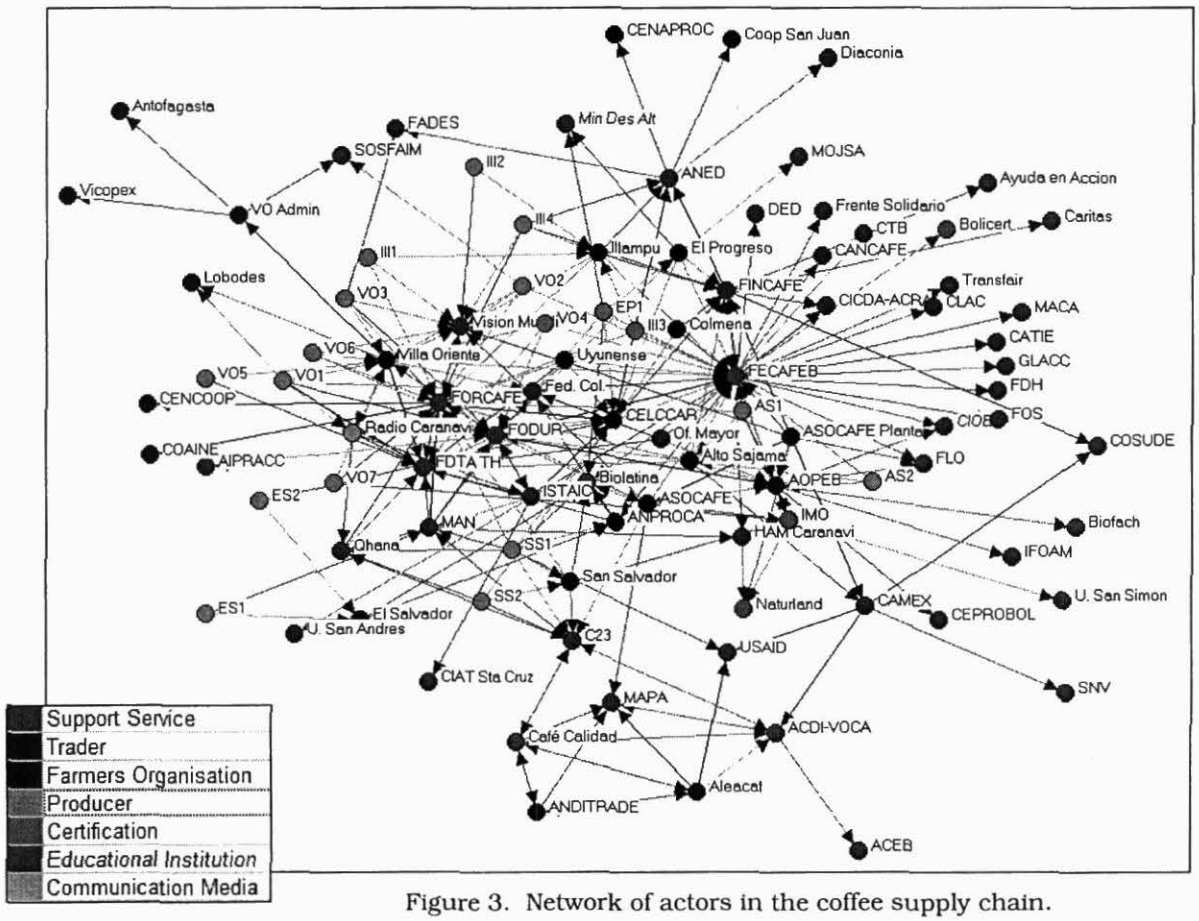

Figure 3. Network of actors in the coffee supply chain.

As with the chili supply chain, we are able to remove certain parts of the network to facilitate the analysis. In the case of coffee, we decided to try the analysis without producers to get a clearer look at the inter-institutional relationships, as shown in Figure 4. While the central part of the sociogram is still a tangled mess (the sign of a healthy network), it is also easier to see the important position of FECAFEB (Federation of Bolivian Coffee Exporters) to the left, which has both the greatest in-degree (number of times named as an information source) and out-degree (number of information sources) in the network. On the right-hand side of the sociogram is a cluster of actors, who are highly interconnected between

themselves but peripheral to the network as a whole; they represent the different projects funded by Alternative Development Program of the US Agency for International Development (USAID), which encourages coffee production as part of a coca eradication strategy. From the sociogram it is clear that these projects have not integrated into the wider coffee network and feedback from some of these actors on the utility of the sociograms to assist in strategy development was extremely positive.

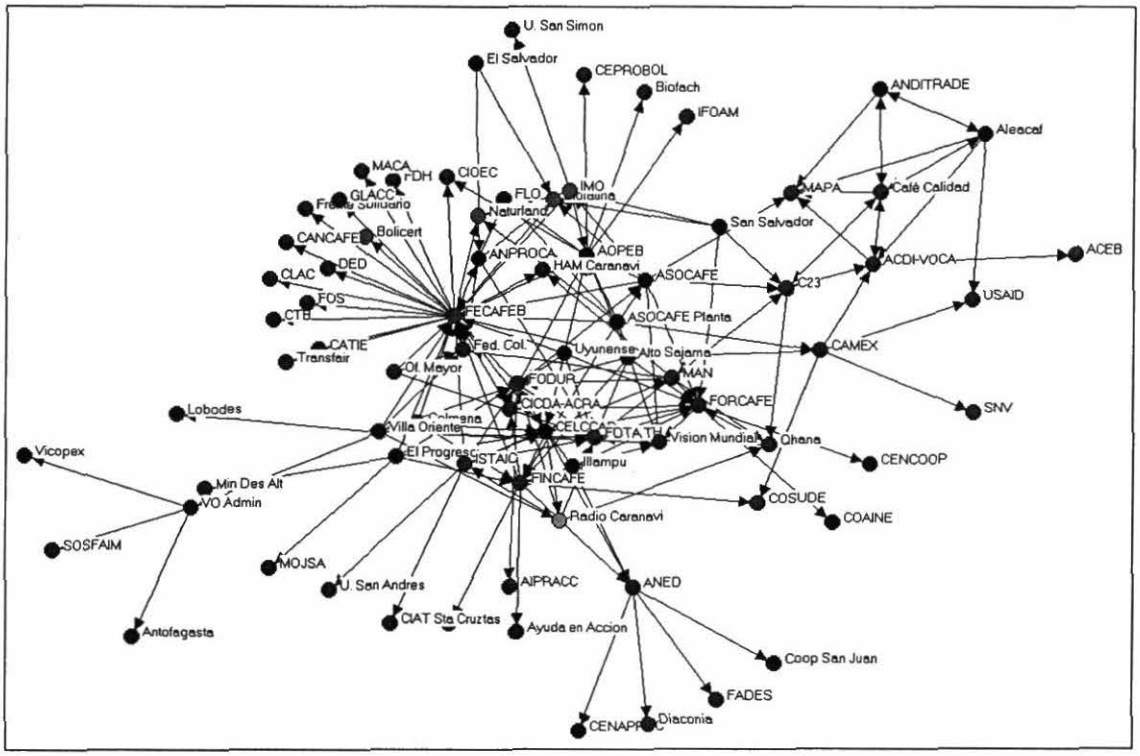

Figure 4. Network of actors in the coffee supply chain without producers.

Figure 5, indicating the flow of information on crop management, demonstrates the versatility of the tool. It isolates certain types of information, highlighting the role played by different actors in providing different types of information.

Peach—This supply chain presented an interesting case in that two principle sources of information were identified: FDF, the technical assistance provider, and a radio program called *Correo del Agricultor* (Farmers Post). At first glance it is difficult to identify which is the most influential actor in the network. The potential of applying social network statistical measures in such cases will be discussed in more detail below. RedCampo was also interested in identifying the different communication media used, and using Netdraw it has been possible to identify the influence of different media in the network. The two most influential media used are visits from the technician and radio, as can be seen in the sociograms presented in Figures 7 and 8.

While it may be obvious that the technical assistant will rely on visits and that information transmitted by radio will depend upon this medium, these examples are used to demonstrate the adaptability of SNA as a tool to identify communication in supply chains. We hope other researchers and practitioners will be able to adapt the tools RedCampo has developed for their own purposes.

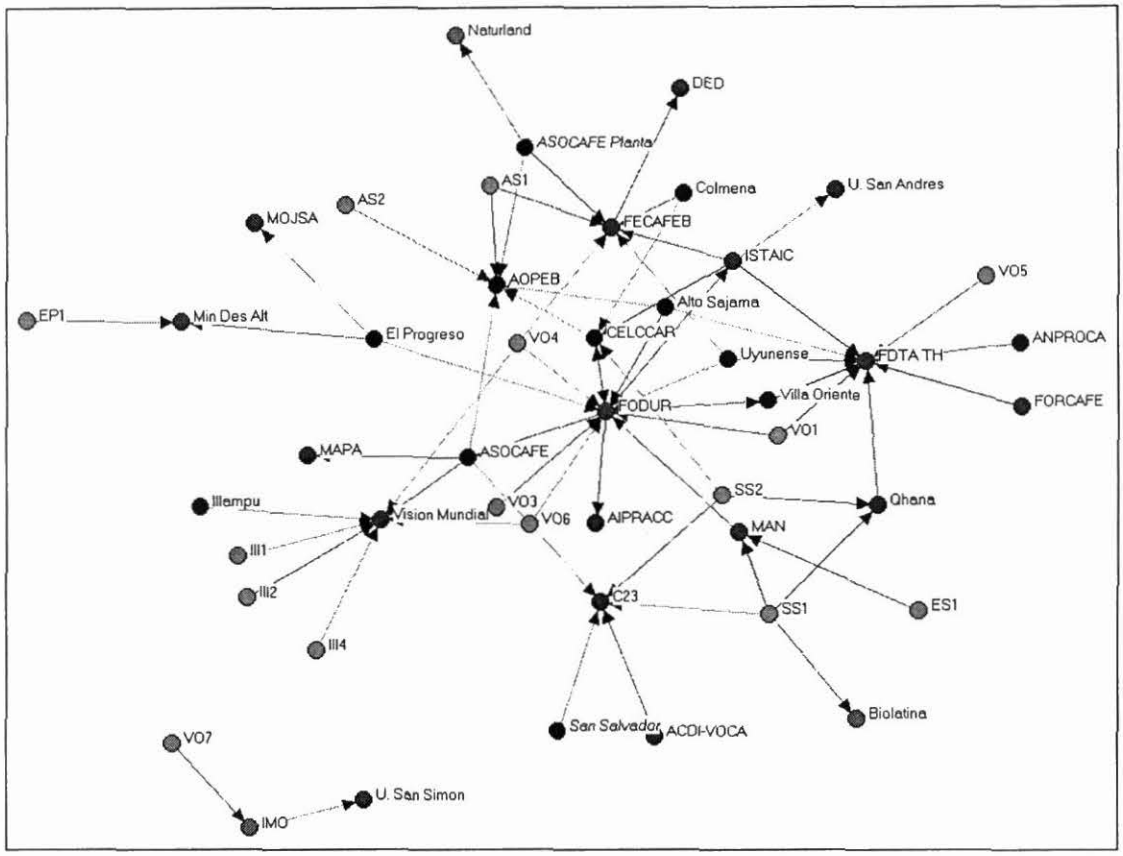

Figure 5. Flow of information on crop management.

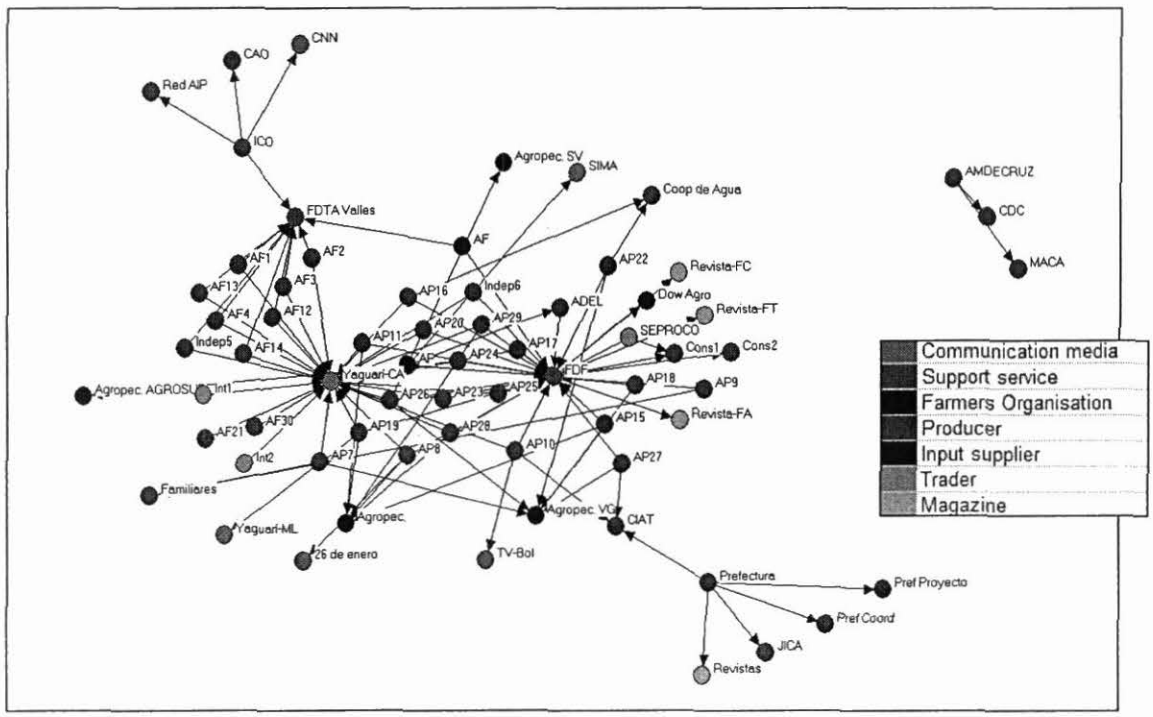

Figure 6. Network of actors in the peach supply chain.

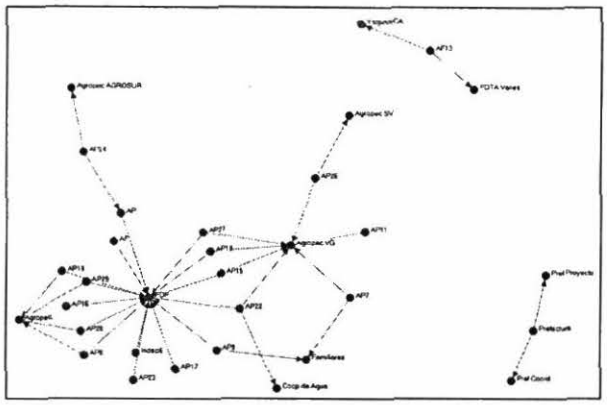

Figure 7. Information flow from visits.

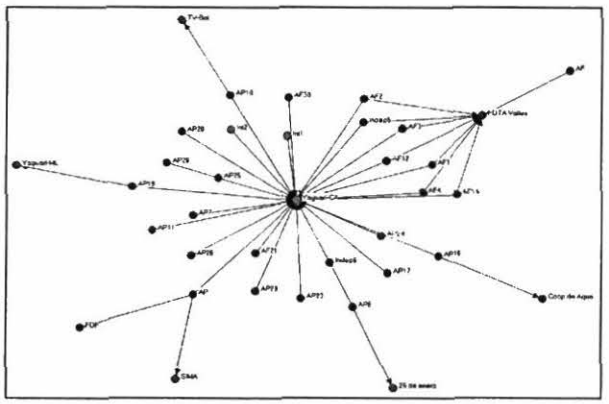

Figure 8. Information flow from radio.

Results: Lessons Learned about the Methodology

The use of SNA as a diagnostic tool to identify information flows in supply chains requires further refinement, and the experience of RedCampo has helped identify some critical questions to be addressed in future studies.

Sampling—One of the key methodological issues in any social network study is how to define the boundaries of social relationships, a question that is extremely pertinent in discussing supply chains in which key actors are often geographically dispersed and heterogeneous.

Scott (2000) identifies two approaches to defining samples for social network studies, positional and reputational. The former defines a cut-off point beyond which the investigation is not interested in the social relations, while the latter relies on interviewing agents identified by knowledgeable informants. The studies presented here used a combination of these methods to define the sample, relying on a reputational approach to identify key actors in the supply chain, based on recommendations from project partners. Once the interviewing had begun, snowballing techniques were used; that is, actors named became potential interviewees, highlighting the importance of using a number of different starting points, ideally from different stages in the supply chain. There is still a need to establish a cut-off point to delimit the study and give precedence to interviews with key supply chain actors. Information sources that cannot be interviewed are still valid and should still be included in the study to demonstrate their influence on the supply chain.

Representation of the supply chain—It is extremely important to represent actors from every stage in the chain. RedCampo had great difficulty locating traders and middlemen. Even when identified, they were extremely reluctant to give interviews. While these actors were rarely named as information sources, we had hoped for a much more representative sample of this group, since mapping the information flows between producers, middlemen, and traders has the potential to yield major insights into how information flows through supply chains.

We recognize that these studies used very small samples, particularly of producers and traders, making it questionable how well they represent reality. In this regard our focus on specific project sites rather than supply chains in general has proved advantageous. Even

with a relatively small sample size, we were able to identify the key players. This finding has led to the hypothesis that SNA has great potential as a diagnostic tool for making rapid appraisals of information flows. By offering a general, rather than comprehensive, picture of the relationships within supply chains, SNA can thus help identify potential partnerships (and pitfalls) for development interventions. Developing mechanisms to analyze feedback from the actors identified will form an important part of future research.

Individuals and institutions—A further methodological question is how to deal with social network data that involve both individuals and institutions. In future studies we might differentiate between these two groups by using different shaped nodes in the network map. The information flows between producers and their organizations are incredibly complex, and to really understand communication within producer organizations merits an entire social network study.

It is also important to think about the role of vague references, the most common of which are family, neighbors, and technicians. While it may be interesting to look at the importance of these informal sources, they may also distort the network. How to deal with these data should be carefully considered during data collection and analysis.

Social network metrics—This article has focused on SNA as a tool for visualizing supply chain information flows. It is important to highlight, though, that SNA can generate a vast quantity of statistical data on the relationships within the network. The most commonly used tool to for metric calculation is Ucinet, which calculates metrics based upon data presented in matrices. In developing methodologies for use in rural development, it is important to consider the accessibility of the tools. While the sociograms presented in this report have been created with Netdraw©, a software package that can be downloaded free from the Internet, Ucinet requires a license (Borgatti 2002; Borgatti et al. 2002). Presenting sociograms to actors in each of the supply chains gave the project team a certain credibility and provided a starting point from which to elicit information about relationships between actors in the supply chain that most likely would not have emerged without this visual prompt. The relative value of the metric measures commonly used in SNA, such as density, degree, centrality, and betweenness are still under consideration.

Two-mode networks—Based on the experience of collecting and analyzing data on supply chain information flows, we have developed the capacity to create two-mode network maps. This tool could be used to visualize how certain actors are clustered around different information demands. The sociogram in Figure 9 has been created with simulated data to represent the information demands of different producer groups, based upon the size of their land holdings.

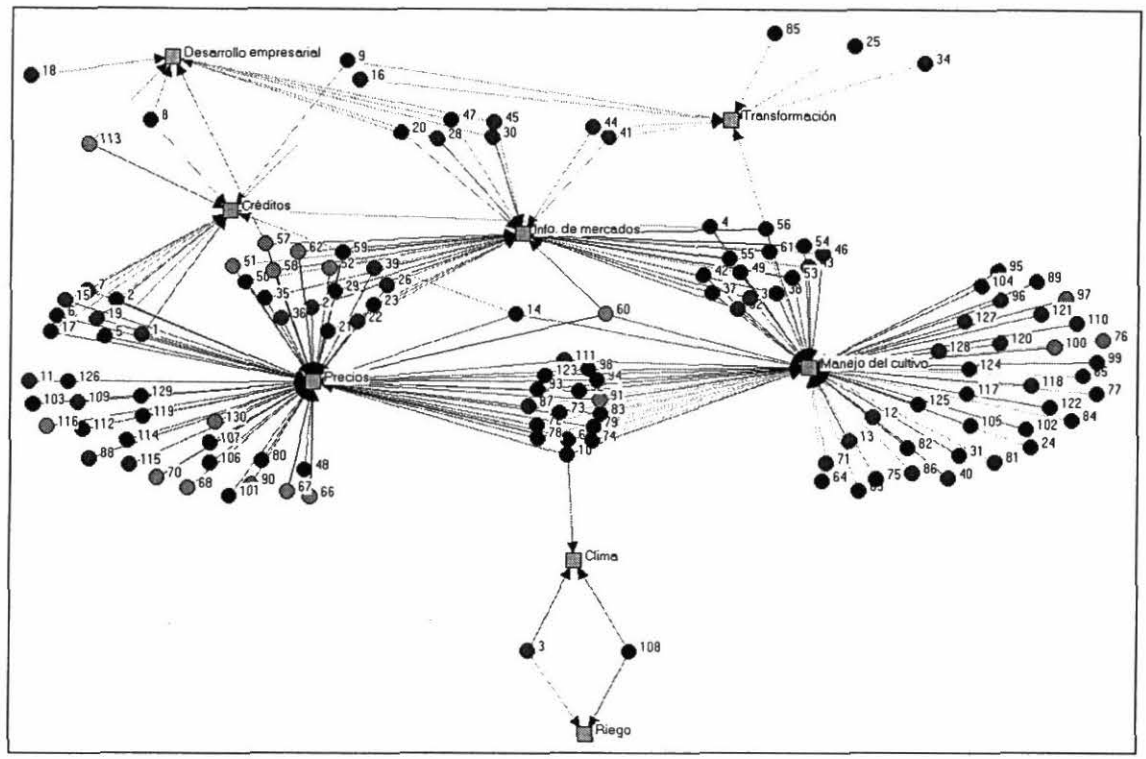

Figure 9. Simulation of information demands.

Conclusions

Research on the use of SNA to map supply chain information flows, while still in preliminary stages, has produced promising results, most notably on the potential of this tool as a diagnostic aid. Further work is planned to validate the methodology, including analysis of how project partners could adapt it to their own specific needs, their opinions on the value of visualization maps, and most importantly the perceived accuracy of the network relationships according to the key actors identified. As the tool is applied in different contexts, we hope that answers will emerge to some of the key questions, such as optimal sample size, the value of social network metrics, and possible applications of the two-mode network model.

Another question for further research is how network maps can be used to stimulate participation in project activities. Can they contribute to a common sense of identity among supply chain actors and facilitate the creation of something akin to communities of practise (Wenger 1998), in which different actors identify and work towards common goals? While the RedCampo network maps generated interest among key actors in the supply chains, this was not sufficient to motivate them to develop joint strategies for information sharing. Our experience suggests that such changes form part of more long-term objectives, requiring actors to recognize for themselves the importance and potential benefits of communication within the supply chain. For such processes to become an integral part of supply chain relationships requires that the actors involved internalize certain values. While project interventions can prepare the soil and plant the seed, much patience and nurturing are required before this labor can bear fruit.

The ability to map network actors is particularly useful given the increasing complexity of the institutional landscapes in which community and producer organizations interact. The constantly changing panorama of government, nongovernment, and private sector actors places serious limitations on the continuity and consolidation of successful experiences. While this research has focused on mapping supply chain information networks, we hope that SNA will find many other applications within the field of rural development, contributing to better planning of project interventions and facilitating the creation of social capital, as key stakeholders recognize their role in the network. This should enable them to take better advantage of existing information and avoid duplication of investment and effort, highlighting the importance of complementarity rather than competition and contributing to a shared vision of local development.

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Methodologies for Strengthening Local Information and Communications Promoters in Bolivia

Mirtha Ramírez C., Dora Arévalo, Nathan Russell, and Louise Clark

Summary

CIAT research on community telecenters, which provide public access to new information and communications technologies (ICTs), has shown that farmers face serious geographical, economic, and cultural barriers in using the formal sources of information to which telecenters can provide access. In search of ways to reduce those barriers, the Center began in 2002 to develop a methodology centering on groups of information intermediaries within agricultural supply chains. Developed initially in Colombia, using the supply chain for unrefined sugar as a pilot case, the methodology was designed to build the capacity of *gestores de comunicación* to generate and disseminate useful information among supply chain actors.

Under a project in Bolivia, the methodology was adapted and implemented with farmers and other actors (referred to *promotores de información y comunicación*) in three supply chains for higher value crops, each at a remote rural location: coffee at Caranavi, chilli at Monteagudo, and peach at Valle Grande. Based on a participatory approach to communications, the methodology proved to be appealing and relevant to small farmers and others, and it brought about significant changes in their attitudes and activities. After a series of four intensive, monthly sessions, farmers were motivated and able to use the Internet and to develop sociodramas for radio as well as printed products, such as posters. They also showed confidence in their ability to disseminate information and to engage in dialog with other supply chain actors. Related research in Bolivia resulted in the development of an innovative approach for training technicians and farmer leaders to improve farmers' capacity to use market information.

Background

During the mid- to late 1990s, various organizations in Africa, Asia, and Latin America began exploring the potential of community telecenters as a means of improving information availability in rural communities. Community telecenters may be defined as facilities, generally operated by local NGOs or other organizations, that offer public access to new information and communications technologies (ICTs) as well as training and orientation in their use for individual and community development.

Research conducted by CIAT and several partner organizations in southwestern Colombia from 2000 to 2003 demonstrated the significant potential of community telecenters for strengthening local development organizations (Amariles et al. 2005). But this work also underscored the formidable barriers faced by individual farmers in using telecenter services to find helpful information about agriculture. The majority of farmers live great distances from the small towns where telecenters have been established, and the normal hourly fees are generally prohibitive for them.

Other barriers have to do with culture and content. In general, farmers obtain the information on which they base key decisions from people they know personally and trust, such as family, neighbors, and possibly agricultural extension agents. Only a small proportion of farmers obtain important information from documents, such as pamphlets and manuals, and much less from the Internet. Even when Colombian farmers availed themselves of telecenter services, we found they had difficulty finding information relevant to their specific concerns and local circumstances.

Thus, far from bridging the so-called "digital divide" in rural communities, telecenters seemed to created new inequities, which particularly affect small-farm families. We concluded from this experience that, if telecenter development is to have a significant direct impact on small-scale agriculture, it must be linked to complementary interventions that bridge the geographical, economic, and cultural divides separating farmers from telecenters and from the formal sources of information to which telecenters can provide access. In search of ways to accomplish this, we began in 2002 to develop an approach centering on groups of information intermediaries within agricultural supply chains.

For the purposes of this pilot action research initiative, CIAT staff helped form three groups in southwestern Colombia, referred to as *gestores de comunicación*. All three were made up mainly of small-scale producers of *panela*, or unrefined sugar, though some

agricultural technicians took part as well. The idea was to provide these groups with enough communications training that they could develop relevant agricultural content with only modest assistance, drawing on local knowledge as well as information available from nearby research and development organizations or through the World Wide Web. In developing local content, an important challenge for the *gestores* was to "translate" the terminology of formal organizations into a language that farmers can easily understand. They also learned to share the resulting content through communications strategies combining Internet use with a variety of conventional and alternative media, including radio, printed materials, and dramatizations. Results from that experience are presented in the article following this one.

In 1994 we gained an opportunity to further develop this method under a project funded by the UK's Department for International Development (DFID) through its Facilitating Innovative Technology (FIT) Program in Bolivia. There, as in Colombia, we saw good opportunities for exploring the potential of information intermediaries to use new ICTs and other communications tools for agricultural development.

Objectives

The central objective of the FIT3 Project (which we subsequently renamed *RedCampo*, for "Rural Network") was to design and implement effective approaches for using ICTs to enhance supply-chain information networks involving small-scale production of high-value crops. More specifically, we wanted to learn what was entailed in adapting a method originally developed in Colombia to the more difficult conditions of rather remote locations in Bolivia. In relation to this secondary objective, we also wanted to explore the kinds of institutional arrangements that could be established in Bolivia to support the efforts of local information intermediaries.

The project set one further objective in response to demand from a key project partner – FDTA-Valles, one of four Foundations for the Development of Agricultural Technology, which form part of the Bolivian System for Agricultural Technology (SIBTA). Our joint objective was to devise a method by which information intermediaries could be trained to help farmers improve their capacity to use market information disseminated via radio through the Servicio Informativo de Mercados Agropecuarios (SIMA). FDTA-Valles provides this service nationally on behalf of the country's Ministry of Peasant and Agricultural Affairs (MACA). Operating the system and ensuring the information's accuracy represent a significant investment for the Foundation. And SIMA's proponents are well aware that simply disseminating market information widely to farmers provides no guarantee that they will be able to use it effectively, thus justifying the investment in this service. That is why Foundation leadership was keen to find a way of boosting the effectiveness of SIMA's training program.

Methods

Upon completion of the social network analysis (SNA) described in the preceding article, the results were shared with supply-chain actors who had participated in the analysis. At each of the three locations where SNA was conducted, a group of volunteers referred to as *promotores de información y comunicación* was formed, with the aims of improving communications between the various chain actors identified through SNA and meeting the information needs determined. Each group, with 8 to 16 members, consisted mainly of small farmers belonging to associations, though at one site many members were students whose

parents are small farmers. Group members tended to be young, and all were involved or had a particular interest in the supply chain for a specific high-value crop of considerable importance at their location: coffee at Caranavi, La Paz; chili at Monteagudo, Chuquisaca; and peach at Valle Grande, Santa Cruz. From August to November 2005, the groups participated in monthly training workshops, each covering 2 or 3 of a total of 11 communications training modules.

Some weeks prior to the start of that work, RedCampo Project staff completed an assessment of the methodology employed by FDTA-Valles to train farmers in the use of market information disseminated through SIMA. They proposed an innovative alternative for preparing *facilitadores* SIMA to train much larger numbers of farmers than could be reached with the method used previously.

Both the new methodologies for building the capacity of information promoters are based on a participatory approach to communications, which draws on insights from experience with adult education in rural areas. This experience has shown, as one would expect, that learning by doing in an informal setting is more effective than conventional classroom lectures for preparing adults to better manage real-life situations.

In applying these methodologies with information promoters, trainers do not convey knowledge passively. Rather, they facilitate a process of active investigation, in which participants generate and apply knowledge themselves, drawing on their own experience as well as new ideas. Moreover, the knowledge they create is related to specific objectives for change in their behavior and attitudes, and each training module deals in a practical way with concrete problems or opportunities.

This capacity building methodology involves four steps: (1) sharing of concrete experience, (2) reflection, (3) sharing of new knowledge, and (4) practical application.

First, the facilitator prompts farmers and other participants to share experiences and problems they have had in using market or other information related to an agricultural supply chain. The idea is to ground the capacity building effort in participants' real circumstances through techniques such as group discussions, story telling, and the use of simple drawings.

Second comes a process of reflection, in which participants ask questions about what they have heard, observed, and felt during the session and suggest answers pointing to possible solutions to the problems experienced.

Third, picking up on solutions proposed by participants (from their local knowledge), the facilitator shares new knowledge that might help change the situations and problems described. This knowledge is presented clearly and simply in a language that is familiar to participants, with minimum use of technical terminology.

Finally, the capacity-building process leads to concrete action or application of the knowledge generated by participants. This enables them to incorporate it into their normal practice for using information in relation to agricultural supply chains.

The two capacity-building methodologies developed by RedCampo were implemented in collaboration with project partners, specifically FDTA-Valles, FDTA-Humid Tropics, and the Bolivian Association of Organizations of Ecological Producers (AOPEB).

Results: Strengthening supply chain information networks

Following are brief descriptions of the 11 communications training modules developed by the RedCampo Project and covered with information and communications promoters at three sites in Bolivia.

First workshop

1. ***The agricultural supply chain:*** Participants learn what a supply chain is, and they identify its various links as well as the actors who contribute to its functioning either directly or indirectly. They also consider why it is useful to analyze supply chains and how increased collaboration within chains can help strengthen them.
2. ***Information and communications:*** This module covers basic concepts of information and communications.
3. ***Information networks:*** Here the focus is on the functions and components of information networks, the benefits of being a part of such networks, and the role of promoters in strengthening them.

Second workshop

4. ***Communications media:*** The promoters gain an overview of communications media, including new ICTs, print media (such as pamphlets, posters, and bulletin boards), electronic media (e.g., megaphones, radio, etc.), and alternative media, such as sociodramas and puppet shows. They also learn how to select media, based on their suitability in terms of coverage, cost, and so forth to convey particular messages to a given audience.
5. ***Community telecenters:*** In this module promoters learn what a community telecenter is, what its services can be used for, what conditions are required to establish a telecenter and achieve financial and social sustainability.
6. ***Using the Internet:*** Participants learn the basics of handling computers and gain hands-on experience in using basic computer software, with emphasis on e-mail and searching the World Wide Web.

Third workshop

For the purposes of this capacity-building workshop, the promoters re-examine problems in the supply chain of interest, which they identified and prioritized in connection with the social network analysis. Then, each group of promoters collectively designs a communications campaign aimed at meeting an information need in relation to one or a few of those problems.

7. ***Creating radio programs:*** Promoters draft the script for a radio drama dealing with the problem(s) they have prioritized and determine how it can be produced and broadcast locally.

8. ***Creating printed products:*** Similarly, the promoters develop a preliminary design for a printed product and plan its production and distribution in connection with the information campaign.
9. ***Using market information:*** In this module promoters consider the importance of a specific type of local content and learn how it is disseminated and how farmers can be trained to make better use of it, using a methodology described below.

Fourth workshop

10. ***Organizing information and communications initiatives:*** Here the idea is for the promoters to imagine how they can work independently as a group to implement their communications campaign in collaboration with local organizations.
11. ***Evaluating the capacity-building process:*** In this last module, the promoters reflect on what they have learned over the 4-month period. They describe changes that have taken place in their attitudes and capabilities, recording impressions about the past, present, and future.

At all three of the sites, participation of the promoters in the training sessions was fairly consistent across the 4-month period, suggesting they found the content interesting and useful. As is generally the case with young people, they showed special interest in the use of new ICTs. Training in this topic was limited by the poor quality of connectivity at Monteagudo, where there are two privately operated Internet access centers. Somewhat better results were obtained at Caranavi and Valle Grande, where community telecenters had been established. The one at Caranavi was operated by a RedCampo Project partner, namely AOPEB.

Promoters also showed much interest in designing communications campaigns, using diverse media, and they were strongly motivated to develop creative sociodramas for radio and posters. At Caranavi the promoters divided into two groups for this purpose; one developed a radio program and poster about ecologically sound soil management in coffee, while the other group dealt with the use of a biological control method and a practice referred to as *chajmeo* to control *la broca*, a major pest of coffee. The promoters subsequently produced the radio programs and designed and implemented a plan for broadcasting these in late 2005, with support from local organizations. They also produced a poster. Meanwhile, at Monteagudo the promoters developed scripts for radio sociodramas and designed posters conveying messages about various practices for controlling *chorrera*, a major disease of chilli. They subsequently printed and distributed a poster. In addition, they planned a fair for early 2006 to promote knowledge exchange between farmers. Similarly, at Valle Grande the promoters produced scripts for radio sociodramas and designs for posters dealing with two issues: proper classification and packing of peaches to preserve quality and control of the fruit fly. Both the radio program and poster were produced and disseminated.

Results of the evaluation carried out in the final training session confirmed that the subject matter was novel and interesting for participants. Most gave evidence of important changes in their attitudes and capabilities. They felt confident about their ability to disseminate information relevant to their respective supply chains and to share their knowledge with other chain actors.

Viviana, an information and communications promoter at Caranavi, wrote as follows:

Past: I used to be very timid. I wanted to get ahead, but in my organization they don't take women's opinions into account.

Present: I have changed the way I handle myself. I have better relationships with organizations, and I have gotten closer to the leaders of my own organization.

Results: Building Local Capacity to Use Market information

Early in 2005 the RedCampo Project developed a proposal for strengthening the training efforts of FDTA-Valles in the use of market information disseminated through SIMA. The proposal has four main components.

The first involves improvements in the diffusion of SIMA price information via radio. This can be accomplished through analysis of the use of price information by farmers and organizations, continuous updating of information on radio stations and their coverage, and workshops with radio station staff aimed at improving their presentation of the price information.

The second component of the proposal – its centerpiece really – is a methodology based, as described above, on a participatory communications approach to adult education. Using this participatory tool, agricultural technicians, farmer leaders, and others can act as *facilitadores* SIMA, i.e., multiply local capacity to use market information by offering training to farmers.

The capacity-building methodology is designed to be implemented through a day-long workshop involving about 20 farmers. The event is divided into 10 segments, each with a specific purpose, as follows:

1. Create a mood of confidence and explain the content of the workshop.
2. Reach an understanding of the concept of agricultural supply chains, based on farmers' experience.
3. Prompt farmers to reflect on their current knowledge and practices with respect to the sale of agricultural products.
4. Introduce the concept of negotiating prices.
5. Help farmers improve their ability to calculate the production costs of their crops.
6. Describe what SIMA does and how it works.
7. Help farmers improve their ability to listen to and note down price information disseminated by SIMA.
8. Analyze, interpret, and calculate sale prices for agricultural products.
9. Identify barriers to effective price negotiation and alternatives for overcoming these.
10. Evaluate the workshop in a participatory manner.

As explained earlier, the idea is that the SIMA facilitators, rather than simply instruct farmers in the conventional way, will facilitate workshops, helping farmers reflect on their experiences with price information and strengthen their knowledge through practical application of new ideas.

For this purpose RedCampo has developed four products for use by potential SIMA facilitators. These include a set of ten posters, each corresponding to one of the 10 segments described above; a brief guide to the use of the posters, which describes participatory

techniques for interacting with farmers; a more detailed manual explaining the methodology and the thinking behind it; and a sociodrama developed for radio and recorded on cassette, called *Para Ganar, Hay Que Saber Negociar* (To Make a Profit, You Have to Know How to Bargain). The dramatization is useful for prompting farmers to reflect on and discuss issues related to the use of price information.

The third and fourth components of the proposal for strengthening SIMA's training program involve the creation of alliances with development organizations, local governments and schools, and the mass media for large-scale implementation of the new training methodology.

The proposal was finalized and discussed with FDTA leaders and staff during April-May 2005, and implementation was begun in July. In collaboration with the NGO Food for the Hungry International (FHI), the methodology was tested at Sucre, Chuquisaca, with a group of technicians. Under a more formal agreement with FHI and other organizations, the methodology was further refined, and the training materials described above were developed and tested. Through this agreement we were able to test on a pilot basis the potential of alliances with local organizations for massively scaling out training for farmers in the use of market information.

Conclusions

Further evaluation of the capacity-building methodologies presented here will take place before the end of March 2006, when the RedCampo Project comes to a close. The results of evaluations carried out so far suggest that small-scale farmers and others consider the methodologies to be interesting and relevant. Implementation of the methodologies with groups working at diverse locations in different agricultural supply chains has shown that small farmers are fully capable of acquiring new information and communications skills in a remarkably short time. Applying those skills boosts farmers' confidence in their ability to share information, using diverse media, and to collaborate and communicate with other supply-chain actors.

The interest of international and national development organizations, local universities, and municipal authorities in these methodologies is also noteworthy. Again, this tells us that the methodologies are highly relevant to problems or issues that many colleagues are eager to address. What remains to be seen, of course, is what impacts are generated by changes in the attitudes and activities of the information and communications promoters. Are the benefits large enough to justify investing in the implementation of these methodologies? In seeking to detect such benefits, we would pursue two possibilities.

One is that the information disseminated by the promoters and the knowledge shared by SIMA facilitators might influence farmers' decisions about crop production, postharvest handling, or marketing and thus have an economically significant effect. It would also be useful to determine whether farmers serving as promoters and facilitators have any particular advantage over agricultural technicians and other chain actors as sources of technical and market information.

A second possibility is that empowerment of the promoters will improve their position with respect to knowledge access and perhaps enable them to promote stronger relationships and communication within the supply chain. In other words the promoter

groups might provide a mechanism for knowledge sharing between chain actors. One would then have to examine whether this has economically significant consequences for farmers and other actors who tend to occupy a weak position in supply chains.

Another critical issue is that of sustainability. Is the support of local organizations sufficient for enabling the promoters to function as a group? Do that support, plus enhanced self-confidence and social status, provide the promoters with sufficient incentives to continue? And if the promoters do not continue working as a group, can they have an impact by applying their new skills individually?

Fortunately, an extension of the FIT Program and of RedCampo seems highly likely, so we will probably have the opportunity to pursue those lines of inquiry. Moreover, our work on information and communications will be integrated with a FIT project focusing on the use of participatory research methods to enable technicians and farmers to generate new knowledge collaboratively. So, we hope to have a much-awaited opportunity to seek potential synergies between participatory approaches to research and communications.

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An Information System for Rural Enterprise Development: Support in Planning and Decision Making for Small Producers

Jhon Jairo Hurtado, Dora Patricia Arévalo, and Odilia Mayorga

Summary

The idea of devising a methodology to create information systems for rural enterprise development (SIDER, the acronym in Spanish for this concept) grew out of our perception that small farmers lack reliable information on which to base many of their decisions. The methodology described in this article was developed in response to the demands of local actors and with their participation. It seeks to put information at the service of enterprise development, so that through continuous promotion of this information can stimulate innovation among small-scale entrepreneurs, help make them more competitive, and contribute to improved incomes. In this article we describe how the methodology can serve as a tool for bringing together supply chain actors, new information and communications technologies (ICTs), virtual and face-to-face networks, and content relevant to enterprise development.

Background

In the course of CIAT's work with small farmers in central and northern Cauca Department, Colombia, it has become evident that one of the principal limitations in rural enterprise development is the lack of adequate support services, such as technical and business assistance, training, credit, and information and communications.

Among these services, information access appears to be indispensable as a basis for sound decision-making. Small rural entrepreneurs need timely and reliable information on markets (prices, buyers, trends, quality requirements, etc.); technology options (e.g., processing equipment); production costs; sources of funding for projects; and suppliers of inputs and support services, among other topics.

In an effort to determine how such needs can be met, an initiative was launched in southwestern Colombia to create an information system for rural enterprise development (SIDER, the acronym in Spanish for this concept) that would cater specifically to small producers. The methodology for creating this system was developed in three municipalities of Cauca Department through a joint effort by InforCom and CIAT's Rural Agroenterprise Development Project in collaboration with several local organizations, including the Institutional Consortium for Sustainable Agriculture in Hillsides (CIPASLA), its association of beneficiaries (Asobesurca), the Corporation for the Development of Tunía (Corpotunía), the Association of Panela Producers of Santander de Quilichao, and the Youth for the Future Foundation of Suárez. The idea was to create a model information system through which the generation of local content and creation of information networks would strengthen enterprise development.

Objectives

The central objective of this work was to place within reach of small producers the information they need for their development as entrepreneurs through the use of methods and strategies that permit continuous exchange of knowledge, experience, and lessons learned between farmers, local organizations, and other supply-chain actors. More specific objectives were to:

- Strengthen the capacities of rural communities and organizations to generate, access, and use information.
- Create a local system through which communities and organizations can share information and knowledge.
- Link the use of new information and communications technologies (ICTs) to the social dynamics of rural communities.
- Strengthen the orientation of participants toward rural enterprise development.

Methods

With the aim of promoting a culture of information use within rural communities, we have developed the SIDER as a model for managing information and knowledge, based on demands from local actors and with their participation. The process has consisted of three distinct phases: design, implementation, and diffusion.

Design phase—This first phase allowed us to define the purposes that would guide the construction of the system as well as to gain a general overview of the area in which we worked and to bring together the different components that would make up the SIDER. For this purpose, we followed the steps outlined below:

1. Formation of working groups

There was no working group in the region with a particular interest in establishing an information system that would strengthen rural enterprise development. So, it was necessary to form such a group, including representatives of various local actors who could take part in the planning and implementation of the SIDER. To identify candidates for the group, we relied on key local informants and secondary information.

2. Strategic aims

To guide the design of the SIDER, we helped the working group define the goals and objectives they wished to achieve and on that basis the strategies and activities they would undertake. Among the aims defined were to generate local capacity for managing information, to build face-to-face and virtual information networks, and to generate local content for rural enterprise development. In defining strategic aims, it is helpful to pose the following questions: What changes do we wish to achieve among the beneficiaries of the system, and how will these be measured? What types of development proceses do we wish to promote? And with which organizations can we and should we work?

3. Diagnosis of information and knowledge needs

Identifying information and knowledge needs for the development of an information system is a matter of understanding the demands of the market to which the system will be directed. For this reason it is essential to identify the specific themes about which local actors (including organizations and communications media) seek information and knowledge.

4. Characterization of information and communications networks

In order to better mobilize information, it is important first to know what type of information is being exchanged, to visualize the channels through which it flows, and to identify the gaps or obstacles (which may be persons, organizations, or places) where information is lost or blocked. In this way we can analyze current information availability, the relationships that form around information use, and the current possibilities and mechanisms for accessing, exchanging, and disseminating information. This characterization can be carried out by means of a rapid communications diagnosis, the creation of exchange maps, the use of social network analysis, and other methods.

5. Designing a system to improve information dynamics

Based on the results of the design phase, the working group was able to construct a model of the information system. For this purpose the group defined each of the system's components and the way these would be connected. The components are the actors (that is, the persons who handle information); the content (on topics the group considers to be of high priority); the information and communications media and technologies (these include both traditional or conventional media as well as new tools for handling information); the face-to-face and virtual networks for exchanging information and knowledge; intermediaries (that is, the persons who facilitate the sharing of the information generated); and monitoring and evaluation (the means by which the system's effectiveness is measured).

Implementation phase—Once the system had been designed in a participatory manner and on the basis of the real circumstances of the study area, the model was shared in the communities where it was to be implemented. Implementation involved a plan of capacity strengthening, content development, establishment of alliances, and training of system users.

1. Sharing the design

It is important to share with the communities involved in creating the system the recommendations that have emerged from the design phase. This exchange should involve the persons who will actually implement the system as well as others who can in the short term undertake actions aimed at improving current patterns of information use. Sharing the design of the information system marks the beginning of a process of cultivating interest in information and giving visibility to the system in the community. This process is key for the establishment of alliances, which are vital for giving the working group access to important sources of information required for content development.

2. Implementing the design

Implementation consists of four components: definition and implementation of a plan for capacity strengthening (focused on the local capacities considered necessary for the development of content), content development (centering on themes that have been assigned high priority), the establishment of alliances, and training for users of the system, so they can learn through concrete examples how strategic use of information can benefit them.

3. Diffusion

Sustainability ought to be a key cross-cutting theme of any initiative. Even so, it receives particular attention in this phase, given that the model information system is never really complete but rather is created to be continuously adapted, as new information demands arise. For this reason it is essential, once content development is under way, to carry out a first evaluation of the model to make any adjustments that should prove necessary.

In addition, efforts should be made to promote the system by such means as agricultural or knowledge fairs, releasing the system through important public events, and others that give visibility to the system itself as well as to the people who are serving as information and communications intermediaries in the community. This will let people know whom they should seek with the need or have information to share.

Results

During the construction of the model information system presented here, we took into account all the phases mentioned above under methods. Nonetheless, this was not exactly the procedure we followed in Cauca Department. The SIDER was developed through an action research initiative consisting of two parallel processes: (1) the centralization of useful information for rural enterprise development in a Web site called Caucasider and (2) strengthening of a local communications network. We present the results of the research on the basis of those two research areas.

The Web site—This was the technological option we selected for centralizing information, and it was developed with the direct participation of small farmers involved in the information system's development. They indicated their information needs, the form in

which they wanted to find information, and their preferences with respect to graphic design. Thus, the final product faithfully represented the interests and demands of participating communities.

The site was constructed in Mambo 6.0, a free software package, for which the cost of maintenance is low. Afterwards, the site (www.caucasider.org) was placed in Nidohosting, an option that is inexpensive, offers easy access, and will permit any local partner to administer the site in future, as was planned from the outset.

Below we describe the content that was developed for Caucasider in collaboration with local organizations that support small farmers and on the basis of the results of the information diagnostic study.

1. Prices and markets

The principal objective of Caucasider's market information service is to better enable different supply chain actors (including producers, processors, traders, and consumers) to make better decisions about the production and marketing of agricultural products.

This component of the system offers price information for more than 25 products that are important in Cauca's agricultural economy and for 13 cities in or around Cauca, whose markets influence prices in the area or represent a market oportunity for producers. These prices are supplied by the Colombia International Corporation (CCI), with which we established an agreement for obtaining weekly price information.

2. Agricultural supply chains

The purpose of this component of the Web site was to provide information on various supply chains in Cauca Department that are considered to be of high priority by producers and traders in the local economic context.

So far, the site contains only information about the *panela* (unrefined sugar) supply chain, which was selected as a pilot case. The information covers the steps involved in panela production and processing, the current status of this supply chain, and recent technological advances in the *panela* industry of Cauca and other regions of Colombia. This information has been thoroughly evaluated by producers and representatives of local radio stations in Cauca, and they assert that the information is so clear and easy to understand that it can be transmitted via radio with little, if any, adaptation.

3. Enterprise development

This component of the site includes seven sections: development of rural micro-enterprises, project development, financing and strengthening enterprise development, legal aspects, business support services, capacity strengthening and events, and a virtual library on enterprise development. Offering about 300 resources, including case studies, links, and documents, the site has the potential to be quite useful to individuals and organizations interested in promoting and strengthening rural enterprise development.

4. Our network

This section of the site is dedicated to the municipalities in which the SIDER was developed and to the producers who took part in the process. Here they have the opportunity to share their social and cultural context with the rest of the world through the creation of

content on culture, education, history, tourism, and local personalities. They compiled this information with the support of community members and organizations.

The local communications network—The network is made up of various individuals and organizations, who work together to ensure that information reaches producers by means of various media and channels (such as bulletin boards, radio, printed bulletins, community meetings, and others) that are far more accessible to them than Internet.

In strengthening the network, which forms an integral part of the SIDER model, we worked with a total of about 30 panela producers, between the ages of 14 and 17, in three municipalities of Cauca Department. With the support from CIAT facilitators, these producers took part in a program of capacity strengthening that introduced them to basic concepts of communication and rural enterprise development and enabled them to build skills in handling diverse communications media and in creating content pertinent to enterprise development.

These actors, the first beneficiaries of the network component of SIDER, formed three distinct communications groups in the three municipalities – Suárez, Santander de Quilichao, and Caldono. Their function was to use local communications processes to disseminate among other farmers the information contained in the Caucsider Web site. In the paragraphs that follow, we describe the results for each group.

1. Suárez

The group at Suárez, despite being the largest and most diverse of the three, is the one that has remained most stable throughout the process. The group initially experienced difficulties because of the differing ages and interests of its members, but commitment and hard work enabled the group to overcome those obstacles and gain significant influence in the office of the local mayor, as shown by two developments in particular:

- The group was assigned a workspace of its own adjacent to an entity that is the principal source of enterprise information in the municipality.
- A project was approved for the official launch of the communications group and Caucasider Web site at the municipal and departmental levels.

Currently, the group is developing proposals for further projects that would help sustain its communications activities. It also continues producing information bulletins and radio programs for the community. So far, the group has published and disseminated more than 60 bulletins and eight radio programs based on the technical content of the Caucasider Web site.

2. Santander de Quilichao

The group at Santander de Quilichao, which was initially made up of young people for the most part, was quick to apply what members learned through the capacity-strengthening sessions. This group, like the one in Suárez, produced a significant number of information bulletins and radio programs. Nonetheless, young members' eagerness to find work or opportunities for study gradually led most to move to other parts of the country, until only one was left.

3. Caldono

The group at Caldono, made up mainly of women, was dissolved as a result of armed conflict in central Cauca, which took the life of the group's leader. Before its breakup, however, the group was able to produce useful content on their municipality, which now appears in the Caucasider Web site.

The work carried out with these groups and the results obtained prompted us to reflect on the desired profile for group members in terms of their skills, personal experience, relationships with organizations that have content pertinent to enterprise development, time available for the process, and other aspects. On the basis of these reflections, we identified a set of lessons learned that made it possible to strengthen the group at Suárez, revitalize the one at Santander de Quilichao, and make a new start at Caldono.

At this latter site, a new communications group was formed with persons having a different profile from those involved previously. The new group consisted entirely of persons who belonged to local organizations and for whom information handling is not just a necessity but rather a part of their normal functions at work. In working with group, we focused on generating enterprise-related news, publishing news through the Caucasider Web site, and disseminating content to local users.

To strengthen an information network requires the participation of various actors. For that reason, throughout the process, we have established relationships and agreements with government entities and NGOs, local communications media, Internet access centers, and both formal and informal educational institutions. These actors have played important roles in the process, offering significant support to the communications groups. The principal achievements in this regard were:

- Collaboration with the Cauca Regional Center for Productivity and Innovation (CREPIC), which is a key candidate for applying and expanding the SIDER model on a departmental scale.
- Two workshops with 12 indigenous and Afro-Colombian radio stations in Cauca to share with them content of the Caucasider Web site and to promote its dissemination.
- An agreement with the CCI for obtaining the price information presented in Caucasider.
- An agreement with the Department of Social Communications at Cauca University for involving students and professors in support for the work of the communications groups.

Under the leadership of the communications group at Suárez, the Caucasider Web site was officially launched in late 2005. Participants in this event included large numbers of community members, several news media (including newspapers and televisión programs), and representatives from organizations in all three of the municipalities where the SIDER was developed.

Collaboration with local organizations and the dissemination of information by the communications groups in their communities has given the SIDER and the methodology on which it is based considerable visibility in Cauca and beyond. This achievement has been strongly reinforced by the products and events listed below:

- A video on the communications group at Suárez, produced by the university students who supported their process.
- A television documentary on this same experience, produced by Canal Caracol, a major television network in Colombia.
- A presentation of the experience of the Suárez group, made by group members themselves, during Colombia's third national telecenters workshop.

As a result of this last event, the group at Suárez will have the opportunity in March 2006 to present its experience with the SIDER at the Observatory of Experiences and Policies Related to the New ITCs, an event being organized by the Digital Colombia Corporation (www.colombiadigital.net/). This was one of just two initiatives selected from a total of 150 for presentation at the national level.

In addition, the SIDER initiative received third place in a regional contest called "Systematizing experiences and lessons learned in rural agroindustry" and organized by the Program for the Development of Rural Agroindustry in Latin America and the Caribbean (PRODAR), which is supported by the Inter-American Institute for Cooperation in Agriculture (IICA) and the United Nations Food and Agricuture Organization (FAO).

Conclusions

CIAT's effort in Cauca Department over the last 3 years to devise a methodology for creating local rural enterprise information systems with rural communities has led to the creation of new knowledge that is important to take into account in future endeavors of this sort and to guarantee the continuity of the process under way in Cauca.

One particularly important lesson is the need to form communications groups from the beginning with the participation of key persons and organizations working at different levels in the region. These people are essential for defining the strategic aims of the information system, developing an action plan, and promoting the creation of local content and its modification through constant consultation with external sources of information. The participation of these actors also facilitates the creation and strengthening of relationships of confidence and collaboration with outside sources of support for development of the information system and for information exchange.

Moreover, it is vital that the information system be conceived and constructed on the basis of a realistic assessment of local information needs and that the communications techniques and technologies chosen be the ones that are most sustainable and easily accessible to beneficiaries. This should ensure that opportunities to obtain and use information are shared equitably and do not generate or increase inequity in the community, as can happen when too much emphasis is placed on Internet and other ICTs that are not widely available.

In seeking to identify and support information intermediaries (whether they represent local communications media, organizations, or the comunity), it is important to focus the search on persons having a certain profile; that is, they should show good reading and writing skills, strength in oral communication, and leadership qualities. It is also important to seek a reasonable degree of homogeneity in the age and ethnic identity of the members of a local communications group.

Finally, in designing and implementing the information system, it is important to have a strategy for the development of capacities that intermediaries will require as effective information users; that is, they must learn to convert information into concrete opportunities and benefits for enterprise development and share this knowledge with small farmers.

In the future a major challenge for SIDER development is to identify local or regional partners that can assume the leadership of this type of initiative. In the meantime the communications group at Suárez has begun the year with good prospects for obtaining resources and with strong relationships within the group and in the community.

An Integrated Approach to Generating Knowledge for Local Development in the Andean Region

Dora Arévalo and Verónica Gottret

Summary

In recent years CIAT and various national partners have developed a series of participatory methodologies and have promoted them in every region of the developing world. These methodologies are designed to help rural people generate the knowledge and acquire the skills they need to build sustainable enterprises catering to domestic and export markets. Until now, the several projects that comprise CIAT's Rural Innovation Institute have developed and evaluated these methodologies separately at distinct locations. In the process we have come to see each one as a valuable point of departure for efforts to promote technological and social innovation in rural communities. An obvious question is whether or not these methodologies would give better results if implemented together in an integrated fashion.

In order to explore this question, InforCom, in collaboration with two other CIAT projects – Participatory Approaches and Rural Agroenterprise Development –embarked on a new initiative in 2005 that will provide methdological support for as many as six Integrated Project Alliances, or CIPs, which are based on a development model created and supported by the W.K. Kellogg Foundation. Support for the CIPs will be channeled through a "learning alliance," in which we will work closely two national partners in Bolivia and two in Peru. Together with these partners, we made progress during 2005 in consolidating the learning alliance, and we began characterizing the CIPs and their territories to better understand their circumstances and needs.

Background

Rising demand for a wide variety of tropical products, in both domestic and export markets, is creating new options for rural people to raise incomes. Those options, in turn, offer new means for communities to strengthen food security and better satisfy other needs, such as education and health care, which are critical for improved livelihoods. A central challenge now is to enable farmers to connect with growth markets either by adding value to their traditional crops or by diversifying into new enterprises. This requires that farmers build new skills and that communities and organizations strengthen the array of support services needed in order for new agroenterprises to thrive.

Among the skills and services that rural communities require is a stronger capacity to obtain, use, and share vital information. Breaking into new markets, for example, requires up-to-date information about product options, price trends, quality standards, and crop management practices. In order to act on such information, though, farmers must be able to create the knowledge required for producing, processing, and marketing higher value crops through viable rural agroenterprises. For this purpose, it is vital that rural people and the organizations serving them find new ways to stimulate social and technical innovation through local experimentation. Often, farmers' best hope for building and maintaining new agroenterprises lies in collective action, which permits them to share risks and responsibilities as well as benefits.

To help rural communities achieve those ends, CIAT and various R&D partners, have devised and applied in recent years a series of participatory approaches by which farmer groups, with the aid of local organizations, can accomplish several key tasks:

1. Prepare and implement plans for developing rural agroenterprises in a given territory.
2. Develop, identify, or adapt technologies that are suited to farmers' circumstances and enable them to enhance their food security or competitiveness in markets.
3. Strengthen the knowledge systems and information networks needed to support those agroenterprises as well as other development initiatives, with the aid of new information and communication technologies, or ICTs.

So far, the three projects that constitute CIAT's Rural Innovation Institute have developed and evaluated those approaches separately at different locations. However, if each approach represents an important point of departure for rural innovation, an obvious question then is what would happen if the approaches were applied in an integrated fashion at the same sites. Would an integrated approach achieve greater impact as a result of synergies between different but complementary methodologies? Or, on the contrary, would this simply complicate matters for national partners and rural communities by confusing and burdening them with too many activities at the same time?

InforCom and two other CIAT projects – Participatory Approaches and Rural Agroenterprise Development – are addressing those questions in a new project called "Knowledge Generation for Local Development," or GestionCIP for short, which began in 2005 with funding from the W.K. Kellogg Foundation. In this project CIAT is collaborating with two Bolivian and two Peruvian partners: Foundation PROINPA (Promotion and Research for Anean Products), working hand-in-hand with the Networks for Sustainable Development Foundation (REDES) in Bolivia, and the Peruvian Center for Social Studies (CEPES), together with the Center for Consulting and Integrated Services of the Pontifical Catholic University of Peru (InnovaPUCP).

Together, they are supporting several Integrated Project Alliances (CIPs), a model proposed by Kellogg and currently being implemented at several locations in the two countries. The idea is for several projects dealing with diverse themes – such as education, health, governance, and production – to work in an integrated fashion within a given territory toward poverty reduction, with special emphasis on creating new options for youth. Local partners in the CIPs have expressed strong interest in the various approaches with which this project deals. And the Kellogg strongly prefers that CIAT and its national partners support the use of those approaches in an integrated fashion, in keeping with the collaborative spirit of the CIPs.

Objectives

The project's central objective is to strengthen the organizations involved in the CIPs through a learning alliance that brings together development organizations, local government, and researchers for the purpose of promoting rural innovation through rural enterprise development, participatory research, and improved handling of information and knowledge, leading to social and economic development.

Project support is directed at strengthening local capacity to:

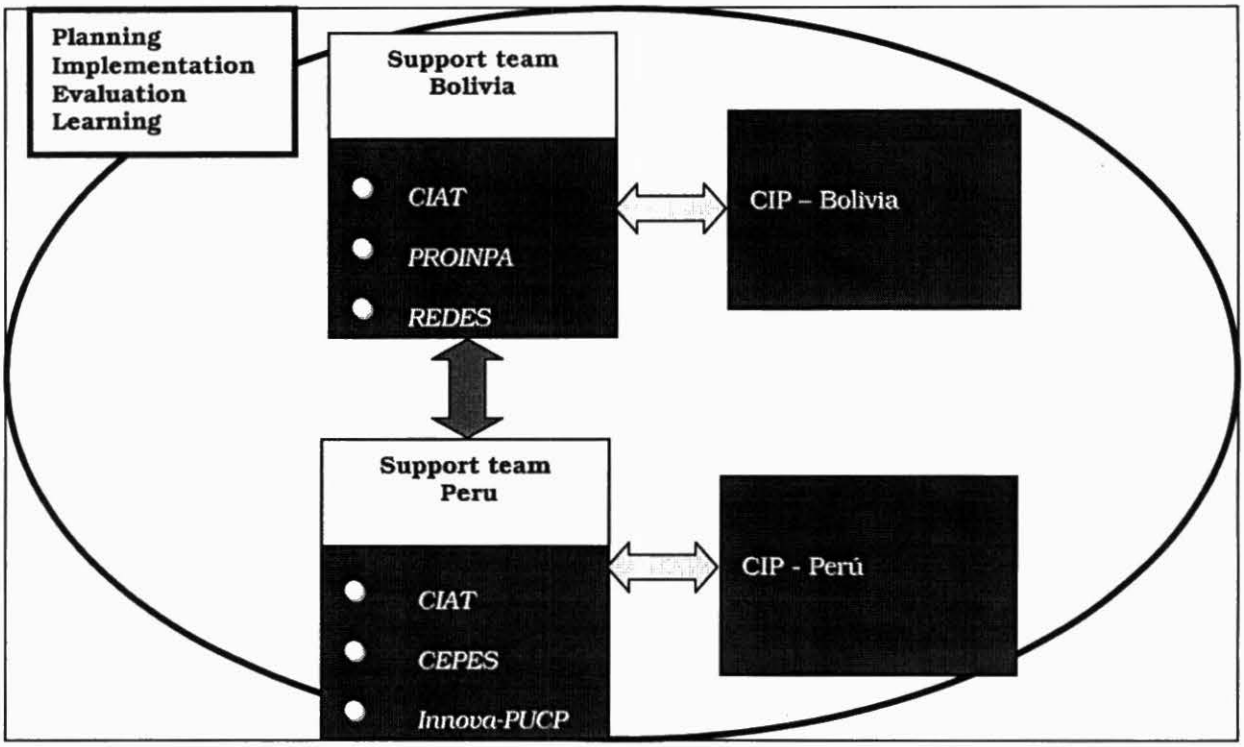
1. Obtain, use, and share information, with the aid of new information and communications technologies (ICTs).
2. Develop and implement plans for enterprise development in a given territory.
3. Create new knowledge that contributes to enterprise development.
4. Generate, identify, and/or adapt technological innovations and proceses through local participatory research.

Methods

The project works through a "learning alliance" between international, national, and local organizations, including the proponents of the CIPs and their partners. The alliance is a coalition of partners, who together implement a set of jointly designed development approaches in a territory of mutual interest, with a strong emphasis on capacity building. In the process they reflect collectively on what is working and what is not and then put the lessons into practice, leading to new cycles of learning.

In this particular case the alliance functions as indicated in the accompanying figure. CIAT facilitates the alliance, while direct support for the CIPs is mainly the responsibility of PROINPA, REDES, CEPES, and InnovaPUCP. Together, alliance partners will seek answers to these questions: (1) what are the most effective interventions for promoting the creation, sharing, and use of information and knowledge for rural innovation under diverse circumstances, and (2) how can various actors in agricultural supply chains best be supported, as they attempt to bring together different types of knowledge needed for the innovation process? With methodological support from CIAT, CEPES, PROINPA, REDES, and InnovaPUCP will work with the CIP proponents and their partners over a 2-year period to find and apply answers through a collective learning process, involving the components listed below:

1. Identification and analysis of relevant experiences
2. Planning and design of suitable approaches
3. Capacity building and implementation
4. Learning and systematization



A learning alliance to support the CIPs in Bolivia and Peru.

Results

The GestionCIP Project has been under way for just a few months. In the sections that follow, we briefly describe advances in activities related to the project's first component, which involves identifying approaches and experiences that show promise for helping the CIPs address development needs.

Formation of the learning alliance—An obvious first step for the project was to form and consolidate the learning alliance around which the project is organized. The alliance operates at different levels. First are the project partner organizations (CIAT, PROINPA, REDES, CEPES, and Innova-PUCP) that make up the team supporting the CIPs. A second level includes the organizations responsible for developing the CIPs, with each bringing a different set of approaches and capabilities to a shared development agenda. The third level includes a larger number of development organizations responsible for specific initiatives within the framework of the CIPs.

This last group requires particular attention, since one of the difficulties identified by the CIP proponents is that the collaborative arrangements between these organizations have not yet been consolidated. The learning alliance being formed by GestionCIP can perhaps help resolve this difficulty by providing a framework in which organizations involved with the CIPs can build ties around a shared learning process, with strong support for communications.

In support of the learning alliance, the project has begun using collaborative software (specifically a D-groups site) to facilitate communication between partners as well as access

to information resources. It has also developed an overall communications strategy and the preliminary versión of a Web site.

Characterizing the CIPs and their territories—To identify relevant approaches and experiences, we must first characterize the CIPs and the territories in which they operate. For this purpose the project has begun collecting information in Bolivia and Peru from three sources: (1) secondary sources, (2) interviews with the CIP proponents and partner organizations, and (3) focus groups with beneficiaries of the CIPs and other stakeholders in the CIP territories. A survey has been developed for information collection and was applied initially in Peru. Based on that experience, it was then modified for use in Bolivia. As part of this process, project staff have also attended three workshops organized by the Kellogg Foundation for the CIPs in Bolivia, Peru, and Ecuador; these events dealt with topics such as evaluation and working with youth.

For three CIPs under development in Bolivia –Ancoraimes, Azanake, and Chuquisaca – secondary information has been collected from municipal development plans, an atlas of municipalities in Bolivia, project documents, and other sources. On that basis, we have begun developing a profile of the municipalities in which these CIPs operate. We have also carried out interviews with the CIP proponent organizations to determine what approaches they use (particularly in their support for agriculture and communications), who benefits from their work, and what limitations they face.

In the case of Ancoraimes, it appears that there is an important opportunity for supporting enterprise development in relation to work on organic agriculture. Another possibility is to support local participatory research involving youth and addressing various disease and pest problems in potato and vegetable production. The logical point of departure for work on communications in support of those activities is a local radio station. Members of youth organizations could be trained to serve as "community reporters," generating content pertinent to rural enterprise development and crop management.

Likewise, in CIPs Azanake and Chuquisaca, there is interest in receiving support for farmer participatory research and for communications initiatives involving community radio or the use of new ICTs.

In Peru the project has so far worked with two CIPs– Trujillo and Carabyllo. A diagnostic study of CIP Trujillo has been completed, and one for CIP Carabyllo is near completion. Based on the Trujillo study, our Peruvian partners expect to support this CIP in three main areas: (1) strenthening organization, knowledge sharing, and development approaches; (2) development of a local information system, and (3) support for local development planning.

Organizing a knowledge fair—As characterization of the CIPs progresses, we are planning the project's next main step, which is a knowledge fair. This will provide project partners and organizations involved in the CIPs with an opportunity to share, promote, and learn about methodologies currently available in the Andean Region for rural enterprise development, participatory research, and development communicatioins, with the use of new ICTs. The idea is to match the available supply of such methodologies with the needs and interests of the CIPs and their beneficiaries, as determined through the characterization. By thus bringing new options to the attention of the CIPs, this event will provide a basis for designing and implementing an integrated approach that responds to their requirements.

Conclusions

One feature of the CIPs that has been made clear by our efforts to characterize them is that they operate in complex multicultural contexts. Another is the complexity of the organizational arrangements involved in these ambitious development initiatives. For those and other reasons, it has proved difficult for the CIPs to build the relationships of confidence, the collaborative agreements, and the dynamic communication needed in order for this model to function as planned.

Against that background the GestionCIP Project may prove valuable to the CIPs for reasons that we did not anticipate. The idea of the project is to develop an integrated approach for promoting rural innovation – one that involves creating and using new knowledge in relation to rural enterprise development, farmer participatory research, and development communications. Under current circumstances it may prove difficult for the CIP organizations to assimilate and apply such an approach. But perhaps their participation in the learning alliance will help them strengthen their capacity for collaborative learning and thus improve the CIPs' overall prospects for success.

Validating Methodologies and Strengthening Rural Planning Capacity with Organizations and Territorial Entities in Colombia

Rogelio Pineda, Ovidio Muñoz, Adriana Fajardo, Nathalie Beaulieu, Maria Fernanda Jiménez, Juliana Giraldo, Maria Isabel Lasso, and Karina Jaramillo

Summary

This article describes progress in strengthening the planning capacity of territorial entities and government organizations and in developing and validating methodologies with them. CIAT support for these organizations consists of a combination of technical assistance and training. Under various institutional agreements, we have supported the Instituto Colombiano de Desarrollo Rural (INCODER) in the development of programs for four "rural development areas"; to the municipality of Puerto López, Meta Department, in the monitoring, evaluation, and revision of its territorial plan; and to the agricultural secretariat of Valle Department for strengthening the capacity of the Municipal Councils for Rural Development (CMDR).

Background

The Colombian component of CIAT's work on rural planning began in 1999 as part of the Land Use Project, and it was integrated into the InforCom Project in 2003. This work has been funded mostly through an agreement with the Colombian Ministry of Agriculture and Rural Development (MADR). Recently, it has generated interest among various Colombian organizations, which have established agreements with CIAT for support of their capacity strengthening and other activities. These arrangements have allowed the planning group to develop and test methodologies and decision support tools as well as to document case studies – thus producing international public goods – while also strengthening the capacities of the organizations concerned.

Planning processes do not end with the elaboration of a plan. Rather, they are dynamic, involving adjustments and changes, adaptation to circumstances and resource limitations, evaluation of the results obtained, and learning from experience for individuals, organizations, and society as a whole. The organizations we support are often responsible for coordination of planning, monitoring, and evaluation. It is important to help them take advantage of these processes, seeing them as opportunities for learning and innovation rather than as administrative procedures and mechanisms of control from above. A more detailed description of the philosophy underlying our work on planning can be found in Beaulieu et al. (2004).

Work with the Instituto Colombiano de Desarrollo Rural (INCODER) began in 2004, while that with the agricultural secretariat of Valle Department is a new activity, begun just this year. The municipality of Puerto López has been a pilot site for methodology testing since 1999, but our agreement for supporting the revision, monitoring, and evaluation of the territorial plan began in 2005.

The municipal councils for rural development (CMDR) are composed of representatives from local government, public and private institutions, community organizations, and producers unions and associations. They are intended to serve as platforms for participation in the discussion of policies and programs for rural areas, and they are expected to play an important role in planning the rural technical assistance programs and rural components of the local development plan. These councils have ceased to function in many municipalities, however. It has been proposed that the CMDRs be rehabilitated through participation (Piedrahita et al. 2000) in planning, monitoring, and evaluation and through a more active role in municipal decision-making. Supporting the CMDRs has been a collaborative endeavor with CIAT's Participatory Approaches Project and is described in greater detail in another section of this report.

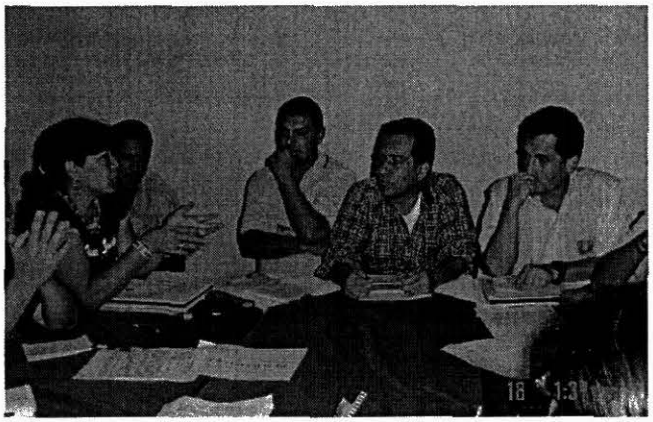
Objectives

CIAT's general objective in this work is to develop and test methodologies, document case studies, and strengthen the capacities of partner organizations, which form part of Colombia's national agricultural research system. Each of the organizations supported has its own expectations regarding the agreements, so on this basis we have established the following specific objectives:

- Help INCODER develop rural development programs for four of its "rural development areas."
- Help the municipality of Puerto López revise its territorial plan (*Plan de Ordenamiento Territorial* or POT) and to develop a functional monitoring and evaluation system.
- Through participatory planning, monitoring, and evaluation, help the agricultural secretariat of Valle Department strengthen the capacities of the CMDRs in three municipalities, with the aim of later replicating the process in others.

Methodology

The general approach employed across these applications is to accompany the partner organization in its activities and to test or develop different methodologies in each case. Capacity strengthening is achieved through formal training activities but also through planning, monitoring, and evaluation, which catalyses a learning process for those involved.



An INCODER workshop.

In the case of INCODER, support was provided through a series of five participatory workshops in each of the four areas: the southeastern portion of Valle del Cauca, the southern part of Magdalena Department, the *Altillanura* region of Meta Department, and the portion of Guaviare Department that is included in the peasant reserve. The themes of the five workshops were: (1) planning, (2) identification of possible projects, (3) development of agreements between public and private institutions, (4) communication of results and feedback, and (5) final presentation. The first three workshops were conducted in 2004 and the last two in 2005. For each of the rural development areas, final reports on a proposed rural development program and a development project were distributed in print form and on CD-ROM. A previously developed methodology, called Visions-Actions-Requests, or VAR (Beaulieu et al. 2002; also included in Beaulieu et al. 2003), was used in the first workshop. Participants presented their own plans and activities as a set of desired future conditions, contributions, and requests from other partners. This work was done in collaboration with the Rural Agroenterprise Development Project.

Workshop to review the territorial plan of Puerto López.

In the case of Puerto López, support includes three components. The first is reformulation of the territorial plan, which CIAT helped the municipality develop in 1999. For this purpose a series of eight workshops was organized to conduct a pre-evaluation in relation to the plan's short- and long-term objectives. A workshop in Puerto López included participants from the municipal office, the municipal council, and CORMACARENA, the environmental authority of the area. During these workshops the previously mentioned VAR methodology was used. The second component consists in the implementation of a monitoring system for the municipal development plan, which will make it possible to evaluate progress towards goals and milestones as well as the use of financial resources invested in them. For this purpose *SEGUIMIENTO*, a tool developed previously in Microsoft Access (Muñoz et al., 2004), was improved and adapted to the municipality's needs. Details of this exercise can be found in Muñoz (2005). The third component consisted in organizing and facilitating an environmental forum, aimed at recuperating the river Caño Banderas, which flows through the municipal capital. In relation to this forum, a call for proposals was issued at the national level. Four proposals were selected and presented in a seminar with the community and other stakeholders. Of these four proposals, the proponents of the most pertinent (the Pontifical Javeriana University in Bogotá) were invited to team up with the municipal

administration, CORMACARENA, and CIAT for fundraising and initiating certain activities in the affected area.

Illustrating the concept of social networks, using colored string during a workshop with the CMDRs.

Work with the agricultural secretariat of Valle Department was conducted in collaboration with CIAT's Participatory Approaches Project. Three capacity-strengthening workshops were conducted with CMDR members in three municipalities: Argelia, Bugalagrande, and Palmira. These workshops focused on supporting the internal committee of the CMDR in elaborating operational plans, using the VAD method and a participatory monitoring and evaluation methodology developed by the Participatory Approaches Project (Hernandez et al. 2004); social network analysis was also carried out in these workshops. Two participatory workshops were conducted during 2005 in each of the three municipalities, dealing with: (1) diagnosis and (2) legal frameworks and planning concepts. A third workshop on participatory monitoring and evaluation, leadership, and teamwork was planned for the beginning of 2006 (Fajardo 2006).

Results

With INCODER four general rural development programs have been formulated, one for each of the areas mentioned above, based on inputs from the workshops conducted in 2004 (Pineda y Cuellar 2005; Pineda and Diazgranados 2005; Pineda and Ortíz 2005; Pineda and Rincón 2005). In each of the areas, one project has been formulated on which the local stakeholders have chosen to focus INCODER support (Hernandez et al. 2005; Sandoval et al. 2005; Barona et al. 2005; Izquierdo et al. 2005). Stakeholders in Meta have chosen to strengthen the animal feed production chain based on maize and soybean, while in Magdalena they have opted to strengthen aquaculture. In Valle the developed project is focused on value-adding by small farmers, while in Guaviare it deals with integrated production of products such as rubber and Amazonian fruits. Feedback provided by local stakeholders in the workshops conducted in 2005 was taken into account in adjusting the programs and projects as well as in a final presentation.

At Puerto López a new version of the Territorial Plan (PBOT) has been formulated with various stakeholders. Its timeframe remains unchanged, however, and when it expires in 2009, it will be renewed for another 12 years. One outcome of this exercise was to strengthen local capacities in the use of planning methodologies. In addition, an application of the SEGUIMIENTO tool now contains the municipal development plan's projects, programs, milestones, and investments so as to facilitate monitoring and evaluation (Giraldo et al. 2005). The environmental forum created institutional linkages and prepared a concrete action proposal for recuperation of the river Caño Banderas.

With respect to the CMDRs in Valle Department, the diagnosis workshops helped identify network structures, levels of trust, representation on the councils, and their problems. They also provided participants with a better understanding of planning processes and of links between the different planning mechanisms in Colombia and within the municipality. During the workshop on participatory planning, monitoring, and evaluation, participants learned about legal frameworks and the roles and responsibilities of the CMDRs. They also explored concepts of participatory planning, monitoring, and evaluation through practical exercises, leading to the development of an action plan for the council. The workshop on leadership covered the conditions necessary for effective development of the organization and the importance of teamwork for reaching shared goals. In the different committees that make up the CMDR, the elaboration of an operational plan was begun, and participants identified mechanisms for participatory monitoring and evaluation.

Conclusions

Based on results from each of the experiences presented here, we conclude that methodologies developed by CIAT or others can be adapted to diverse cases and are effective in strengthening government institutions at different administrative levels. We have also been able to accompany planning processes of different kinds, involving a wide variety of stakeholders. Supporting organizations as a service has proved to be a valuable mechanism for funding development-oriented research that results in methodologies adapted to partners' needs. Additional funding is needed, however, to make the observations and carry out the kinds of experiments required to test the methodologies more rigorously and to demonstrate their impact on information networks in the rural sector. This work requires extra time that contracting organizations are not likely to pay for.

In 2006 we will continue to assist the municipality of Puerto López in monitoring its plans as well as the CMDRs. Specifically, the InforCom Project will design and implement an information and communications system for the three CMDRs receiving support, in collaboration with other organizations in the municipality and with other multi-stakeholder platforms in the country.

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Developing Participatory Planning Methodologies Adapted to the Bolivian Context

Hubert Mazurek

Summary

This article describes work in Bolivia aimed at adapting participatory planning methodologies to the Bolivian context and to strengthening national and local capacities in the process. We work toward these aims by (1) developing case studies in contrasting sites throughout Bolivia in collaboration with the Territorial Planning Unit (UOT) and the Council for Development and Population (CODEPO), (2) organizing workshops with entities involved in territorial development and planning to reflect upon experiences, and (3) contributing to the drafting of laws and a methodological document in collaboration with the Ministry of Sustainable Development. The case studies mostly involve developing territorial plans with the local territorial entities at different administrative levels. Progress is described for work in the municipalities of Calamarca (La Paz Department, Altiplano), Potosí (Potosí Department, Altiplano), and Pojo (Cochabamba Department, Valles); with an association of four municipalities in Pando Department (Amazon); and with a new project of the Bolivian System for Agricultural Technology (SIBTA) in Santa Cruz Department (Llanos).

Background

Our work in Bolivia is funded by France's Institute of Research for Development (IRD UMR-151), CIAT, and Bolivia's Vice-Ministry for Sustainable Development and Planning. Since 1994 Bolivian law on popular participation and decentralization has provided municipalities with new responsibilities and financial resources for administering their territories. Land-use planning as such is the object of a normative and methodological framework defined by the Bolivian General Direction of Land-Use Planning. Since 1996 departmental administrations have prepared land use plans, known as *planes de uso del suelo* (PLUS). These represent agroecological zoning but lack relevance for planning and preparing development policy.

Just recently, some municipalities have initiated a similar process, although most of these plans are prepared by external organizations or consultants and are not effectively used, first, because they do not correspond to the population's needs and, second, because municipal technicians find them difficult to understand. In addition, the land-use planning methodology is based almost exclusively on the use of biophysical parameters to define balanced land use.

Objectives

Our work in Bolivia therefore aims to engage institutions responsible for participatory planning in a learning process. It also focuses on developing planning methodologies and guidelines in collaboration with the Territorial Planning Unit (UOT), which is oriented towards biophysical considerations, and the Council for Development and Population (CODEPO), which establishes demographic policies. We also seek to provide examples that can be used throughout the country in capacity strengthening and to ensure that the proposed guidelines are adapted to the Bolivian context.

Methodology

The approach used for developing methodologies and strengthening organizational capacity has three components:

The first involves developing case studies in contrasting sites throughout Bolivia in collaboration with the UOT and CODEPO. The case studies consist, for the most part, in developing territorial plans with the local territorial entities at different administrative levels in the following sites:

- Municipality of Calamarca (La Paz Department, Altiplano)
- Municipality of Potosi (Potosí Department, Altiplano)
- Municipality of Pojo (Cochabamba Department, Valles)
- Four municipalities in Pando Department (Amazon)
- A project of the Bolivian System for Agricultural Technology (SIBTA) in Santa Cruz Department (Llanos)

The second component consists in organizing workshops with entities involved in territorial development and planning to reflect upon experiences, while the third involves contributing to the writing of laws and a methodological document in collaboration with the Ministry of Sustainable Development.

Results

The main achievement in 2005 was to develop genuine collaboration between the various institutions and integration of the participatory approach into the territorial planning methodology. Our close collaboration with the Ministry of Sustainable Development helped integrate the participatory approach into national policies through the law project and methodological document, which are being written jointly. This collaboration led to the effective participation of the UOT in various phases of preparation of the plans developed through the case studies, namely, in the definition, implementation, and monitoring.

Case studies—The territorial plan for Calamarca was completed at the end of 2004, and its implementation is now being monitored. A workshop was organized in November 2005 with the UOT, municipal government, community leaders, and NGOs in charge of carrying out prioritized projects. At present three of the six projects planned (mostly on water management) are being implemented. The social impacts of these will be measurable in 2006 during the next cropping season.

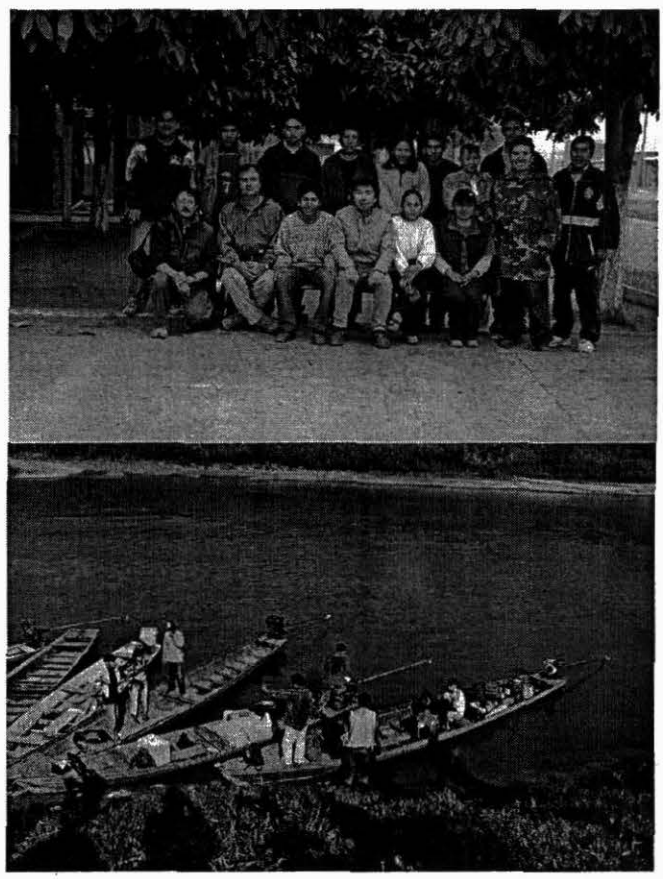
Workshop in a rural area of Potosí Department.

An agreement was signed with the municipality of Potosí for developing a territorial plan for the municipality's rural area. The process was initiated with the formation of a technical team of five persons within the municipal administration, whose mission is to elaborate and monitor the plan. A first training workshop was organized in December 2005 on GIS and mapping; training was provided by the UOT technicians. The fieldwork will begin in February 2006 with an extended team.

The agreement between the municipality, UOT, and CIAT commits the municipality to including a strong financial component in its annual operating plan (POA), which ensures execution of the prioritized projects. This is also partly assured through the availability of five technical staff and various vehicles for fieldwork. This POA will be linked with a decentralized cooperation project (managed by the French Embassy) focused on the decontamination of soils affected by mining. In this area soil contamination by mine residues is a serious problem generating conflict between farmers and small mining companies. Two engineers from the school of mines at St. Etienne (France) will come to Potosí in February 2006 to initiate a diagnosis and propose possible actions.

Preparation of a plan for the municipality of Pojo, Cochabamba, was interrupted in 2005 due to lack of funding. The producers association AGROPOJO and our team have submitted a proposal to the World Bank's Global Development Marketplace for a project aimed at developing a territorial plan around the issue of water management. If approved, the project would start in February 2006.

In Pando Department four municipalities (Puerto Rico, Bella Vista, Abuna, and Sena) initiated participatory plans during 2005. In August we conducted a survey, employing ten students from the University of Pando, who interviewed 237 persons in 67 isolated communities of the area.

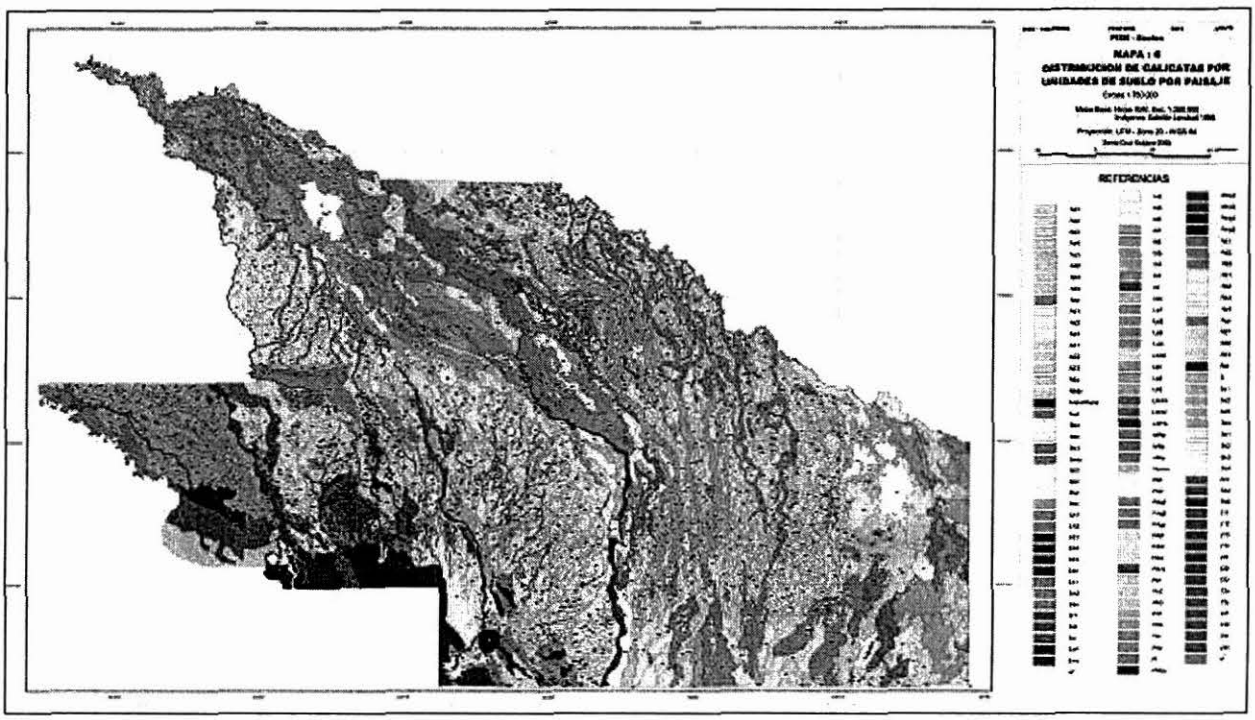


The team of surveyors and their departure towards communities on the Tihuamano, Manuripi, and Orthon Rivers.

The survey will be repeated during the Brazil nut picking season (February and March) of 2006, with the objective of determining the population of settlements, migration and settlement of new communities, and local knowledge regarding environmental problems and territorial legislation. On this basis a participatory plan for the four municipalities will be developed in June 2006.

The last case study is being carried out through a project called "Technologies for sustainable use of soils in the humid tropical zone and its expansion" in Santa Cruz Department. Begun in 2005, this is a project of the National Program for Strategic Research (PIEN), which is funded through SIBTA in the Ministry of Peasant and Agricultural Affairs. The project is being carried out in association with the Tropical Agricultural Research Center (CIAT, a national institution headquartered at Santa Cruz that is entirely distinct from CIAT-Colombia) and ANAPO (the Association of producers of wheat and oil crops). It is an integrated project aimed at developing the instruments necessary for sustainable use of soils in soybean production, on both small and large farms.

Our team works on two modules: (1) implementation of a geographic information system (GIS) to manage the data corresponding to soil samples on the map of soils and vegetation and (2) the elaboration of plot-level plans as a training tool for farm owners. The soil data management are being generated using the GEOSOIL database tool (Rubiano 2005). The first phase of this project was concluded in December 2005, with the publication of a report in print form and on a CD-ROM. The second phase will be concluded at the end of February 2006. A synthesis will be published in the form of a book with a CD-ROM containing all of the information collected during the project. The program is being carried out by Ismael Gonzalvez, who was hired full-time by CIAT.



Soil map for Santa Cruz Department.

Seminars and workshops—In 2005 our team participated in the organization of three workshops.

One entitled "Territorio y Planificación: Un Balance de las Políticas Territoriales en el Ambito de los Municipios del Departamento de Cochabamba" was held on 15 April 2005 in Cochabamba. It was organized by the Prefecture of Cochabamba, the Association of Architects of Cochabamba, the Center for Superior University Studies (CESU, University of San Simón), and CIAT.

Our team organized another seminar to present the UOT Web site to national institutions and the public. The site was developed by the University of Texas, USA, and presents the legal and institutional contexts of planning in Bolivia. This event took place at the Ministry of Sustainable Development on 5 May 2005 in La Paz.

Finally, a seminar dealing with "Territorio y Constituyente" was held on 10-20 September 2005 at the *Palacio de Comunicaciones* in La Paz. It was organized by the Ministry of Sustainable Development, the Association of Architects, and CIAT and was hosted by the French Embassy. This seminar involved 235 persons from 67 institutions, including political parties, farmer and indigenous organizations, professional associations, public institutions, NGOs, and international cooperation agencies. The first day was dedicated to a public debate between political parties (candidates for the national elections), grassroots organizations, and civil society. During the second day, three working groups met to discuss (1) the "construction of territories with a multicultural approach," (2) "national and regional territorial policies," and (3) "planning and management approaches proposed to the next constitution." A book synthesizing the proceedings of the seminar is being published.

Representatives of indigenous organizations at a seminar on "Territorio y Constituyente."

Laws and methodological documents—Our team participated in six inter-ministerial working groups preparing laws on population and territory, a process initiated by the Population Council (a council of the ministers of sustainable development, economic development, education, and indigenous issues, which also includes popular participation). We prepared a document for two of these working groups, one on territories and the other on migration.

Conclusions

The plans under development will serve as the basis for a book about participatory planning in Bolivia. Various books are expected to be published in 2006, based on the seminars and the PIEN project mentioned above.

CIAT will have legal status as an international organization in Bolivia starting in January 2006. A formal agreement will be developed with the new Bolivian government for use of our planning methodologies on a national scale.

The Bolivian political context has changed significantly in recent weeks. A new government will place more emphasis on planning, folding various ministries into the new Ministry of Planning and Sustainable Development. This will help us consolidate our approach to planning for development and open up new opportunities for projects.

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Monitoring and Evaluation of Municipal Development Plans for the Diffusion of Natural Resource Management Innovations in Senegal

Nathalie Beaulieu

Summary

This article describes a process of using the monitoring and evaluation efforts of local governments to scale up and out some local and introduced technological innovations for natural resource management (NRM). This work has been under way since the end of 2003 within the framework of the Desert Margins Program. Activities in 2005 focused on gathering and diffusing information in response to issues addressed during planning and evaluation workshops in rural communities. The article also reflects on the conditions that favor or inhibit the utility of this approach in scaling out NRM options and in making researchers and development agents more aware of local innovations.

Background

This approach grew gradually out of work begun in 1999 by CIAT's Land Use Project, which led to the activities in Colombia described earlier in this report. The initial objective was to develop GIS-based decision-support tools as well as participatory planning approaches, which could be used by municipal planners to develop better land management practices. In the process, we realized that the municipal planning efforts could help identify demands for research products. If sufficient feedback could be exchanged between researchers, farmers, and other local stakeholders, with extension agents serving as intermediaries, the municipal plan could trigger a multi-stakeholder learning process. The approach of using rural municipal planning as an entry point for technology transfer and learning was then built into the Senegalese component of the Desert Margins Program (DMP), in which CIAT is involved.

The DMP is coordinated by the Sahel Center of the International Centre for Crop Research in the Semi-Arid Tropics (ICRISAT) in Niamey, Niger. Funded by the Global Environment Facility (GEF), the program works in nine countries of eastern, southern, and West Africa. CIAT's Rural Innovation Institute contributes to the Senegalese component, while the Tropical Soil Biology and Fertility (TSBF) Institute of CIAT supports the overall program. The Senegalese component, under the coordination of the Senegalese Institute for Agricultural Research (ISRA), was begun in 2003, and CIAT has been involved since September of that year. Senegalese partners include various of ISRA's centers (specializing in agronomy, livestock, horticulture, and economic analysis); the National Agency for Rural and Agricultural Counseling (ANCAR); the Directorate of Water, Forests, Hunting, and Soil Conservation [DEFCCS]; the Directorate of Agriculture; and the NGO ONG-Sahel-3000.

Rural municipalities in Senegal have an obligation to conduct participatory planning, monitoring, and evaluation in the context of decentralized governance and to produce a local development plan (République du Sénégal 1996). As in many countries whose governments are undergoing decentralization, environmental management responsibilities have been transferred from central to municipal governments. However, this transfer of responsibilities has not in most cases been accompanied by a corresponding transfer of financial resources and technical capacities. The approach presented here could help these local governments reinforce their capacities, while allowing the project to benefit from their experience with natural resource management (NRM).

Objectives

This work aims to apply on a pilot basis an approach in which monitoring and evaluation of local development plans stimulate a learning process that can benefit agricultural research and development projects. We assume this process can be used to scale out and up NRM practices and technologies promoted by the project. A second assumption is that this can help research and development agents become more conscious of local innovations, which can then be diffused among other local stakeholders. Finally, we assume that the approach can help information networks expand and become denser and more intensely used. The research questions we are addressing have to do with the conditions under which these assumptions are true or false.

The DMP constitutes a case study in our work, but it is also a partnership program that we support through joint research. From the point of view of the program's coordinators, the specific objectives of this work (which correspond to the program's outputs) are to scale out NRM options, promote stakeholder participation, strengthen local capacities, and document livelihood options. Meeting these objectives, especially scaling out NRM options, requires the deployment of information and communication technologies and practices.

Methodology

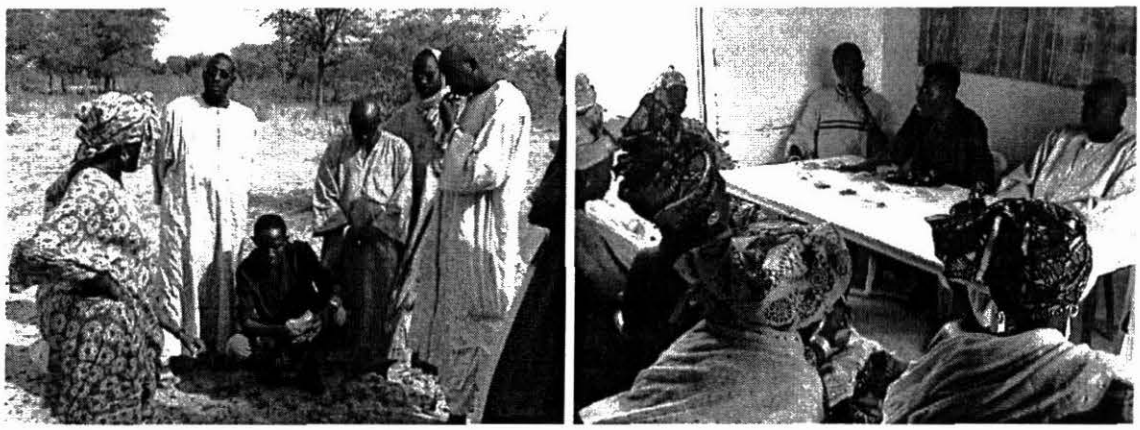
The local development plans (PLD) of rural municipalities are being used as entry points for technology transfer, stakeholder participation, and the encouragement of local innovation. The program works in the groundnut basin of Senegal, specifically in four regions: Thiès, Diourbel, Kaolack, and Fatick. Twenty rural communities were chosen for these activities, five in each of the four regions, but activities have actually begun in only eight of them.

In each of these communities, an initial workshop was organized in the second semester of 2004, in most cases jointly with the local ANCAR representative, involving the

rural council, the union of farmer associations, and the union of women's groups. During this meeting we examined the local development plans to identify their objectives and determine what was being done to attain them, what remained to be done, which were the obstacles, and which were the demands to partners outside the rural communities. Of particular interest were demands for knowledge, which could be directed to the program's technical partners or to other rural communities. Program partners were queried through the project's list server about these demands, and documentation was prepared to answer some of the questions raised.

In principle these first meetings were supposed to be followed by monitoring and evaluation meetings, planned to take place every 4 months. However, there was a long delay between the end of phase I of the DMP and the beginning of phase II, causing funding to be extremely limited for this activity in 2005. This hindered the organization of workshops, but the activity continued through communication of various types, including informal visits to rural communities, collection of documents, preparation of technical fact sheets, and production and distribution of video footage about options that could help overcome obstacles identified in the meetings with rural communities.

The scientists and professionals of the partner institutions in Dakar work in teams on specific subjects through activities funded by the DMP. Scientists are expected to maintain a database on possible options, to conduct research in a subset of the farmer experiments mentioned above, train trainers from the extension agencies, and be attentive to feedback from farmers and extension agents. However, the delay between the two phases of the project limited the involvement of these teams in 2005; they lacked resources to conduct field visits until late in the year. In preparation for activities in 2006, a meeting was conducted with Meissa Diouf, coordinator of DMP activities in horticulture, in the municipality of Ngandiouf. The formation of a farmer field school focusing on home and market gardens was discussed with the mayor, the National Program for Rural Infrastructures (PNIR) – which will be integrated in 2006 into the National Program of Local Development (PNDL) – as well as with representatives of farmer organizations and women's groups. This farmer field school would be located beside the municipal primary school and would serve as a resource center, demonstration area, and training site for this municipality and for two others nearby at Mbayène and Taiba Ndiaye.



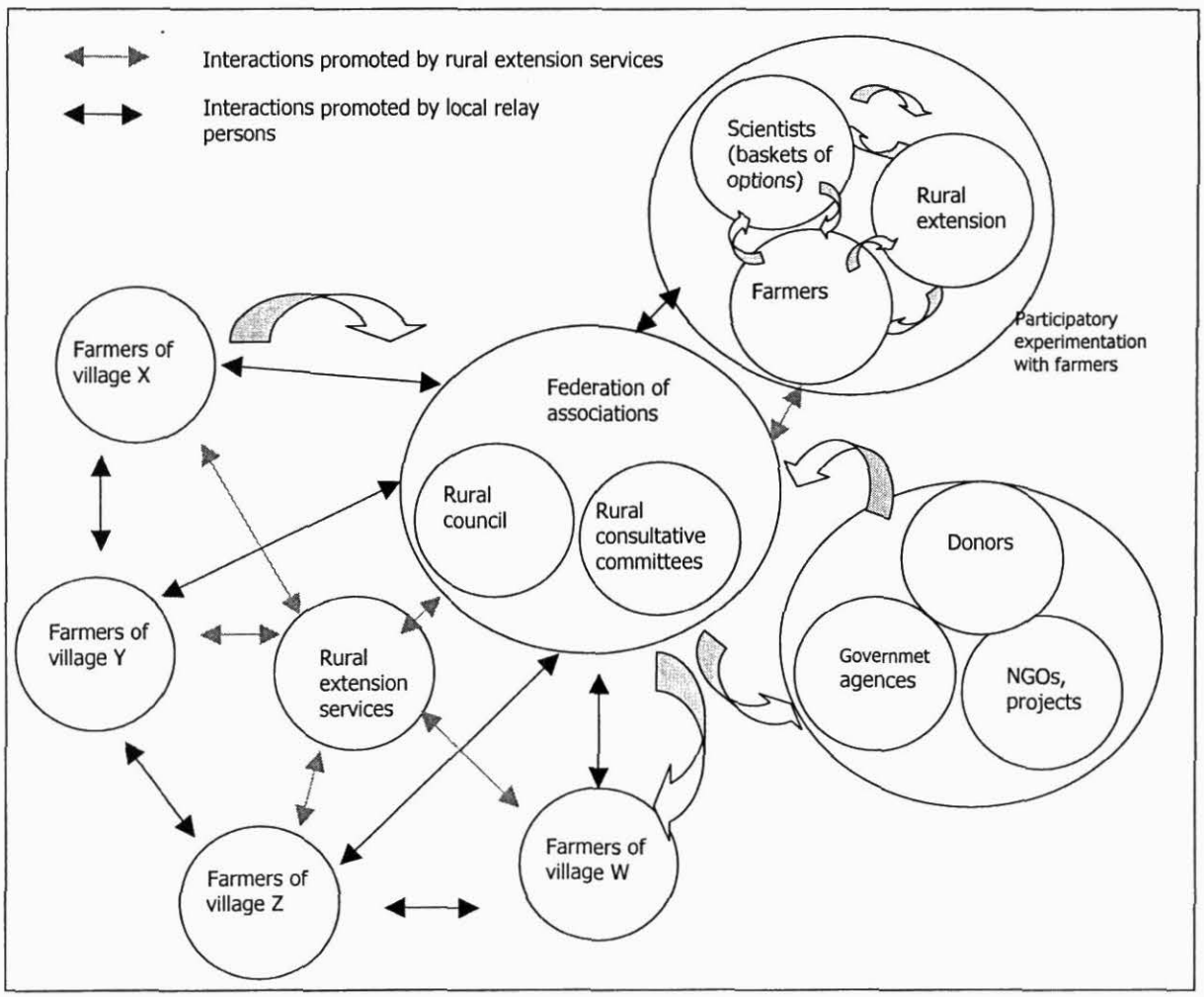
Discussing the formation of a farmer field school in the municipality of Ngandiouf, Senegal.

Extension agents and participating NGOs are expected to ensure the flow of information back and forth between researchers and rural communities, to train farmers in the use of new options, and to assist them with their experiments, paying particular attention to farmer adaptations and feedback so that it can be communicated to other farmers and to scientists. Again, delays in the program's phase II hindered these activities, although they continued under the organizations' own programs.

A list server (http://dmp.sahel.info) was created in 2004, and in collaboration with France's Center for International Cooperation in Agricultural Research for Development (CIRAD), we created an Internet blog to post news, documents, and technical fact sheets, thus complementing the personal and telephone communications between various partners.

A training kit is being developed and will be continuously updated. It is composed of books, technical fact sheets, and CD-ROMs with video and audio footage. Parts of the kit have already been distributed to the rural communities in which we have been active, so that local organizations can begin discussions.

The desired interaction between these stakeholder groups as well as others involved with the rural communities is represented in the accompanying figure.



Desired interactions between stakeholders in the DMP.

In connection with these activities, the Senegal Biodiversity Day was organized during January 2005 in collaboration with CIRAD and the French Institute of Research for Development (IRD) within the framework of the DMP program. This knowledge-sharing event involved 30 participants (including policy-makers and donors, local elected officials, extension agents, and scientists), many of whom are partners in the activities mentioned above. It included a series of presentations by participants and an exercise in which participants were divided into three groups – policy makers/donors, local elected officials/extension agents, and scientists – and asked to inventory their contributions to biodiversity conservation. The groups were also asked to pose three questions, expressing demands, to the two other groups. The questions and responses were then shared by one spokesperson in each group.

Results

The Senegal Biodiversity Day has shown that many policies exist concerning the management of biodiversity, the fight against desertification, and the mitigation of climate change. But while much of the responsibility for dealing with these issues has passed to rural municipalities, they have limited technical capabilities and financial resources for action. There is a need for researchers to work more closely with local groups to ensure that research is relevant, but the three groups mentioned above also stressed the importance of technology transfer. This underscores the importance of our objectives in the DMP. In the sections that follow, we present our 2005 results in working toward these objectives, organizing the discussion around key research issues.

Conditions favoring the municipality-based approach to scaling up/out NRM options—During the workshops with rural municipalities, we found that many components of the municipal plans – relating to agriculture, livestock, forestry, and NRM – have objectives similar to those practices promoted by the DMP (for example, improving soil fertility, forage resources, ligneous resources, and vegetable production). We also found that municipalities invest significant human and financial resources, generally with support from international organizations, in local capacity-building programs and in infrastructure (roads, warehouses, market places, electrification, etc.) – investments that can facilitate technological innovation. The municipalities also have internal structures through which village-level talks and training can be organized and options can be promoted. In addition, they develop by-laws, which can prohibit or encourage certain practices. These elements confirm that working through municipalities is a valuable approach for scaling NRM practices up and out.

The year-long delay in funding has not allowed the DMP to function as planned. Nonetheless, we have been able to identify cases in which NRM practices could be diffused, even with little funding. Though external funding is necessary, it is not the only condition required for achieving positive impact. More important is the use of appropriate approaches that achieve impact without creating undue dependency on external funding or unrealistic expectations (Cleaver 1997). The current practice of paying per diems to farmers, development agents, and scientists to participate in meetings has made it almost impossible to organize events without having significant resources. A more effective approach, and one requiring only minimal resources, would be to incorporate new initiatives into processes already under way with institutions acting as knowledge brokers or information diffusers.

In many cases ANCAR's rural extension agents, in the context of their own programs, have organized talks using information distributed by DMP in 2004 and 2005. They have also reproduced some plant materials and distributed them to farmers, as was the case with a program on home gardens in the rural community of Dya. Since the information reproduced was posted on the Web, the ANCAR agent was able to print copies during his weekly visits to the regional office.

In response to limited funding, some municipalities and/or the projects working in them have offered to support some activities in 2006 (e.g., providing food for workshop participants and funding for training). The Groundnut Basin Program (PBA) of the German Agency for Technical Cooperation (GTZ), for example, is forming a significant partnership. The NRM project PAGERNA, which has now been fused with the PBA, has made significant progress in promoting successful NRM options and organizational models, many of which resulted from local innovations. The PBA is now more oriented towards support for decentralization, and it sees in the DMP an opportunity to diffuse the positive results of PAGERNA more widely, with support from the capacity- strengthening programs of the municipalities in which the project works.

Another limitation is that little material is available from research partners for diffusion to farmers. The materials available (Ba Diao 2004; Diouf et al. 2004; Diaité 2005; Diallo et al. 2005; Beaulieu et al. 2003, updated in 2004; DMP-Senegal 2004 a and b) have been complemented with materials prepared by others (Rippstein 1999; Rippstein and Clavel 2003; Irrigasc 2004; ATDMT 2004; David and Oliver 2002). Members of the NGO Centre Mamou, whose 2004 and 2005 almanacs (Fall and Hahn 2004 and 2005) were disseminated by the program in rural communities, also agreed to include some DMP contributions in the 2006 edition. The diffusion of information and training materials would be much easier if the rural communities had an Internet connection. Currently, Internet communication with rural communities is possible only through ANCAR.

The municipal approach as a means of making R&D agents more aware of local innovations—During our workshops with rural municipalities, an inventory was made of activities that have been undertaken to achieve the objectives of the local development plan, and the obstacles encountered were discussed. This enabled us to identify both successful and unsuccessful practices and on this basis to adjust the capacity-strengthening themes.

The classical approach to reforestation in Senegal is to produce young trees in greenhouses managed by villagers, municipalities, DEFCCS, or NGOs and to plant them during the rainy season. The trees are often damaged by cattle, creating tensions with nomadic herders and local livestock farmers, who are seen as an obstacle to improved NRM. Discussions with many groups have led to the conclusion that it is preferable to encourage natural tree regeneration for reforestation generally and to use greenhouse reproduction techniques specifically for fruit trees (including domesticated forest fruits) and other species grown in home and community gardens, which are adequately protected from cattle.

Another change resulting from these discussions concerns protected areas or "*mises en défens*." The original idea was to protect them from cattle through fencing, but this proved too costly. The rural council of Mbadakhoune obtained good results with unfenced "*mise en défens*" installed in cattle paths and protected from damage by humans through a "code of conduct" but not from cattle; these consist of forage reserves and areas for tree regeneration. The DMP team in Senegal decided to give top priority to promotion of this variant on conventional practice.

However, in order for this approach to contribute to the learning process of the participating researchers and development agents, they must pay close attention to local problems and solutions and be prepared to change their approach if necessary. This is not always the case, though, especially when the researchers' or agents' objective is to promote specific technologies and demonstrate (either to a donor or to the scientific community) that these have large potential impact and are being adopted. Thus, while the stated objectives of development projects regarding the adoption of specific technologies may help focus the work, they may also hinder learning in the absence of a flexible approach that permits adjustments.

One tool that can help identify and disseminate local innovations is the video camera, which can be used to interview farmers and local stakeholders and document practices in the field. Copies of videos can be reproduced inexpensively, and in most rural communities one can find households that have DVD or VCD readers, making it possible to view videos on a television.

Conclusions

The following table presents a summary of conditions found to affect scaling out of NRM options and awareness of researchers and development agents of local innovations.

Assumption	**Conditions for fulfillment**	**Impairing conditions**
The municipal linkage can help scale out and up NRM practices.	Funding available for basic activities. Promoted practices respond adequately to local needs. Institutions and individuals realize the relevance of diffusing these options to the achievement of their own missions and consider this the main incentive for participating. Municipalities realize the importance of these practices for their own missions/objectives and make complementary investments in financial or human resources.	Paralysis of activities due to funding problems, which can undermine credibility with partners and local stakeholders. An extractive attitude toward projects, in which financial incentives to participate in activities become an end instead of the means to achieve development objectives.
Municipal linkages can help scientists learn from experience and diffuse local innovations.	Careful observation and discussion of activities aimed at meeting local objectives, of successes, and of obstacles encountered. Open-minded scientists and a willingness to adjust practices and technologies on the basis of lessons learned. Documenting local innovations with video cameras and distributing the resulting footage in VCD format. Participating in experimentation, monitoring, and evaluation, while paying attention to feedback from farmers and other local stakeholders.	Promoting the adoption of specific technologies as a justification for the work of a scientist or organization. Blindly seeking to fulfill project objectives without being willing to adjust these to local needs along the way.

In 2006 the monitoring and evaluation workshops in rural municipalities will be resumed and conducted by the ANCAR agents assigned to them. Research partners in the DMP will conduct experiments in some of the municipalities on specific options, especially for home and market gardens, and on management of protected areas through the commercialization of forest fruits and medicinal plants as well as the use of forage reserves. CIAT will contribute by finishing and distributing information kits, including written, video, and audio materials. We will also study the impact of municipal linkages on information networks.

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