Project SN-4

Annual Report 2003

Information and Communications for Rural Communities (InforCom)

November 2002 - October 2003

CIAT
Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture

The International Center for Tropical Agriculture (CIAT, its Spanish acronym) is one of 16 food and environmental research organizations known as the Future Harvest centers. The centers, located around the world, conduct research in partnership with farmers, scientists, and policymakers to help alleviate poverty and increase food security while protecting the natural resource base. The Future Harvest centers are principally funded through the 58 countries, private foundations, and regional and international organizations that make up the Consultative Group on International Agricultural Research (CGIAR).

In 2002, CIAT received support from the following donor countries: Australia, Belgium, Brazil, Canada, Colombia, France, Germany, Iran, Italy, Japan, Mexico, the Netherlands, New Zealand, Norway, Peru, South Africa, Spain, Sweden, Switzerland, Thailand, the United Kingdom, and the United States of America.

Our work was also financed by the following organizations and foundations: the Andean Development Corporation (CAF), the Asian Development Bank (ADB), the European Union (EU), Fundación Polar, the International Development Research Centre (IDRC), the International Fund for Agricultural Development (IFAD), the Kellogg Foundation, the Nippon Foundation, the Rockefeller Foundation, the United Nations Environment Programme (UNEP), the United Nations Food and Agriculture Organization (FAO), the Wallace Foundation, and the World Bank.

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Contents

Project SN-4: Information and Communications for Rural Communities

Objective: To strengthen rural communities' capacity for innovation by better enabling them to obtain, generate, and share information and knowledge, with the aid of modern information and communications technologies (ICTs).

Outputs:

1. Computer-based distance-education (e-learning) programs, multimedia products on CD-ROM, and printed materials that convey science-based knowledge and methods in forms that are useful for development professionals
2. Proven approaches and tools for finding and obtaining agricultural information, especially via the Web
3. Community telecenter models for providing connectivity and building local capacity to use ICTs for rural innovation
4. Approaches for creating a local culture of knowledge discovery and sharing, with the aid of new ICTs linked to other communications media
5. Approaches for stimulating the development of local content that is relevant to rural innovation

Milestones:

2004 Efforts under way in Colombia, at least one other Andean country, and in two Central American countries to incorporate the use of ICTs into rural development, with particular emphasis on support for small agroenterprises. Four e-learning courses completed and at least one multimedia training tool under development. New collaborative arrangements established in Colombia for improving access to agricultural information.

2005 Regional projects on ICTs for development under way in Latin America and East Africa. Local information systems and communications groups created and operating in both those regions. Further e-learning courses and multimedia products developed.

Users: The primary users of the project's outputs will be development professionals and community leaders associated with local organizations (particularly farmer groups, NGOs, and rural schools). These persons will acquire new tools and approaches that better enable them to help rural people create useful knowledge and improve services needed for solving problems and acting on new opportunities in agriculture.

Collaborators: SN-4 is building alliances with various international organizations that support the use of ICTs for development, including Canada's Institute for Connectivity in the Americas (ICA), Fundación Chasquinet (a Latin American initiative based in Ecuador), and the global Association for Progressive Communication (APC). In addition to profiting from these organizations' experience and expertise, CIAT can tap into their networks of local partners in developing countries.

CGIAR system linkages: Training (30%); Information (60%); Organization and Management (5%); Networks (5%).

CIAT project linkages: SN-4 will provide all Center projects with new means of increasing research impact and obtaining feedback on research products from rural people. The project should be particularly useful to CIAT's new Rural Innovation Institute (RII) as a means of strengthening participatory approaches to agroenterprise development, local adaptive research, community-based watershed management and rural planning.

SN-4 Project Log Frame (2004-2006): Information and Communications for Rural Communities

(Nathan Russell, project manager)

Narrative summary	Measurable Indicators	Means of verification	Important assumptions
Goal To help the rural poor build sustainable livelihoods by improving the flow of *genuinely* relevant information among rural communities and research and development (R&D) organizations.	• Increased occurrence of technical and social innovation in target rural communities. • Increased opportunities for off-farm activities that generate income and employment.	• Impact evaluation within a sustainable livelihoods framework, based on household surveys, interviews with key informants, and group techniques in target rural communities.	
Purpose To strengthen rural communities' capacity for innovation by better enabling them to obtain, generate, and share information and knowledge, with the aid of modern information and communications technologies (ICTs).	• New options for enhancing livelihoods identified by individuals and organizations in rural communities through improved information access. • Stronger planning and problem-solving capacities in rural communities, based on improved electronic communications both among communities and with R&D organizations. • A greater capacity in local organizations to satisfy information demand in rural communities.	• Case studies on the use of information obtained with the aid of ICTs in target rural communities. • Impact evaluation of Web-based information applications developed by local organizations.	• Rural communities can obtain affordable, reliable access to the Internet. • National and local organizations commit themselves to providing rural communities with relevant information services. • Rural communities prove receptive to a new information culture based on the use of modern ICTs. • Systems for continuous monitoring and evaluation adopted by organizations hosting rural community telecenters.
Outputs 1. Computer-based distance-education (e-learning) programs, multimedia products on CD-ROM, and printed materials that convey science-based knowledge and methods in forms that are useful for development professionals. 2. Proven approaches and tools for finding and obtaining agricultural information, especially via the Web. 3. Community telecenter models for providing connectivity and building a local capacity to use ICTs for rural innovation. 4. Approaches for creating a local culture of knowledge discovery and sharing, with the aid of new ICTs linked to other communications media. 5. Approaches for stimulating the development of local content that is relevant to rural innovation.	• E-learning programs under way and multimedia products available to partners. • Diverse clients (from researchers to telecenter operators) more effectively obtaining information and using it in their work. • Financially and socially sustainable *telecenters* established by local organizations, with the aid of training tools developed by CIAT. • Local communications groups formed in target communities and providing effective information services to rural communities. • Dynamic, Web-based information systems (integrated with conventional communications media) developed by local organizations that have received training and other support from the Center.	• On-line evaluation of e-learning programs. • Training tools available in print form and on CD-ROM. • Locally developed information systems available on the World Wide Web. • Consultancy reports and project information on the Web and in print form. • Conference papers, journal articles, and technical reports on the performance and impact of approaches developed by the project.	• Public and private telecommunications agencies support initiatives to create affordable, reliable Internet access in remote rural areas. • National and local organizations can generate resources through information services that enable them to sustain these services. • National and local organizations gain credibility in rural communities as reliable providers of useful Web-based information services.

Introduction

It is difficult to imagine how millions of rural families in the tropics can achieve sustainable livelihoods as long as their access to information and knowledge continues to be so limited. Agricultural R&D organizations in developing countries must, therefore, join the search for ways to break down the isolation of rural communities. Specifically, we must identify practical approaches whereby rural people can build the knowledge they need to make their agricultural production more resilient and competitive, protect the health of fragile agroecosystems, and bring about technical and social innovation.

Modern information and communications technologies (ICTs), such as the Internet, could facilitate that task, but the new ICTs have not yet been made widely available or relevant to the poor in rural communities. Nonetheless, many developing countries have seen a proliferation of privately run Internet cafes in small towns, and some national governments and NGOs are extending Internet access to more remote rural areas through ambitious and socially progressive connectivity programs.

These developments offer CIAT and its partners an exciting opportunity to demonstrate convincingly how ICTs can be used to create stronger links between progressive, client-oriented agricultural research and local efforts to achieve sustainable rural livelihoods. In pursuit of that opportunity, CIAT established the Information and Communications for Rural Communities, or InforCom, Project in mid-2002.

In 2003 the project completed its first full year of operations. During the first few months of the year, we defined a five-part strategy for developing international public goods aimed at strengthening the capacity of rural communities and R&D organizations to obtain, generate, and share information, with the aid of ICTs. The strategy consists of the five central components listed below, which encompass a broad continuum of information and communications functions, from international and national organizations to rural communities:

1. ***From research results to development resources***—e-learning programs and multimedia training tools
2. ***Better access to global information and knowledge***—proven approaches and tools for finding and obtaining materials on the Web
3. ***Local use of ICTs for rural innovation***—sound models for development of community telecenters to provide connectivity and build local capacity in ICT use
4. ***Local communications groups***—community-based approaches for creating a local culture of information use
5. ***Local information systems***—Approaches for stimulating the development of local content relevant to rural innovation

Building on previous experience in some of those areas, InforCom made significant progress during 2003, as described below, in advancing with all five components of its strategy.

From Research Results to Development Resources

Through agricultural research CIAT, other international centers, and many national institutes are amassing a wealth of information and knowledge about tropical crops and soils, integrated pest management (IPM), and related topics.

CIAT and others are also creating a wide array of participatory approaches that offer rural people a more prominent role in actions leading to sustainable livelihoods. These actions include crop diversification, agroenterprise development, local adaptive research, integrated pest and disease management, regeneration of degraded soils, and land-use planning at the community level. CIAT shares participatory approaches through training, printed materials, and Web publishing. But there is clearly a great need and much potential to do more. With a view to making these and other products of agricultural research more widely available and more relevant to development professionals in rural areas, CIAT has embarked on two new initiatives, one focused on e-learning and the other on multimedia training tools.

E-learning

Early in 2003, the project launched a new venture in distance education. For this purpose we chose a computer-mediated approach, or e-learning, because of its distinct advantages over other options. Unlike videoconferencing, for example, e-learning allows students to interact with tutors and other students over long periods (usually 3 months), in an asynchronous manner (i.e., at any time), and at any place where there is an Internet connection. E-learning thus lends itself more readily to life-long learning for busy professionals, who may lack the time or money to participate in courses involving specific time commitments and travel to remote locations.

Students are accompanied by experienced tutors, who facilitate the learning process. The experience is further enriched by discussions among students through a virtual campus, which is accessible to students, tutors, and experts invited to cover specific topics in the course. Students may access lessons and discussions in the virtual campus from Internet cafés, community telecenters, universities, or home computers, and they can download study materials and discussions.

To speed the incorporation of e-learning into CIAT's work, we chose REDCAPA as our partner. Headquartered in Brazil, this not-for-profit NGO has 8 years of experience in computer-mediated distance education. The head of CIAT's Information and Documentation Unit (IDU) and supervisor of library public services first established a representative working group of CIAT staff and then, with support from CIAT's Project Development Fund, organized a 10-day e-learning consultancy with REDCAPA's director. This included a 3-day workshop, which was attended by 40 CIAT staff. In addition, the consultant conducted interviews with 40 staff, which resulted in a list of 37 possible topics for e-learning courses. We also discussed funding opportunities and agreed to share experiences on how best to proceed jointly.

Based on the outcomes of this consultancy, the working group recommended that we concentrate on just a few courses initially, particularly on one—Ex-situ Conservation of Plant Genetic Resources and Management of Germplasm Banks—that had already been organized several times, in conventional fashion, by CIAT and IPRGI at CIAT headquarters. We decided to go about developing the course as a joint venture with Colombia's Universidad Nacional, IPGRI, and REDCAPA. Preparations for this course are well under way, and individuals from each institution are participating enthusiastically. Four other courses are in preparation.

Multimedia training tools

While continuing to produce printed materials, CIAT has also built the expertise required to develop multimedia products for distribution on CD-ROM. These products are designed to convey science-based knowledge and methods in forms that are practical, interactive, and instructive.

In 2003, InforCom completed its first multimedia training tool. Based on the experience of a recently completed 3-year project (InforCauca), the tool—called *Telecentros Comunitarios: Una Estrategia para Promover el Uso de las Nuevas Tecnologías de Información y Comunicación (TIC) para el Desarrollo Sostenible en Zonas Marginales*—offers recommendations and advice on telecenter development. It also provides details about the telecenters and organizations that InforCauca supported, with funding from the International Development Research Centre (IDRC) and Rockefeller Foundation. *Telecentros Comunitarios* presents this material in an engaging and interactive manner through a combination of brief, interestingly written Spanish-language texts, animation, photos, and other graphic elements.

The product was launched at Colombia's Second National Telecenter Workshop, which CIAT organized with two local partners and hosted at Center headquarters in early October 2003. *Telecentros Comunitarios* will be distributed to workshop participants, and it will be publicized in Colombia through Colnodo (an NGO partner that promotes the use of ICTs for development) and elsewhere in Latin America through the Fundación Chasquinet, which coordinates the regional telecenter network Somos@Telecentros. Local partners in Colombia plan to use the tool for promoting telecenter development through meetings with municipal government officials and NGOs.

The InforCom Project believes that multimedia products could usefully complement the training and learning processes through which CIAT works with partner organizations. As such they are potentially powerful tools for translating research results into resources for development. For that reason, having developed our first multimedia training product, we will now explore interest among other Center projects in applying this approach to a wide range of topics.

Better Access to Global Information and Knowledge

Over the last couple of years or so, the CIAT Web site has proved effective for broadening access to information about our research and its results and products. Statistics on use of the Web site during 2003 show a steady increase in the total number of visits to the site per month, which reached 133,000 in September, up

from just over 80,000 in January. The total number of visits for the last year was about 1.3 million. For September we estimate that the number of different individuals accessing the site was roughly 72,000 from 166 countries. It is also worth noting that throughout the year the Agroenterprise Project site showed, by far, the largest number of files downloaded (e.g., informal documents, formal publications, and PowerPoint presentations); the figure for September was about 82,000.

Even so, filling Web sites with on-line scientific information does not by itself guarantee that users will be able to find the material they want and make good use of it. Key scientific information resources must be promoted among specific user groups and training provided in the use of these tools. Users also need to know about recently implemented copyright regulations for electronic publishing, which differ by country and tend to be much more restrictive than those for printed materials.

To help meet those needs, InforCom offered a series of workshops in 2003, which contributed importantly to the capacity of close partners in Colombia and heightened their awareness of information resources available through CIAT. Three new initiatives were received with special enthusiasm: (1) a workshop for 15 professors at the Universidad Nacional-Palmira on access to electronic sources of scientific information relevant to their research and teaching responsibilities, (2) a similar event for 20 researchers from the Palmira facilities of CORPOICA, and (3) another for community telecenter operators, emphasizing information resources that are relevant to the needs of rural communities. In addition, interlibrary loans and other library services were formalized and streamlined for easier access in the future.

The project also supported initiatives involving the use of metadata, with multilingual keywords, to facilitate access to information across language barriers. For example, we took part in the CGIAR's InforFinder Project, which includes work on multilingual categorization schemes and key words.

In addition, we helped conceive and implement a project in collaboration with the UN Food and Agriculture Organization (FAO), the World Health Organization (WHO), Cornell University in the USA, and the Rockefeller Foundation, aimed at making scientific journals readily available to the world's poorest nations. In connection with this work, the World Bank's Agricultural and Rural Development commissioned CIAT to carry out a consultancy in Ethiopia, Kenya, and Uganda to assess the capability of libraries to access on-line scientific information resources. In the course of the consultancy, the head of the IDU gave a presentation on information access at a staff retreat of Uganda's National Agricultural Research Organisation (NARO) and in 10 other institutions that were visited.

Local Use of ICTs for Rural Innovation

As mentioned in the introduction to this report, Internet access is gradually spreading in developing countries, even in remote rural areas. As that happens the wealth of useful information being made more readily accessible to agricultural R&D institutions will also be available to growing numbers of rural communities.

Even so, increased public access to ICTs by no means guarantees that rural people will use them to obtain information relevant to sustainable livelihoods. For that to happen local organizations must make a deliberate effort to incorporate ICTs into pro-poor development initiatives.

Over the last several years, CIAT communications staff and local partners in Colombia's Cauca Department have been examining the potential of community telecenters as a means of fomenting local use of ICTs for rural development. In collaboration with the Corporación Universitaria Autónoma de Occidente (CUAO) in Cali, we have supported three telecenters, two rural and one urban, under the InforCauca Project.

A community telecenter is a public place where individuals and organizations can learn to use ICTs for development. It differs from the typical cybercafe in that telecenter operators provide users with personalized computer training as well as support in applying ICTs for specific purposes. To reinforce the development orientation of the community telecenters, InforCauca has devised a general model for telecenters, in which they are hosted by local NGOs possessing a strong record of community service.

When the InforCom Project was created last year as part of CIAT's Rural Innovation Institute (RII), the telecenter work was incorporated into this new communications and information endeavor. As InforCauca came to an end (June 2003), we placed particular emphasis on evaluating the impact of the three telecenters supported by the project (with valuable assistance from CIAT economist Nancy Johnson) and on implementing a strategy to achieve telecenter sustainability.

Financial and social sustainability

The sustainability of InforCom's telecenter model depends on three key elements: (1) income for services, (2) support from host organizations, and (3) funds generated through the development of local projects involving ICT use.

Four months after the close of InforCauca and the end of donor support, all three telecenters are still operating and show reasonably good signs of achieving financial sustainability. Income for services, however, covers no more than about half the total costs of operating the telecenter (in some cases less). Interestingly, the host organizations have proved willing to pick up the rest of the costs. And some have been remarkably successful in obtaining funds for their own projects involving the telecenter operators and services.

Particularly noteworthy is the experience of a telecenter operated by the Corporación para el Desarrollo de Tunía (Corpotunía) in central Cauca. Early in the year Corpotunía received funding from the Spanish Fundación Desarrollo Sostenible (Fundeso) to coordinate Colombian participation in a project called Interculturanet. Its purpose is to promote cultural exchanges, via Internet, between school children in Spain and counterparts in Bolivia, Colombia, and Morocco, with a view to combating prejudice against migrant workers from those countries. Under this project Corpotunía organized the participation of children from 10 schools in Cauca and Valle Departments.

Corpotunia was able to undertake the project, because it had several years of experience in managing a community telecenter and could thus offer the necessary infrastructure, skills, and knowledge. Based on these same strengths, Corpotunia also obtained funds from the Instituto Colombiano para el Desarrollo de la Ciencia y la Tecnología (Colciencias) for a research project centering on the formation of *grupos gestores de comunicación*, or "communications groups," within local grassroots organizations. For more details about this project, which InforCom actively supports, see the discussion below under "Local Communications Groups."

The Asociación de Cabildos Indígenas del Norte del Cauca (ACIN), which operates a telecenter at Santander de Quilichao in northern Cauca, aspires to similar success. And for that reason it has developed a proposal for a communications project (not yet funded), under which it hopes to share its successful experience in the use of ICTs with other indigenous people's organizations in Valle and Chocó Departments. The project's title, Communication for Life, refers to ACIN's new conviction that communications in general and ICTs in particular are essential tools for defending the human rights of indigenous groups and for advancing other aspects of what they call their "life plans," including their work in agriculture and natural resource management.

One of ACIN's telecenter operators presented the project idea and shared the organization's experience with ICTs at the Workshop on Support Networks for Indigenous Peoples of the Americas. This event took place in the framework of the Second Annual National Forum on Connectivity for Canadians, held at Ottawa, Canada, in March.

It appears, then, that the financial sustainability of the telecenter depends only partly on its success as a microbusiness selling ICT services to the public. To a larger degree, it hinges on the host organization's conviction that community telecenters are a means of generating social benefits through specific ICT applications relevant to rural schools and other local organizations. Corpotunia and ACIN not only believe that is the case but have taken the further step of seeking funds for projects designed to generate such benefits.

Evaluation of institutional impacts

The results of InforCom's work on telecenter sustainability are closely related to some of the main conclusions of our impact evaluation. At the outset of the project, we expected impact to come chiefly from the decisions and actions of individual telecenter users. Contrary to our expectations, the most notable impacts can be seen within the organizations hosting the telecenters.

To examine those impacts systematically, CIAT's Impact Assessment Project carried out studies of two rural telecenters in Cauca, one hosted by ACIN and the other by Corpotunia. For this purpose Center economist Fabiola Amariles designed a survey of key individuals in those organizations, using a method developed by IDRC for assessing institutional changes attributable to particular projects or interventions. The method examines three aspects of an organization—motivation, capacity, and relationships with the external environment—with a view to determining how its performance may have improved in terms of effectiveness (or

ability to achieve goals), efficiency (in the use of resources), and viability (or financial health).

The telecenter at ACIN

It is evident from study results that the telecenter has given rise to substantial changes in the life and work of this organization, which supports a dozen or so indigenous reserves in northern Cauca Department. The reserves are home to some 75,000 people, most of whom belong to the Paez ethnic group.

All of the ACIN staff interviewed had acquired new knowledge, improved the way they work, and linked their activities more closely than ever with those of outside agencies. Specifically, staff underscored the value of routine use of e-mail in ACIN to facilitate contacts and to develop externally funded projects, and they cited the usefulness of Web searches for accessing information that was previously unavailable to them.

In examining the motivation of ACIN staff, the study found that the telecenter had better enabled them to fulfill the organization's goals, mainly in two ways.

First, the use of e-mail and the Web has enabled and motivated ACIN to compete more effectively for project funds. Staff are now more knowledgeable about opportunities and more efficient in handling project proposals. Increased awareness of the organization on the part of donors and collaborators has also helped: "We've made ourselves better known to the rest of the world," as one person put it; "we have greater credibility with other organizations," said another. Staff also note that ACIN's attractive organizational Web site has contributed importantly to those ends.

Second, learning about the strategies and experiences of other organizations, particularly those connected with indigenous movements in the Americas, has heightened ACIN's awareness of the overall significance of its work. This, in turn, has reinforced the commitment of individual staff to the organization's mission.

With regard to motivation, the study also looked for changes in decision making and organizational values. Although ACIN was a fairly democratic organization to begin with, the staff interviewed commented that decision making now rests on a broader base of information about a wide range of topics. Moreover, it appears that the telecenter has strengthened the role of women in the organization and in the indigenous communities generally. This is a result of the telecenter's active support for ACIN's Women's Program, particularly by obtaining and disseminating information about the use of gender analysis methods in

projects. One result is that gender indicators have been incorporated into the land-use planning of indigenous reserves in five different municipalities.

These changes seem especially significant if one bears in mind that, from the outset of the InforCauca Project, some indigenous leaders have expressed concern that the adoption of new ICTs would do more harm than good. Their quite legitimate fears range from issues of personal safety and cultural pollution to questions of intellectual property and possibly negative implications for the Paez people's oral tradition of communication, which is a central element in their collective mode of decision making.

The debate about these issues continues in ACIN. And they are considered sufficiently important to have warranted, at the end of 2002, the creation of a Concejo de Comunicación, or Communications Council. This provides a formal framework for the telecenter as well as for several community radio programs and other communications activities. The Concejo also represents a partial answer to some indigenous leaders' reservations about ICTs. Appropriate, high-level leadership is one way of ensuring that these new technologies, in combination with "old" ICTs like radio, help rather than harm ACIN and the communities it supports.

Another way to ward off potential negative impacts is by building the organization's capacity to use ICTs appropriately. And in this regard the telecenter has contributed importantly to the personal and professional development of ACIN's staff. The changes began with telecenter operators like Wilma Almendra:

> As a person I've benefited enormously. Before, I wasn't interested in the community. I hardly ever took part in meetings and assemblies, and when I did go, I usually fell asleep, because I didn't understand what people were talking about. Now, I not only attend assemblies, but I participate in them and tell others what I'm doing; and they show an interest in my work.

Other ACIN staff remark that new computer skills have improved their efficiency in the organization and in other activities, such as teaching. Some have also learned through the Web about opportunities for obtaining financial support to attend workshops and receive training.

One important manifestation of ACIN's improved communications capacity is the stronger integration that exists now between the organization's headquarters and some of the more remote indigenous reserves it supports. This has been achieved primarily by linking telecenter services with community radio programs. Under a system that ACIN staff call "chivanet," the telecenter operators copy documents, such as e-mails and files from Web sites, onto diskettes and deliver these to the driver of a rugged rural bus called a *chiva*, which travels daily to the remote reserves. The driver delivers the diskettes to the radio operators, who then convey messages and incorporate information from the Web into their radio programming.

According to the institutional impact study, ACIN has also benefited greatly from improved external communication. Staff note a marked increase in the organization's links with various types of organizations, especially donors, within

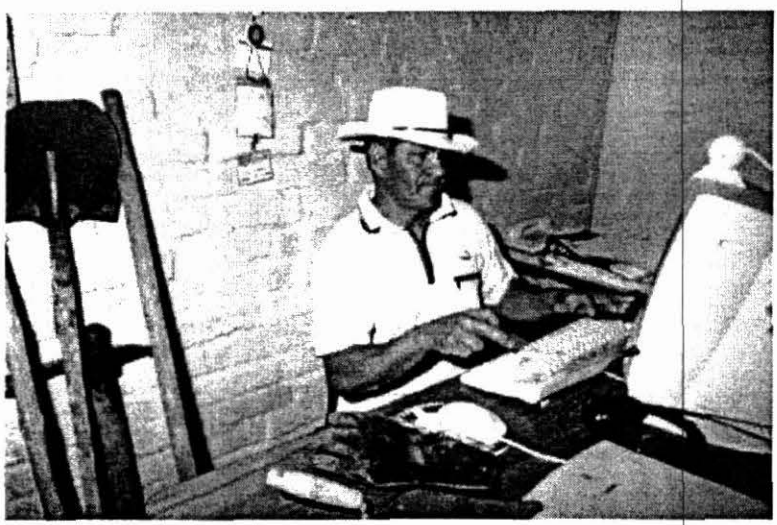
Colombia and around the world. Each ACIN program—for health, education, natural resource management, and so forth—has widened its contacts with organizations that can provide specific information and other support.

ACIN received a dramatic lesson in the value of such contacts 2 years ago, when the intensification of fighting between guerillas and paramilitaries in northern Cauca resulted in gross human rights abuses against the Paez people. This included the assasination of indigenous leaders and massacres in remote Paez communities. The telecenter operators began sending digital images of missing persons to human rights organizations, in addition to using these to make printed notices for distribution by family members of the *desaparecidos*. With assistance from CIAT, ACIN also developed a media list and began sending communiques about the human rights abuses to the press and human rights organizations. Eventually, ACIN and other indigenous associations in the region organized a massive human rights march, in which 35,000 people participated. On this occasion the telecenter proved vital in handling logistics as well as communication with the media and other organizations.

In sum, the telecenter has served as a kind of communications unit for ACIN, and this helps explain why the latter is now willing, in effect, to subsidize telecenter operations. Arguably, the organization could have reaped the gains described above by adopting the use of ICTs in some other way, that is, without necessarily creating a telecenter. But, on the other hand, the strong training component of the community telecenter model and the continuous support offered by InforCauca proved decisive in successfully incorporating the use of ICTs into the organization. Moreover, having set up the telecenter, ACIN is now well positioned to extend the benefits it has reaped as an organization to the larger Paez community as well as to other indigenous people's associations.

The telecenter at Corpotunía

Corpotunía is a not-for-profit NGO dedicated to promoting agricultural as well as social and cultural development in various municipalities of central Cauca through participatory approaches.



Unlike ACIN, Corpotunía had already begun using the Internet when the InforCauca Project came along. Nonetheless, staff and management tended to view this largely as a secretarial function. Not until Corpotunía came to host the telecenter—after unsuccessful trials in a local technical school and the town cultural center—did it stimulate within the organization a learning

process through which all staff acquired and began to apply ICT skills. Once it dawned on Corpotunia that hosting the telecenter placed it in the vanguard of local ICT promotion, then it made sense—even became urgent—for the organization's own staff to join the early adopters of this new technology.

The primary impact of this process within the organization has been to broaden considerably its field of action. What this means concretely is that the telecenter has given Corpotunía an entirely new focal point for project development—a task in which, as mentioned earlier, the organization has been remarkably successful. The new projects, in turn, have provided staff with exciting and innovative ways to work toward their development mission. As a result, they have come to see the telecenter as a source of broad social benefits—such as finding practical information for local flower producers, helping students with their homework, and reducing the cost of communication with friends and relatives working abroad.

Little wonder, then, that CORPOICA's manager, William Cifuentes, has become a strong proponent of ICT use in the region, "selling the idea to everybody," as he puts it. In doing so, though, he emphasizes the need for *acompañamiento*, or continuous support, in ICT application. Partly as a result of his efforts, another community telecenter has been set up in a neighboring municipality, and the Universidad del Cauca has become interested in supporting the telecenter movement at the departmental level.

In addition to motivating Corpotunía to widen its development vision, the telecenter has helped it build the necessary capacities for contributing to that vision. As at ACIN, this is particularly evident in the telecenter operator, Karla Bolaños, but other staff have acquired valuable skills as well. One commented, for example, that she used the Web to prepare for meetings and that this better enabled her to debate issues and participate in decision making. With regard to agriculture, technicians working for Corpotunía described how they were able to obtain technical information from the Web that proved useful in their extension activities with farmers. This is particularly important for the majority who are paraprofessional extensionists possessing only a high school education.

By adding an interesting new dimension to its work, Corpotunía has substantially improved its image or standing among other organizations. And it projects that image strongly through a well-designed Web site. Moreover, the manager of Corpotunía frequently shares his organization's experience with ICTs, for example, through the National Confederation of NGOs and board of directors of the Regional Center for Productivity. For those reasons and because of its success in ICT project development, Corpotunía is now viewed locally and in national organizations (including Colombia's Ministry of Communications) as a pioneer and leader in the use of ICTs for rural development in Cauca. As with other telecenter experiences, strong leadership (that is, the presence of a telecenter "champion") has proved to be a critical factor in this success.

The new telecenter mentioned above is supported by the Consorcio Interinstitucional para una Agricultura Sostenible en Laderas (CIPASLA) in Caldono,

Cauca. Its director, Rodrigo Vivas, has also become a strong local champion for the use of new ICTs in rural development.

Telecenter impact in rural communities

In contrast with the experience of the staff of telecenter host organizations, use of the telecenter by members of the surrounding communities is still relatively limited. Numbers of users are still somewhat small in relation to the local population, and so is the range of economically significant ICT uses. This is evident from a series of evaluations carried out by CIAT economist Liliana Mosquera from 2001 to 2003.

In late 2001 she conducted user surveys in all three telecenters supported by InforCauca. About a year later, in late 2002 and early 2003, a baseline survey of rural households was carried out in communities around the telecenter operated by Corpotunia. Analysis of the user surveys was completed in 2002, and the baseline survey data were analyzed in mid-2003. At about the same time, follow-up focus group interviews were organized with users of all three telecenters to get a better sense of how the telecenters are affecting users' lives. Corpotunia and its rural beneficiaries are more typical of CIAT clients in general than is the case with the other two telecenters supported by InforCauca, so we focus mainly on this telecenter in reporting on impacts among ICT users in the community.

Results of a telecenter user survey

The main purpose of this study was to characterize telecenter uses and users. It looked at how people draw on both new ICTs as well as other communications media (including letters, telephone, radio, television, newspapers, and magazines) to meet their diverse needs. The idea was to determine how ICTs fit within a broader pattern of media use and to identify potential implications for telecenter impact.

One key point underscored by baseline study results was that telecenter users tended to be fairly young and well educated. At Tunia their average age was 30, and 95% had at least a secondary school education. Telecenter users were thus not representative of the general population but rather constituted a relatively elite group fitting the typical profile of "early technology adopters."

There were no differences between men and women in terms of the availability or quality of services, suggesting that the latter do not necessarily face major barriers in gaining access to ICTs. Nor did users face tradeoffs for financial reasons in deciding whether to use one information source or another. In fact, they were spending more for information from conventional sources than on Internet use. So, among these early Internet adopters, cost is not a barrier to Internet access.

In analyzing uses of new ICTs and other media, the study grouped them into four categories: (1) family communication, (2) general information, (3) personal development, and (4) specialized information. With respect to Internet use, the patterns are quite clear. As indicated in the accompanying table, the great majority of telecenter visitors use the Internet for family communication and for obtaining information that is of general interest or relevant to personal development. They use

other media for those purposes as well, so the Internet complements conventional information sources rather than substituting for them.

Uses of Internet in community telecenters, Colombia, 2001

-	Family communication	20
-	General information (news)	18
-	Personal development (education, employment)	27
-	Combinations of those three	24
-	Specialized information (e.g., technologies)	2
-	Specialized info. in combination with others	9

Significantly for CIAT and other R&D organizations, only about 11% of users sought specialized information related to decisions or activities of economic importance. But then, only 29% of telecenter users said they were obtaining such information from any formal source.

So what are the implications of these findings for community telecenter development? Obviously, if telecenters are to have an economic impact in people's lives, we need to know why so few telecenter users search for specialized information on the Internet or through other formal communications media. Is such information simply not available, or if it is, do users have little faith in its veracity? Are they getting this type of information mainly through family or personal communications in which they have more confidence? Clearly, important challenges are to boost the overall number of telecenter users and to expand the uses of Internet, which does, after all, offer the advantage of being a highly multipurpose resource.

Baseline survey of a telecenter's community

The main purposes of the baseline survey (of 445 households) carried out in late 2002 and early 2003 were to document the extent of telecenter awareness and use in the community, to identify any changes in the pool of telecenter users (in relation to results from the 2001 users survey), and particularly to compare users with nonusers. The survey also allowed us to examine broader information and communication patterns in the community.

Telecenter use at Tunía is still rather low, compared with use of other information sources. Only 25% of the town's population of just under 2,000 have visited the telecenter, even though just over half have heard about it. The figures are far lower for an agricultural community about 20 kilometers away, in which only 8% of the respondents had even heard of the telecenter at Tunía. Fortunately, though, CIPASLA has recently established a new telecenter in that community, which is clearly beyond the reach of the telecenter at Tunía.

Telecenter users are not as educated as the elite early adopters surveyed a year ago, suggesting that the user pool has broadened somewhat. Yet, telecenter users are still significantly better educated than nonusers, and they are also better off in terms of material well-being (i.e., access to electrical appliances, public services, and so forth). In addition, telecenter users are more likely to use, and spend significantly

more money on, other communications media. Users and nonusers do not differ, however, with regard to gender or participation in community activities.

With respect to use of the Internet in seeking economically important information, little has changed since 2001. More than half of the farmers included in the survey, even the few who had used the telecenter, said they got such information from informal sources, chiefly other farmers, while 31% relied on formal sources, such as extension agents, agrochemical company representatives, and printed pamphlets.

The limited importance of the Internet as a source of specialized information could relate to availability and confidence, as suggested in the discussion above of telecenter user survey results. But the baseline community survey points to still another possible explanation. When asked what information might be useful to them in their work, farmers referred generally to technical assistance, training, and other topics, but only 21% were able to identify at least one concrete information need, as indicated in the accompanying table. In contrast, 34% of the students and all of the teachers were able to identify such needs.

Percentage of respondents who identified concrete information needs, Colombia, 2003

Activity/occupation	
Agriculture	20
Business	25
Construction	33
Employees	46
Homemakers	6
Teachers	100
Students	34

These findings are consistent with the predominance of students and teachers among telecenter users. Teachers in particular are willing to pay for Internet use, because they evidently know exactly what information they need and can readily obtain it through the Internet. If community telecenters are to become equally effective as a source of information for farmers and other actors in rural development, then the needs of these people must be defined more concretely, and more must be done to identify or create reliable information sources that are genuinely useful to them.

Particular emphasis should be placed on using ICTs to develop projects aimed at improving public services or creating new employment opportunities. As mentioned above, Corpotunia has been quite successful in that regard. But according to the baseline survey, lessons from the organization's experience have not yet reached the community in general. Only one respondent in Tunia reported using the Internet for project development. The more common sources of information for this purpose are community meetings and leaders. Hopefully, Corpotunia's work with communications groups in local grassroots organizations (described in detail below) will result in more frequent use of the Internet for project development.

The outcomes of the focus group discussions with telecenter users essentially reinforced patterns that are evident from the user and community surveys. Users tend to be younger and better educated than nonusers. And they frequent the telecenter mainly for computer training, to obtain general information (related to school assignments or availability of scholarships, for example), or to communicate with friends and relatives. Cases of individuals obtaining technical or economic information for use in development-related decisions are still scarce.

Even so, the few such cases that exist can be quite instructive. Members of a local association of flower producers, for example, have received training in basic computer software at the telecenter in Tunía. With a view to identifying the requirements for breaking into export markets, a Corpotunía agronomist helped them consult the Web sites of other associations. The group determined that, in order to export their flowers, they would need to improve their infrastructure, meet new demands in terms of product volume and quality, obtain credit, and so forth. Thus, access to information has enabled the group to clarify its vision for the future and to identify specific needs. But this information alone obviously will not enable the group to realize that vision. Other support services are required as well.

Some conclusions about telecenter impacts

Even though use of the telecenter at Corpotunía to obtain specialized information is still limited, this forward-looking organization and the surrounding community have made an important start.

A quarter of the town's population have become telecenter users just a few years since its establishment, and 18% have used Internet. They are proud to have the telecenter in Tunía and are pleased with what they have learned about ICTs. When asked about their own perceptions of the telecenter's impact, 83% of telecenter users (and 66% of nonusers) said it had generated benefits. The predominant telecenter uses—helping children do homework assignments and keeping in touch with friends and relatives—may seem superficial in terms of rural development. But they represent important gains for the townspeople, resulting in significant savings in time and money—a point stressed by many focus group participants.

Moreover, these telecenter uses are feeding the community's hope for a better future. The telecenter is fulfilling many people's desire to learn and to connect themselves with the wider world. The parents of young telecenter users express high expectations that, by learning to use ICTs, their children will gain new opportunities for education and advancement. With continuing support from Corpotunía, the experience of these early telecenter users should provide a solid foundation for further ICT applications that contribute more directly to the achievement of sustainable rural livelihoods.

Apart from this sense of optimism about the future, what specific lessons can we draw from our results on telecenter impacts in organizations and among users in rural communities? Or to pose the question in a different way, what can rural people reasonably expect from a community telecenter?

Clearly, in the early years of telecenter operations, its impacts in terms of sustainable development are most likely to be an indirect result of the improved efficiency and effectiveness that the host organizations gain through the use of ICTs. Presumably, such gains enhance these organizations' performance in helping rural communities develop new sources of income, improve their management of natural resources, and address other important challenges. It will take time and concerted effort, though, before significant development benefits arise from better decisions and actions taken by individual users of telecenter services.

Thus, we should view telecenters, in the first instance, as a strategy for strengthening local organizations and not just as a means of making useful information more readily available to rural communities. That being the case, the financial sustainability of the strategy can depend only in part on income from telecenter services to the public. The more decisive factor in the beginning is the conviction of local organizations that telecenters have a potentially large social value, of which the organizations themselves can be the immediate beneficiaries.

Once a telecenter is up and running, however, it is vital for host organizations to take further steps that enable other groups and individuals to realize the social benefits of ICT use. Only then will users become the mainstay of telecenter sustainability, reducing pressure on the host organization to subsidize telecenter operations.

Local Communications Groups

In search of means by which telecenter host organizations can enhance the direct development impact of ICTs among users in surrounding communities, the InforCom Project embarked in late 2002 and early 2003 on new endeavors that complement our support for the telecenters.

In search of information intermediaries

We believe that one of the keys to enhancing the telecenters' development impact lies in the formation of information or communications intermediaries in rural communities. Telecenters can clearly be an effective means of introducing connectivity and creating basic computer literacy in rural areas. But as our impact data show, many farmers will not have easy access to the telecenter, or will not feel inclined to visit it, or if they do visit, will not necessarily have a concrete idea of their information needs. Moreover, even if they do find information on the Internet that is relevant to their work, this may not generate the confidence needed to translate information into knowledge through experimentation, leading to effective action aimed at solving a specific problem or seizing a new opportunity.

Who, then, can help farmers perform those tasks, serving as a bridge between community telecenters and remote or reluctant users? Our experience with telecenters as well as other CIAT work point to various candidates.

Rural schools are an obvious one. At Tunía we did not find the local vocational school to be an effective host for the telecenter, mainly because school management was reluctant to assume the responsibility. Nonetheless, teachers and students are

among the principal users of the telecenter hosted by Corpotunía, and in this they are strongly supported by parents. What role could schools play in making information more readily available to rural households? Apart from aiding in school work, could this information help address concrete family needs and influence economically important decisions?

Another obvious candidate for the information intermediary role consists of extension officers like those working for Corpotunía. The use of ICTs has apparently better prepared these paraprofessionals to provide farmers with technical assistance. How much scope is there for extensionists to go beyond their conventional role in technology transfer to help identify information needs, use diverse communications media to link farmers with information sources, and foment a culture of knowledge discovery and sharing? And what kinds of training and institutional arrangements would be necessary to bring about such a shift?

Yet another possibility is to form communications groups within or in association with community-based organizations. Consisting of a half dozen to 10 people, these would include members of farm households with a particular interest in using modern ICTs, linked with conventional or traditional communications media, to overcome the isolation of remote rural communities. Gender and equity considerations would weigh heavily in the formation of these groups, so they could serve as a means of including women, indigenous people, rural youth, and other frequently neglected sectors of the population in the development of a local communications capacity.

CIAT experience has shown that farmer groups can learn to carry out valid research and develop successful agroenterprises, thus promoting an experimental and entrepreneurial culture in rural communities. Thus, it should also be possible for groups of farmer-communicators to learn to obtain and share useful information, thus fomenting a local culture of knowledge discovery. If successful, these groups could provide a useful support service to local research and agroenterprise development.

With a view to exploring this last possibility, InforCom has pursued two closely related lines of research over the last year or so.

Groups in grassroots organizations

Under a 1-year project developed by Corpotunía with funds from Colciencias, we are supporting efforts to develop *grupos gestores de comunicación* ("communications groups") within five community-based organizations operating in central Cauca. These are the following:

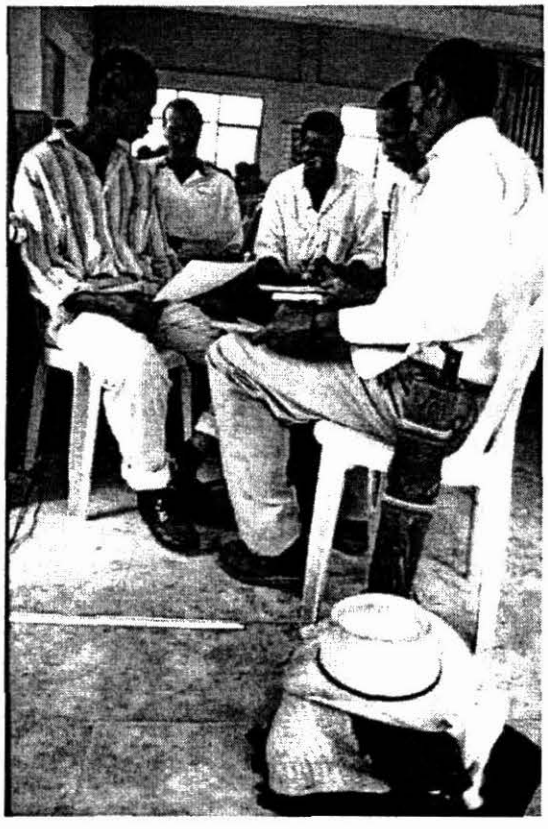
- Asociación de Productores de Frutas y Hortalizas Orgánicas de Silvia, APRAOS (Silvia Association of Organic Fruit and Vegetable Producers)
- Asociación de Beneficiarios de la Subcuenca del Río Cabuyal, ASOBESURCA (Cabuyal River Watershed Beneficiaries Association)
- Asociación de Mujeres de Cajibío, ASOMUCA (Cajibío Women's Association)
- Cabildo Indígena de Honduras (Honduras Indígenous People's Council)
- Junta de Acción Comunal de Tunía (Tunía Community Action Board)

The central aim of the project is to determine whether and how the groups can be trained to build and share—through information acquisition and communication—the knowledge their organizations need to solve specific problems or seize particular opportunities. Toward this end a baseline survey of the five organizations was conducted in early 2003 to characterize them in terms of decision making, principal activities, institutional relationships, role of communications, and use of diverse media. Analysis of the results has not yet been completed.

The groups have received or are undergoing training on the following topics: introduction to communications, organizational strengthening, project planning and development, basic computer programs (covered in large part by Corpotunia's telecenter operator), and the use of diverse communications media. Each of the five groups has designed a project. The idea now is to see how they can use ICTs and other media (such as radio and video) to build the knowledge needed for implementing their projects and to share this knowledge with other members of the organizations.

Community-based groups

In related work, supported initially by IDRC and Rockefeller and currently with InforCom core funds, we have helped form three other groups of farmer-communicators in three municipalities of northern Cauca. Group members are connected with various *panela* (brown sugar) producer associations scattered across the region. The aim is to establish whether and how these groups can acquire the capacity to provide an effective information support service or network for the *panela* industry (as a pilot case) and subsequently for small agroenterprises dealing with the region's other main value-added products.



For this purpose the groups received intensive training over the last year on a variety of topics. In addition, as with the *grupos gestores*, a baseline study was carried out. Unlike those groups, however, members of the three groups described here had not all previously worked together. So, their training initially focused on group organization and networking. The groups next received training in use of the Internet as well as other media, such as radio. They also took part in workshops on graphic design, Web site development, and use of information resources available in the CIAT library. In addition to training, each group received *acompañamiento*, that is, weekly visits from InforCom staff, and occasionally met with the other groups to share experiences.

During recent months the groups have been developing communications work plans, according to which they will perform the following tasks:

- Characterize their main audiences in local communities.
- Publicize the local Information System for Rural Agroenterprise Development (SIDER, see the discussion below), which the groups are helping develop.
- Seek information from local sources as well as the Web that matches the needs of their main audiences.
- Determine current information flows in their communities and identify the main communications media and channels.
- Develop and implement communications strategies for sharing useful information in the SIDER with target audiences through appropriate communications media.
- Define mechanisms for evaluating the impact of these communications strategies.

As the groups progress with their action plans, they are also establishing links with a wide range of local actors, including formal and informal educational institutions, government agencies, NGOs, and communications media. These links are essential for developing a territorial information system or network through which *panela* producers and other local entrepreneurs can construct the knowledge they need to create economically viable and environmentally sustainable agroenterprises.

As a result of our work with different types of groups under diverse circumstances and with different approaches, we expect to develop a generic method for communications group formation. We will then test the approach for its effectiveness in giving rise to "information intermediaries" or "knowledge brokers," who can link telecenter services with specific groups of agricultural information users.

Local Information Systems

Just as groups of farmer-researchers may work in a shared experimental plot, farmer-communicators can jointly build information products. These can provide a focal point for their learning process and eventually the basis for an information support service, which would be offered to the local community, eventually perhaps on a commercial basis.

A central assumption of our work with the communications groups in Cauca is that a locally developed Web-based information system can serve those purposes particularly well. Thus, in 2003 we worked closely with the three communications groups in northern Cauca to develop an on-line SIDER.

Rescuing local knowledge

Why a locally developed information system? Are not international and national organizations better placed and equipped to generate on-line content relevant to users of rural community telecenter? Certainly, these institutions do have an

important role to play, and that is why translating research results into development resources (through e-learning and multimedia products) is the first output of the InforCom Project.

Nonetheless, much of what rural people want to know may already be available locally in the minds of innovative farmers or in the filing cabinets of nearby organizations. The development of a local information system is thus a necessary first step in organizing the rescue of that information, so that it can be accessed more easily in the surrounding communities. In addition to raising awareness of local knowledge, the system might serve to build a sense of pride in this and other local resources. Moreover, once local knowledge is on-line, the information can be shared with R&D organizations. They, in turn, can evaluate this information, add value to it based on other experiences, and give the added-value information back to rural communities through client-oriented electronic publishing.

But why an on-line local information system, given that few producers and processors have access to the Internet and are inclined or able to use it? One compelling reason is that an on-line system can easily be updated, as the communications groups glean new information from both local and distant sources. Another is that, as we have seen in the development of CIAT's own Web site, a relatively complex Web-based system lends itself to decentralized development, so it is a good vehicle for involving group members directly in the process.

In fact, software is now available that makes it possible for individuals to publish information on a Web site without having direct access to the server or even to standard Web-publishing tools; all they need is a Web browser. CIAT's Information Systems Unit (ISU) has recently evaluated one such option—Action Applications, developed by APC. With support from the ISU, we will incorporate the use of ActionApps into the SIDER, which should be on-line by early next year.

To overcome the problem of limited Internet access, the communications groups are being trained, as described above, to analyze and use a wide range of other more conventional or traditional media, such as community radio, printed documents, community assemblies, and so forth. Through these media group members will be able to channel information available in the on-line system to a wide audience in their communities.

Building an agroenterprise information system

What kinds of information will aspiring entrepreneurs obtain through this process and how is that information being collected? The SIDER consists of five components: (1) a price information service, (2) general information resources on agroenterprise development, (3) detailed information about the region's main value-added products, (4) a section including other information about the region (prepared by the communications groups), and (5) an explanation of the SIDER process.

Farmers using the SIDER will find answers to questions such as "where can I sell my product" or "how much should I expect clients to pay?" Both farmers and organizations will find information that helps them improve agroenterprise management and enhance efficiency in adding value to specific tropical products.

The process of gathering all this information has proved to be slow but is now well advanced. Part of the difficulty has been the participatory character of the undertaking. Many of the actors (group members and local organizations) have had to learn new skills and acquire the habit of documentation. The overall procedure consists of the following steps:

- Define collectively the types of information to be included in the SIDER.
- Review the various types of agroenterprise systems developed elsewhere.
- Organize a workshop on Web site development.
- Form a team of persons who participate directly in site development.
- Design the structure or architecture of the site and obtain feedback from group members.
- Develop content and prepare a prototype site showing the structure, design, and system of site navegation.
- Evaluate and adjust the prototype.
- Build mechanisms and capacity for continuous local development of the site.

Development of the price information system is perhaps least advanced. But we have reviewed 26 Web sites of market information systems around the world and sought support from Corporación Colombia Internacional (CCI). As for the general agroenterprise information, we have compiled, in collaboration with local partners, information on sources of financing, agroenterprise organization, support services, and relevant legislation. Working closely with Corpotunía, we are also well along in developing content on specific value-added products, particularly *panela*. The topics covered by this component of the system are as follows:

- ***Production technology:*** Sustainable crop management, integrated pest management, reducing harvest losses, production of improved planting material, calculating production costs, use of inputs, and so forth
- ***Processing technology:*** Storage procedures, processing practices and their costs, quality control, and so forth
- ***Market information and contacts:***
  - Fresh products
  - Processed products (volume, packaging, seasonality, etc.)
  - Instructive experiences in commercialization
  - Alternative markets (e.g., for organic products)

In the future such information will be available for at least six products that have been prioritized by an agroenterprise stakeholder group (of which Corpotunía and CIPASLA are members) in northern and central Cauca. They are dairy products, blackberry, plantains, anthuriums (a tropical flower), cassava, and *panela* (brown sugar).

The work of the groups on more general information about their communities has proved essential for getting them directly involved in site development and for building their sense of ownership of the SIDER. The groups are focusing on topics such as community history and tourist attractions, information that should better enable the SIDER to stimulate a sense of pride in local culture and resources.

As in our work with the various communications groups, we plan to develop a generic procedure for participatory development of local agroenterprise information systems. We will then evaluate the effectiveness and viability of this approach for making relevant content available (through ICTs and other media), both to local entrepreneurs and R&D organizations.

Plans for 2004

Based on the project activities and outcomes presented in this report as well as on new opportunities that have arisen recently, we have tentatively defined the following activities for next year.

- Four e-learning courses will be carried out, covering the following topics: ex-situ conservation of plant genetic resources and gene bank management, three-dimensional participatory mapping, production chains as tools for linking smallholders to markets, and entrepreneurial orientation and market fundamentals.

- Having developed its first multimedia training tool in 2003, InforCom will promote the use of this tool in Latin America, identify suitable topics for further products of this type, and proceed with the development of one or more promising candidates in 2004.

- The project will establish new collaborative arrangements with Colombia's Universidad Nacional, CORPOICA, and other organizations aimed at strengthening the national agricultural information network. A project proposal for this purpose will be developed for consideration by a new World Bank-funded project on rural diversification.

- InforCom will work with other CIAT staff to develop an ICT/knowledge management project for the CGIAR.

- Based on the outcomes of the InforCauca Project, InforCom will consolidate and extend its work with community telecenters and related initiatives in Colombia by expanding its alliance with local partners. Negotiations are already under way, for example, with the Universidad del Cauca.

- As described below under "Resource Mobilization," InforCom will seek to establish "learning alliances" with organizations in selected countries of Central America, the Andean Zone, and East Africa that are exploring the use of ICTs in support of agroenterprise development and related aspects of rural innovation. Efforts in 2004 will follow up on contacts and consultations made this year with CIAT staff and potential partners in those regions. The main purpose of our learning alliances will be to combine CIAT's experience and results with those of partner organizations, with a view to identifying good practices that can be adapted to diverse circumstances. For this purpose collaborative software, called Expertise and developed by CIAT's Information Systems Unit, should prove highly useful.

Annex: InforCom Staff, Partners, and Support Activities

Project Staff

Nathan Russell (50%), Project Manager and Head, Communications Unit (CU)
Edith Hesse (30%), Head, Information and Documentation Unit (IDU)
Dora Patricia Arévalo, Research Assistant
Rebeca Bolaños (30%), Secretary
David Brand, Economist
Eduardo Figueroa (50%), Training Specialist
Jorge Gallego (25%), Systems Engineer
Luz Marina Gómez, Research Assistant
Odilia Mayorga, Research Assistant
Mariano Mejía (30%), Library Public Service Coordinator
Erika Mosquera, Communications Student
Liliana Mosquera, Economist
Olga Patricia Paz, Research Assistant (left during the year)
Silvia Andrea Pérez, Communications Assistant
Martha Cecilia Sarria, Community Facilitator
Simone Staiger (25%), Web Publishing Coordinator
Diana Paola Valero (25%), Graphic Designer

Note: Staff for whom no percentage is indicated worked full-time for InforCom.

Project Partners

- Asociación de Cabildos Indígenas del Norte del Cauca (ACIN), Santander de Quilichao, Cauca, Colombia
- Association for Progressive Communication (APC), through Colnodo (NGO), Bogotá, Colombia
- Consorcio Interinstitucional para una Agricultura Sostenible en Laderas (CIPASLA), Caldono, Cauca, Colombia
- Corporación Colombiana de Investigación Agropecuaria (CORPOICA)
- Corporación para el Desarrollo de Tunía (Corpotunía), Piendamó, Cauca, Colombia
- Corporación Universitaria Autónoma de Occidente (CUAO), Cali, Colombia
- Fundación Chasquinet, Quito, Ecuador
- International Plant Genetic Resources Institute (IPGRI), Office for the Americas, Colombia
- Red de Instituciones Vinculadas a la Capacitación en Economía y Políticas Agrícolas en América Latina y el Caribe (REDCAPA), Brazil
- Universidad Nacional, Colombia

Note: Within CIAT, InforCom collaborated actively with the Rural Agroenterprise Development and Impact Assessment Projects in research on telecenters, communications groups, and local information systems. Work on e-learning was done in collaboration with the Genetic Resources, Rural Agroenterprise, and Land Use Projects.

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- Russell, N. 2003. Is there an "e" in scaling up? Lessons from a community telecenter in southwestern Colombia. *In*: Pachico, D. (ed.). Scaling up and out: Achieving widespread impact through agricultural research. Centro Internacional de Agricultura Tropical (CIAT), Cali, Colombia. (In press)

In addition, InforCom staff supported the development by a local partner (CUAO) of an approximately 20-minute documentary video dealing with the educational potential of community telecenters. The video will be presented in November at the Segundo Festival Educativo y Cultural in Madrid, Spain.

Project staff also made three formal presentations of InforCom at various symposia in Colombia and four informal presentations to potential local partners or supporters in Colombia, including the country's first lady, Doña Lina de Uribe.

Training Courses

- Three workshops on accessing electronic sources of agricultural information at Colombia's Universidad Nacional-Palmira, CUAO, and CORPOICA.
- Two training workshops for telecenter operators and other staff of local partner organizations in Colombia, one on basic graphic design and another on agricultural information resources relevant to rural communities.
- A workshop on how to use controlled vocabulary for better access to Web-based resources for information managers in CIAT projects.
- Several training workshops for members of community-based communications groups on the following topics: introduction to communications, group organization, organizational communications, formation of social networks, project planning and design, basic computer programs, use of various communications media (e.g., radio, video, and printed products), Web site development, and design and implementation of communications strategies.

Workshops

- Organized and hosted Colombia's Second National Community Telecenters Workshop at CIAT headquarters (80 participants).
- Participated in the Second Regional Telecenter Workshop, organized by the Fundación Chasquinet at Quito, Ecuador.
- With REDCAPA organized a workshop on computer-mediated distance learning for CIAT staff and selected partners.
- Organized the participation of Colombian telecenter operators in these events:
  - Workshop on Support Networks for Indigenous Peoples of the Americas in the framework of the II Annual National Forum on Connectivity for Canadians at Ottawa, Canada.
  - VI Taller de Redes Internet para América Latina y el Caribe in Mérida, Venezuela.
  - Conéctate, Primer Encuentro de Informática de los Niños y Niñas de Colombia, in Bogotá, Colombia.

Students

A communications student at the CUAO is carrying out a practicum, in which she provides communications support the above-mentioned SIDER.

Assistance

InforCom staff provided weekly assistance to three community telecenters, based on telecenter work plans, as well as on-site training in Web site development. They also made nearly weekly visits in support of a total of eight community-based communications groups in northern and central Cauca, with a combined membership of more than 80 people.

Planning for Rural Development

CIAT's work on planning for rural development was provisionally attached to the InforCom Project in 2003, pending a final decision about how exactly the former will be integrated into the Rural Innovation Institute. For that reason the following annual report on planning is presented here with the report on InforCom.

Abstract

This section addresses how territorial entities and community-based organizations can use planning as a mechanism for rural development, and how scientists and information providers can use planning as an entry point into development. This work began in 1999 as the "Land Use" component of the agreement between CIAT and the Ministry of Agriculture and Rural Development (MADR, the Spanish acronym), and this year has seen the addition of case studies in Bolivia, Peru, and Senegal. We aim at facilitating the use of information by local stakeholders for the management of their natural resources by providing methods and tools, documented examples of planning, and principles (or insight) that can help successful planning and the efficient use of information. These are developed through case studies in specific locations, and are then diffused through training events, seminars, reports, and publications, as well as through the CIAT Web page. This year in Colombia, the prototypes of a series of decision support tools were "launched" and made available through the CIAT Web page. They will continue to be co-developed with users in Colombia. Following CIAT's restructuring, this group was placed in the new project "Information for Rural Communities (InforCom)", under the Rural Innovation Institute.

Introduction

We are aiming at validating a series of hypotheses on why certain approaches work better than others, why planning simply does not work in certain circumstances, and why information is seldom used for decision making. This research component, which we had previously approached by trial and error through development applications, is just beginning to emerge more formally.

Scientists and information providers can use planning as an "entry point" to rural development

Planning is part of the coordination and management process of any individual, group, or organization. In some cases, the law requires official planning mechanisms, which makes them less appealing, but turns them into a predictable process to which scientists and information providers can link. Decentralized countries are divided into a hierarchic arrangement of "territorial entities" that are responsible for coordinating development activities and resources over their entire territory, both urban and rural. These entities are obliged to conduct regular planning exercises, supported with monitoring and evaluation. Although these exercises are often perceived as bureaucratic requirements, and are not sufficiently taken advantage of, they are extremely valuable mechanisms to coordinate the various players of rural development. Local groups and administrations can make

good use of planning if they are proactive, and approach the exercises with a learning attitude, where local actors consider the different actions they (and others) have to conduct to reach a desired future.

During planning, monitoring, and evaluation, participants have to determine their desired situation, and periodically evaluate and compare it with their present one. They then have to consider different possible actions that they can put forward to get closer to the desired conditions, and determine what contributions are needed from outside. When they make decisions, they are actually making hypotheses about what should work best, and they can validate these through monitoring and evaluation. Indeed, as they go along, they observe the consequences of their decisions and actions, and eventually adjust their plans, learning in the process. Planning groups can benefit from the input of scientists, experts, and information to better evaluate their situation and their context, to broaden their range of possible options, to explore their long-term implications, and eventually to choose between them. Scientists and information providers can benefit from these exercises to put their knowledge to work, and to better focus their research and data collection regarding the needs of rural development processes. They can even work on testing local hypotheses with local groups. To participate in local development, they need not necessarily participate actively in the meetings of local groups, but can be linked to them through information communication technologies (ICTs).

Planning as a research theme in itself

The systems approach to planning that we are promoting is not something fundamentally new, as many aspects of rural development have been approached systematically for decades. However, we have some research hypotheses that we want to verify through our case studies:

- Planning, where groups engage in a continuous process of diagnosis, action planning, and monitoring and evaluation, can greatly improve local learning, rural innovation, and the capacity of rural populations to adapt to adverse or changing conditions (this can seem obvious, but considering how few consistent processes of planning are being implemented, we think this hypothesis is worth demonstrating).

- Many of the obstacles related to planning and politics result from an inadequate sense of responsibility on the part of leaders and citizens, or are related to counterproductive logic, such as looking at issues with a "winners and losers" perspective, being obsessed with growth (either economical, social, or emotional) at the detriment of the group's well-being, the quest for quick and easy gain, a dependence on assistance, or a focus that is too short term or too restricted to certain economic sectors. These can be strongly moderated by adopting a logic of progression towards long-term and collective goals. This logic can be developed in planning workshops where participants discuss their desired future conditions, their possible contributions, and the contribution they need from other players (or requests).

- During diagnosis, monitoring, and evaluation, information is not used optimally if participants and planners do not have a clear idea of their desired

future conditions. Clearly stating these allows indicators to be defined, and allows a reference with which to compare observed conditions. In their absence, diagnosis and monitoring remain purely descriptive, not allowing judgment, and thus reducing the possibilities of learning in the process, and data can be accumulated without ever being used for decision making.

- Different hierarchic levels of territorial administration can improve the coordination of their development efforts by articulating various "contributions" and "requests" of the players from one level to the next, from the bottom up. This approach can be used in the articulation of municipal plans at departmental level, and of departmental plans at national level.

Context of the development of research activities on planning in CIAT

This work began in 1999 with the contribution of the Land Use project to the agreement between CIAT and MADR. We wanted to put geographical information and decision support tools (DSTs) at the service of decision makers so they could improve the rationality of land use. Planning mechanisms, required from all administrative levels, and that can also be implemented at the village level, appeared as our best entry point, for the reasons mentioned above. Through our case studies in Colombia, described in more detail later, we observed that the potential of planning is often not well taken advantage of, neither as a learning and development tool, nor as an entry point by scientists and information providers. We realized that planning processes could be improved greatly, not so much by the use of specific methods, but by a change in the approach and logics behind the activity. In addition to continuing to work on how geographical information could be used in planning, and how scientific results could be made into DSTs and also used in planning, we started looking at ways to improve the planning processes themselves. Our Colombian case study spurred interest, and we received much demand for training on territorial planning, in which we needed to give recommendations to participants. This encouraged us to reflect on ways to improve planning, and we are presently promoting a systems approach to planning, based on the consideration of society as a system, interrelated with biophysical systems, organized hierarchically. We have developed a very simple participatory planning approach that allows municipalities to quickly articulate visions, proposed actions, and requests of different stakeholder groups (Beaulieu et al., 2000; 2002), and that departments could use to articulate municipal plans. We have also become interested on how planning processes can catalyze and facilitate learning and rural innovation. This team therefore joined the InforCom project in 2003, while continuing to contribute to some outputs of the Land Use project.

In 2003, we began case studies in other countries—Bolivia, Peru, and Senegal. Our partners in these countries have a strong interest in revising existing planning guidelines to improve planning processes. We are therefore continuing our reflections on these methodological issues with a much larger range of partners and cultural contexts. The work in Peru was initiated through an alliance with the German Agency for Technical Cooperation (GTZ) and CONDESAN, who were interested in applying some of our methods, jointly with theirs, in some of the pilot watersheds of the CONDESAN consortium. The work in Bolivia has resulted from the hosting of Hubert Mazurek, a scientist from IRD, in the InforCom project. The

work in Senegal is conducted in relation with the Desert Margins Program (DMP), and involved the posting of Nathalie Beaulieu in Dakar. These case studies will be described in more detail below, but it is important to mention that, through them, we have agreed to follow a coherent research agenda, where the studies in different countries will contribute to our understanding of how rural development can be improved, and help us demonstrate some basic hypotheses.

Our work in Colombia will continue through a new agreement with MADR, and will be oriented more specifically towards improving the efficiency of rural technical assistance through municipal planning in the entire country, and through follow-up in coordination at the department level. As the 1999-2003 agreement is presently finishing, this year involved concluding and launching the various DSTs prepared for the Colombian llanos.

Through case studies in Colombia, Bolivia, Peru, and Senegal, we will test the research hypotheses mentioned above, develop documented examples that can be helpful in other sites, and develop methods and tools for rural planning. The experience acquired in these case studies is then communicated to others during training, and in reports and publications. Note that we are not studying planning as an end in itself, but as a mechanism allowing collective learning and organization for rural development.

Colombia

Contributors: Jaime Jaramillo, Rogelio Pineda, Adriana Fajardo, Nathalie Beaulieu, Marcela Quintero, Ovidio Muñoz, Yolanda Rubiano, Maria Fernanda Jiménez; Diana Maria Pino (Secretary of Planning, Municipality of Puerto López); Noemi Peñuela (Director, Puerto López Unidad Municipal de Asistencia Técnica Agropecuaria [UMATA]); Wilson Gaitán (SN-1); Fernando Calle (Consorcio Latinoamericano y del Caribe para la Investigación y el Desarrollo de la Yuca [CLAYUCA]); Clément Geney (Université Montpellier II)

Materials and methods

The Colombian MADR funds work in Colombia. The area chosen by the MADR for its 1999-2003 agreement with CIAT was the Colombian llanos, or eastern plains, with a particular interest in the area between the cities of Puerto López and Puerto Gaitán, previously dominated by livestock, but with potential for new crop varieties that are tolerant to acid soils. Municipal planning appeared the best mechanism to make use of the geographic information that had already been digitized by the Land Use project, and to have a concrete influence on land use decisions. Incidentally, all municipalities in Colombia were under the pressure of producing their *Plan de Ordenamiento Territorial* (POT), a new, long-term, spatialized planning exercise that they had never experienced before. We supported the administration of the municipality of Puerto López, which almost reaches the city of Puerto Gaitán, in the elaboration of their *Plan Básico de Ordenamiento Territorial* (PBOT; Alcaldía de Puerto López-CIAT, 2000). This experience triggered an important demand for training in planning methodology and GIS tools, to which we responded with a number of courses given from 2000 to 2002. We then supported the municipality in

the elaboration of its *Plan de Desarrollo Municipal* (PMD) in 2002 (Alcaldía de Puerto López-CIAT, 2002).

Understanding the importance of the contributions of all administrative levels, we have designed our activities to support decisions at the national, regional, departmental, municipal, and village levels, although until now we have worked mostly at the municipal and village level. Through the logistic support of local projects related to cassava, we realized that planning workshops and follow-up at the village level, which were conducted for municipal planning, helped develop new partnerships between local groups, the municipality, the municipal unit of agricultural technical assistance, researchers, and private industry. In Colombia, municipalities are responsible for providing free technical assistance to small-scale farmers, and thus of planning this assistance with the beneficiaries, through a municipal committee of rural development. In Puerto López, the various committees formed to follow up on specific aspects of the municipal plans (local emergencies, territorial planning, sports, rural development, etc.) were combined into one committee that holds more frequent meetings for the follow-up of activities, and has the possibility of articulating activities that affect various sectors.

Results

The highlights of the Puerto López case study for this year are:

- A multi-sectoral committee of the civil society, with our support, is conducting follow-up of the municipal PBOT and PMD, using the SEGUIMIENTO tool, presented later.
- With the UMATA of Puerto López, we are continuously following up planning meetings in communities, and have supported various initiatives.
- A cassava drying trial, conducted in 2002, led to the adoption of this practice in the village of El Turpial, the commercialization of dry cassava with animal feed factories, and the funding of a drying facility by the municipal administration.
- Cassava variety trials were conducted in five of the rural communities, jointly between farmers and CIAT's cassava project.
- The indigenous communities of Humapo and La Victoria constructed a tree reproduction greenhouse, and have begun producing small trees for the reforestation of their reserve and for commercialization.
- A poster was presented at the Global Forum on Agricultural Research (GFAR) meeting in Dakar, May 2003, explaining how municipal planning catalyzed local innovation and partnerships related to the cassava crop (CIAT, 2003).
- With MADR, we have identified specific contributions of rural planning for the next phase of the agreement with CIAT, oriented towards improving the efficiency and relevance of rural technical assistance, through municipal planning and monitoring, as well as monitoring at the department level.

Bolivia

Contributors: Hubert Mazurek (IRD, UMR-151, hosted in CIAT); Louis Arréghini (IRD); Ismael Gonzáles (Dirección General de Ordenamiento Territorial, Vice Ministerio de Planificación y Desarrollo Sostenible [VMPDS]); René Pereira, Jaime Montano, Hugo Torrez (Consejo de Población [CODEPO], VMPDS); Andrés Uzeda (Universidad Mayor de San Simón-Instituto de Estudios Socio Económicos [IESE]); Fernando Antezana (Universidad Mayor de San Simón-Centro de Planificación y Gestión [CEPLAG]); Marcel Galindo, Miguel Peñaranda (Instituto Nacional de Estadística [INE])

Materials and methods

Our work in Bolivia is funded by IRD UMR-151, CIAT, and the Bolivian Vice Ministerio de Planificación. Since 1994, the Bolivian laws of popular participation and decentralization have provided municipalities with responsibilities and financial resources to administer their territory. Territorial planning as such is the object of a normative and methodological framework defined by the *Dirección general del Ordenamiento Territorial* (OT). Since 1996, departmental administrations have elaborated land use plans (Planes de Uso del Suelo [PLUS]), which represent an agro-ecological zoning, but lack relevance for the planning and elaboration of development policy. Very recently, a few municipalities have started the same process. However, most of these plans are elaborated by external organizations or consultants, and are not effectively used, on the one hand because they do not correspond to the needs of populations, and on the other hand because municipal technicians find them difficult to understand. In addition to this, the methodology used for the OT plans is based almost exclusively on biophysical parameters used to establish a balance of the use of the land's potential. Our work in Bolivia therefore aims at engaging a learning process, within the institutions in charge of planning, about participatory planning. In addition to this, we aim to develop, jointly with these institutions, a set of regionally adaptable guidelines for participatory territorial planning that can be used for municipalities, groups of municipalities (*mancommunidades*), or departments to articulate their activities in the various economical sectors, as well as to integrate local and regional development projects.

Methodological collaborations have been initiated with the *Dirección del* OT (much oriented towards biophysical considerations), and CODEPO (which establishes demographic policies), INE, the Ministry of Agriculture, and institutions of the Sistema Boliviano de Transferencia Agropecuaria (SIBTA). As explained in the introduction, the case studies are conducted to ensure that the proposed guidelines are adapted to the Bolivian context, and contrasted sites were chosen to allow Bolivian diversity to be taken into account. Like in the other countries, these case studies will also yield examples that will be communicated throughout Bolivia, and are providing opportunities to test our research hypotheses.

Results

In Bolivia, the highlights of our activities for this year are:

- Three groups of municipalities (four in the *Altiplano* south of La Paz, four in the department of Pando, and one in the department of Cochabamba) were chosen for pilot study sites. Initiation workshops were conducted in two municipalities, which signed an agreement of engagement (with the *Dirección del* OT) to conduct participatory planning. Meetings with mayors of the other municipalities were conducted, in September 2003, in which we jointly agreed to start the planning processes in March 2004. General Agreements between the *Dirección del* OT, CIAT, and municipalities should be signed before the end of 2003.
- A collaborative agreement was drafted between CIAT / IRD, the *Dirección del* OT, CODEPO, and INE to define respective roles in the collaborations under way.
- We are currently reviewing the methodology used by the Bolivian government for territorial planning to include many more socioeconomic aspects and participatory practices.
- We participated in the teaching of courses of the Masters degree in Rural Development of the Universidad San Simón de Cochabamba, and in the directorship of three Masters theses on rural innovation.
- On the 29th and 30th of September 2003, we organized a seminar on stakeholders, territory and local development, where we analyzed the progress of local development planning in different regions of Bolivia, in the context of the 50th anniversary of the agrarian reform.
- We organized a statistical cartography course at the end of October 2003, for technical staff working in the organizations with a role in public planning.

Peru

Contributors: Marcela Quintero; Wilson Otero (GTZ-Colombia); Rubén Darío Estrada (Centro Internacional de la Papa [CIP]-CONDESAN); Alonso Moreno (GTZ-Proyecto Cuencas Andinas); Josef Haider (GTZ-Corporación Para la Seguridad Alimentaria [COPASA] Arequipa)

Materials and methods

Work in Peru is funded by GTZ-Peru. In May 2003, The Peruvian Congress approved the new municipalities law, the *Ley Orgánica de Municipalidades*, defining the responsibilities of municipalities, which can either be provinces or districts. One responsibility is to promote the integral, sustainable, and harmonious development of the municipality's circumscription, with the help of a local planning process that must be integral, permanent, and participatory, and coordinated with the regional and national levels of government. A variety of sectoral and multi-sectoral plans are required regularly from municipalities. Multi-sectoral plans include the *Plan de Desarrollo* as well as the *Plan Urbano Rural* (for districts), and the *Plan de Acondicionamiento Territorial* (for provinces). Each year, municipalities have to plan their budget through a participatory process, resulting in the *presupuesto participativo*.

Through an alliance with CONDESAN and GTZ, we agreed to give support to GTZ in Peru for the implementation of territorial plans, and at the same time participate in these experiences as case studies. We jointly decided to begin this collaborative work in the region of Arequipa to benefit from links with projects such as the *Gestión de Riesgo de Desastres Naturales con Enfoque de Seguridad Alimentaria en el Departamento de Arequipa* (executed by COPASA-GTZ), *Cuencas Andinas*, and CONDESAN, which is active in the region. The district of Pampacolca was chosen as a pilot site for the elaboration of the *Plan Urbano Rural*. Before starting actual work in the pilot site, we agreed to jointly organize a course on territorial planning directed to some of the institutions of the regional government of Arequipa and of the district of Pampacolca, to members of universities and NGOs of the region, and to GTZ staff in Peru. We agreed also to organize a workshop on the importance of territorial planning, involving decision makers of the districts, provinces, and regional government of Arequipa. These workshops were conducted in September this year.

Results

The highlights of our work in Peru for this year are:

- We conducted field visits in the districts where GTZ-COPASA intervene, to become acquainted with their development plans, and the problems they have experienced.
- We conducted the workshop/seminar entitled "Bases para la Formulación de Planes de Ordenamiento Territorial", in Arequipa, from 8 to 14 September 2003, including a practical component in the district of Pampacocla.
- We conducted the workshop/seminar entitled "Planes de Ordenamiento Territorial como herramienta de gestión del espacio en Arequipa" on September 16th in Arequipa.
- CIAT and GTZ-Colombia are assisting GTZ-Peru in the writing of terms of reference for the elaboration of a pilot territorial plan in the district of Pampacocla.

Senegal

Contributors: Nathalie Beaulieu; Abdourahmane Tamba (Institut Sénégalais de recherches agricoles [ISRA], DMP National Coordinator for Senegal); Ibrahima Diaïté (ISRA, Bambey); Samba Ndiaye (ISRA-Consejo Nacional de Recursos Hidricos [CNRH]); Jean Charles Faye (Agence nationale de conseil agricole et rurale [ANCAR], Thies); Oumar Daff, (Direction des eaux et forêts); Aline Ndiaye, Khady Sow (ANCAR); André Bationo (TSBF); Ramadjita Tabo (DMP Regional Coordinator, ICRISAT), Saidou Koala (overall DMP Coordinator, International Crops Research Institute for the Semi-Arid Tropics [ICRISAT])

Rationale

Work in Senegal is funded by GEF. As previously mentioned, our work in Senegal is made possible by the hosting of Nathalie Beaulieu at ISRA, and her inclusion in the DMP team. The DMP is not a project on territorial planning, but is a project that

aims at improving rural livelihoods through the improvement of biodiversity and soil fertility. One of its objectives is to improve knowledge on the existence and management of this biodiversity and soil fertility. It started in 2003 and works in nine sub-Saharan countries—Senegal, Niger, Mali, Burkina Faso, Namibia, Kenya, South Africa, Zimbabwe, and Botswana. Two of its outputs are entitled "stakeholder participation" and "capacity building". In Senegal, planning (including monitoring and evaluation) is the mechanism that has been chosen for their implementation. All of the activities of the DMP in Senegal will be conducted at the level of the rural community, but with strong linkages with the higher administrative levels, which are municipalities (either *arrondissements* or *communes*), departments, and regions, as well as with a network of resource persons (rural extension agents and scientists). A rural community can include various villages. As prescribed by the Law on Decentralization, rural communities must conduct and follow up local development plans.

Materials and methods

The Senegalese component of the DMP is focused, for the first 2-year phase, in four regions of the country—Kaolak, Diourbel, Fatik, and Thiès. In each region, it will work in about four rural communities, which are therefore the pilot communities for the case studies on planning as a rural development tool. At present, because the program has only recently begun in Senegal, we have only established links with the rural communities and other partners, through visits and workshops in the regional capitals and rural communities.

Results

The highlights of our activities in Senegal for this year are:

- An agreement was made with ISRA for CIAT to contribute to the Senegalese component of the DMP through the out-posting of Nathalie Beaulieu at ISRA in Dakar, starting September 2003.
- Several meetings were conducted with regional and local partners to discuss study sites and methodologies used for common outputs on local stakeholder participation, capacity building, and monitoring of land degradation. Study sites were visited.
- Four Regional Development Council (CRD, the French acronym) meetings were held in the "*gouvernance*" (regional parliament) of the studied regions, with the participation of regional, departmental, and local authorities.

Methods and Information Tools Developed for Rural Planning

A series of tools and methods were "launched" this year as a result of the 1999-2003 Agreement with the Colombian Ministry of Agriculture and Rural Development. The preliminary development of most of these tools was reported in previous annual reports of CIAT's Land Use project. We expect to continue adapting and co-developing them with partners though extensive training and follow-up in Colombia, and through our work in the various case studies mentioned above. We detail below the function of each tool, and explain what has been achieved this year.

Participatory systems approach to planning an *Herramienta de Planificación Participativa* (HePP)

Contributors: Nathalie Beaulieu, *Jaime* Jaramillo, Genner Narváez, Juan Lucas Restrepo, Jorge Mario Diaz; Grégoire Leclerc (CIRAD-Département territoires, environnement et acteurs [TERA])

In 2000, we presented a participatory planning method that could be used for municipal planning, and to articulate municipal plans into departmental ones (Beaulieu et al, 2000). In 2001, we elaborated a computerized tool that allowed users to store their results in a database, and use them as a "draft" for discussion with the Intelligent Team Decision Assistant (ITDEA) discussion support tool (Leclerc and Narváez, 2001). This tool was "launched" as a prototype this year, along with the other, hoping to further improve it with partners. We realized that this method, although complete in its consideration of the steps of the planning process, was too long and complicated to use for many municipalities. In 2001, we tried to derive its essence, and came out with a simplified version, entitled "Visions, actions and requests across administrative levels", which we tested in Puerto López for the elaboration of the municipal development plan (Beaulieu et al., 2002).

This year, we presented a more general systems approach to planning in Beaulieu et al. (2004), and in didactic form and in Spanish for rural communities in Beaulieu et al. (2003). We continue to promote the visions-actions-requests as part of this general approach. The systems approach to planning encourages players to acknowledge the systematic nature of society and its environment, to realize how the groups they are part of are part of larger groups, and for leaders to understand which other systems are components that they are coordinating. It encourages players to reflect on their long-term goals (or desired future conditions), how they fit in with the goals of the systems of which they are part, and, if they are leaders, how the goals of the components contribute to the goals of the level they coordinate. It aims at:

- Encouraging a greater sense of responsibility in citizens as well as leaders, through the concept of 360° responsibility, by acknowledging that coordinators of each level have responsibilities towards the levels below, the levels above, the other systems of the same level, in addition to ensuring the perpetuation (and eventually the growth) of the system they represent.
- Improving interactions between players by finding complementarity between their actions, matching the actions of some players with the requests of others.
- Reinforcing self-correction and learning through continuous planning, monitoring, and evaluation, rather than perceiving the latter as mechanisms of control from above.
- Improving communication and the use of information by identifying the different feedback loops needed to effectively monitor and evaluate as well as to make decisions, and by identifying desired future conditions to use as a reference in diagnostics.

The obstacles to planning are often not so much methodological, but related to counterproductive mindsets. A logic of "winners and losers" often underlies political activities, where the goal of winning the election overthrows development goals.

Other counter-productive mindsets include the obsession for maintenance and growth, which also overthrows development goals, as well as the culture of quick and easy gain. These can be moderated by an increased sense of responsibility (in the 360° directions), and by a longer-term vision of where we want our system to go, which can be encouraged by the use of vision-based planning methods.

CUFRUCOL (Cultivos y Frutas para Colombia)

Contributors: Adriana Fajardo, Maria Fernanda Jiménez, Genner Narváez, Nathalie Beaulieu; Libardo Rivas (BP-1)

The CUFRUCOL database was developed and reported in the PE-4 2001 Annual Report. It stores information on botanical characteristics of crops, their biophysical requirements, and production costs. It allows input of data into GIS DSTs, such as CLIMCROP, and it allows the printing of illustrated and informative cards for participatory discussion of crop options with farmers. Since 2001, it has been improved, and data have been added.

Data about botanical characteristics, biophysical requirements, and production costs were compiled for 120 crops of interest for Colombia, including grains, forages, fruits, and vegetables. These data were stored in a database in Microsoft Access format. When possible, data were taken from Colombian sources, and when unavailable, biophysical requirements were taken from the ECOCROP database developed by FAO. Users can also input their own data into the database, if they dispose of local data or data relative to specific varieties. They can also add new entries on crops not yet considered, or on combined production systems.

This database was designed to be flexible and useful for a variety of users. If adequately distributed, farmers could consult it at UMATAs. It could be used by UMATA agents themselves to help farmers plan production projects that combine a variety of crops, and to make economic evaluations of different scenarios. This will help farmers plan more sustainable production projects, and will help them present well-documented projects for credits or for anticipated purchase contracts. Through the use of this tool, we aim at increasing the capacity of municipal institutions to provide technical assistance to farmers, and of farmers to access information. The distribution of this tool will be accompanied by training and notes on the importance of using this information for preliminary indications only, giving priority to local information and common sense in planning agricultural projects.

GEOSOIL

Contributors: Yolanda Rubiano; Edgar Amézquita (PE-2); Dimas Malagon (Universidad Nacional); Soil group of Corporación Colombiana de Investigación Agropecuária (CORPOICA) Regional 8

GEOSOIL is a database tool that allows the storage of soil information for soil profiles or for soils represented in a soil map. For each new entry, it allows the user to enter the physical and chemical data that are available, without obliging the user to fill in all the fields. For soil characteristics that are not numerical, for example for texture or landforms, it allows the user to choose from a range of options, coding the

choices in the process. For a number of soil properties that can be used as indicators of soil quality, it produces a report of a diagnosis, using criteria established for the Colombian llanos. It allows the comparison of soil characteristics with the requirements of a given crop and, when the necessary, chemical information is available, can produce a report of fertilization recommendations. The soil requirements can be imported from the CUFRUCOL database, or the user can specify them. It allows the export of soil data and corresponding geographic coordinates to GIS programs for their mapping, or to geostatistical programs for an analysis of spatial variability and interpolation. The preliminary developments of this tool were presented in the 2002 PE-4 Annual Report.

This year, the application of this database was completed with 1:100 000-scale soil map data for the municipality of Puerto López, generously provided by the Instituto Geográfico Agustin Codazzi (IGAC) for research purposes, extracted from the detailed agrological study for the department of Meta (IGAC, 2000). More detailed data were stored for a portion of this area, resulting from field measurements and characterization of soil samples in a portion of the municipalities, around the villages of El Turpial, Humapo, La Victoria, and Puerto Guadalupe. A geostatistical analysis was made with these point data, and raster maps of a number of soil characteristics were derived by interpolation with a krieging approach. Figure 1 shows the result of this analysis for soil penetrability. The application for Puerto López was shared with CORPOICA, but an empty structured database (which can be filled with data from other sites) is made available to the public through the CIAT Web page. A users' manual and a help module were also developed this year. Figure 2 shows two of the displays of the database tool, regarding the comparison of soil characteristics with specific crop requirements.

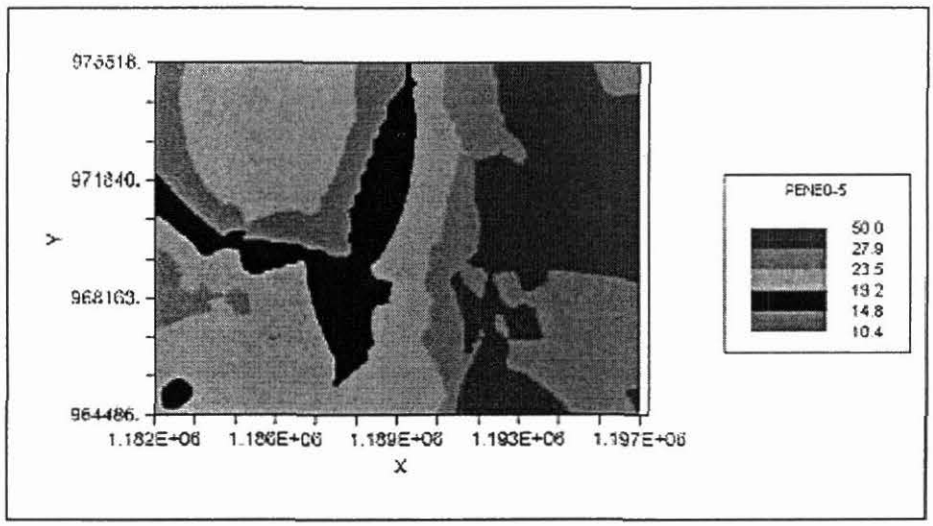

Figure 1. Map of soil penetrability isolines obtained with the GS+ geostatistical software, using field measurements in a portion of the municipality of Puerto López.

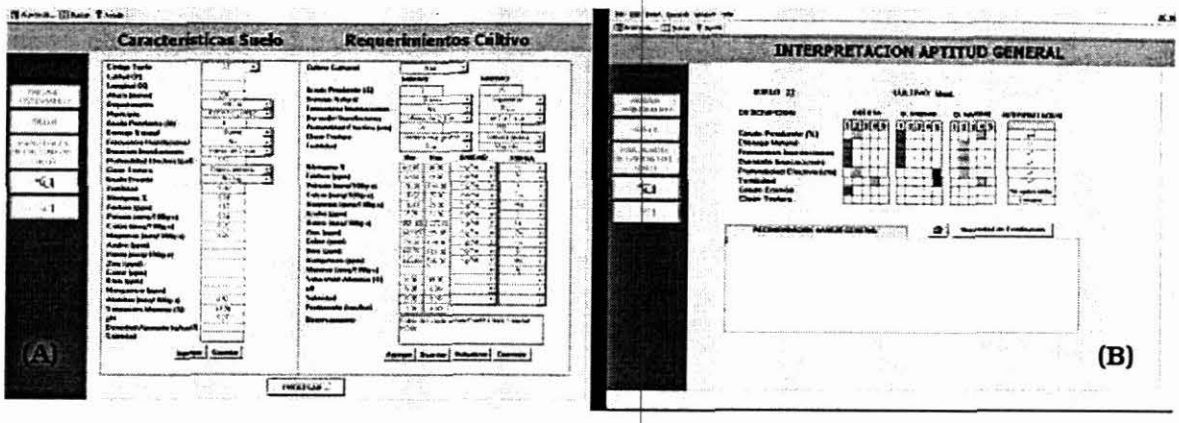

Figure 2. (A) Comparison of soil characteristics for a given soil, with the requirements of a given crop; and (B) interpretation of this comparison through a graphic display of where the coded soil characteristics stand with respect to the minimum and maximum characteristics specified in the soil requirements.

ARBOLES

Contributors: Marcela Quintero, Yolanda Rubiano, Edgar Amézquita, Phanor Hoyos (PE-2), Nathalie Beaulieu

ARBOLES is a DST that indicates land use alternatives that are most appropriate or sustainable regarding soil and topography characteristics, based on a decision tree constructed from technical and local knowledge in a given locality. It has been elaborated with Microsoft Access 2000 database software, with which the decision rules were programmed in Visual Basic. Decision rules can be applied on soil and topography characteristics specified by the user for a given location, or on the characteristics stored in a table corresponding to the polygons in a soil map. In our application for the municipality of Puerto López, we used the decision tree elaborated by Hoyos et al. (2001), and digital soil coverage elaborated by combining 1:100 000 scale soil maps from IGAC (1978) and IGAC (2000).

If the user specifies the soil and topography characteristics, the application presents a menu of soil textures and ranges of slope and effective soil depth from which to choose. As a result of the application of the decision tree, the tool proposes a range of possible land uses, the number of options increasing as soil depth increases and slope decreases. Practices for the generation of an arable layer are proposed in cases where the soil depth is low. To use a soil map and then spatialize the results in GIS software, soil and slope characteristics were coded according to the values used in the decision tree. The polygons in soil maps generally correspond to groups of soils that can have different characteristics. The percentage that each soil represents in the polygon is indicated in the tables accompanying the maps. Because there a range of different land uses is suitable for each soil type, the results of the analysis are best displayed through a series of maps, one for each land use option, where the polygons are colored according to the percentage of soil which is suitable for that option. We linked the ARBOLES application for Puerto López to both the SPRING and MapMaker Popular GIS packages. We elaborated a customized application of MapMaker for Puerto Lopez Popular with all the maps resulting from

the analysis of the soil maps, for each of the 13 land use options considered. Figure 3 shows one of the displays of this customized application for Puerto López.

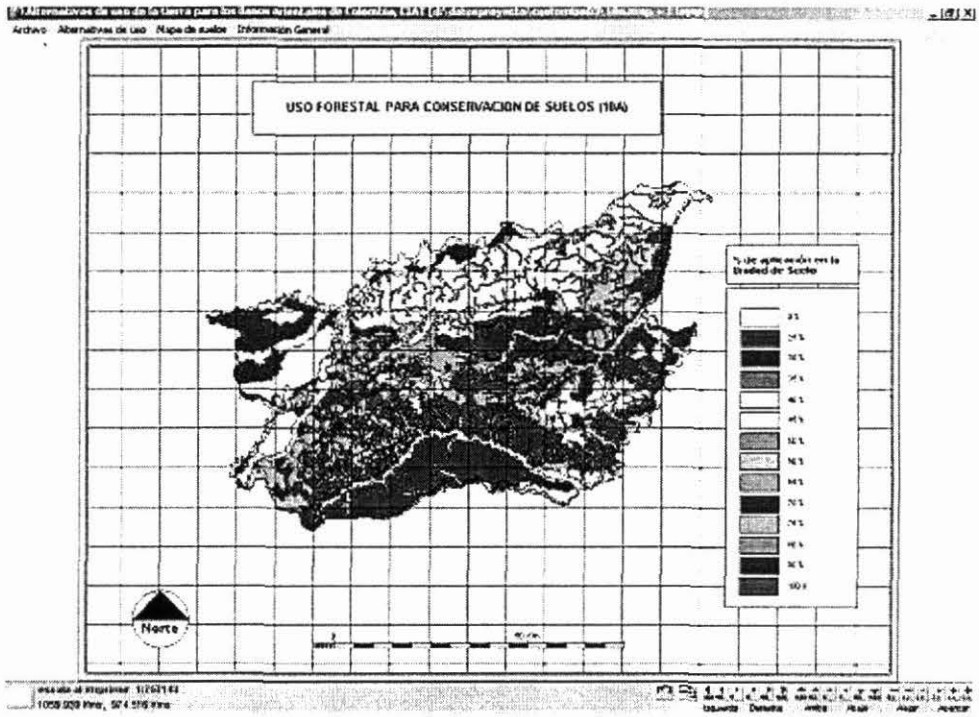

Figure 3. Mapping of areas recommended for forest use and soil conservation in function of the percentage of area of each polygon having severe soil limitations for any type of agriculture. Additionally to these soil limitations, the Código Nacional de Recursos Naturales obliges natural vegetation to be conserved along streams.

The database tool was designed to allow a modification of the decision tree to adapt it to other localities, or simply to allow experts to revise their decision rules with time. It allows the inclusion of criteria other than simply soil and topography. It could be adapted to a completely different problematic than land use. We predict that through the use and adaptation of this tool with partners, users can combine their knowledge into decision trees, work out how local stakeholders can use these, and then adjust the decision rules through monitoring the results of the adoption of the proposed options.

Preliminary developments of this tool were presented in the 2002 PE-4 Annual Report. This year, the tool was completed, a users' manual and a help module elaborated, and the tool was presented in October to potential partners and users.

SEGUIMIENTO

Contributors: Jaime Jaramillo, Maria Fernanda Jiménez; Diana Maria Pino (Secretary of Planning, municipality of Puerto López)

SEGUIMIENTO is a simple tool, developed this year in Microsoft Access 2000, which can be used for the follow-up of actions planned in territorial or development plans. It can be adapted to any plan at any level, through a detailed definition of policies,

programs, and projects, indicating milestones and final goals, and indicators used for evaluating progress. The monitoring of many plans is made difficult by the absence of clear milestones, goals, and indicators. A tool such as SEGUIMIENTO can help municipalities and other institutions structure their plans to make monitoring and evaluation more straightforward.

This tool is now being validated with the Secretariat of Planning of the Municipality of Puerto López, for the follow up of the activities planned in the PBOT and PMD. Difficulties lie mostly in the collection of information from the numerous municipal offices and partners involved in these plans, about the progress of their activities.

Organization of Seminars and Training Activities

National workshop on use of DSTs and GIS for territorial planning

Contributors: Yolanda Rubiano, Marcela Quintero, Ovidio Muñoz

Between 2000 and 2002, CIAT conducted various training activities with the support of MADR in various departments of Colombia to teach methods and GIS tools for the elaboration of territorial plans. To date, 220 public servants have been trained in Colombia.

With the objective of following up on the trainees and the activities they developed with the skills they acquired, we organized a workshop, "El encuentro nacional de usuarios de herramientas SIG para la toma de decisiones en planificación rural y Ordenamiento Territorial", at CIAT headquarters in Palmira from 13th to 15th November 2002. Fifty participants attended. The event included oral presentations, discussion sessions, a poster session, and an evaluation of needs in planning approaches, legislation, information tools, and coordination between different administrative levels.

One of the results of this seminar was the formation of a network with the workshop participants, and the other beneficiaries of training events organized on rural planning, to discuss various issues of development planning in general. This network is open to new members, and new subscriptions should be sent to Ovidio Muñoz at o.munoz@cgiar.org

The Latin American workshop on territory and sustainable development

Contributors: Jaime Jaramillo; Hubert Mazurek (IRD); Paolo Groppo, Federica Ravera (Land tenure service, FAO); International Land Coalition; CIAT rural planning team; CIAT training unit

From June 17th to 20th, CIAT-Headquarters hosted the workshop entitled "Taller latinoamericano *Territorio y desarrollo sostenible*", funded by the International Fund for Agricultural Development (IFAD). This workshop was organized to form a network of professionals on the themes of territory and sustainable development, to exchange experiences, and to evaluate processes and methods of participatory and

negotiated territorial planning, aiming to explore implementation channels related to rural development and the management of natural resources in Latin America.

The 53 participants contributed their experience in applications or research related to land tenure and the management of natural resources, territorial planning, rural institutions, and participation. This event had representatives from academia, public administrations, international institutions, grassroots organizations, and NGOs. A CD-ROM was prepared with materials from the workshop.

Launch of tools

Contributors: Rogelio Pineda, Ovidio Muñoz, Jaime Gómez, Yolanda Rubiano, Adriana Fajardo, Maria Fernanda Jiménez, Marcela Quintero; CIAT training unit

On the 16th and 17th October 2003, at the Hotel Villavicencio Plaza, we organized a workshop for the socialization of methods and DSTs for land use planning developed during the last 5 years of the agreement between CIAT and MADR. We benefited from the participation of representatives of farmer associations and unions, the private sector, academia, regional environmental corporations, NGOs, research institutes, municipal administrations, departmental administrations, UMATAs, and other institutions involved in environmental management. There were 43 participants from 22 institutions. This has allowed us to develop partnerships with users of these methods and tools, with whom we can further co-develop and adapt them to user needs.

Training in remote sensing

In the context of the agreement between MADR and CIAT, we organized training on basic concepts of remote sensing, using the (free) GIS and image processing software, SPRING, developed by the Instituto Nacional de Pesquisas Espaciales (INPE) in Brazil. This course was organized jointly with CORPOICA Regional 8, and was conducted at the Universidad de los llanos from 21st to 25th October 2002. There were 15 participants, from institutions such as the Institut de Estudios Ambientales (IDEAM), CORPOICA, Instituto Nacional de Adecuación de Tierras (INAT), División Municipal de Aguas (DIMA), Corporación para el desarrollo sostenible del area de manejo especial la Macarena (CORMACARENA), CIAT-Santa Rosa, Universidad de los Llanos (UNILLANOS), Policía Nacional del departamento del Meta, Gerencia Ambiental y Secretaría de Planeación de la Gobernación del Meta, and Instituto Técnico Industrial.

A training course was given by Nathalie Beaulieu at the Geography Department of the University of Uberlândia, Brazil, from May 10 to 13, 2003, on Monitoring of land use/cover and land degradation with temporal series of satellite imagery. Students from the course for Masters in Geography took this course.

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Appendix: Other Project Information

Staff

Nathalie Beaulieu	Ph.D. Remote Sensing	Senior Research Fellow
Adriana Fajardo	Biologist	Research Assistant 2
Jaime Jaramillo	Civil Engineer	Professional Specialist
Maria Fernanda Jiménez	Systems Engineer	Visiting Scientist
*Hubert Mazurek	Ph.D. Ecology	Researcher
Ovidio Muñoz	Agronomist, DESS	Research Assistant 1
Rogelio Pineda	Geologist	Research Assistant 1
Marcela Quintero	Ecologist	Research Assistant 2
Yolanda Rubiano	Ph.D. Agrology	Candidate in Agronomical Sciences, Universidad Nacional in Palmira (50% InforCom, 50% PE-2)

* Arrived in 2003, Investigator at IRD UMR 151 "*Populations, environnement et développement*", hosted at CIAT, posted in Bolivia.

Participation in Workshops and Seminars

- 2nd plenary meeting of the Global Forum for Agricultural Research (GFAR), May 22-24, Dakar, Senegal.
- CIAT-CIO meeting, May 26-28, Montpellier, France.
- 51 International Congress of Americanists, Santiago de Chile, 14-18 July 2003: Seminar "Desarrollo local versus desarrollo global".
- 50 años de reforma agraria, seminario "Actores, Territorio y Desarrollo Local", 29-30 de septiembre 2003, organizado por CEPLAG, IESE, PROMEC, CIAT/IRD.
- Taller "Metodologías para la Identificación y Priorización de Demandas para la Innovación Tecnológica en Bolivia", proyecto FOCAM-CIAT, Cochabamba, Octubre 8 y 9 de 2003.

Publications

Book chapters

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Collaborators

- Internationally: IRD-UMR 151, ICRISAT, TSBF, CIRAD-EMVT, CIRAD-TERA.
- In Colombia: MADR, CORPOICA, Alcaldía de Puerto López, UMATA de Puerto López.
- In Bolivia: Vice Ministerio de planificación y desarrollo sostenible (Dirección de Ordenamiento territorial y CODEPO) IESE and CEPLAG (Universidad de San Simón), INE-Instituto Nacional de Estadística, Municipal offices of Calamarca, Ayo Ayo, Patacamaya, Umala, Asociación de municipios de Pando.
- In Peru: GTZ, CIP, CONDESAN, Municipal office of Pampacocla.
- In Senegal: ISRA-CDH, ISRA-CNRF, ISRA-BAME, ISRA-LNERV, ANCAR (regional offices in Thiès, Diourbel, Fatik, Kaolak), PAFD2, Direction des Eaux et Forêts, Direction de l'agriculture.

Donors

- Colombian Ministry of Agriculture and Rural Development (MADR)
- Global Environment Fund (GEF)
- GTZ
- Viceministerio de planificación y desarrollo sostenible (CODEPO y FNUAP)

Acronyms

ANCAR	Agence nationale de conseil agricole et rural (Sénégal)
BPS	Bureau de pédologie et de sols du Ministère de l'agriculture (Sénégal)
CDH	Centre de développement de l'horticulture (Sénégal)
CEPLAG	Centro de planificación y de gestión (UMSS, Bolivia)
CODEPO	Consejo de población (Vice ministerio de planificación, Bolivia)
CNRF	Centre national de recherche sur la foresterie (Sénégal)
CRD	Conseil régional de développement (Sénégal)
CSE	Centre de suivi écologique (Sénégal)
FAO	Food and agriculture organization (United Nations)
GEF	Global Enviroment Fund (United Nations)
IESE	Instituto de Estudios Socio-Económicos (UMSS, Bolivia)
INE	Instituto Nacional de Estadística (Bolivia)
ISRA	Institut sénégalais de recherche agricole (Sénégal)
MADR	Ministerio de Agricultura y Desarrollo Rural (Colombia)
PRD	Président de communauté rurale (Sénégal)
NGO	Non-governmental organization
SIBTA	Sistema Boliviano de Transferencia Agropecuaria (Bolivia)
UMATA	Unidad Municipal de Asistencia Técnica Agropecuaria (Colombia)
UMSS	Universidad Mayor de San Simón, Cochabamba, Bolivia