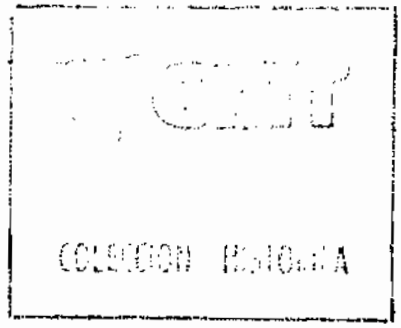

Investing in People

The Farmer-researcher as the Protagonist in Rural Development

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Power to the Poorest

The CIAL is a new kind of institution that puts resource-poor farmers in charge of a research process that benefits both them and their community. What does a CIAL consist of? How does it work? And how did the idea originate?

A prize-winning process

Bumping up the track in their 4-wheel drive, the ministry officials from Quito weren't expecting to find very much. Most farmers of the high Andes were poor people, down-trodden and inarticulate. Would this community really be any different?

At 3500 metres, the track leveled out abruptly on a bare shelf of hillside. Round a corner a small, tin-roofed building came into view amidst wind-swept fields. Outside it, a sign: "Comité de Investigación Agricola Local (CIAL), 11 de Noviembre". They had arrived.

The building's interior was spartan, furnished only with wooden benches and a small, wobbly table. The officials took their seats, introductions were made and the reason for the visit was explained. The officials, from the Ministry of Social Welfare, were responsible for awarding a prize to the best organized farmers' group in Ecuador. They were here to judge the entry submitted by the 11 de Noviembre group.

Then the presentations began. Leonides Gualpulema, a local farmer and the group's leader, described how and for what purpose the group had formed. After him Alfonso Villarroel, another farmer, talked about the results it had achieved.

As the two men spoke, the officials felt their interest quicken. The group had tackled a problem vital to the livelihoods of the community, that much was clear. Yields of potato, the community's main subsistence and cash crop, had been falling for several years as pests and diseases took hold. With the support of a technician from the local branch of the research service, the group had obtained new resistant varieties and had run its own trials to compare these with the traditional variety.

"At the start, we felt ridiculous sowing such small plots. Later, when we saw that some varieties didn't do well, we saw how important it was to sow small."—Leonides Gualpulema, leader, CIAL 11 Noviembre, Ecuador.

Thus far it sounded like conventional on-farm research. Yet there were some intriguing differences. Clearly, the speakers no longer thought of themselves as just farmers. They were, they explained, also researchers. Just like researchers in the formal research system, they had collected data from their experiments and analysed the results. They spoke confidently and knowledgeably, not just about the technology they had tested but also about the research methodology they had followed, using words that farmers didn't normally use, such as "treatment" and "control". They seemed, in short, to be in control of the process. The technician, a man called Merino Fausto, had played a comparatively modest role—supporting the group without dominating it as so often happened when agricultural professionals worked with farmers.

Even more intriguing was the way the whole thing had been set up. The group had been elected by the local community, which had also decided the topic to be researched. It had formed a committee of four people, each with a clearly defined role. It even had a fund to finance the research. And it had reported the results back to the community—something that formal researchers usually neglected to do.

By the time they left, the officials were deeply impressed. The group had demonstrated something new to them—that farmers can take the lead in conducting adaptive research, becoming active, responsible partners in the research process. Moreover, they could do so in a way that was responsive to the needs of the local community, who seemed fully supportive of the work and well informed about its results. Above all, the group radiated an energy and optimism that gave the lie to the conventional image of the marginalized Andean farmer.

A few weeks later the 11 Noviembre group learned that it had won the prize, not so much for its results as for the process it had followed to obtain them. When Alfonso and Leonides travelled to Quito to receive the prize on the group's behalf, they were proud to see their small community, normally a quiet backwater remote from the mainstream of national debate, featured in the national press and on television. On their return they held a meeting with the rest of the group, at which it was decided that the prize money, around US$ 1000, should go towards the purchase of a small diesel-powered mill, a labour-saving piece of equipment long needed in the community.

Originally dependent on external support, the group is now able to sustain itself as a small business. It sells seed potatoes of the varieties it has tested and provides milling services for barley and other crops. Its customers include most farmers in the local community and people from further afield. Visitors from other villages often say they would like to start a similar group of their own.

What *is* a CIAL?

Leonides and his colleagues are members of a Comité de Investigación Agrícola Local—CIAL for short. That's the Spanish for Local Agricultural Research Committee.

A CIAL is a new kind of institution—a farmer-based research service answerable to the local community. CIALs test agricultural technology, report on their findings and disseminate those that are useful to the community's farmers. The idea of the CIAL arose in response to the needs of resource-poor farming communities in Latin America, but it could prove applicable in Africa and Asia too.

The technology tested by a CIAL may originate from within the farming community or from the formal research system, or it may be a hybrid of the two. The CIAL is both a means of accelerating farmer-to-farmer transfer of technology that is already available and a platform for evaluating, adapting and disseminating new technology. Last but not least, it is also a channel for communicating the needs of resource-poor farmers back to the formal research system.

The CIAL is a radical new concept in agricultural R&D. Whereas formal research tends to be dominated by scientists, ownership of the CIAL lies entirely with the local farming community. The community elects the CIAL's members, decides on the topics to be researched and feeds its reactions to the results back into the research process. It also evaluates the performance of its CIAL, which can only continue its activities with the community's good will. Ownership of the process by the community ensures that research is relevant to its needs, making the results more likely to be adopted. Because it makes farmers responsible for the research process, the CIAL is a means of empowering people who, in the past, have had little control over their lives and few opportunities to improve them.

Who takes part?

Though some CIALs develop into larger groups, most have four members:

- A leader, usually recognized as a dynamic member of the local community
- A treasurer, responsible for managing the CIAL's finances
- A secretary, who takes minutes of meetings, records data and writes the CIAL's reports, and
- An extensionist, responsible for disseminating the results of the CIAL's research and advising those adopting them.

Most CIALs need the support of an external facilitator or outsider in their opening stages. Indeed, the idea of forming a CIAL in the first place is usually implanted in the community by an outsider. The effectiveness of the CIAL in empowering local people depends critically on how the outsider behaves. His or her role is to guide the process, not control it, to feed in ideas, not impose them.

The outsider may be a technician (often an agronomist) from a sympathetic formal research or extension service or from a non-government organization (NGO). Alternatively, he or she may be a paraprofessional recruited from the farming community. In either case, the outsider should be well trained in the CIAL process and an experienced practitioner of a participatory approach to research.

What does a CIAL do?

The CIAL follows a cyclical process that has these stages:

- *Motivational meeting.* The outsider proposing the CIAL invites everyone in the community to a meeting. After explaining the purpose of the meeting, the outsider asks farmers to analyse what it means to experiment with new agricultural technology. Local experience in experimentation and its results are discussed, together with the possibility of accessing new technology from outside the community. The nature and purpose of a CIAL are explained. The community then decides whether or not it wants to form one. If its decision is positive, it elects a committee with a minimum of four members to conduct research on its behalf.
- *Diagnostic meeting.* The new CIAL calls a meeting of the whole community to diagnose the community's agricultural problems and select one or more topics for research. Among the topics commonly selected are

the evaluation of new crops or crop varieties, the control of crop pests and diseases, and the use of fertilizers.

- *Planning meeting.* The CIAL meets with the technician or paraprofessional supporting the research to define the objective of the experiment, the treatments and the control, the site(s) and timing of the experiment, the inputs needed and the data to be collected. Responsibilities for the various tasks associated with the experiment are allocated to different CIAL members.
- *Implementation.* The CIAL members implement the trial, using the CIAL fund to pay for inputs. Data are collected at each stage from sowing to harvest.
- *Evaluation.* The CIAL meets with the technician or paraprofessional to evaluate the data collected. Conclusions are drawn and preparations made to present the results to the community.
- *Feedback meeting.* The community meets to hear a presentation by the CIAL of its activities, results and financial status. The presentation may be supported by simple posters showing the trial's results. According to the results achieved, the community may decide that the CIAL should continue with the same experiment or switch to a new topic.

The outsider guides the CIAL through a 3-year cycle of research. In the first year, the CIAL tests innovations on small plots, which may have several treatments (e.g. different varieties, fertilizer amounts or types, and sowing dates or densities). The treatments evaluated as the most promising are then tested on larger plots in the second year, leading to the selection of two or three treatments for testing in still larger production plots during the third year. After this, the CIAL may continue with commercial production if it wishes to do so, or switch to a new research topic.

Starting small is central to the CIAL methodology. The small plots, while they may attract ridicule at first, enable resource-poor committee members to test new technology without taking too great a risk.

Each CIAL should have a fund on which it draws to finance its activities. The fund is usually launched through a one-off donation from outside the community. A typical fund size at the outset of the process is US$ 500.

The purpose of the fund is to absorb the risks of research incurred by resource-poor farmers. If the research is successful, the CIAL should be able to repay the costs of research to the fund by selling the produce from its

commercial or communal plots. In this way the fund builds year by year, enabling the CIAL to continue its research, pay its members a profit and/or invest in new equipment or services. Gradually, the CIAL becomes a self-sustaining small business.

The CIAL as synthesis

Like most successful ideas in rural development, the CIAL methodology blends the traditional and indigenous with new elements from outside the farmers' environment.

Let's begin with the traditional and indigenous. Traditional farming used to be perceived as a static system in which farmers unquestioningly did what their parents had done. But during the 1980s social scientists began to uncover a rich seam of spontaneous experimentation in such systems. Many farmers were avid collectors of new crop species or varieties, which they tested in small niches on their farms. Others sought new ways of controlling pests and diseases, or of maintaining soil fertility and preventing erosion. This "hidden research system" constituted a vast resource for technology development and dissemination that had been more or less ignored by the formal public-sector research and extension services.

At about the same time, development workers in non-government organizations (NGOs) and a few scientists in the formal research system began criticizing formal research for its lack of impact on resource-poor farming systems. The criticisms were of two main kinds.

First, scientists were accused of adopting a "top-down" approach to technology design in which farmers' needs and opinions were not adequately taken into account. The result was technologies that were too expensive or too demanding of labour to be useful to small-scale farmers. In particular, the formal system, with its limited resources, was unable to produce technologies that were sufficiently adapted to the highly varied needs of resource-poor farmers in the diverse and risk-prone environments typical of rainfed agriculture.

The clearest example of the justice of this kind of criticism is the blanket fertilizer recommendation. Even today, scientists and extension workers regularly recommend that farmers use expensive (and often unavailable) commercial fertilizers in amounts that far exceed what they can afford. The same recommendations are made year after year for large areas of rainfed

agriculture, despite the fact that actual needs vary so greatly in time and space that such recommendations are virtually meaningless.

The criticism was somewhat less just when it was applied to new crop varieties, many of which turned out to be better adapted to the needs of resource-poor farmers than the critics originally thought. But even these often need more testing at local level than the formal research system can deliver.

The second major criticism was that the links between research and development were weak. Scientists generated new technology, but did little or nothing to secure its adoption. Extension services, under-funded and demoralized, felt little ownership of the products of research, often remaining completely ignorant of them. Government seed services were particularly ineffectual. These shortcomings meant that, even when relevant technology was developed, it was not becoming available to farmers.

One response to these criticisms was to try to develop and disseminate technology independently of the formal research system. This was a way taken by many in the NGO movement. The practitioners of what became known as participatory technology development (PTD) typically rejected the products of formal research, attempting instead to build on farmers' capacity for experimentation and to rely on farmer-to-farmer transfer of research results. This turned out to be a cul-de-sac: farmers' traditional knowledge systems and technology had been romanticized, and proved for the most part unable to deliver the increases in productivity and incomes that were now so badly needed.

Others in the NGO movement conceded that the products of formal research could be useful, but felt that farmers should have a far stronger say in designing them and in deciding which to try. The lack of specialized technical training characteristic of these NGO workers was both an advantage and a handicap. On the one hand, it led to a more open diagnostic process in which farmers were free to choose whatever research topics were the top priority for them, unfettered by the opinions of disciplinary scientists. On the other, many of these practitioners, at least initially, lacked the technical knowledge to diagnose farmers' problems effectively and did not know where to look for solutions. Later, some became more competent at this than others, but the gulf in understanding that had by this time opened up between formal research and the NGO movement slowed down the learning process.

Scientists in the formal system had mixed reactions to the first criticism. Some felt it was unfair. Farmers, they argued, had been involved in formal research ever since the early 1970s, when the farming systems research movement had knocked down the fence that separated the research station from farmers' fields. Conventional on-farm research, testing products that had been developed on the basis of an accurate diagnosis of farmers' needs, should be all that was needed. Others, however, agreed that farming systems research had lost its way, getting bogged down in a sterile debate on methodological issues at the expense of its original emphasis on making the farmer the centre of the research process. In much on-farm research the farmer was still treated as little more than a provider of land and labour. The scientist decided the research agenda in advance, supplying ready-made solutions to farmers' problems that had been developed on the research station. Often, these solutions reflected scientists' interests rather than farmers' real priorities.

The latter group of scientists began trying to make their research more responsive to farmers' needs. They adapted the diagnostic and design phases of research to allow more active participation by farmers. Participatory plant breeding (PPB) approaches were developed to improve farmers' input into technology generation. Often, however, the research agenda was still restricted to those subjects in which the scientists conducting the research had expertise. In addition, the degree of farmer participation was still controlled by the scientist, who saw participation as a way of improving the efficiency of research rather than empowering farmers.

The response of formal scientists to the second criticism—that links between research and development were weak—was more positive. Many increased their emphasis on technology transfer through on-farm research, seeking stronger collaboration with extension services in the field. Research with groups of farmers rather than individuals was used as a means of scaling up while cutting costs. Seed services and national release committees came under increasing pressure from plant breeders to do their jobs properly. Most important, formal researchers—at least in Africa and Asia—started working with NGOs, mainly to multiply and disseminate seed but also on other types of project, including participatory research and development projects. The rigid linear model of research and development began to give way to a more flexible one in which the two activities were integrated.

Against this background, the CIAL methodology can be seen as a synthesis of rival traditions in agricultural R&D. Despite its origins in the formal research system, it leans towards the NGOs and the more radically minded formal scientists in building on farmers' capacity for experimentation and in adopting an open diagnostic process in which farmers determine the research agenda. At the same time, unlike PTD it remains open to the products of formal research, providing a powerful new means of adapting and disseminating the new technology that is so greatly needed by resource-poor farmers.

CIAT's experience

In 1984 a sociologist named Jacqueline Ashby joined a collaborative project between CIAT and the International Fertilizer Development Center (IFDC). The appointment was to prove a turning point for CIAT, which had so far had little experience in participatory research.

Funded by the Ford Foundation, the project involved the on-farm testing of fertilizer recommendations in Colombia's Cauca Department. Ashby had been recruited to persuade farmers to adopt the recommendations, but she found them unwilling to do so. The farmers thought the use of fertilizers in the amounts recommended by the project was too risky in the uncertain environment in which they farmed.

For Ashby, the experience raised fundamental questions about the way the recommendations had been formed. When the Ford Foundation project ended, she turned to the Kellogg Foundation for help in funding a new project with a more participatory approach. The aim would be to find out whether increasing farmer participation in the diagnostic and design phases of the research would alter the conclusions

reached and hence the recommendations made. The Kellogg Foundation, which had long had a policy of "investing in people", expressed keen interest and committed funds for a 3-year project from 1987 to 1990, again in Cauca Department. Entitled Investigaciones Participativas con Agricultores (IPRA), the project was implemented by a new team of social scientists and agronomists recruited by CIAT—the CIAT-IPRA team.

The farmers participating in the project consisted of two groups, both testing the same treatments, namely different levels of management of beans and potatoes. One group took management decisions independently, while the other was able to consult with scientists.

The results produced a clear message: researchers failing to involve farmers as active and autonomous partners early in the research process risk developing irrelevant technology that won't be adopted. Farmers taking independent decisions achieved lower yields and reached different conclusions about the use of inputs to farmers with access to researchers. Having a researcher around to advise them reduced the uncertainty experienced by farmers, who increased their use of inputs in such trials. The results also showed that early farmer involvement could lead to the selection of potentially useful options for testing that would have been rejected by researchers working on their own.

Dan Moore, Vice-President of the Kellogg Foundation, acknowledged the project's achievements but challenged the CIAT-IPRA team to go a step further. He pointed out that, although farmers had participated in the project, their participation had still been initiated and controlled by scientists, for the sake of benefiting the research process rather than the farmer. Could participatory research be established on a sustainable basis in the village community? And could a process be devised that would be fully owned and controlled by farmers?

Seed-time

At about the same time, a different question was being put to CIAT researchers by farmers at Pescador, one of the Kellogg project's sites. As the project drew to a close, the farmers asked: "What happens when CIAT leaves?"

For researchers especially, the simplest questions are sometimes the hardest to answer. Had nothing come out of the project that farmers would

continue with independently, once it was over? Ashby and the CIAT-IPRA team drove down to Pescador to talk the issue through with the farmers.

What they found fascinated them. The farmers wanted to continue doing their own research in small groups, sharing the results with the wider local community. But they needed the help of a technician to get them started. They also needed funds to support their research, and asked Ashby to help raise them.

The seed scattered by the farmers fell on fertile ground. Ashby and her colleagues returned to the office to write a second project proposal to Kellogg that defined the CIAL concept and outlined a plan to test it.

The Cauca laboratory

If one had to choose a single adjective to describe rural life in Andean Latin America, it would be "unfair".

No one who has visited the region can forget its distinctive topography: flat plains flanked by steep ranges of hills, rising to the occasional snow-capped peak. In the plains, the living is easy. Well-watered, fertile pastures and cropland, coupled with moderate temperatures, make the ideal farming environment. The hillsides, in contrast, present extremely difficult conditions. Apart from the odd area in which the hills open out, flat or gently sloping land is scarce. Farmers scratch a living from soils on steep slopes prone to erosion and landslides. As the nutrients wash down to the valleys, soil fertility is in constant

decline. At the higher altitudes, these problems are compounded by low temperatures, hail, frost and—surprisingly—drought.

Reflecting this topography, society is highly polarized. From the times of the *conquistadores* onwards, the powerful and rich have colonized the plains, displacing the defenceless and the poor, who take refuge in the hills. The process of displacement continues today, as the wealthier urban classes buy *fincas* in the lower hill areas close to cities, forcing up prices to levels that the locals cannot afford, and as large farmers expand their *haciendas* with impunity, driving out settlers from land officially classified as "unused". A combination of population growth, declining crop yields and acute land scarcity is forcing agriculture to expand into higher and higher areas, at the expense of remaining areas of forest. These higher areas are the home of the region's original inhabitants, the Indians, who are today its poorest ethnic group. They are also the refuge, in some countries, of guerrilla movements, armed gangs and drug traffickers.

The state of Cauca, on CIAT's doorstep in southern Colombia, is one of the country's poorest and most inequitable. Its smallholders, who represent more than 80% of the population, own only 22% of the land, often farming areas of less than 2 hectares. Here they grow a wide array of food and cash crops including maize, beans, coffee and sugar cane, usually at very low levels of productivity.

This area, already the location of the previous Ford and Kellogg projects, provided the ideal testing ground for the new CIAL concept. Its highly diverse, risk-prone farming systems presented formal research and development with a formidable challenge to which they had not proved equal. The few improved technologies that had been developed had reached farmers' fields only in minute quantities. At the same time, the rural communities of Cauca were known for two features that would provide a firm foundation for the CIAL methodology: their community spirit and the capacity of their farmers for spontaneous experimentation.

In 1990 the CIAT-IPRA team launched five pilot CIALs in Cauca. The five host communities were chosen to test the concept in different institutional settings. Three of them—El Diviso, Sotará and San Bosco—already had strong farmers' associations, a feature that suggested a strong sense of community. A fourth, at Portachuelo,

provided an opportunity to involve an NGO in establishing and guiding the CIAL, while a fifth, Cinco Dias, had no pre-existing institutions that might support the process.

So what?

To sum up:

- *The CIAL is a radical new concept in rural R&D offering new hope for the resource-poor farmers of the Latin American hillsides*
- *A CIAL is a farmer-based research service answerable to the local community. It harnesses the natural curiosity of farmers and places it at the service of the community*
- *It empowers local people by putting them in control of the research process*
- *It is a synthesis of rival traditions in research, building on farmers' experimentation while remaining open to the products of the formal research system.*

The Opening Flower

What sort of people become CIAL members? What do farmers want out of their CIALs? And what, in the opening stages of the process, do they actually get? The early stages of a CIAL are often accompanied by elation as farmers experience a new feeling of control over their lives. Equally, disillusion can set in if things start to go wrong. But for most communities a CIAL represents new hope for a better future, free from poverty and hunger.

A new sense of self

"I have woken up as a farmer and as a researcher." Thus Ernesto Quintanillo, leader of the CIAL at Palmichal, in Honduras, sums up what he has gained from the CIAL process.

As a farmer, Quintanillo had plenty of experience in the traditional practices used to raise crops and livestock in the poor hillside areas of his home province of Santa Barbara. But he lacked access to improved technology, which seldom reached this remote community suspended high above the plains where the government seed and extension services are based. Like many of his friends, Quintanillo had noticed how the traditional variety of maize had become susceptible to pests and diseases in recent years. Yields had fallen steadily, and he seldom had a surplus for sale. Applying fertilizer didn't solve the problem, since the plants just grew tall and then fell down in the wind. And without fertilizer the soil was becoming exhausted, accelerating the decline in yields.

Until recently, Quintanillo could see no way out of his predicament and felt that the future held little for him. But things have started to change for the better. Through their participation in the CIAL, he and his fellow committee members have been able to test new maize varieties that greatly increase their yields. Of the several on offer to them, they have chosen one called Guyape that has good resistance to pests and diseases, doesn't fall over and—most important—has good cooking qualities and taste when

made into *tortillas*. With the support of an external technician they have learned how to get the best out of Guyape by sowing it more densely and applying chicken manure. They have also learned the techniques of seed selection and multiplication, required to keep the variety pure and to build a surplus of high-quality seed for sale to others.

If Quintanillo has gained a new lease of life as a farmer, as a researcher he has acquired a whole new identity. He speaks of a new self-confidence in his own powers of observation and analysis and a new ability to express himself. He has discovered his qualities as a leader and is eager to pass on what he has learnt to others.

These new personal qualities are not a false identity borrowed from others. Rather, becoming a researcher has brought out in Quintanillo qualities that were latent but needed fuller expression. Like all CIAL members, Quintanillo was elected by his community because, in their eyes, he met certain criteria identified as desirable in such a role.

"I have woken up as a farmer and as a researcher. I can contribute to decision making in our community and feel able to lead this and other community organizations. I have ideas and opinions; I can observe and evaluate, not only our CIAL trials but also my own farming and that of others. I feel I can teach others all that I have learnt. I have grown up a lot"— Ernesto Quintanillo, CIAL leader, Palmichal, Honduras.

The qualities of a farmer-researcher

Que no sean egoistas—let them not be selfish! The words look down from posters on the walls of many a community room in the 200 or so villages across Latin America that now have a CIAL. The posters, which variously describe the aims of the CIAL, the roles and responsibilities of its members and the results achieved in experiments, are one means by which the CIALs explain themselves to their local communities. They are also a way of reminding CIAL members of what is expected of them.

Community-mindedness is the first essential quality of a CIAL leader or member, since the CIAL will stand or fall in the longer term according to how it is perceived by the people it serves. CIALs that are seen as hoarding knowledge or resources instead of sharing them with others will not be supported.

The concept of the CIAL draws on the tradition of sharing and serving others that is the great strength of poor societies in so many parts of the world. In Latin America, the sense of community pervades rural life, being reflected in local politics (the community is the lowest level in the administrative hierarchy), in village infrastructure (most villages have a community room), in the way work is organized (many communities have a day in the week in which all work together) and in the conduct of farming

Adelmo Calambaz

You wouldn't believe it now, but Adelmo Calambaz used to be deeply shy. "When we first met him, he wouldn't say a word", says Teresa Gracia, sociologist with the CIAT-IPRA team.

Adelmo is of humble origin. Born in San Bosco of landless Indian parents, he left primary school after 3 years without being able to read or write. When his father fell ill, responsibility for feeding his large family fell to him as the eldest son. Adelmo became a labourer, rising every day at 4.00 am to set off on a 3-hour walk to reach the small plot he rented to grow the family's maize. There he worked without rest or food until late afternoon. After the long trek home, he would eat and fall asleep.

Exhausted and barely able to break even, Adelmo decided on a change. With his mother's support he reduced his solitary toil on the distant plot to 3 days a week, devoting the other 2 to voluntary activities in the village itself. Only through work with others, on behalf of the whole community, could he himself advance.

The decision proved a turning point. With others in the village, Adelmo formed a literacy group and began work on a community garden. The group met in the evenings at the house of Doña Ruth Bueno, the village's largest farmer and a leading light in the community. There he met Ruth's son, a schoolteacher who taught the group and who became his friend and mentor. It was while the two were seeking ways of enabling the group to develop that they heard of the CIAL concept and wrote to CIAT asking for help in starting up the San Bosco CIAL.

Because of his reputation for hard work and community-mindedness, Adelmo was elected the new CIAL's secretary and later its leader. Undeterred by the failure of their first experiment, on potatoes, he and his fellow members persevered and, after a few years, began selling seeds of a new maize variety. Soon a milling enterprise was also established.

Adelmo's work with the CIAL has transformed his situation. He now has a house in the village and his own land nearby—2 hectares on which he grows maize, beans, plantain and coffee. In recognition of his outstanding contribution to the community, he was recently elected chairman of the Junta Comunal or village council. He has also become an ambassador for the CIAL process, often being invited to visit other communities to tell them of his experiences.

But the biggest change of all is in Adelmo's perception of himself. "I am a different person", he says. "I have more confidence in my abilities and feel I could now manage to farm a much larger area. My training in the CIAL has helped me learn to speak in public. I'm no longer afraid of outsiders and don't feel uncomfortable going to government offices."

Zuly Pajoy

"Do you like being a researcher?"

"Si". A smile lights up the young face. *"Si! Because when I do research, I learn."*

The speaker is 14-year-old Zuly Pajoy, who lives with her parents at San Isidro, a village in the cassava-growing country of Colombia's Cauca Department. Zuly is the youngest member of a 7-strong all-women CIAL that is seeking alternatives to the crop, which became unprofitable when the processing sector slumped in the mid-1990s.

Opportunities to learn mean a lot to Zuly. She was born in the village, where she studied to fifth grade in the local primary school. But after that she had to stay at home to help her mother with the housework, since San Isidro has no secondary school. Local government's answer to the village's long-running campaign to get one is that it has no money to pay for a teacher. Sixty other pupils in the village are in Zuly's position.

Fortunately, Zuly has acquired another interest, one that takes her out of the house. Unlike other girls in her village, she likes farming. While still a school-girl she joined a group of women learning about chicken production. The group, originally organized by the local branch of the extension service, later evolved into the CIAL.

The CIAL is conducting research on soya bean, a new crop for the area. The learning experience hasn't been easy, Zuly says. The first trial, sown in an El Niño year, was lost to drought. The crop grew well in the second year, but shelling the harvested beans by hand was tedious and time-consuming—so much so that some members of the group wanted to give up. A borrowed de-podding machine came to the rescue. Now the group has been granted a loan to buy its own machine.

Last year Zuly received her first ever invitation to pass on what she has learned to others. She visited CIAT for the first time, where she made a presentation on the San Isidro women's CIAL to a workshop on participatory research. "I was nervous beforehand, but when I started speaking I relaxed", she says. The scientists in her audience were deeply impressed. "If only we could learn to explain things so simply and clearly", said one.

Zuly's dream is to go to agricultural college—but that would mean leaving San Isidro and the CIAL. Living elsewhere would cost money that Zuly's parents don't have, at least not at the moment. They have told her she must wait until her older brother, now at high school, has finished his education.

Until her dream becomes a reality, Zuly is content to go on "learning by doing", through her participation in the CIAL. What has she learnt from her research?

"That you have to persevere to overcome difficulties, that you have to be patient". And Zuly smiles again.

(community land is worked in common and the harvest is shared). In many villages, the CIAL takes its place among other committees that organize collective aspects of village life, such as sport, health and adult education.

The second essential quality of a CIAL member is curiosity. CIAL members must "like doing research" *(que les gustan ensayar)*. This quality is also strongly present in poor rural societies. The CIAL builds on the farmers' natural tendency to experiment, adding to it skills and principles taken from formal research. The CIAT-IPRA team has found that farmers can appreciate the basic rules of experimental design and data analysis and can greatly enhance the value of their results by applying them.

The posters go on to list other criteria for CIAL membership. Some of these are additional personal qualities, such as the ability to communicate or the desire to learn from and teach others, while others are practical considerations, such as the amount of time the person would be able to devote to CIAL work. Some qualities are assigned to specific committee functions. The secretary, for example, must be able to read and write, while the treasurer must be trustworthy.

All these qualities are looked for when the community makes its choice of CIAL members, at the motivational meeting that begins the research process. They are also instilled in elected CIAL members by the technician supporting the CIAL during its early stages. Of course, being human, not all CIAL members will have them in equal abundance!

What sort of people make good CIAL members?
They should:
- be willing to work for the community
- like doing research
- be responsible and concerned
- be communicative
- be able to solve problems
- be able to take time for the CIAL
- be good farmers
- not be selfish
- like learning from and teaching others.

Adapted from a CIAL poster, Flor Naciente, Ecuador.

Increased social status

Well before material benefits start to arrive, CIAL members typically gain status in the eyes of the rest of the community. This gain reflects their role as the holders and dispensers of knowledge.

At Lavanderos, in Honduras, CIAL members said the rest of the community treated them "like consultants", often coming to them for advice on technical issues. This kind of attention is a healthy sign that the CIAL is doing its job of reaching out to the rest of the community.

Some CIAL members may have had the role of advisor unofficially, before the CIAL was launched. For them, joining the CIAL is a confirmation of this role. But for others the transformation is dramatic. "Before I joined the CIAL I was nothing", said one man. "Now everyone comes to me for advice."

In the early stages of the CIAL process, when the support of the outsider is most intense, non-CIAL members of the community may notice, and even envy, the more frequent contact that CIAL members have with urban professionals and foreign visitors. This was the case at San Bosco, in Colombia, where many in the community thought that such contacts led to economic advantages over others. Later, when the results of the CIAL's research were widely disseminated, these suspicions evaporated.

Aspirations

CIAL members almost invariably cite the opportunity to learn as central to their reasons for joining. "This is our school of agriculture", said Eliverio Orellana, leader of the CIAL at El Paraiso, in Honduras. Farmers' desire to learn is every bit as ardent as that of researchers. For them, learning is a means of empowerment, of taking control of their lives. It is also an exit route from poverty. Indeed, with credit usually unobtainable and government services to the rural poor in retreat, learning and self-help are often the *only* available ways forward that preserve the social fabric and remain within the law.

Despite the great hopes vested in the CIAL process, most CIAL members, and especially their leaders, are sanguine in their short-term expectations. "We don't expect to grow rich, but we can get some extra income by improving our farming", says Orellano. Partly this is the natural cynicism of the rural poor, born of years of economic stagnation. Partly, however, it is deliberate policy. CIAL members are careful to avoid raising the community's expectations to unrealistically high levels.

Aspirations often differ with age-groups and standing within the community. Older and poorer members tend to express a wish for mere survival—a reduction of the risk element in farming, or at best an easing of hardship. "We hope to breathe more easily", as one farmer from El Tontolo, Honduras put it. Younger or relatively wealthy farmers have higher expectations, though even they do not expect to get rich quickly. One 42-year old CIAL member summed up the difference between the generations by pointing at his son, also a member of the group, with the words: "I am 43, so for me it's a bit too late. He'll learn faster than I can and will do what I cannot".

Women's aspirations are similar to men's, except in one vital respect. Both men and women are interested in increasing food security and cash income, but women often see a separate CIAL of their own as a route to emancipation. "We wanted to do something *for us*", said one member of an all-female CIAL at Cinco Dias in Colombia. Through such groups the women aim to earn an income that can be kept separate from that of their husbands and used as they see fit—albeit usually to benefit the family rather than themselves. Often the emancipation sought is psychological as well as material, with the women using their groups to maintain a distance from the men that allows them a freedom to discuss and to laugh and joke together. At El Tontolo, where the women already had their own market gardening group before the CIAL started, the men were not permitted to join. "Our husbands have realized they cannot stop women from thinking and deciding, so they have given us the freedom to do that", says Susana Dominguez, the group's coordinator. In these situations, the CIAL becomes an instrument in the struggle to improve the lot of women in societies where they are still routinely repressed.

Sometimes the early stages of the CIAL process allow the CIAL members and the community to develop explicit, shared aspirations. At Palmichal, CIAL members speak of a "dream" which, they say, emerged from their group but is now increasingly shared by the community through their meetings and interactions with them. In the dream, the community undertakes collective action to protect the natural resource base by planting trees and giving up burning to clear land—longer-term objectives that can be

addressed once the immediate need for increased food security has been met (see below). It remains to be seen whether this dream can be realized, but shared aspirations of this kind bode well for the future support of the CIAL by the community.

In other cases, the connection between the objectives of members and those of the community is less explicit. In one newly formed CIAL, members asked about the CIAL's objectives each expressed their own ambitions. "I want to become an expert in seed selection," said one. "I'd like to learn how to make the most efficient use of my land", said another, while a third said: "I want to learn to become a *really great* farmer". After all had spoken there was a pause, into which someone added, as an afterthought: "Oh yes, and we'd like to serve the community too!"

Food first

Because research topics are chosen solely by communities, without the intervention of formal researchers, they provide an accurate reading on farmers' most pressing problems.

Most communities identify their major food crops as the first priority. Thus, in Honduras, virtually every CIAL is working on beans and maize—the two most important ingredients of the staple diet. In the Andes of Ecuador, Bolivia and Peru the emphasis is on potato and broad bean—crops which determine the very survival of Quecha-speaking Indian communities farming at the upper limits of cultivation. In Colombia, there is more diversity in the commodities and topics researched, but food crops still occupy pride of place.

These choices reflect the poverty and hunger that still afflict most hillside areas of Latin America. Many CIALs have been set up in areas left aside by conventional research and extension. Others are in areas served only half-heartedly by them, with projects that do not meet farmers' real needs. Asked what they want to learn, CIAL members typically cite the basics of good farming—the use of new varieties, sowing dates and densities, fertilizer applications, seed selection. These technologies, taken for granted in the wealthier farming areas of the lowlands, are ones to which most hillside communities have as yet had little exposure.

In the few areas where food security is better and the rural economy is more diverse, CIAL research covers a broader range of topics. The emphasis here is on raising incomes by diversifying into new crops or by adding value

through improved processing. In the Cauca Department of Colombia, the commodities covered include *mora* (a kind of blackberry, suitable for fruit juice production), sugar cane (for processing into *panela*, a form of brown sugar that makes a popular energy-giving drink or snack), cassava (dual-purpose varieties for starch production and domestic consumption), soy, groundnut, potato and several vegetables, in addition to the staple food crops, maize and beans. In Cundinamarca, which has the vast urban market of Bogotà on its doorstep, CIALs work on several commercial crops, including snap bean.

Many CIALs are conducting research to protect the natural resource base at the same time as they explore new crop varieties. At El Paraiso, in Honduras, farmers are testing live and dead barriers to control erosion in a steeply sloping field sown to new bean and maize varieties. There is more interest in such research among younger CIAL members, who often see it as a necessary response to the poor practices of previous generations. At Palmichal, one farmer-researcher described the challenge facing the CIAL as to "get out of the mess we are in as a result of the way our parents exploited the land". Some members of this CIAL have sworn "never to burn again". In an area where burning off vegetation to clear land for cultivation has been traditional for centuries, this represents a significant break with the past.

Thus the progression of research in the CIALs mirrors that in the larger, formal research system. The emphasis is on satisfying food needs first, then on increasing incomes through diversification and processing. Research to protect natural resources becomes important when the deteriorating resource base starts to threaten livelihoods, bringing about a change in awareness.

Teething problems

Being a CIAL member is not for everyone. Many groups experience a turnover of about half their members in the opening year.

CIALs often go through a difficult period during their early development. This typically occurs a few weeks after foundation, when the initial rush of enthusiasm experienced at the motivational and diagnostic meetings has worn off. Some members feel that the research topic chosen by the community doesn't meet their own priorities, and lose interest. Others drop out because the CIAL takes up too much time they had rather spend doing their own farming. Women, in particular, find it hard to fit in CIAL activities because of their many other commitments.

People in the community often mock the small plots started by CIAL members. "You'll never get rich that way", is a frequent taunt. CIAL members can get discouraged by such remarks, especially if they feel external support is also lacking.

A difficult period may deepen into crisis when the first year's experiment does not deliver a clear or useful result. At Pasca, in Colombia's Cundinamarca Department, a poorly designed integrated pest management trial on a new pest in potato failed because the experimental plots were too close together, causing the treatments to become confounded. Juan Guerrero, the CIAL's leader, says the CIAL may not be able to continue since the local community, sceptical from the start, is now thoroughly unsupportive.

Achieving good results early in the research process is probably the single most important factor in retaining community support and is therefore vital in determining the CIAL's survival. Most CIALs wisely keep their research simple to start with, choosing a problem that is relatively easy to solve and that does not require highly developed skills in experimental design or data analysis. Most also choose annual crops rather than trees or livestock, thereby achieving results quickly.

Lessons in the risks of research can come hard. At San Bosco, in Colombia, the CIAL's first experiment was on potato, a new crop for the area. The varieties tested soon showed vigorous above-ground growth, luring the CIAL into a decision to skip the rest of the research phase and go straight to commercial production. Eager to cash in at the end of the current season, CIAL members worked hard to clear and plant a large area

while there was still time. But with the harvest came disillusion: to their dismay, the potatoes they dug up were tiny! That the CIAL continued at all can be credited to the courage and determination of two its members, Adelmo Calambaz and Eliecer Sandoval, who borrowed some oxen, turned in the failed crop and, as soon as the season allowed, sowed cassava and beans, two more dependable crops already widely grown locally. To their relief the two were rewarded with a good harvest that enabled them to pay off the debt incurred by the failure of the first experiment. They then made a fresh start by calling a new diagnostic meeting.

Many other CIALs have shown similar perseverance in the face of setbacks. At San Isidro, in Colombia, a women's group decided to conduct research on soybean, in an attempt to find alternatives to cassava. The crop yielded well, but proved extremely difficult to pod by hand. Some of the women wanted to give up, but the men in the village urged them to continue. Now the women are looking for funding to help them buy a huller.

Eventually, perseverance is rewarded with the first signs of success. These may take unexpected forms. One back-handed complement the community can pay the CIAL is to steal seed from its trial plots—a sure sign that the improved varieties being tested are exciting interest. One CIAL that had lost its seed to pests and diseases—or so it thought—appealed to neighbours to give back any seed they had taken. Red-faced, the neighbours had to confess they were able to replace the CIAL's entire lost harvest, as they had taken enough to multiply large quantities.

CIALs going through difficulties can often take strength from visiting other groups that are further advanced. Maria Guttierez was the secretary of the newly formed 11 Noviembre group in Ecuador when she was invited to travel to Colombia to attend the annual meeting of the CIALs in Cauca Department. There she met people from El Diviso, a CIAL that had successfully launched its

"The people from El Diviso told me how they had experimented with maize and how, at first, nobody in the community paid any attention. Then, as soon as they got good yields on the production plot, the community became interested. I was especially thrilled to see their milling machine. At 11 de Noviembre we had already had the idea that we might get one, but I still needed convincing. Now I felt convinced! It was a wonderful experience, because at the time our own group was discouraged."— Maria Guttierez, secretary, 11 Noviembre CIAL, Ecuador.

own seed production and milling enterprises. They invited her to visit their community after the meeting. The visit rekindled her belief in a successful outcome to her own CIAL's efforts. Fired with a new enthusiasm, she returned to Ecuador, where she was able to persuade her dispirited fellow CIAL members to continue with their research.

Today the 11 de Noviembre group, like El Diviso, is selling seed and providing milling services both to its own community and to others. And it too receives visitors from other communities that have heard of its work and are interested in starting their own CIAL.

Old habits die hard

"I wish they would stop calling me 'Doctor'", says Hector Andrade, plant breeder with Ecuador's national agricultural research institute. He's referring to the habitual deference shown by farmers to those they consider their social superiors. The habit irks Andrade, who tries to treat the farmers he works with as his equals.

"The farmers expect you to arrive with something. Breaking this down is difficult".— Iván A. Reinoso, Director, Santa Catalina Research Station, INIAP, Ecuador.

The deference is a symptom of *paternalismo*—a set of traditional attitudes that can subtly undermine the CIAL process in its early stages, causing both sides to fall back on conventional behavioural norms rather than accepting the challenge of working together in new, more participatory ways. The chief ingredient of *paternalismo* is a culture of dependence on the part of farmers, accustomed to participating in research projects as passive recipients rather than active protagonists. Such farmers typically join CIALs to receive inputs rather than to serve the community. The culture of dependence is reinforced by the natural tendency of the formal-sector scientist or technician to dominate by virtue of his or her superior education and social status.

Andrade points out that while older farmers are especially prone to paternalism, younger ones are at once more at ease and more demanding in their relationships with researchers. This problem should, therefore, gradually solve itself as education and living standards in rural areas improve.

Another problem that can afflict the CIAL process right at the outset is "participation fatigue". This debilitating condition arises in communities in which too many past projects have left too few lasting improvements in living standards.

At Silisgualagua, in Honduras, few people attended the motivational meeting to launch the CIAL. Villagers thought the project was a re-run of a

previous World Neighbours project that had also used small experimental plots to introduce innovations. That project had left its participants with few lasting changes for the better in their lives, so they weren't queuing up for a repeat performance. The CIAL leader at Pasca, in Cundinamarca, told of a village meeting called by a company to introduce a new range of biological pest control products to farmers. Despite the offer of free food and beer, few people attended. "They're disillusioned with research", he said.

CIAT-IPRA encountered an acute case of participation fatigue when its researchers told communities in Cauca's Cabuyal watershed about the CIAL process. The watershed had for several years been the site of previous CIAT research, some of which had introduced useful innovations to farmers. "Not CIAT *again*", said villagers. "We've already got all we need out of you lot." The six or so CIALs in the watershed are today among the weakest CIAT-IPRA has started. Many participants say they are tired of meetings and discussions and just want to get on with their own lives.

Such problems occur rarely, however. For most communities, the idea of starting a CIAL is a welcome one.

Room with a view

If the altitude doesn't take your breath away, then the beauty of the setting will. At over 3000 metres a ruined farmhouse in the traditional *hacienda* style stands amidst green pastures and cropland, with a view towards the snows of Chimborazo, Ecuador's highest mountain.

Inside the farmhouse a group of Quecha-speaking Indian women wearing brightly coloured *ponchos* sit on benches arranged round the walls of the one room that still has both a ceiling and a floor. Most are undernourished, many have coughs and colds, some are exhausted from working the land while ill and hungry.

But despite their sufferings, these women radiate optimism and determination. They have just finished clearing 100 hectares of land on the *hacienda*. Last year the land and the house were allocated to them by Ecuador's Land Reform

Agency after protracted negotiations with the previous owner and a 10-year struggle to raise the necessary money, in which each member of the community contributed what little they could, whenever they could. The women have renamed the community 19 de Setiembre—the day the deeds to the property became theirs.

One of the first things the women did as a new community was to arrange a visit to the 11 de Noviembre group, where they met Maria Gutierez and her colleagues. Inspired by what they saw they decided to form their own CIAL, which they have named Flor Naciente, the opening flower.

The women have designated the one useable room in the farmhouse as Flor Naciente's meeting place. That room is their toe-hold on a better future.

"We have been deprived; we have stagnated, been frozen in time. There is little education here. But this is a way to learn, a way to move forward"— Olga Azi, leader, Flor Naciente CIAL, Ecuador.

Today they are gathering to decide the CIAL's research priorities. Top of the list of priorities for most of the women is potato—a crop they must grow to feed their families but whose yields have fallen owing to pests and diseases. Today's meeting is thus concerned with bare survival. But a few years from now, if their research is successful, the women will start a seed potato business, then venture into other crops such as barley and broad beans. Eventually, they hope to have enough money to renovate the rest of the house and turn it into a training centre for other farmers.

"Flor Naciente", "Esperanza", "Nuevo Pensiamento", "El Progresso"—the impoverished and marginalized communities that launch CIALs often give them names that speak to us of their belief in a brighter future—one that is free from hunger and poverty. The CIALs are a promise these communities make to themselves, an assertion of their determination to succeed through the pursuit of knowledge and the power of collective action.

So what?

To sum up:

- *Most resource-poor farming communities welcome the idea of launching a CIAL*
- *Putting farmers in control of a research process gives them a new sense of purpose in life and enhances their status in the community*
- *Most communities ask their CIALs to conduct research on their most important food crops*
- *Achieving good results early in the process is an important determinant of community acceptance of the CIAL*

The Mature CIAL

After 3 or 4 years the benefits of the CIAL process start to be felt by the whole community. Typical early benefits are the availability of improved seed and milling services, obtainable from the CIAL as it develops into a small business. But there are also impressive knock-on effects on the rest of the village economy. In this chapter we visit El Diviso, a community of 150 families in the south of Colombia's Cauca Department, to examine the impact of a CIAL that is now in its eighth year.

First fruits

As the first rains fall, the road to El Diviso carries a larger than usual volume of travellers. Most arrive on foot, but some come in *chivas*, the colourful open-sided buses that carry people and just about anything else in rural Colombia, and a few in cars or pick-up trucks. Farmers from outlying areas are on their way to the community's CIAL to buy maize seed.

"Our seed has become well known for its high quality", says .....Medardo, the CIAL's leader. So much so that it has brought about a dramatic change in people's sowing practices, with farmers who used to sow unsorted grain now willing to pay the much higher price (over four times as much) for pure seed. In the 4 years it has been in commercial production the CIAL has sold 7 tonnes of seed at an estimated value of US$.....

Small farmers, each buying 3 to 4 kilos, are the main customers. Most are from El Diviso, but the numbers coming from further afield are rising steadily as the CIAL's reputation for seed quality grows. The business has also attracted custom from the local branch of the extension service and the Coffee Board, which have bought seed in bulk to distribute to farmers participating in their programmes. The extension service is using the seed to run demonstration plots in six other communities.

Use of the seed has transformed the community's food security. In the early 1990s, many went hungry in the months immediately

before harvest. The traditional maize grown at that time was a tall variety that had to be sown at a low density, was unresponsive to fertilizer, had only one head per plant and took xxx months to reach maturity, allowing only one crop per year. The plant often fell over in the high winds of August, as the crop approached maturity. Yields were stagnant or falling, but demand was rising as farmers struggled to feed not only their own growing families but also the extra labourers recruited to harvest a higher-yielding coffee plant. In contrast the new variety, developed by national researchers from germplasm supplied by the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), is a shorter plant that can be sown at nearly double the density, has three heads instead of one and is highly responsive to fertilizer. All that adds up to a colossal gain in yield—an estimated ..... tonnes of maize per hectare on the average farm.

"We are recognized as seed producers. People come here looking for us, asking for our maize. And at the same time they ask us for beans". —.....Medardo, leader, El Diviso CIAL.

But the most important gain of all is in the stability of production. The new maize has a shorter cycle, enabling it to be grown twice in good years and to perform well when rainfall is poor. In the El Niño year of 1997, farmers who had not adopted the new variety lost their entire crop to drought, while those at El Diviso reaped a bumper harvest. At the start of the next season, the queue to buy seed at the CIAL was swollen by farmers who had lost their own seed and had decided, belatedly, to switch varieties.

The new variety has created a grain surplus in the community, raising family farm incomes. ....**Data needed here on income derived from maize sales, if we have any.**

Despite—or rather because of—the profitability of its seed enterprise, the CIAL has retained its originally strong orientation towards serving the community. "If there is demand for research on a particular crop and we know it is suitable for our environment, we will respect that demand", says Medardo. Next on the CIAL's list of priorities is

beans, the community's second most important food crop and one for which Medardo and his colleagues are receiving a growing number of requests.

Adding value

Seed production is the first enterprise of most mature CIALs. Many go on to invest the profits in new hulling and milling equipment, providing a further service to the community.

At El Diviso, having a mill in the village centre saves everyone huge amounts of time—a long trudge to a nearby town or a whole day spent milling by hand an amount that takes 3 minutes by machine. It also saves some pesos, as the CIAL undercuts the higher prices charged by larger scale millers. Milled maize has a higher retail value than the unprocessed crop, helping to raise the incomes from grain surpluses still further. Another advantage is that the machinery can be used to mill other cereals besides maize and to process ripe coffee berries.

Many households feed some of their surplus maize to animals, whose products also have a higher cash value than the grain. People in the village say the number of chickens kept has risen sharply in recent years. Women in poor households, especially, have gone into egg production to earn extra cash.

Another project under consideration by the CIAL is to make and market a feed concentrate using maize and other ingredients. This would give a boost to the small-scale dairying sector, currently constrained by the shortage of high-protein feeds to supplement the basic diet of pasture.

Spill-over benefits

Going shopping in the distant market town used to be an enjoyable day out for some of the wealthier inhabitants of El Diviso, but for most it was a time-consuming chore, performed only when the needs mounted up to the point at which the trip became absolutely necessary. Nowadays, however, the villagers are more likely to pop out to the local shop to get those little forgotten extras. Thanks to a one-off donation by the CIAL, the farmers' association that runs the shop has been able to carry a wider range of goods than is normally available in a country district.

The donation is just one of the many spill-over benefits that have flowed from the CIAL's work.

For the CIAL itself, the most important benefit is access to more land. In 1996, the CIAL members joined with two other farmers in the community to make a successful application to the Instituto..... (INCORA), the government agency responsible for land allocation. As a recognizable organization of at least six people with a proven track record in implementing a clearly defined project, the CIAL fulfilled the agency's conditions for an allocation and gained an extra 40 hectares of land. Used for seed production, the land is the very basis of the CIAL's growing prosperity.

"Since the CIAL, more and more institutions are coming here offering credit and training"— .....Medardo.

"I used to see livestock and sugar cane as our main priorities. Now, with this new maize so much in demand, we are making that a priority instead."— .....Medardo, extension agent, UMATA Rosa, Colombia.

In a land-scarce rural society, extra land is a vital exit route from poverty. To the north of El Diviso lies the village of San Bosco, whose inhabitants are mostly landless labourers. When the leader of the CIAL at San Bosco heard about El Diviso's successful application, he decided to visit El Diviso to learn more. Now he too has launched a similar application.

It was one of many such visits. "People come from near and far", says Medardo, "and they ask us about all sorts of things". As Cauca Department's most successful CIAL, El Diviso has become a show-case for the methodology, spreading knowledge of its potential and providing advice and help to others along the way. Many groups going through difficulties in their early stages have been given new hope by the glimpse of their future afforded by a visit to El Diviso. It is impossible to calculate the economic value of such visits, but it must far outweigh their costs.

Besides helping other communities, the CIAL at El Diviso has attracted more support from other institutions to El Diviso itself. For example, it has forged links with the Servicio Nacional de Aprendizaje (SENA), a government training service, from which it hopes to obtain assistance in developing its feed concentrate. According to Medardo, the credit and training opportunities open to local smallholders have increased markedly since the CIAL began.

The CIAL has also influenced the priorities of formal R&D institutions. A local extensionist noted that, in response to demand from farmers, his office was switching its priorities from livestock and sugar cane to multiplying and disseminating the new maize variety.

A self-sustaining R&D programme

One of the most exciting spill-over benefits from the CIAL's work is the creation of what amounts to a self-sustaining local R&D programme. The

programme helps the community's farmers diversify into new commercial enterprises by reducing the high cost of credit.

On every kilogramme of maize seed sold, the CIAL makes a small contribution (around US$ 0.20) to a rotating fund set up at the CIAL's request by the local farmers' association. Farmers who are members of the association can borrow from the fund at interest rates well below those obtainable commercially—currently 20% compared with 35% from the banks. The loans are conditional on the farmer's receiving prior training in the production of a new commodity. So far loans have been granted to farmers venturing into tomatoes, beans, maize, pigs and chickens. Training has been provided by several NGOs and by SENA. Farmers applying for a loan must submit a written proposal, which is vetted by the association with advice from the CIAL. The CIAL also helps identify sources of training.

"It's all based on the experience we had in the CIAL", says Medardo, who regards the programme as an important new development in the village. "The CIAL has made many farmers in our community more interested in innovating."

"This methodology is extremely useful. I talk about it wherever I go"—....Medardo.

Medardo, like many CIAL leaders, remains modest in his assessment of the CIAL's impact. But even he can't help concluding, with just a hint of pride in his voice, that life has got better in El Diviso since the CIAL began. And he has become an ambassador for the CIAL process on the many trips he makes to other communities that have yet to start their own CIAL.

Growth, equity, sustainability

As events at El Diviso demonstrate, the CIAL process can stimulate rapid growth in the rural economy. Launched in 1990, El Diviso is among the more advanced CIALs, but many others show a similar evolution, with a promise of similar impact. **(What percentage of CIALs are evolving in this direction? Do we have any real data on impact on family farm income?)**

With its emphasis on empowerment, the CIAL process also has highly positive equity effects. Several cases demonstrate its impact on very poor or marginalized groups normally left behind by development, such as landless labourers, Indians and women (see Chapter). **Need data on incomes of poor people who have benefitted. Any hard data on landless people at San B? Are any women's groups or Indian groups particularly profitable?**

Often, the simplest innovations can bring impressive benefits to marginalized groups. At Santa Isabel, high in the mountains of Cauca, a

group of resource-poor Indian farmers began using stakes and string to support their snap bean crop after they had come into contact with another CIAL using the same technique. The stakes lift the beans clear of the soil, freeing the crop of the soil-borne fungal diseases that used to devastate harvests. CIAL-to-CIAL transfer of technology of this kind is increasing among such groups, many of which operated in comparative isolation before the CIAL process helped them to break down barriers and form alliances with others.

The impact of the CIAL process on the sustainability of production appears neutral. How agriculture affects the natural resource base depends more on the judgement and skills of individual farmers, the options open to them and the kinds of technology tested than on the research process per se. At San Isidro, in Colombia, members of the women's CIAL are funding their activities by growing maize, beans and soy on a steep hillside perilously vulnerable to erosion if the rains turn heavy. Meanwhile the men in the same village are concerned about the sustainability of cassava cropping, the topic of research in their CIAL. They believe farmers must diversify into crops profitable enough to justify the use of fertilizer and compost, but have yet to find a crop that is suitable, having been forced back into cassava when trials with maize and onions failed. They have considered the use of live barriers on sloping fields—but livestock would be needed to make economic sense of this option, and farmers at San Isidro do not have the spare cash to invest in them. The CIAL provides a forum for the discussion of such issues, but that does not mean that action will follow. Awareness may be raised, but practical alternatives to current

practices are still few, the day-to-day grind to earn an income taking precedence over longer-term considerations.

Nevertheless, many CIALs are testing technology that, if widely adopted, will protect the natural resource base. In several countries the introduction of new varieties of maize and beans that respond to fertilizer is leading to an increase in the use of chicken manure, with benefits to soil fertility and structure on steep slopes. The CIAL at El Paraiso, in Honduras, is testing the use of live barriers in a large sloping field cultivated to maize and beans. The CIAL members cleared the field without burning—hard work, but worth it for the saving in nutrients, they say. In such cases it is sometimes unclear whether the decision to test resource-conserving technologies genuinely reflects priorities in the community or is more influenced by the external technician supporting the CIAL process.

Many CIALs are conducting research on the integrated management of crop pests and diseases. One group, CIAL El Progreso in Ecuador, has succeeded in halving the number of fungicide applications to potato from 14 to 7 in a season. As well as benefitting the environment and human health, this has brought the farmers a saving of approximately US$ 280 per season. Another group, in Colombia's Valle Department, has developed new indigenous technology to combat nematodes on blackberry *(mora)*. Local farmers suffering from an infestation of nematodes had noticed while cleaning their fields that *paico*, a tall-growing aromatic herb already known for its medicinal value, was one of the few plants not affected. They asked their CIAL to conduct research on it. The CIAL found that a cupful of *paico* extract applied to the soil surface round each *mora* bush banished nematodes after 5 months and that pesticide applications could be discontinued. Finding such as these testify to the CIAL's effectiveness in building on farmers' indigenous knowledge and powers of observation.

CIALs operate mainly at community level. However, conserving and enhancing the natural resource base often requires decision-making and action on a whole watershed basis, cutting across community boundaries. Pilar Guerrero, sociologist with the CIAT-IPRA team, thinks that the CIALs are not an ideal structure for dealing with such issues. "Most CIAL members and farmers still work individually", she points out. "Being profit-oriented they are not sufficiently inclusive or outward-looking to be able to reach out to resource users beyond the community." CIALs in Cauca Department's

Cabayul watershed are participating in the Consorcio Interinstitutional para Agricultura Sostenible en Laderos (CIPASLA) as a way forward in developing more sustainable agriculture. CIPASLA negotiates deals between communities and individuals in which socially and ecologically desirable projects such as the protection of water resources are undertaken in exchange for short-term benefits such as access to credit for specific investments.

Assessing impact

In 1998 CIAT launched a study to assess the impact of the CIAL programme. The study compares four communities that have no CIAL with four that have a well developed CIAL. For the communities with a CIAL, the situation before foundation is being compared with that 4-5 years afterwards. All the communities are in Cauca Department.

Only the preliminary results of this study are so far available. They show that, in communities with CIALs, many more farmers cultivate beans than in those without—70% compared with only 48%—and that most of these have adopted at least one improved variety. The data on maize are expected to show a similar trend.

Farmers in CIAL communities also grow more vegetables, have greater access to credit and have more off-farm activities—all signs of a more dynamic village economy.

Critics of the CIAL methodology sometimes argue that turning farmers into researchers will suppress indigenous knowledge and destroy their spontaneous capacity for experimentation. One interesting finding of the impact study suggests that this fear is unfounded. Communities with CIALs had more spontaneous experimentation going on in them than non-CIAL communities, with many farmers who were not members of the CIAL conducting their own research. "There is a romantic view of indigenous knowledge systems that advocates their isolation and protection from the corrosive effects of modern science and technology", says CIAT economist Doug Pachico, who is responsible for the study. "Our study suggests that, on the contrary, the more you introduce the concept of learning to a community, the better it gets at it. The barrier between indigenous and modern knowledge is in any case artificial—it's more like a continuum in which the two blend into one another."

CIAT's assessment of impact from the CIALs' work is far from complete. Watch this space for further details!

So what?

To sum up:

- *In communities such as El Diviso, whose CIALs are mature, the CIAL process has had a great deal of impact on rural well-being, often moving the community from food deficit to food surplus*
- *Impact typically begins with the CIALs establishment of seed production and milling enterprises*
- *Knock-on effects are felt in many areas, notably in livestock production and in access to land, credit and training*
- *CIALs can help to draw the attention of formal research and extension services to farmers' concerns and priorities*
- *The CIAL process is especially effective in benefiting poor and marginalized groups*
- *It is neutral with regard to sustainability and resource conservation issues*
- *CIAT's impact study has shown higher adoption of improved crop varieties in CIAL communities.*

The Community's Verdict

Whether or not the rest of the community supports its work is the litmus test of an effective CIAL. In the early stages support depends critically on the degree to which a CIAL keeps the community informed about its progress and results. In the longer term, it is vital that the benefits of research experienced by CIAL members are shared by others in the community, including potentially marginalized groups.

The community that changed its mind

The people of 11 de Noviembre had a problem. Some members of their community—a tiny village high in Ecuador's Andes—wanted to be excused *minga*.

Minga, or community service, is a common custom in the rural areas of Andean countries. One day a week, all working members of the community come together to perform tasks that will benefit all—such as repairing paths or roads, or cultivating fields in common. At 11 de Noviembre, the community had decided to grow an extra potato crop for market, raising money to improve the village's scanty facilities and services.

The 12 individuals who thought they ought to be exempt from this project had formed what they called a local agricultural research committee. They claimed their work for the committee should be seen as equivalent to *minga* because it was for the benefit of the whole community. But was it really? The plots they had started were so small compared to the communal plot. They wouldn't produce a large enough harvest to make a profit. And even if there were a profit, wouldn't the 12 just keep it to themselves? The rest of the village remained sceptical—and refused their request to be exempted.

That was 3 years ago, when the CIAL at 11 de Noviembre had just begun. By 1998, the community had reversed its decision. Thanks to the CIAL, most farmers in the area now had access to new varieties of potato and the village had its own milling service for barley and legumes. Almost everyone had benefitted, and the CIAL's case for exemption from *minga* had been accepted as a result.

The community and the process

Communities interact directly with their CIALs at three formal meetings during the CIAL process: the motivational meeting, the diagnostic meeting and the feedback meeting.

At the motivational meeting the community decides to have a CIAL and appoints the CIAL members. The main criteria for election are community-mindedness and an interest in doing research. There is much evidence to suggest that the people elected not only meet these criteria but have a reputation as extremely hard workers into the bargain. The CIAL leaders at San Bosco and El Diviso are prime examples of this kind of person.

The people elected to the CIAL may be already recognized as leading figures in the community, but this does not mean they are necessarily wealthier or more influential than the community's "average" members. And even if they are, that does not matter provided they are willing to share the results of the CIAL's research with others.

The diagnostic meeting is crucial for the community's ownership of the CIAL process. In principle, the advantage of deciding on priorities at a public meeting is that it creates an open, transparent process in which anyone is free to participate and which all can agree to be fair. In practice, however, it may not quite work out that way. Jacqueline Ashby, former

coordinator of the CIAT-IPRA team, comments: "The research agenda is set by the community—but the community itself is heterogenous, consisting of young and old, male and female, wealthy and poor, landed and landless. Not all these groups will be represented at the meeting, so the resulting priorities will be priorities only for some." Those least likely to attend are the ones who feel research cannot benefit them—precisely those who are probably marginalized already.

Despite this disadvantage, few communities give the impression of having had a closed diagnostic process with a foregone conclusion. At 11 de Noviembre, as at many CIALs, the number of votes for each of the commodities short-listed during the meeting is openly displayed on a poster in the community room—signs of a healthy debate at the meeting itself and of a CIAL keen to communicate with those who weren't at the meeting.

The feedback meeting is the community's chief means of ensuring that the CIAL remains accountable to it. In communities with a strong CIAL this meeting is held each year, at least until the production stage is reached. Weaker CIALs sometimes allow the meeting to lapse after the first or second year. The reasons for such lapses vary, but the cause is more likely to be poor or unclear results than a deliberate attempt to withhold valuable information. CIALs with poor results do not like having to confess them to the community for fear of embarrassment or blame, followed by a loss of support. Nevertheless, Ann Braun, CIAT-IPRA coordinator, notes that feedback to the community is potentially the weakest point in the CIAL process and the one most frequently attacked by critics. In Colombia, CORFOCIAL has recently signalled its concern for this part of the process by introducing a tough new rule for the CIALs it supports: a CIAL that fails to present its results to the community will not be supported when it sows its next year's trial.

The three formal meetings are the most important means of communication between the CIAL and the community, but there are others. Many community rooms in CIAL villages have posters displaying the results of research. In some CIALs, the secretary produces a written report describing the trials and their findings—although this is not usually made widely available. Almost all CIALs have an extensionist, whose responsibility is to spread awareness and provide advice and help to others. CIAL members can often be contacted individually, in the community room or at their homes. And during the cropping season there are plenty of opportunities for

informal dialogue across the fence or over the plots themselves. At Palmichal, in Honduras, one CIAL member said: "People pass by my fields and ask me what I am doing, so I have a teaching process under way".

Nicaragua provides a good example of community involvement not only in priority setting and evaluation but also in trial implementation. The people of Nuevo Pensamiento, at Cuyas in Somoto State, assist their CIAL's researchers in sowing the trial and collecting data on crop growth and resistance to pests and diseases, then harvest the crop and help calculate the yield. Carlo Arturo Quiroz, the CIAT-IPRA team member who has monitored this group's progress, says that community implementation leads to strong ownership of the trial's results. In Brazil, the involvement of larger groups in the CIAL's work is common.

Are the CIALs elitist?

Elitism is the criticism most frequently levelled against the CIALs concept by other workers in participatory research and development. Elitist CIALs, it is alleged, betray the community-based CIAL process by retaining knowledge and resources for their own use instead of sharing them with the community.

To what extent is this criticism justified? In the short term, the CIAL process undoubtedly creates a small group of farmers with privileged access to new technology. The CIAL fund, in particular, creates a freedom to innovate that other farmers in the community do not have. In the longer term, however, this difference should disappear, as the CIAL disseminates its results to the broader community.

Does this process of dissemination actually take place? The trend in community acceptance of the CIAL at 11 de Noviembre confirms that it did so there. Not all communities provide such a clear indicator of the successful transfer of CIAL results, but there is growing evidence to suggest that a similar process occurs, or is about to occur, in many other places. In communities such as El Diviso, it is clear that the benefits of the CIAL's work are widely shared.

A study of the CIAL at San Bosco, also in Cauca Department, found no significant difference in the economic circumstances of CIAL members (including their immediate families) and the rest of the commu-

nity, some 6 years after the CIAL was established. Almost all the non-CIAL members of the community who were interviewed said they had benefitted from the CIAL's work, citing the use of new seed and milling equipment as the chief benefits.

CIAT's impact study in Cauca, Colombia found that, in four communities with CIALs that had reached the production stage, awareness of the CIAL and its activities was high. Around 75% of a randomly chosen sample of non-CIAL members in each community were at least reasonably well informed about the CIAL and its activities. Some 50% knew all about the CIAL trials and their objectives, while 40% knew the trial results in detail. Clearly, these CIALs are communicating well with a high proportion of their communities.

The most convincing evidence of the spread of benefits from the CIALs' work is the personal testimony of non-CIAL members of the community. Romelia Salazar, who lives and farms at San Bosco, tells how the work of their CIAL has made life easier for her and for many others in this once impoverished village.

Most CIALs testing new food crop varieties seem likely to evolve along the lines of El Diviso or San Bosco. In such cases the CIAL becomes a seed production enterprise and a small-scale milling business also develops, either within the CIAL or separate from it. Both types of enterprise bring benefits that spread widely within the local community and also attract clients from further afield. This type of CIAL may be thought of as the "classical" model, in the sense that it conforms most closely to the ideal in which the community fully captures the benefits of the research process. The profit motive of individual CIAL members is not at odds with the CIAL's objective of sharing research results widely. In fact, it is essential to meeting this objective.

Elitism is therefore seldom a problem in this model, but there are other types of CIAL in which it seems more likely to arise. The temptation to hoard knowledge or resources is perhaps greatest in specialized processing enterprises, especially when these are competing fiercely in a shrinking market.

"We all benefit from the work of the CIAL. Before, we had to go far, to the forest and over the rivers, to find a plot to clear by slash-and-burn. Now we can farm here, because the CIAL members have learned how to grow maize on slopes, sowing the crop more densely. Before, we used chicken manure only on cassava. Today we also use it on beans and maize; it helps to make the hillsides more stable and fertile. Now we prepare land for

maize with animal traction, which we used to use only for other crops, not for maize.

"The new maize hulling machine is a wonderful service for the whole community. Before we had to hull maize by hand or go all the way to Mondomo. Now we have this machine, it's much easier. Even people from other communities come to use our service. And it can be used for coffee as well as maize, so now we can store large amounts of coffee ready for consumption.

"Previously, our community was isolated. The CIAL has opened the door for institutional support. For example, the UMATA of Santander came and

The Asopanela CIAL, in Cauca, was formed to seek efficiency gains in the small-scale production and processing of sugar cane to make *panela*, a form of crude sugar used to make energy-giving drinks and snacks. The price of *panela* had fallen dramatically when large-scale modern sugar plants, short of orders for refined sugar, began competing with the small-scale producers. When the CIAL's research showed promise, other producers who had been part of the Association before it became a CIAL wanted to rejoin. But the CIAL effectively kept them out by requiring a hefty re-entrance fee. Asopanela has since gone on to sell its expertise in process-

ing to other associations. It plans to become a regional school for the production of *panela*.

The jury is still out on whether or not Asopanela has behaved fairly. Its research addresses a specialized interest that is not widely shared by the broader community. And even within its interest group, it has not shared its knowledge freely with non-CIAL members. On the other hand, there is no real difference between Asopanela's commercialization of its expertise and the sale of seeds and milling services by classical CIALs. Both provide a much needed service and both ensure the sustainability of the CIAL as a business, if no longer as a research committee. Asopanela plans to donate its research fund, now 40% higher than it was at foundation, to a new group that is forming to conduct research on plantain.

Another form of elitism may be thought to arise when CIAL members invite their relatives to join the CIAL. Of the 12 members of the CIAL at El Paraiso, in Honduras, nearly all are related to each other by blood or marriage. CIALs of this kind court the accusation of being "cosa nuestra"—a family business intent on protecting the interests of a clan or grouping within the community. However, there is no conclusive evidence that such groups do in fact withhold information or resources from non-members. In more isolated communities it may be difficult to compose a CIAL whose members are not related.

Lastly, there are cases of elitism by default. CIALs in their early stages sometimes have a weak sense of responsibility to the community because the CIAL process is new to them. They may be more accustomed to working in conventional on-farm research projects, which do not require them to report back to the community. The CIAL is especially likely to think of itself as just another form of on-farm research when formal research or extension services launch CIALs in areas where they have already worked before. Under these circumstances both farmers and technical staff can find it difficult to shake off old working habits and expectations.

organized a womens' group to raise chickens. We will use our surplus maize to feed the chickens.

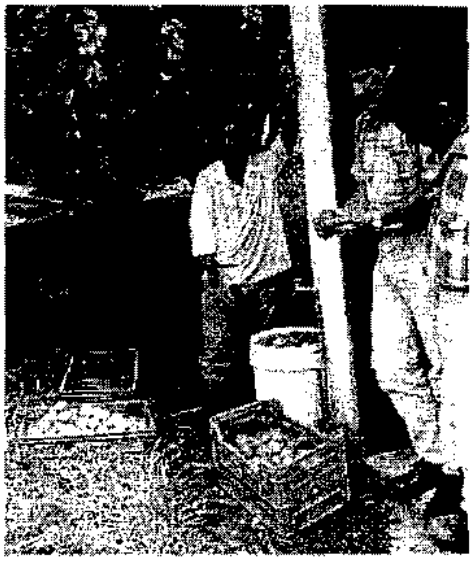
"The CIAL is very active in the community. They always have ideas for the village. They have united the community and are essential to its life."
— Romelia Salazar, non-CIAL member, San Bosco, Colombia.

Poverty and the community spirit

According to some observers, CIALs are likely to work best in poorer communities, where there is a strong self-help tradition and strong social cohesion. Where farming is more commercial and therefore more competitive, it is harder to generate and retain community support.

Experiences in the contrasting environments of Cauca and Cundinmarca add weight to this hypothesis. Cauca, where the average annual income is ???, is one of Colombia's poorest provinces. Yet it is host to some of the most successful CIALs, including both San Bosco and El Diviso. Villages in

which there was a pre-existing farmers' association or self-help group have shown a particularly high success rate. The presence of these institutions, which often organize communal production and other cooperative ventures, may be taken as a proxy for the community spirit that makes a CIAL process work.



In market-oriented Cundinamarca, in contrast, the community spirit is less evident. "Farmers here tend to work by themselves", as one CIAL member at Pasca remarked. At Arvelaez, where the CIAL is conducting research on snap beans for market, tensions in the group are occurring as its members experience conflicting demands on their time. This stands in marked contrast to San Bosco, whose landless labourers made time for CIAL activities despite their long working day, which included a 3-hour walk to their leased fields. Where time is money, farmers are less generous with it.

It would be dangerous to generalize on this point, however. Being a poor community is by no means synonymous with having a strong self-help tradition. Many poor hillside communities are deeply divided along political or ethnic lines, frustrating collective action or at least making it controversial. In such places the fate of the CIAL depends greatly on the perceived impartiality of its members and those who support it. One CIAL in Colombia's troubled Cabayul watershed ran into difficulties because a technician recruited locally by CIAT was a controversial choice in the eyes of the Indian community, who resented his large land holdings and the low wages he paid them as labourers.

In troubled communities the CIAL appears as a fragile vessel, tossed on the tides of local feeling and easily wrecked when tensions ignite into violence. Yet it is equally true that the CIAL process can help to heal past divisions. In El Salvador, the community of San Francisco consists of refugees who have returned after 10 years of civil war. Some are from the area originally, whereas others have come from elsewhere. The existence of the two groups creates the potential for conflict, fueled by unequal access to resources and unsettled scores from the past. However, representatives of both groups are on the CIAL, which is addressing the shared need to increase basic food supplies. "Our common maize culture unites us", they say.

Do the CIALs reach the marginalized?

How much does a CIAL's success depend on the crop tested? Maize

When the CIAT-IPRA team received a letter from landless labourers in San Bosco asking for help in forming a CIAL, it sparked a lively debate. Some members of the team felt the area was too poor to be able to gain from the CIAL process and that landless labourers, in particular, would not have the time and energy to participate. Others argued that to ignore such a request would be to betray the marginalized people who most needed to benefit from a CIAL. Launching a CIAL in San Bosco would be the ultimate test: if it could work there it could work anywhere.

Luckily for San Bosco, the latter view prevailed. The community got its CIAL, which today is one of the most successful in Colombia. Here as at El Diviso, the main achievements are the introduction and testing of new varieties of maize, the formation of a seed production enterprise and the establishment of a milling service.

The pattern of farming in San Bosco reflects its location, in an area of steeply sloping hillsides prone to erosion and declining soil fertility. Good land holdings close to the village are scarce. When the CIAL was founded, most of its adult male inhabitants, including three out of four CIAL members, had to walk for 3 hours to reach fields that they leased in more productive areas. It is here that they cultivated most of the maize and other crops on which their family's survival depended.

The CIAL's work has benefitted these landless labourers in several ways, the most important of which is a radical change in land use. Unlike the traditional variety, the improved varieties of maize introduced by the CIAL can be grown on slopes close to the village. The use of higher sowing densities and fertilizer make it possible to produce maize sustainably in areas where the risk of erosion and declining soil fertility once ruled out the crop. This frees up time and resources to cultivate more lucrative crops in the more distant plots. Some labourers have even been able to relinquish these plots in favour of newly cleared land closer to the homestead. Effectively, they have become land holders, with greatly increased returns to their labour and to the profitability of their farming.

Several other benefits from the CIAL's work accrue to the landless just as they do to those with land holdings. These include the local availability of improved seed and the village's new milling enterprise, which saves every-

one in the community time and money. Regardless of whether or not they own land, most families in the community now enjoy a maize surplus. Many are now able to keep chickens—an ideal enterprise for households with little land.

Another marginalized group that has shown strong participation in the CIAL process is resource-poor Indian farmers. Indian communities live in some of Latin America's least hospitable terrain—high areas close to the upper limits of cultivation and remote from markets. Yet such areas have bred some of the most active and successful CIALs. One of these, at Totoro, in Colombia, has re-introduced a crop lost to the community over 20 years ago. Totoro's CIAL process started when village elders told visiting CIAT-IPRA technician José Ignacio Roa how they used to cultivate wheat before it became susceptible to fungal diseases. Nowadays, they had to walk many kilometers to the town of Popayan, where they bought bread of inferior nutritional quality. Roa wrote to the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), known to be a source of resistant germplasm. Today the CIAL is experimenting with no less than 14 new varieties and there are plans to restore the community's abandoned mill.

Women form a third marginalized group in many rural communities. Of the 2... or so CIALs that have now been formed, around 2... or .. % (the (vast?) majority?) consist entirely of men. Women form the minority in mixed groups, in many of which they take part as secretary because of their higher educational levels and literacy skills. Pilar Guerrero, a sociologist with the IPRA-CIAT team, feels that women should have their own CIALs. "They tend to drop out of mixed CIALs because of machismo", she says.

When mixed or all-male CIALs select and disseminate improved crop varieties, women in the community benefit alongside the men. Indeed, women are often the final arbiters of whether or not a new variety is acceptable, since they do most of the processing and cooking and often grow the crop too. At Palmichal, in Honduras, Andrea Hernandez, the wife of a CIAL member, was among the first to submit the new maize

variety selected by the CIAL to its final test—its performance in the frying pan when *tortillas* are made. At El Diviso, one of the maize varieties selected by the CIAL was rejected by the community's women, who complained that the grain was too hard to separate from the cob.

Despite women's role in screening technology, all-women's groups are likely to work better for women in the community as a whole than mixed groups, if only because they specifically set out to do so. Surprisingly, relatively few all-women's groups have yet been formed. Among those that have, several have shown courage and determination, as well as a robust good humour, in their struggle to appropriate the CIAL process and make it work for them despite a discouraging lack of support from the men. Here is the story of one such group.

Revolt in the kitchen

"When the men organized their CIAL, the only role assigned to us women was to cook and wash up for them at their meetings." The speaker is Ana Margot Campo, extensionist with the Cinco Dias womens' group at Alfonsa, Colombia. Campo was one of several women present at the motivational meeting that had launched Alfonsa's first CIAL, back in 1990. She and the others had listened in silent resentment as the men had left them out.

A few weeks later, Campo was among the women toiling away in the community hall's small kitchen during one of the men's meetings. As usual, the women were grumbling about the men, relieving the tedium of their chores through mockery and laughter. But they grew serious when one of them said, "Why don't we start our own CIAL?"

The women were enthusiastic about the idea, but decided to keep it under wraps. They knew that, if they announced it to the men, they would only be laughed at. Over the next few weeks, as the men continued with their own meetings to discuss the business of the community's official CIAL, a parallel unoffical planning process took place behind the community hall's kitchen door.

The kitchen proved the ideal place to conduct the group's diagnostic work, the women discussing the pros and cons of each ingredient as they prepared it and placed it in the pot. Beans? The men are already researching

"We women used to be considered as housewives only. We were not encouraged to leave our houses. One evening I went out to a group meeting and returned to find that no one in my family had cooked supper. I told them this must never happen again! Now, when I go out, I come back to find the children in bed and the supper on the table. My husband and eldest daughter do the work. The same is happening in other houses in the village. It's a revolution in family role playing and the way we share work. The men now accept our status as researchers." — Ana Margot Campo, extensionist, Cinco Dias CIAL, Colombia.

that. Plantain? That's a man's crop. Coffee? No, not profitable enough. In the end the group settled on *mora*, a blackberry that is ideal for processing in the home and would bring in some badly needed extra cash.

After simmering for several weeks the idea came to the boil, at which point it could no longer be concealed from the men. When the women told them of their plans, the reaction was predictable: half patronizing disbelief, half an attempt to muscle in what sounded like a possible money earner. "You women won't be able to do the field work", the men argued, "so we ought to help you". The women replied that they wanted to be a "women only" group. Just as they took care of the housework and children by themselves, so too would they manage the field work.

The women posted announcements in the village shop to recruit more women to the group. They then launched their research, comparing different varieties of *mora* bush for fruit productivity and quality. Initially dependant on the men's group for funds, the new CIAL soon broke away to start its own bank account when the money promised by the men never materialized.

The CIAL's research has now reached the production plot stage. In material terms its impact is still modest. The *mora* bushes have been plagued by a disease, frustrating the commercial production of jam and fruit juice.

But the women say their activities have had a profound effect on family life and on their status in the community. Once relegated to the role of housewives, they are now considered as researchers, just like the men. There has been a shift towards a more equitable sharing of household tasks, with men who once refused to cook or to look after children now standing in for their wives on evenings when they go out to meetings.

The revolt that started in the kitchen has become a revolution whose effects have spread throughout the home. And its impact should soon be felt materially, as well as psychologically. Despite their early setbacks, the women plan to scale up production and to sell their produce, first in the village shop and then in a nearby market town.

So what?

To sum up:

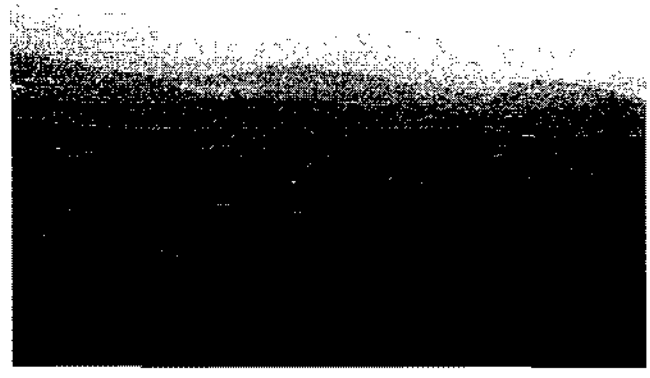
- *There is growing evidence to show that the benefits of the CIALs' research are widely shared in the community*
- *Equitable sharing of benefits occurs most readily when CIALs become seed production enterprises*
- *Marginalized groups in the community can benefit from the CIALs' work.*

Can You Repeat That?

To fulfil its potential to alleviate poverty, the CIAL process will have to be widely adopted. That means the process must be robust enough to be replicable in different institutional and cultural settings, without losing the essential characteristic of farmer empowerment that makes it effective. The quality of support received by a CIAL during its early stages critically determines its long-term survival and impact.

A new challenge

Experience in the Cauca laboratory had shown that the CIAL process could benefit resource-poor farmers. But could it work outside Colombia? And could organizations other than CIAT support the process?



That, in essence, was how Dan Moore, Vice-President of the Kellogg Foundation, once again challenged the CIAT-IPRA team at the end of the second Kellogg Project. The team's response was to seek funding for a third project whose aim would be to disseminate the CIAL methodology more widely in Latin America. Launched in 1995, the project initiated CIAL programmes in Bolivia, Ecuador, Honduras and Nicaragua, while expanding efforts in Colombia. El Salvador and Brazil also joined the project at their own request.

Three "big ideas" characterized this third project. The first was to create a multiplier effect by training trainers in each participating country. The aim was to form core national teams of technicians and paraprofessionals familiar with the methodology and able to teach it to others. Secondly, the project would operate in focus sites—areas close to partner institutions in which a high concentration of CIALs would be developed. These sites would serve as a training ground from which the methodology would radiate out to other areas. The third idea was to form a triangular relationship in each participating country between an agricultural university and/or

a national research institute, a non-government organization (NGO) and farmers' organizations at community level.

The rationale for the triangular relationship was that it would bring the different strengths of each type of institution into the CIAL programme. Experience in the Cauca laboratory had shown that the strongest CIALs formed in villages with a strong pre-existing farmers' association. Involving the universities would be a way of drawing them into the mainstream of national development and building the future human capital available to national agricultural R&D by introducing the CIAL methodology into the teaching curriculum. The NGOs were felt to be ideal partners in disseminating the methodology, given their strong links with rural communities and their commitment to participatory approaches to development.

Disseminating the methodology

In practice, it proved difficult to get a model triangular relationship up and running. Either all three types of institution weren't operational in the same geographical area or, if they were, one or other of them turned out not to be fully committed to the CIAL process or not able to support it effectively. Like many big ideas, the triangular relationship foundered when it hit the real world.

Fortunately, this did not impede dissemination of the methodology. Individual movers and shakers, rather than a perfect institutional model, proved the key resource in building a successful CIAL programme.

The CIAT-IPRA team estimate the total number of CIALs launched in partner countries during the project at around..... Numbers alone do not tell the whole story, of course, since they give no indication of the quality of the CIAL process. However, according to the team's observations, successful CIALs have been established in all participating countries.

The progress made in each country can be summarized as follows:

- *Bolivia.* The country's first CIAL was launched in Tukma Baja, near Cochabamba, in 1994 by scientists of the Programma de Investigacion de la Papa (PROINPA), who had received training from CIAT-IPRA. After initial doubts, interest among PROINPA scientists quickened when a number of CIALs evaluated and promoted PROINPA technologies. PROINPA now has CIALs in five of its seven pilot areas. Several NGOs began their own CIAL progammes following a training course in 1996. These include the Centro de Desarrollo Agropecuario (CEDEAGRO),

which now has seven CIALs. Links with the Universidad Mayor de San Simón have served to introduce the methodology to students, but the university itself has not formed any CIALs. By April 1998, the country had a total of 17 active CIALs.

- *Brazil.* There are now about 25 CIALs, locally known as Comités de Pesquisa Agrícola Local (COPALs), in northeast Brazil, the country's poorest region. Most started with research on cassava, but some have since diversified into vegetables and fruit production. Testing of the CIAL methodology came about originally through the Proyecto Proteção Fitosanitária Sustentável da Mandioca (PROFISMA), a collaborative cassava IPM project between CIAT and the Centro Nacional de Pesquisia Mandioca y Fruticultura (CNPMF), a commodity research centre of the Empresa Brasiliera de Pesquisa Agropecuária (EMBRAPA). Local extension services played a key part in ensuring successful implementation. EMBRAPA has since taken up the methodology enthusiastically and now wishes to apply it nationwide. It has submitted a project to the World Bank for funding to train a core group of national staff. The institute has also received requests to test the CIAL concept in Portuguese speaking Africa.
- *Colombia.* The CIAL programme in CIAT's host country goes from strength to strength. Cauca Department now has over 50 active CIALs, many of them at an advanced stage. The Cundinamarca region, near Bogotà, has become a second centre of activity, with over 20 CIALs launched by the Corporación Colombiana de Investigación Agropecuaria (CORPOICA), the country's national agricultural research institute. A variant of the CIAL has been developed for cassava producers and processors on the country's north coast, and a few CIALs have been developed in Valle Department. The extension services, together with a number of NGOs, have become active partners alongside CIAT-IPRA and CORPOICA. CORPOICA plans to apply the methodology nationwide.
- *Ecuador.* The main protagonist in Ecuador is the Programa Nacional de Investigación de la Papa (FORTIPAPA), a potato research project of the Instituto Nacional de Investigaciones Agropecuarias (INIAP), which has launched an active CIALs programme through INIAP's extension arm, the Unidades de Validacion y Transferencia di Technologia Activities (UVVTs). From use solely in connection with potato, the CIAL approach is now spreading to other commodities, including maize, barley and legumes. Training has been a key element in the building of a core national team,

which is now training others (see Chapter...). Activities in Ecuador are coordinated by the International Institute for Rural Reconstruction (IIRR), an NGO with a presence in several Latin American countries. A university social science programme, the Fundación Latinoamericana de Ciencias Sociales (FLACSO), has made valuable training inputs.

- *El Salvador.* Activities here began when an NGO, the Fundacion para la Cooperacion y el Desarollo Communal de El Salvador (CORDES), contacted CIAT-IPRA for information and support. CORDES has since led the country's CIAL programme, demonstrating strong commitment to it. After a course attended by representatives from CORDES and eight other institutions, seven CIALs were launched. Several of these are operating in areas devastated by the country's 10-year civil war. A professor from the national university became interested, provided some support and is now preparing a proposal to include the methodology in the course he teaches. The national agricultural research institute, the Centro Nacional de Tecnologia Agropecuaria (CENTA), has yet to become fully involved.
- *Honduras.* Activities in Honduras began in 1995, under the Investigaciones Participativa para Centro-America (IPCA) project funded by Guelph University and implemented by the Universidad de La Ceiba, mainly in the north of the country. The Escuela Agricola Panamericana (EAP), based at the Universidad de Zamorano, in the south, has its own separate CIAL programme. A national NGO, the Fomento Evagelico para el Progreso de Honduras (FEPROH), has also been an active partner. Staff from all three institutions have received training from IPRA-CIAT and have gone on to train others. Progress has been rapid, with a total of nearly 50 CIALs now launched. IPCA hopes to evolve into an NGO in 2000, when Guelph funding stops, and to broaden its activities to other Central American countries.
- *Nicaragua.* Here a Swiss-funded NGO network, the Proyecto de Agricultura Sostenible para las Laderas Centroamericanas (PASOLAC), was selected as a partner organization because of its extensive links with national institutions. PTD and farmer-to-farmer approaches have traditionally held sway in Nicaragua, with the result that there was some resistance to the introduction of another methodology. A course was held in 1996 for 18 participants from two universities and nine NGOs. After the course, around eight or nine CIALs were launched, but only five got as far as sowing their first trial. The Instituto de Promocion Humana (INPHRU), a rural NGO,

launched three CIALs and is keen to launch more, but has experienced difficulty in obtaining seeds of improved varieties. Attempts to strengthen links with the Instituto Nicaraguense de Tecnologia Agropecuaria (INTA) continue. Several other NGOs have become interested through exposure to INPHRU's experience. The Universidad Campesina (UNICAM) is comparing farmer-to-farmer technology transfer with the CIAL methodology, with a view to a possible synthesis between the two.

Many different kinds of people have had a hand in disseminating the CIAL methodology—farmers, technicians and paraprofessionals, national scientists and research managers, university academics, NGO workers. What can we learn from their experiences?

Academics get their hands dirty

Agricultural universities in Latin America have long been urged to confront the practical challenges of national development. The CIAL methodology is helping them do so.

No one knows this better than Nelson Gamero, who works in the Unir Project at Honduras' internationally renowned EAP, based at Zamorano University. The project is responsible for introducing the CIAL concept to an academic community whose wide-ranging regional activities and busy teaching programme have in the past kept it somewhat aloof from the farmers in its own backyard, the Yeguare region. The CIALs work is part of a broader effort to stimulate the region's development.

According to Gamero, the little applied research and extension work carried out by the university used to follow a linear process in which research was conducted on station before recommendations were made to farmers. "We called it participatory", he says, "but it was participatory in name only."

Since 1996, the project has started nine CIALs, all of which are conducting research on beans and maize. Farmers say they are delighted not only with the new technology introduced but also with the change they have noticed in the university's attitude towards them. They now enjoy increased contact with university staff, who visit their communities more often and invite them, in turn, to visit the university, where they evaluate new bean varieties on the research station.

Gamero says that experience with the CIAL methodology has so far had its greatest impact on the university's bean programme, which is now planning its own CIAL activities independently of Unir.

"The CIAL is like a bridge between the university and the community. Before, they used to tell us what to do; now we decide"— Tomas Barakona, leader, Lavanderos CIAL, Honduras.

"We are starting to see changes at Zamorano. Some students are inviting their professors to come here. Their professors are taking more interest in us, in learning from us."— Francisco Roger Figueroa, member, Silisgualagua CIAL, Honduras.

"I am convinced that the CIAL process empowers farmers. In my 10 years professional experience of working with farmers, I have had the best results using this method."— Nelson Gamero, agronomist, EAP.

The programme's scientists were initially sceptical of the methodology. The turning point came when Dr Rosas, head of the agronomy department, attended the feedback meeting of the CIAL at Lavanderos, a village in the nearby hill country. There he listened to Yolanda Nuñez, the CIAL's secretary, as she presented the results of their trials on beans to the community. He later told Gamero that he had been deeply impressed by her grasp of the principles of research and the soundness of the results she had presented. Questioned closely after her presentation, she had answered him confidently and in a more relaxed way than some of his academic colleagues would have done! As so often happens in participatory research, a personal encounter with farmers convinced when classroom seminars and discussion groups had not.

Dr Rosa's endorsement of the methodology encouraged others in his department to take an interest in it. Now the department's staff frequently accompany Gamero to the field and regularly attend the diagnostic phase of the process.

A little learning...

Older, more established scientists may be sceptical, but the rising generation of would-be scientists—today's students—typically embrace the CIAL methodology with enthusiasm. At La Ceiba University in northern Honduras, as at Zamorano, students are taught the methodology despite the fact that it is not yet officially part of the university curriculum.

"All the students I have anything to do with get introduced to the CIAL process", says Juan Gonzales, assistant professor at La Ceiba. "Some become very interested and stay involved long after we've covered it." Like Gamero, Gonzales sees his students as his secret weapon—a means of infiltrating university opinion with a view to gaining official acceptance of the methodology in the longer term.

There can be no doubt that Honduras' next generation of agricultural professionals will be better versed in the merits of a participatory approach than their predecessors. Those of today's agricultural professionals who accept a participatory approach typically came to it relatively late in their careers, turning to it when they realized that top-down approaches weren't working. Teaching the CIAL and other participatory approaches in universities is vital for raising awareness of the importance of farmer participation in research and disseminating the skills necessary to implement it.

When students come into contact with the CIAL process purely to learn from it, the experience can only be beneficial. But using students as a form of cheap labour to support CIALs is not a good idea. In Colombia, an NGO that had formed a relationship with a local university employed students doing thesis research to launch and guide the CIAL process. The farmers say the students, each of whom was only with them for 6 months, had a poor grasp of the CIAL methodology and did not pass on information about the CIAL to the next arrival in the field. Being expected to accept advice and assistance from people younger and less experienced than themselves also caused them problems. The farmers felt they knew better than to follow some of the advice they were given!

"The students were studying for their theses, not for us. They had too much theory and not enough practice"— Carlos Alfonso Ruiz, secretary, San Isidro men's CIAL, Colombia.

Driven by technology

Gonzales is normally a relaxed, unhurried driver. But not today.

Today, sitting bolt upright and staring straight ahead, he's got a vice-like grip on the steering wheel. On the twisty mountain road from Tegucigalpa, he grinds his teeth in frustration each time another heavy truck looms into the view ahead, slowing him to a crawl. As the road straightens out on its descent to the plain, he accelerates gratefully. On the final straight into Comoyagua he puts his foot right down, weaving through the traffic like a get-away car in a gangster film.

Gonzales is on his way to the regional research station of the Direccion de Ciencia y Tecnologia Agropecuaria (DICTA), Honduras' national research institute. This year, for the first time, the station's seed production unit has promised him enough improved maize seed to meet the needs of the entire CIAL programme. Gonzales is making sure he's on time to pick up the precious packets before the unit's manager changes his mind and gives them to someone else.

In Honduras as in most other Latin American countries, seed of improved varieties is scarce and competition for it hot. Previously, the IPCA Project hasn't had priority in the queue for supplies, but last year saw a breakthrough: invited to the annual CIALs meeting, senior DICTA staff were so impressed with what they heard and saw that they made a commitment there and then to meet the programme's demand for maize and bean seed every year.

Juan Gonzales

The management jargon refers to them, inelegantly, as "boundary spanners", and they are often a company's most valuable human resource: people whose interests and knowledge cross disciplinary or sectoral frontiers, placing them at the margins of their own institution but giving them a special ability to forge creative relationships with others. These are the people who take their institutions in new, unexpected directions.

Straddling the frontier between academia and development work, Juan Gonzales is a typical boundary spanner. He has one foot on the ladder of a promising academic career: a 1992 graduate of the School of Agronomy of Honduras' La Ceiba University, he has since worked at the university as an agronomist and was recently promoted to assistant professor.

The other foot is planted firmly in farmers' fields. When the IPCA Project was launched in 1995, Juan became the university's contribution to it. Born in the Atlandida Region, he seemed the ideal person to support the establishment there of Honduras' first two CIALs. Now, as the project's coordinator for Santa Barbara Province, Juan works tirelessly to nurture the 25 or so (???) CIALs under his care.

Having at first learned about the process solely from manuals, Juan attended a CIAT-IPRA course in 1995. He says that the course gave him renewed confidence in establishing and supporting CIALs. His visit to Cauca Department to see advanced CIALs such as El Diviso has inspired him to work even harder to guide his own groups to this stage.

People like Juan give the lie to the conventional image of Latin American universities as remote from the problems of rural development. Their ability to unite the two worlds of the farmer and the academic will benefit both.

Gonzales' dash to the research station is a measure of the importance he attaches to new technology in securing and retaining the interest of farmers in the CIAL process. Involving national research institutes is vital, since they hold the key to one of the engines that drives the process economically—the potential for small-scale farmers to multiply and sell improved seed.

For national institutes, different levels of involvement in the CIAL methodology are possible. Some institutes, such as DICTA in Honduras, choose to support the CIAL programmes of others by supplying seed and/or other services on request, but have not yet started their own CIALs. Others, such as INIAP in Ecuador, not only provide seed but experiment with the

CIAL process, comparing it with other participatory methodologies. The national institutes of Colombia and Brazil have announced their intention of applying the CIAL methodology nationwide. Meanwhile, in Nicaragua and El Salvador, it is NGOs rather than national institutes that have so far led the diffusion process.

Going national

Luis Humberto Fierro first came across the CIAL methodology while searching through literature references on participatory research in CORPOICA's library. At the time the institute was going through a crisis over its lack of impact and senior staff were being asked to think of new approaches to technology transfer.

After receiving training, Fierro and his colleagues decided to launch a CIAL programme in the country's crucial Region 1, the commercially oriented Cundinamarca area. With funding from another government agency, they established 21 CIALs, some of them showing great promise.

Now CORPOICA has decided to go nationwide with the CIAL methodology. The decision came when Fierro's directors approved a strategic plan developed by the institute's Technology Transfer Programme. The plan, which will be launched in all 10 CORPOICA regions in 1999, gives pride of place to participatory approaches, including the CIAL methodology.

Both Fierro and his former director, Santiago Fonseca, agree that the CIAL programme has been a success in Region 1, cutting the costs of research while increasing its impact. But they also acknowledge that success hasn't come easily: the groups need a lot of support at first; and some of CORPOICA's technicians and scientists find it hard to resist the temptation to dominate the process. However, both men are confident these problems will ease with time.

How does it fit in?

Most of the national institutes that have shown enthusiasm for the CIAL methodology are also testing other participatory approaches to R&D. An exciting process of cross-fertilization is under way, in which the different methodologies are enriching each other.

Brazil provides a classic example of how introduction of the CIAL methodology can alter the formal research agenda, increasing its relevance and potential impact. According to Tony Bellotti, CIAT entomologist with

"The only way I see the CIALs becoming sustainable in this country is to train them not just in the methodology but also in the use of new technology"—Juan Gonzales, CIAL coordinator, IPRA Project, Honduras.

"We were asked to do something different, so we did! I truly believe this process is useful, but because it's new for both researchers and farmers it's hard work in the opening stages. Young groups, especially, need a lot of hand-holding; when they're mature, they're more able to access their own resources."—Luis Humberto Fierro, CORPOICA, Colombia.

"As a whole the CIAL programme has been very successful for us. The success was reflected in the fact that we got 15 CIAL leaders here for a meeting. I was immensely impressed by the way they presented their projects and knew then that our efforts had paid off. More than doing research, the CIAL process is a way of revitalizing the whole community. If you launch a successful CIAL there is no doubt the members will eventually take it over and go further and faster, with less direct support from CORPOICA".— Dr Santiago Fonseca, former Director, Region 1, CORPOICA, Colombia.

PROFISMA, the project had previously been concerned with a narrow range of IPM problems, including biological control of the cassava green spider mite. The open diagnostic approach used in the CIAL process threw up a broader array of issues of concern to farmers, notably declining soil fertility, a different set of pests and diseases and the shortage of improved cassava varieties. "We realized that these issues were actually more important to the farmers than the topics we were researching", says Bellotti. The CIAL process enabled the project to change direction, focussing more sharply on farmer' priorities and linking with state and national agronomists in the search for solutions.

While PROFISMA is testing the CIAL methodology, another special project in the CNPMF is using a participatory plant breeding (PPB) methodology to develop and disseminate new cassava varieties. The proximity of the two projects—down the corridor from one another—enables the two approaches to be compared. The PPB methodology, originally developed by CIAT cassava breeders Edward Carey, Carlos Iglesias and Luis Alfredo Hernandez in northern Colombia, has the advantage of telling the researcher more about why farmers like or dislike different varieties, whereas the CIAL methodology achieves greater farmer ownership of the research process and its results. "The two groups are rivals", says Iglesias. "They haven't yet realized that the two methodologies are complementary, but we expect a synthesis to occur". A third special project financed by the International Fund for Agricultural Development (IFAD) will shortly test a PPB approach within six existing CIALs.

Meanwhile, Hernandez has developed a tool that should enable users of the CIAL process to extract from it more information useful to plant breeders. At present, farmers in the CIAL process express their reaction to a new variety by ticking a column headed by a smiling face, a "neutral" face or a glum face. Hernandez uses these data to create a simple matrix plotting varieties against farmers' preference order. The matrix bridges the gap between the CIAL methodology and the information obtained through PPB, in which farmers assess and score individual plant traits. Varieties emerging as preferences according to the matrix can be checked against farmers' scores in the PPB surveys. They can also be analysed for their characteristics as known to plant breeders.

Ecuador's national research institute, INIAP, is also testing the CIAL methodology alongside other participatory approaches. These include PPB

and an approach developed for use in women's groups formed for cassava processing.

Hector Andrade, leader of INIAP's FORTIPAPA project, feels that there is a logical progression from conventional plant breeding approaches, through PPB to the CIAL methodology. He became interested in participatory approaches when he realized that his conventional research was having little impact, especially on poor producers. PPB was useful while new technology was being developed, whereas the CIAL methodology came into its own at the dissemination stage. Some of the CIALs launched by FORTIPAPA actually evolved from farmers' groups that had evaluated improved potato varieties as part of a PPB project. Their involvement in technology generation has increased their ownership of the final product, making these CIALs stronger than those developed independently.

Several Quecha-speaking Indian communities have started CIALs in Ecuador. These people, who speak and read little Spanish, are being introduced to diagnostic techniques developed in some of the cassava women's groups. **More here? Or cut?**

Two problems with the CIAL methodology frequently arise for national scientists. The first is a clash between their specialization in certain commodities or disciplines and the broader range of priorities identified by farmers. The second is a clash between their knowledge of, and desire to test, new solutions to farmers' problems and the farmers' tendency to stick with what is tried and tested.

Bolivia provides a good illustration of these concerns. PROINPA's initial reaction to the CIAL methodology was that, as a specialized potato research institute with many technologies that it wished to test with farmers, it found the open research agenda of the CIALs ill suited to its needs. It also found that CIALs' research on pest and disease control tends to be weak, as farmers choose to test pesticides instead of the more sophisticated IPM technologies now available. The farmers are more familiar with the pesticides, find them easier to use and appreciate the relatively simple trial design they require.

Both problems raise the issue of the balance of power between the CIAL and the outsider supporting the process. Scientists' specialization and knowledge can all too easily lure them away from participatory approaches back to a relationship in which they determine the research agenda and impose their own solutions. At the same time, the scientists' concerns are legitimate: their so-called top-down approach in fact reflects a genuine

"I could have gone on for ever doing field experiments, recording data, and so on. But I became concerned about the impact of my work on poor farmers. How to make an impact gradually became my overriding preoccupation."—Hector Andrade, plant breeder, FORTIPAPA Project, INIAP, Ecuador.

desire to benefit resource-poor farmers—farmers who, after all, would probably not be wishing to test pesticides today unless some scientist had first introduced chemicals to them 20 or 30 years ago. In the case of IPM and other complex technologies such as integrated crop and soil management, the CIALs have much to learn from the farmer field school (FFS) approach, originally developed in Asia for IPM in rice. The FFS approach invests heavily in enrichment processes, teaching farmers ecological principles as well as fostering experimentation.

Such problems also raise the issue of resource allocation. Should a national research institute, programme or project spend money on launching its own CIAL activity if the priorities identified by farmers are likely to lie outside its mandate area? This is less probable when the entity concerned is responsible for a major food crop of widespread importance to farmers, as is the case for PROINPA. But the issue could arise more often in the future, as food needs are met and farmers seek to diversify. Many argue that research institutes should adapt their mandates as farmers' needs change. That makes sense for institutes such as CIAT, that have a relatively broad mandate, but may be easier said than done for more specialized entities. For these, being open to requests for support from the CIAL activities of others may represent a better option than launching their own CIAL activity.

Again, should scientists support an experiment by farmers when they know in advance that the crop or technology won't perform, or that the design is faulty? Jacqueline Ashby, former CIAT-IPRA project manager, argues that, for farmers as for formal researchers, finding out what *doesn't* work is just as valuable as a positive research result. However, as occurred at Pasca, CIALs failing to produce positive results can quickly lose community support. If the entire CIAL process fails along with the experiment, it is tempting to conclude that the price of total farmer control is too high. The bottom line, however, is that if farmers insist then they must have their way whatever the implications for the CIAL process, since it is *their* experiment.

The current CIAT-IPRA project manager, Ann Braun, believes that formal researchers must find efficient ways of feeding their products and services into the CIAL process while retaining a participatory approach. The issues raised by this challenge won't go away. Indeed, they are likely to become more complex as research itself grows in complexity.

In a true participatory approach, no one is in control. Perhaps *both* sides in the CIAL process—farmers as well as researchers—need to be more open

to suggestions from the other side. That should gradually come about as education and the standard of living in the countryside improve, eroding the status differences between the two groups.

All change!...

When Alfonso Truque, leader of Colombia's second-order organization of CIALs, provided training in the CIAL methodology to staff at the local branch of the extension service in nearby Timbio, he thought he was making a sound investment in future support for the CIALs.

That was in 1997. But in early 1998, local elections resulted in a change of mayor at Timbio. The new mayor brought in his own people, with the result that all local government offices, including the extension service, now have completely new staff. The new director of extension is sympathetic to the CIAL concept but unfamiliar with it, having yet to see it in action. His staff need training all over again if they are to continue with the CIAL programme started by their predecessors.

As part of its strategy to apply the CIAL methodology nationwide, CORPOICA has expressed its intention to provide training to all branches of the national extension service. Unless the service is first reclassified as something other than a government office, that could turn out to be a waste of resources.

Extension services are not the only type of organization to suffer from political fall-out. In El Salvador, the director of the national research institute became interested in the CIAL methodology and was about to receive training in it when he lost his job owing to a change of government. Staff turnover at Bolivia's Universidad Mayor de San Simón delayed acceptance of the methodology there. And NGOs also undergo frequent changes of staff, especially when policies alter.

...but no small change!

Of the six CIALs launched by the extension service at Timbio, only one survives. The high casualty rate has a simple explanation: the CIALs were not provided with their own fund at the outset of the process. Instead they received only the inputs required for their experiments.

Like all government organizations in Colombia, the extension service would be acting illegally if it were to donate cash directly to local communities. That means that the fund, a basic building block in the process and the key to farmer empowerment, cannot be provided when CIALs are launched by such organizations.

CIALs forced to rely on inputs alone are dealt a potentially fatal body blow right at the start of the process. They say that inputs are usually received late, crippling the harvest from their first trial. Since selling the harvest is their only means of raising funds, this endangers the very future of the CIAL process. At San Isidro, the women's CIAL, originally set up by the extension service, has asked to be transferred to CORFOCIAL as its support organization. They say they have noticed how the men's group in the same village, which is supported by CORFOCIAL, gets better service.

Such experiences show why it is important to have a second-order organization responsible for promoting and sustaining the CIAL process. Neither in Colombia nor in other countries can government organizations be relied on to provide support consistently and continuously.

Practise what you preach

There are honourable exceptions, but generally speaking the NGOs made disappointing partners in the drive to adapt and disseminate the CIAL methodology.

Let's take the exceptions first. NGOs such as FEPROH in Honduras, CEDEAGRO in Bolivia and CORDES in El Salvador were enthusiastic and energetic adopters. They all launched their own CIAL programmes, often with considerable success. FEPROH, for example, now supports around 25

CIALs, has adopted the methodology throughout its programmes and is keen to market the approach to other NGOs in Latin America.

All too often, however, NGOs mismanaged the CIAL process in ways that betrayed its basic principles. Many displayed the same faults as those of which they accuse the formal research system.

NGOs often have an anti-research culture, rejecting the products and services of formal research as part of a system allegedly designed to exploit resource-poor farmers. Such NGOs typically reject the CIAL concept altogether, claiming they already have their own participatory methodologies. These usually relate only to farmer-to-farmer technology transfer and lack mechanisms for the systematic comparison and evaluation of technologies. Alternatively, when these NGOs do agree to participate they often make bolshy partners, unwilling to provide CIAT or other institutions with feedback on the performance of the CIALs they have started.

Surprisingly, some NGOs have rigid programmes which sit uneasily with the CIAL's open-ended diagnostic process and objective of farmer empowerment. In one case, farmers wishing to form a CIAL had to choose to conduct research on one of the three commodities in which the NGO had programmes—beans, pigs or plantain. Having made their choice, the farmers had to buy the NGO's manual on that commodity and take its course in small business administration, for which they also had to pay. Failure to take the course led to disqualification from the programme and the withdrawal of credit facilities.

Such organizations use the CIAL process unashamedly to dominate the research agenda and promote their own institutional interests. In its search for financial sustainability, one NGO had colluded with an agro-chemical company to introduce chemicals to CIALs in exchange for funding. When one of the CIALs rejected the chemicals, having already selected improved seeds resistant to pests and diseases, the NGO withdrew its support. This NGO also misused the CIAL process to bolster its ailing credit scheme. Communities with a poor past repayment record were blacklisted and told they were ineligible to have a CIAL. In villages with newly formed CIALs, the NGO held the CIAL responsible for repayment when non-CIAL farmers defaulted. In one case, CIAL members were hoodwinked into signing credit guarantees on behalf of other farmers, then punished by having inputs for their trial withheld until a certain farmer repaid.

Like government services, NGOs frequently attempt to launch CIALs without a fund. They provide inputs late, blighting the CIAL's future by spoiling its first trial results. One NGO even charged interest to its CIALs on the supply of inputs.

NGOs commonly seek to retain power over the CIAL process by withholding money from the CIALs. In one case, an NGO refused to release funds donated by CIAT to its CIALs, which were requesting them to form their own second-order organization. It handed the CIALs back to CIAT—but kept the funds. Another NGO acquired funds from CIAT to act as a broker, but has made no practical contribution to the programme, merely extracting information from other institutions and using it without giving proper credit. Such organizations are among the first to accuse CIAT of being over-demanding in terms of its reporting requirements and of placing too much emphasis on accountability.

Lastly, one NGO provided a text-book example of how to alienate farmers. Having put inexperienced students in charge of the CIAL process, it offered credit to farmers venturing into the commercial production of beans for a local supermarket chain. The harvest was plentiful, but was turned away by the supermarket because it did not meet the required quality standards. It turned out that no one, least of all the students, had explained the quality criteria (colour, size and shape of bean) to the CIAL. The rejected beans were returned to the farmers, who had to sell them at a lower price through their normal outlets. Despite its mistake, the NGO insisted that the farmers repay the credit. Those who did so made a severe loss.

What are the reasons for this lack-lustre performance? Is it just mismanagement pure and simple? Or are there deeper underlying causes?

First, NGOs in Latin America tend to be more radical than in Asia or Africa. Deeply mistrustful of government and all its works, many of them seem to have got stuck in confrontational mode, clinging to their traditional role of challenging formal research rather than risking collaboration with it.

Secondly, the movement is more fragmented than in other regions. Colombia alone has an estimated 80 000 NGOs, most operating at local or regional level with no overarching body that coordinates their activities. The large international NGOs—Sasakawa Global 2000, World Vision, Save the Children—that have such a high profile in Africa are conspicuous by their absence in Latin America. Many of the smaller NGOs lack the funds to run their over-ambitious programmes, which in effect often tax their

participants rather than profiting them. They also lack staff with sufficient experience and knowledge to manage projects efficiently and access resources from outside the farming system.

NGOs make a great deal of their grass-roots identity with the farming community and their participatory approach to development, while often accusing researchers of being aloof from the farmers' real world and seeking to impose solutions from on high. The CIAT-IPRA experience suggests that the NGO community would do better to put its own house in order before lecturing others. Those who preach a participatory approach most loudly seem, on current form, least able to practise it.

The farmers' answer

In 1990, a group of farmers in Colombia's Cauca Department suggested forming a second-order organization to protect and promote the interests of the CIALs. The result was CORFOCIAL, an umbrella association grouping the department's 55 CIALs.

Funded from the interest on the invested capital sum left over at the end of the second Kellogg Foundation project, CORFOCIAL has its own Board of Trustees and a staff of three paraprofessionals who operate from a tiny office in the home of its leader, Alfonso Truque.

Asked how CORFOCIAL benefits the CIALs, Truque immediately cites independence from other organizations. He and his fellow staff have direct experience of how the CIAL process can be subverted when those professing to support it try to control it instead. They see their main challenge as "surveillance of the basic principles that underpin the CIALs' work."

CORFOCIAL supports the CIAL process by accessing training, inputs and services. It

also helps formulate funding proposals, facilitates visits to research institutes or to other CIALs and helps the CIALs exchange seeds and other products. Last but not least, it organizes an annual meeting of the CIALs in Cauca Department.

Areas in which the association has organized training include seed selection in tomato, plantain and onions, soil conservation and integrated pest management. When the women's group at San Isidro ran into difficulties in processing its soy bean harvest, CORFOCIAL staff tracked down external expertise to help them solve the problem. They then arranged for the San Isidro CIAL to train another group that was also interested in soy bean. Now they are helping the group obtain funding for a mechanical huller.

CORFOCIAL's bird's-eye view of the CIALs in Cauca Department gives it a special role in linking them, enabling them to complement each other's work. One CIAL faced a crisis because it was unable to meet the heavy demand for seed from its community after bad weather had destroyed the harvest. Bolivar Muñoz, a CORFOCIAL paraprofessional, was able to come to their rescue by borrowing seed from another CIAL that had had a good harvest but was now busy with its coffee crop and did not wish to make a second sowing. The first CIAL not only met demand by distributing the borrowed seed but also sowed another crop of its own, enabling it to repay the loan in time for the start of the second CIAL's next cropping season.

"CORFOCIAL gave us a fund. We got the money on time and could buy the inputs we needed for the cropping season.— Carlos Alfonso Ruiz, secretary, San Isidro men's CIAL, Colombia.

CORFOCIAL's reputation among the CIALs it supports is high. Several other CIALs have rejected the "support" offered by other organizations and applied to come under the CORFOCIAL umbrella instead. Increasingly, this is placing a strain on the association's resources.

To the interest from the sum invested from the Kellogg project, CORFOCIAL has been able to add other income, raised mainly from government training programmes. "But the annual budget is still far from enough to meet all the demands placed on us", says Truque.

Another problem facing CORFOCIAL is that its paraprofessionals do not have the same span of experience as professional agronomists. One CIAL working on *mora* says it was neglected by a paraprofessional because he had no experience of the crop. Paraprofessionals may also lack the broad range of contacts in the formal research and extension system enjoyed by professional agronomists. As a result they may experience more difficulty in accessing knowledge and inputs.

At present, CORFOCIAL's paraprofessionals do the rounds of the CIALs on motor bikes. Their job as messengers is time-consuming and somewhat hit-and-miss, but an appointment with a CIAL, once made, is kept even if plans have to be changed and the original purpose of the meeting can't be fulfilled. Like CIAT-IPRA, they have a policy of never being a "no-show", knowing the importance of keeping their word if the CIALs are to remain confident of their support organization

One day the bikes could be replaced by electronic bulletin boards, says Ann Braun, CIAT-IPRA coordinator. The use of e-mail has enormous potential in rural areas and could transform the efficiency of the CIAL process by facilitating exchanges among the CIALs and easing their access to external information. But that day is still a long way off: at present only a tiny fraction of households in Cauca Department have a telephone—and most of those are in towns. Even fewer own a personal computer. Even so, Braun and CIAT information staff are hatching a project to connect CORFOCIAL and selected CIALs to the Internet on a trial basis.

The CORFOCIAL experience suggests strongly that the answer to the problems of external support lies with the CIALs themselves. Provided its resources are not overstretched, the second-order organization can provide more effective support than other types of organization, government or non-government.

"What is the institutional home for this type of process? If it's supported by an institution that has a conflicting agenda, you pull out one of the building blocks. That's why farmer paraprofessionals are so important: they know what the farmer feels like."—Jacqueline Ashby, CIAT.

Basic principles

Experiences during the third Kellog project show that the CIAL process is indeed replicable. However, to replicate it well it is vital to observe certain basic principles.

Farmers must retain control of the process. When outsiders start to dominate, ownership passes to them and farmers lose interest in the results of the research. At the same time, however, it is important to introduce new technology to farmers, since this may well be crucial to lifting them out of poverty. Balancing these two needs may require considerable skill on the part of the outsider.

The CIAL fund is an essential ingredient, not an optional extra. In almost every case where supporting organizations have attempted to launch

"It's replicable, but it's delicate"—Ann Braun, IPRA-CIAT coordinator.

CIALs without providing a fund, the result has been failure. It is the fund that guarantees farmer control.

CIALs can become self-sustaining, but in the early stages at least they need external support. The second-order organization, staffed by paraprofessionals drawn from the farming community, seems best able to provide that support.

So what?

To sum up:

- *The CIAL process is replicable by institutions other than CIAT and in countries other than Colombia*
- *Individual people, rather than an institutional model, determine the quality of the CIAL process*
- *Accessing new technology of interest to farmers is an important determinant of economic viability and hence of success*
- *High-quality replication depends critically on observance of the basic principles of the CIAL process*
- *Second-order organizations are better able to support the CIAL process than are most government or non-government organizations.*

On Course for Impact

The CIAL process is a learning experience for all involved—outsiders supporting the process as well as participating farmers. The CIAT-IPRA team has developed an intensive training course and training materials to support replication of the methodology. The course has now been experienced by over 400 people in seven countries, many of whom have gone on to train others.

Seeing is believing

In 1996 Luis Humberto Fierro was one of 10 scientists and technicians from CORPOICA, Colombia's national agricultural research institute, who went on a training course in the CIAL methodology organized by CIAT-IPRA.

Two years later, Fierro retains two vivid memories of the course. The first was how, on the opening day, many of his colleagues expressed scepticism and anxiety. What was the point of asking farmers to do research when scientists could do it better, they had asked. And if farmers could do research, didn't that mean the scientists would be out of a job?

Fierro's second memory is of the change of attitude that occurred when the course participants visited the Cauca region and saw the CIALs at work. "We were confronted with farmers who were strongly motivated, confident about what they were doing and keen to try new technology", says Fierro. "Even the most resistant people in our group were converted by what they saw."

An intensive course

Fierro's account testifies to the power of the training provided by CIAT-IPRA to convince and inspire. But the training experience should be more than just a conversion to the cause: it must also be a thorough grounding in the principles and practices of the CIAL methodology that enables those trained to teach it to others. The quality of training determines the integrity of the methodology as it passes out of CIAT's hands into the programmes of other institutions.

That means the courses must provide more than just a superficial exposure. The challenge is how to achieve sufficient depth in a period short

enough to appeal to busy professionals who cannot afford to take much time out from their regular jobs. The IPRA-CIAT team have designed an intensive 2-week course that combines a theoretical introduction to the CIAL methodology with hands-on practice in implementing it.

The course begins with a 2-day classroom session on the meaning of participation. According to José Ignacio Roa, who often conducts these sessions himself, participation is a *sine qua non* of the CIAL process, so it's important that participants gain a good understanding of it. "Participation means allowing *everyone* in the group a chance to talk, a chance to decide" he says. "It means presenting farmers with a range of options from which to choose." Realizing this can be painful, as many scientists and technicians in the formal system have to unlearn their habit of dominating discussions and imposing solutions. The essence of the CIAL process is that the farmer controls it, not the researcher.

Next, while still in the classroom, the participants are taken step by step through the CIAL process—from motivating the community, through the diagnostic and planning phases to trial implementation, and finally to the evaluation and feedback phases. Besides describing each step, these sessions deal with the basic skills needed by the outsider, such as how to moderate a meeting simply and clearly, how to get quieter group members to contribute, how to ask open questions rather than questions that steer informants towards specific answers, and so on. They also deal with the issues that commonly arise at each step, such as the outsider's role in suggesting new technological alternatives and assisting in trial design.

For the second week the participants take to the field, where they must put the methodology into practice in real village communities. This is organized by rotating participants between different communities at different phases of the process. The motivational and diagnostic meetings take place in one community, after

which the participants move on to a feedback meeting taking place in a second community—and so on. If possible courses are held during the cropping season, so that participants can visit CIAL experiments in farmers' fields.

"This part of the course is challenging," says Roa. "But most participants come through the experience well. The presence of live farmers with real needs acts as a tremendous tonic, bringing out the best in everyone. And there's nothing like exposure to a motivated CIAL group to convince sceptics of the value of the methodology."

The end of the course is not the end of the learning experience. Course alumni are recommended to spend a least a year trying the methodology out for themselves before attempting to teach it to others. During this year, in which each is expected to launch a CIAL from his or her home institution, the former trainees receive follow-up visits from CIAT-IPRA staff to check on their progress and help them solve problems.

Training materials

"What is testing? Testing means trying something new and comparing it with something known."

Thus begins the first in a series of handbooks published by CIAT to guide the CIALs. Each newly formed CIAL receives a complete set of the handbooks, which now number 13. As well as taking the reader through each step of the CIAL process the handbooks cover such topics as experimental design, factors affecting analysis of the results, and how to maintain the community's trust and support. The outsider reads the handbook that corresponds with the activity under way with the members of the CIAL, who are also encouraged to read and use the handbooks on their own.

The handbooks use simple language—but arriving at that simplicity, for the CIAT-IPRA team's specialized professional agriculturalists, was no simple matter. To help them present ideas in ways that farmers would find appealing and easy to grasp, the team went back to the source that had inspired the CIAL concept in the first place—the farmers of Cauca Department.

Around 300 farmers in the communities where the first five CIALs were launched were invited to evaluate the first drafts. The farmers were divided into three groups, each of which worked with a different CIAT-IPRA team

member. Having noted down the farmers' suggestions, the three team members collaborated to compare notes and finalize the drafts.

As a result of this exercise, many of the examples used in the handbooks are drawn from real situations that arose in the Cauca laboratory. And the wording and illustrations used are often those suggested by the farmers.

Feedback from users has been extremely positive. Some CIALs in other countries feel a need to adapt the materials to their own local circumstances. A modified set of handbooks for Central America is being prepared.

Outsiders facilitating the CIAL process need different training materials. Exercises used in the basic 2-week course are available in a set of manuals, which also contain other supporting materials on issues such as gender sensitivity and how to resolve conflicts in groups. A second course manual, for training trainers, is under development. Two instructional units on farmer evaluation of technology have been published, together with a basic handbook on participatory approaches to evaluation. A statistical manual on the analysis of data from preference ranking exercises is also available.

Supporting replication

Training the trainers was the central plank in the CIAT-IFPRA team's strategy for disseminating the CIAL methodology under the third Kellog project. The aim of the 3-year project was to train at least 250 people drawn from the formal and informal R&D sectors, together with 80 farmer paraprofessionals and 40 professional trainers.

That aim turned out to be too modest. By 1998, in response to popular demand, the team had organized 10 introductory courses for over 400 participants from institutions in Colombia, Honduras, Nicaragua, El Salvador, Venezuela, Ecuador and Bolivia. Many of these participants have gone on to train others.

A condition of coming on the course is that each participant should subsequently attempt to start at least one CIAL. Most do so, though inevitably there are some that fall by the wayside. In Honduras and Bolivia, the fall-out rate was around 30%.

A successful first CIAL usually attracts the interest of colleagues. Interest then builds to the point at which professionals in other programmes request their own training. At this point, CIAT-IPRA often become involved again, offering training to this larger group. Eventually, the institution may feel sure enough of its capacity in the methodology to share it with other

institutions. The ideal, in the longer term, is to build a core national team of experienced CIAL practitioners, allowing sustained progress in spreading the methodology independently of CIAT.

Ecuador provides a good example of this process at work. Here the seeds of the CIAL methodology fell on fertile ground, since INIAP, the country's national research institute, had already adopted a participatory approach to research. A series of workshops conducted by CIAT-IPRA staff at the institute's main Santa Catalina research station in 1993-94 persuaded departmental heads to include the CIAL methodology alongside those already being tested. The programme leaders sent their scientists and technicians on an intensive tailor-made 5-week course at CIAT, then followed this up with their own in-country training. A 9-strong national group of experts in participatory research was formed and a workshop held to train the group to train others.

Following that first workshop, group members have held six others in different regions of the country, training a further 60 people including NGO workers as well as staff from the national extension service and regional INIAP offices. From use solely in conjunction with potato, the CIAL methodology is spreading to other commodities including maize, wheat, barley and legumes. The group is even becoming a resource for other Andean countries, having recently hosted a course for participants from Peru and Bolivia in addition to Ecuador. A training manual on participatory research is being developed, with a chapter on how to form a CIAL.

Most countries in the third Kellogg project are not as far advanced as Ecuador in their training, but several are heading in the same direction. EMBRAPA, Brazil's national research institute, has submitted a project to the World Bank asking for funds to train its own core group. CNPMF, the EMBRAPA programme that began experimenting with the methodology in the country's northeast, has expressed its interest in becoming the national training centre.

From conviction to action

Like Fierro, most alumni of the courses say their experience of CIAL groups in the Cauca laboratory was the decisive factor in persuading them to adopt the methodology on return to their own institutions. What convinces them is the testimony of the farmers themselves—their self-confidence in their new-found role as researchers.

"Before, I used to go looking for plots, not people. I saw farmers as a labour force, who didn't know what was going on. All the technologies tested were selected by us technicians. I thought that agricultural research was something expensive and sophisticated that had to be done on research stations. But the course taught me that anyone can do research, including farmers. I was impressed by the simplicity of the methodology and the ease with which farmers could appropriate it. I saw this as something that could make a great contribution to our work."— Carlos Amaya, technology transfer specialist with FEPROH, Honduras.

The experience of Carlos Amaya, a technology transfer specialist with a Honduran NGO, the Fundación Evangelica para el Progreso de Honduras (FEPROH), is typical. Amaya used to conduct conventional on-farm research before going on an IPRA-CIAT course in 1996. During the course he recognized the CIAL process as "something we had long been looking for".

That sense of recognition led Amaya to act decisively on his return home. After discussion with his colleagues, he tried out the CIAL methodology in a village where FEPROH was already working, in the Valle de Cillos area near Tegucigalpa. At the end of the first year's research, the CIAL presented its results not only to the village community but to representatives of 13 neighbouring communities. The results were so impressive that all 13 expressed the wish to start their own CIAL. The experience was enough to persuade FEPROH to adopt the CIAL methodology throughout its programmes.

The response of CORPOICA, in Colombia, was initially more hesitant. Only one CIAL was launched following the first course attended by Fierro and his colleagues. At the time, CORPOICA was going through a profound internal debate on its approach to technology transfer. Most in the institute agreed that the conventional linear approach used in the past did not work with resource-poor farmers. But what should replace it? Once back in their familiar institutional environment, some of the course participants fell back into the doubts so successfully banished during the fieldwork in Cauca Department.

But Fierro remained convinced that the CIAL model was a real way forward. Following the success of the first CIAL, he was able to persuade 11 of his colleagues to go to CIAT for a second course. This time the methodology "took": all but one of this second batch of trainees subsequently set up a CIAL. Now CORPOICA has its own focus site, in the Cundinamarca and Boyaca Department near its main offices in Bogota, where 21 CIALs have been launched. And the institute has recently announced its intention to "go national" with the methodology (see p.).

The case of Bolivia powerfully illustrates the difference in the quality of the CIAL process made by training. Here the first generation of CIALs was set up in 1994 by people who had not been on the CIAT-IPRA course. Most of these early CIALs failed—except for one, established by a group of young researchers who were open to the methodology despite their lack of

training. In 1996, Roa and Carlos Arturo Quiros of the CIAT-IPRA team began providing training and advice to interested scientists and technicians of PROINPA, Bolivia's national potato research group. Since then, the group has successfully established six more CIALs.

Several experiences demonstrate the importance of training an institution's senior staff if the subsequent CIAL programme is to flourish. In northern Valle Department of Colombia, CIALs launched by two technicians now languish without support. Although the technicians had been trained, the regional secretariat of the Ministry of Agriculture was unfamiliar with the CIAL concept and did not support the work. Where senior staff are trained, as at INIAP in Ecuador, the institution is much more likely to encourage the CIAL effort and to back it with additional resources.

Farmer to farmer

Training paraprofessionals in the CIALs methodology is a vital part of scaling up. Paraprofessionals can make two major contributions to the process.

First, they can serve as a gearing up mechanism, supporting larger numbers of CIALs than can a formal-sector scientist or technician working alone. Based in the rural area, paraprofessionals can save time and money for the overstretched technical services of government organizations.

Secondly, paraprofessionals can sometimes provide more effective support than professionals. They are more easily held accountable by the farming community and are therefore more likely to be conscientious. In addition, farmers are more likely to trust a fellow farmer than an outsider. The corollary, however, is that paraprofessionals may be less familiar with the inputs and services available from the formal research system than are professionals.

This means that the key to achieving impact through paraprofessionals is

to ensure that they enjoy good links back to the formal research and extension system, enabling them to draw on its products and services to support the CIALs. The lines of communication may be tenuous at times, especially from the more remote rural areas, but they are vital to success.

Paraprofessionals are probably most effective when they work as a team in a second-order organization. This gives them the ability to tap the expertise of their colleagues, as well as better access to other services. The four-strong team of CORFOCIAL, in Colombia, work closely together and have been able to attract support from several government organizations to provide training and other inputs. Several other countries, including Ecuador and Honduras, have picked up on Colombia's experience and are keen to start their own second-order organizations.

The impact of training individual paraprofessionals who subsequently operate in remote rural areas is less predictable. However, the second-order organization can relay its expertise to such areas at relatively low cost, as CORFOCIAL has already done for several marginalized Indian communities in the higher lying areas of Cauca. In both Colombia and Ecuador, some outstanding individuals are now at work in remote Indian communities.

Given the high turnover rate of professional staff in the government services, training paraprofessionals may turn out to be a vital means of ensuring rapid, high-quality replication of the CIAL process. In 1997, CIAT-IPRA began asking CIALs in focus sites outside Colombia to nominate farmers interested in becoming paraprofessionals. A total of ..... in .... countries have been trained so far.

Farmers notice the difference

Whether support for the CIALs comes from a professional or a paraprofessional, the subtle difference in attitude engendered by training in participatory techniques is not lost on farmers. At Tontolo, in Honduras, the CIAL leader says that external technicians trained in the CIAL methodology propose that "we do something together, learning from each other", rather than seeking to impose technology as they did before. "We take this as a mark of respect", he says.

The last word should go to Hector Andrade, of INIAP in Ecuador, who claims that farmers have become more receptive to him since the CIAT-IPRA course taught him not to dominate in group meetings. His words

epitomize the factors that make a participatory approach so much more effective in developing and disseminating technology than approaches in which scientists predetermine the research agenda and impose their own solutions. Effective training ensures farmer empowerment and ownership of the CIAL process and is therefore crucial to impact.

"On the training course I learned the essential participatory techniques—how to ask open questions and, above all, how to listen more to the answers. Now that I have learned not to dominate, I find that farmers have become more receptive to me".— Hector Andrade, plant breeder with the FORTIPAPA project, INIAP, Ecuador.

So what?

In summary:

- *Good training is essential for installing the basic principles of the CIAL methodology and hence ensuring its successful replication*
- *The CIAT-IPRA course is highly effective in this respect and can be replicated by other organizations*
- *A well trained core national team can ensure a self-sustaining process of replication*
- *CIAT-IPRA should continue to provide training until such teams are in place*
- *Training paraprofessionals and building second-order organizations are also important investments in the future of the CIAL process.*

Where Do We Go from Here?

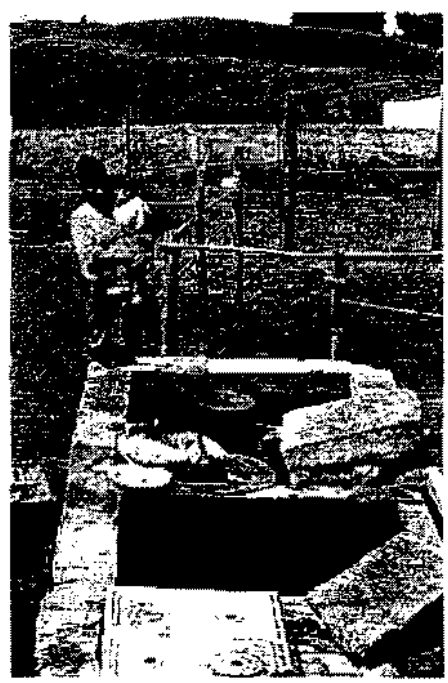
CIAT-IPRA has so far focussed on building the CIAL process and providing training to support its dissemination. What issues should receive the team's attention in future? And what are the implications of a more widely adopted CIAL process?

Take-off

The CIAL methodology stands poised on the edge of mass replication.

The pilot phase, in which the concept of the CIAL was developed and tested, demonstrated its potential to empower farmers and improve livelihoods in resource-poor farming communities in Colombia's Cauca region. A second phase of more widespread dissemination has shown that, provided certain basic principles are observed, the methodology can be successfully applied in other countries and by organizations other than CIAT. A third phase, of rapid spontaneous adoption, now seems likely.

Easy to grasp, the methodology is popular with farmers, who sometimes disseminate it from community to community independently of any support organization. NGOs have also shown enthusiasm, despite the problems associated with their implementation. Several universities teach the CIAL process, and a few have started their own CIAL programmes. With few exceptions, the national research institutes that have been introduced to the methodology are either experimenting with it themselves or supporting other organizations' CIAL programmes with seeds and diagnostic services. One country has formed a second-order organization to protect and promote the CIAL process, and others seem likely to follow suit.



As the methodology takes off, the CIAT-IPRA project faces new challenges. The first and most important is how to maintain the quality of the CIAL process while letting go of its implementation. The answer to this challenge, as we have seen, is to continue the project's training activities. Despite some successes, the task of building a core team of practitioners in all

the countries that currently have an active CIAL programme is not yet complete.

Outstanding issues

Besides the continuing need for training, the dissemination phase revealed several other adoption issues that will need further attention by the CIAT-IPRA team. The main issues are:

• *Sustainability.* Sustaining the CIAL process is a different challenge to replicating it, although the two overlap. Whereas replication tests the robustness of the methodology in different cultural settings and given different forms of external support, sustainability concerns the CIALs' ability to wean themselves of dependency on external support.

Newly formed CIALs undoubtedly depend on external support to survive and prosper in the longer term. A study of defunct CIALs by Teresa Gracia showed that the poor quality of support received during the early stages was the main factor in their demise. Quality varied greatly among different supporting organizations. Those that took control over the process, overriding farmers' wishes, tended to end up with failed CIALs. Among the most common mistakes made by over-weaning support organizations were to appoint CIAL members themselves, instead of having them elected by the community, and to withhold the CIAL fund, effectively preventing the CIAL from taking its own decisions. By turning farmers into passive recipients, these sorts of behaviour betray the basic principles of the CIAL process.

Besides guidance in implementing the CIAL process, CIALs in the early stages need good technical support. Such support helps them access new technology and become better managers of their existing resources. Some outsiders facilitating the CIAL process have pointed to the danger of getting fixated on the CIAL process at the expense of a technical input. A CIAL process that is all process and no product will not command the support of the community for long.

As CIALs mature they become more self-sustaining, but not wholly self-reliant. While they are less dependent on external support for mere survival, they may have even greater need of external inputs and services in order to prosper, especially as they become more market-oriented. This is a critical distinction, since the role of a healthy CIAL in actively demanding such inputs and services is quite different to the passive dependence on hand-outs characteristic of conventional projects and moribund CIALs.

Of the various institutional options for accessing and channelling support, the most attractive is a well-endowed second-order organization with strong links to the national research and extension system. The challenge is how to create such organizations. CORFOCIAL was established through the generosity of the Kellogg Foundation, which donated the funds left over at the end of the second CIAT-IPRA project. This forms an endowment, providing CORFOCIAL with an income consisting of interest from the invested funds.

Endowments are one option, but alternatives are needed. It is difficult, at present, to see what those alternatives could be. Initially at least, the funds to launch a second-order organization must come from somewhere. If they come from the farming community, the organization begins by taxing the very people it is supposed to benefit, as some of the poorer NGOs do. Hardly an auspicious beginning! CORFOCIAL's experiences suggest that a second-order organization can raise some additional income through the sale of training activities, but this is not enough to pay more than a small proportion of total operating costs. The basic problem of how to launch such organizations on a sustainable basis remains unsolved.

One imaginative new idea worth pursuing is a private fund-raising scheme. This would appeal to individuals or communities in the developed world, who would be asked to "adopt a CIAL". Village-to-village support or exchanges, of which the CIAL could form a part, could work particularly well. It might be easier to raise support for the CIAL concept in the rural areas of developed countries, which have a natural sympathy with the problems of small-scale farmers, than in the cities.

- *Money matters.* For the individual CIAL, the major determinant of sustainability is economic viability. Mature CIALs can sustain themselves provided that their product is marketable. This is the case for CIALs producing seed, although the market for improved seed may eventually become saturated. It is also the case for some knowledge-intensive CIALs, notably those adding value by processing. Others, such as those involved in IPM and resource conservation technologies, may find it more difficult to sell their expertise.

The options for self-financing are strongest in the more market-oriented farming areas, although difficulties arise even here. In only 2 years the CIAL at Arvelaez, in Cundinamarca, has doubled its fund from 70 000 to 135 000 Colombian pesos. The CIAL is looking for people to put up the money to

go fully commercial with the large-scale production of snap bean seed. "The trouble is that people suspect some sort of swindle", says extensionist Hernando Malan Jaldenama. Most CIAL members have bought in, but more is needed to access more land. Some, such as secretary Maria del Carmen Escobar, are in the CIAL purely for the money. Maria hopes to finance her studies at the nearby University of Fusagasuga on the proceeds of her stake.

Micro-financing—the provision of small amounts of credit—is another possibility. CIAT's Rural Agricultural Enterprises Project is studying experiences in micro-financing around the world. "There are plenty of success stories, as well as some revealing failures", says Ann Braun. "Interestingly, the schemes with the lowest interest rates are not necessarily those most appealing to smallholders, as they often require collateral. Poor people either don't have collatera, or, if they do, aren't willing to risk it." Nor are schemes that require people to travel away from their villages to complete a mass of paperwork in some town office likely to appeal, as smallholders have little time for this. The schemes most popular with farmers are those brought to the village centre, and they are likely to reflect the high cost of doing this. In short, access, rather than interest rates, is the key determinant of uptake.

Linking farmers more closely to markets is another important way forward for the CIALs. Buyers at present tend simply to wait for farmers who offer the best quality produce at the lowest possible price, offering little help or advice in meeting quality standards. The CIALs could do more to extract information from buyers on these standards and to educate farmers on how to meet them. Initially, organizations supporting the CIAL process have a role to play in pointing commercially inexperienced CIALs and farmers in the right direction. As the failed NGO project linking bean producers to a supermarket chain shows, there is much still to be done in this area.

Buyers representing organic market niches and ethical trading schemes are more likely to provide support and advice to farmers, and more likely to reward them with a fair price, than are conventional buyers. As far as the

CIAT-IPRA team is aware, no CIALs are yet linked up to such schemes. This is an area well worth further exploration.

Braun believes that the CIALs need to develop an aptitude for spotting opportunities, in addition to solving problems. "CIALs may have trouble in marketing their knowledge,", she says, "but if they can continue on the road of empowerment, they can figure out where there unique commercial opportunities lie and so bring economic progress to their communities in new ways." This could mean going beyond agriculture to link with new actors in rural development. Besides becoming a training centre for Indian farmers, the *hacienda* of Flor Naciente, in Ecuador, could perhaps double as tourist accommodation for people climbing Mount Chimborazo.

- *Enrichment.* Another important challenge facing the CIAT-IPRA team is how best to enrich the CIAL process with knowledge, practices and materials from the formal research sector.

The research of most CIALs at present is restricted to relatively simple topics such as the selection of new crop varieties. But in time the CIALs will need to grow more sophisticated in their approach. Farmers conducting research on IPM, for instance, need to understand ecological principles and processes, including the life-cycles of pests and their natural enemies—information that can only be introduced through an intensive interaction between scientists/technicians and the farming community, as occurs in farmer field schools. How can this interaction be organized? And how can scientists' knowledge on such subjects be introduced without undermining the principle of an open diagnostic process which is one of the CIALs' major strengths?

This question arises in acute form with regard to soil and water conservation in hillside areas. It is vital that the CIALs do not repeat the mistakes made in the past by the formal research system, single-mindedly pursuing short-term increases in food production at the expense of the long-term productivity of the natural resource base. It would be a sad irony if, in their desire to leave decisions entirely in the hands of farmers, those supporting the CIAL process were to turn a blind eye to this danger. Will the steeply sloping plot of the San Isidro women's group still be there to cultivate 5 years from now? Or will it have been swept downhill in a freak storm, carrying with it the hopes of Zuly and her friends?

Enrichment will increase the appeal of the CIAL methodology to formal-sector researchers. Introducing simple techniques to extract more information of use to plant breeders will help them improve the relevance of their research. The use of simple cost-benefit analysis would also improve the quality of technology evaluation. As researchers at PROINPA in Bolivia pointed out, the evaluation methods used at present are helpful to farmers but not to researchers: a smiling face for benefits may or may not offset a sad face for costs.

One of the big theoretical advantages of the CIAL methodology is the cost saving it implies for formal public-sector research (see below). Enrichment implies a higher concentration of external scientific expertise applied per CIAL—and hence higher costs. A final problem, therefore, is who would pay for enrichment? There are no easy answers.

- *Group conflicts.* In a survey of CIALs in the Cundinamarca area, Braun noticed that several CIALs had failed, or were about to fail, because of personality clashes within the group. These usually arise when a member feels they are doing more than their fair share of the work.

The CIAT-IPRA team has developed and, in a few cases, introduced a methodology for use by groups wishing to assess their feelings about each other and their performance as a team. Some CIALs have welcomed the methodology; others feel its use might put the future of the group at risk. One possible future initiative for the CIAT-IPRA team will be to expand the use of the methodology and explore its potential to solve group conflicts.

Why bother?

In essence, the CIAL process represents an opportunity to devolve the adaptive research and development process from government services to the farming community. But why bother? Don't researchers conduct research better than farmers can? What benefits would a widely adopted CIAL process deliver that a conventional project-based approach cannot?

Experience with the CIAL methodology has shown that farmers can conduct adaptive research at a fraction of the costs incurred by public-sector

institutions. They can also deliver locally adapted solutions to large numbers of people—a task that the formal sector, by virtue of its structure and its modes of operation, is ill equipped to perform.

The impact of the CIAL process in resource-poor farming communities is pervasive and far-reaching. The process delivers direct material benefits, such as the availability of improved crop varieties and milling services. It has knock-on effects such as access to additional land, increased opportunities for training and a better stocked village shop. And it also brings less measurable but no less real gains, such as improved standing in the community, a fairer sharing of domestic chores in the family, a strengthened confidence in the local capacity for experimentation and better access to knowledge and information.

The CIAL process works because it is based on principles that depart radically from conventional project-based R&D. In the project-based approach, large sums of money are repeatedly injected into the rural area over a set period. The money is spent on vehicles, infrastructure, training, research, inputs, extension—but never, oh never, directly on people. Project expenditures are controlled by the outsiders managing the project. Indeed, the more tightly controlled expenditures are, the better the project is deemed to be managed.

The outcome of such projects is an artificial, short-term improvement in living standards. The project site *looks* good, but only because the research institute manages it rather than the farmer. Especially when donors are about to visit, money and labour are expended on getting every last tree planted, every garden fence mended, every stall-fed dairy cow content and productive. But visit the area 6 years later, once the project and its staff have gone, and little trace will remain of these improvements. Because the role of farmers has been reduced to nothing more than servile acceptance of hand-outs, a culture of dependency has been created that reduces the project's long-term effects to nought.

The CIAL process forms a complete contrast to this approach. Its basic principle is to empower farmers by providing them with a small amount of money and allowing them to decide how to spend it. The money, which is paid once only, protects farmers from the risks of research while allowing them control over the research process. The result is profound and lasting change in the

"This is not some manicured poodle"—Jacqueline Ashby, former CIAT-IPRA project manager.

life of the whole community. The village may continue to look untidy, but its shop has more stock on the shelf.

Widely applied, the CIAL process would fundamentally alter the division of labour between farmers and researchers. Farmers could take far more responsibility for adaptive research than they are normally allowed at present, enjoying an active and equal partnership with researchers and technicians of a kind denied them in conventional approaches.

This in turn would empower researchers. It would increase the impact of their research, because more farmers would be reached with better targeted technologies. It would increase the relevance of their research, since a more articulate and demonstrative farming community would be better at placing demands on them. And it would free up their time and resources for other, more basic, research tasks.

So what?

To sum up:

- *The CIAL methodology is likely to be widely adopted*
- *The support needed needed by a CIAL varies with its developmental stage*
- *Besides training, the CIAT-IPRA team needs to address the issues of sustainability, links to markets, process enrichment and group conflicts*
- *The CIAL methodology could have a considerable impact on resource-poor farmers*
- *It could also increase the efficiency of public-sector research and development.*

Fun of the Fair

Each year the CIALs of Cauca Department get together for a meeting. Half scientific conference, half agricultural fair, the encuentro de los CIALs is a unique experience that combines business and pleasure as only country people know how.

Show business

Hung between two second-floor windows on either side of the narrow street is a large, brightly coloured banner: "Encuentro CIAL, Rosas, 17, 18 y 19 de julio de 1996".

Asked what would become of the CIAL idea when they hatched it nearly a decade ago, few members of the CIAT-IPRA team would have predicted this. Yet a more fitting outcome of a project to promote participatory research could hardly be imagined. For the banner does more than merely announce a meeting: it proclaims ownership. Replete with civic pride, this small country town in southern Cauca is laying claim to the CIAL process, welcoming it, for a few days at least, as its very own.

"A town's offer to host the encuentro is a recognition of the CIALs' work, a way of saying 'We welcome you'".— Alfonso Truque, CORFOCIAL coordinator.

To prove the point, the town has lent its handsome Spanish-style theatre as a venue. Soon the mayor, accompanied by other local dignitaries, will arrive to give his welcome address. By the end of the day, over 70 representatives from the CIALs will have flocked into town from the four corners of Cauca Department, bringing a welcome fillip to trade for the towns' guest houses and shops. At

various times during the 3-day event their numbers will be swollen by additional family members tagging along for the occasion, representatives of supporting government and non-government institutions and, as festivities get into full swing, local townspeople who have no connection with the CIALs but are attracted by the prospect of a rollicking good night out.

As people arrive, the theatre gradually fills with a buzz of conversation. In the queue for registration, old friends meet and start to talk animatedly, enquiring about each other's fortunes during the past year. Once past the registration desk, people gravitate towards the stalls erected on-stage by the CIALs, where they examine the wares on display this year. El Diviso's maize seed, renowned across Cauca for its high quality, excites the most curiosity, but you can also sample soy milk from San Isidro, *mora* juice from Cinco Dias, maize bran from El Bosco, or cut flowers from..... Suddenly a dehulling machine from Santa Barbara leaps noisily into life, drowning conversation but demonstrating its efficacy to interested spectators.

Then a man starts trying to call the meeting to order. For a moment it seems as if his attempt might be in vain, but eventually the dehulling machine is abruptly switched off and the hum of conversation subsides. Everyone is asked to sit down, the rows of seats fill up and the business of the meeting, conducted from a table set up just behind the footlights, gets under way.

Instant tradition

When, in 1991, the CIALs of Cauca first got together to exchange their experiences, no one knew they were starting a new local tradition. So successful was that first meeting that it was decided to repeat it annually. It has since become a popular event which the region's villages and towns vie with each other to host.

The *encuentro* is organized by CORFOCIAL, which each year circulates a proposed agenda to all the CIALs, together with a confirmation of dates and place, well in advance of the meeting. Each CIAL nominates two of its members to come, funding their journey and accommodation for the 2- or 3-day event. In 1998, representatives from the CIALs of Cauca were joined by a group selected from Cundinamarca's CIALs. And a few guests from other countries are occasionally sponsored by CIAT.

Held in a different location each year, the meetings celebrate the diversity of Cauca's rural cultures. In 1994 the host was Timbio, a small town in the

valley near Popayan whose 250-year-old baroque church of San Antonia de Padua provided an unusually beautiful setting. The 1997 meeting, in contrast, was hosted in the remote mountain community of Totoro by the *cabildo indigeno*—the local Indian council—which put on a display of traditional woollen clothing and other products.

Unique hybrid

Just as the CIAL concept fuses the traditional and the modern, so the *encuentro* is a unique hybrid between an agricultural fair and a scientific conference.

Like any traditional rural show, one of the *encuentro's* main functions is to mix people who otherwise don't get much of a chance to meet. Those living in isolated rural communities like nothing better than a get-together to exchange gossip, admire each others' produce, barter or buy goods and services, compete with one another and celebrate their common heritage and values. These are time-honoured rural pursuits worldwide—a factor that helps to explain why the *encuentro* found such immediate popular acceptance.

But the meeting also serves more serious purposes. First, it is the CIALs' opportunity to hold CORFOCIAL and its paraprofessionals to account. An early item on the agenda is the CIALs' evaluation of the support they receive. Are the paraprofessionals dividing their attention fairly, or do CIALs in the more distant communities feel neglected? Do the paraprofessionals know enough about the commodities under research by each CIAL? And do they come to meetings on time? These and other questions are answered on a previously circulated questionnaire, the results of which are discussed at the meeting and published in the minutes. Each year, CORFOCIAL must also present accounts for the past year and its spending plans for the next.

Secondly, the *encuentro* provides a forum at which the CIALs present and exchange their research results, just as formal-sector scientists do at their meetings. All the CIALs attending the meeting are expected to bring a set of posters describing their work, together with samples of their products and services. Every year, six or so are invited to present their work in detail. Turn by turn, a member of each—usually its chairman or extensionist—takes to the rostrum to explain how their research topic was chosen, why it is important to the local community, what results they have achieved and how they are being disseminated. Each presentation is followed by questions.

"The encuentro is a very important time for us, as we are evaluated by the CIALs. We collect ideas from them on how we can improve our performance. It's also a time to offer friendship, to extend a helping hand to those CIALs that need it."—Alfonso Truque.

This trial by a wider jury than their local communities is an important test for the CIALs. "We get to see what they are doing, how well they have grasped the methodology and where the weak points lie", says CORFOCIAL's coordinator Alfonso Truque. "That enables us to encourage the CIALs that are having difficulties and point out how they can improve their performance."

More important still, the presentations are an opportunity for the CIALs to demonstrate their progress and advertise their wares. The CIALs selected to present are usually at a relatively advanced stage, at which their results are potentially of interest to other groups.

Inspiration...

José Ignacio Roa remembers the first *encuentro* at which the El Diviso CIAL presented its results. For the first time, a CIAL was able to display packets of seed it had begun selling to the community's farmers.

"It was an inspiration for the others", says Roa. "New CIALs, especially, that were unsure of themselves suddenly saw what they could do in the future." According to Roa, each year since then has seen an increase in the number of CIALs that have become micro-enterprises. The effect is growing confidence among all the department's CIALs, even those that are struggling, and a heightened competitiveness between the stronger CIALs, as they seek to outdo each other from one year to the next.

The *encuentro* is a powerful vehicle for the transfer of technology and ideas from CIAL to CIAL. Many CIALs now bring seed and sell it at the meeting; some also display their dehulling machines; all are free to swap notes on the support available from different institutions, or to arrange visits to each other. It was at the *encuentro* that Adelmo Calambaz, leader of the San Bosco CIAL, first met the El Diviso group that had successfully applied for additional land from a government land reform agency. They inspired him to prepare his own application and told him the procedure, saving him considerable time and effort. Similarly, Maria Gutrierez, secretary of the 11 de Noviembre CIAL in Ecuador, first saw a mechanical huller at work when she was invited to attend the *encuentro*. The experience helped her persuade her fellow CIAL members to acquire one too.

The *encuentro* also fulfils other, more deeply felt needs. The shared experience of CIAL membership helps to form ties between the separate and sometimes mutually hostile ethnic groups of Cauca, repairing the torn fabric of rural society. When members of the CIAL of Santa Isabel, an Indian

community high in the mountains, came to their first *encuentro*, they heard a presentation by the CIAL of Betania, a lower-lying *mestizo* community in the Cabuyal watershed. This CIAL had experimented with new varieties of snap beans, tied to stakes with string. The use of stakes and string was a revelation for Santa Isabel, where the crop had always been grown without any support. The innovation has since been widely adopted by Santa Isabel's farmers, who say their yields have increased greatly. But this isolated Indian community learnt more than a new technique for growing beans: its shy, mistrustful people discovered that they could gain through their contact with other ethnic groups.

The success of the *encuentro* is attracting increasing attention from senior policy makers, research managers and other government officials whose support is vital to the national CIAL programme. Two directors of SENA, a national training institute, attended the 1998 *encuentro*, together with a director of CORPOICA. For SENA, which is known in Colombia as "the university of the poor", the CIALs represent a new opportunity to reach the poorest rural communities with training and technology to raise incomes and living standards. SENA has already provided training to several CIALs directly. Recently, it decided to fund a course for CORPOICA staff and the scaling up of the institute's activities to a nationwide programme.

In 1997, CORPOICA launched an annual *encuentro* for the CIALs of the Cundinamarca region. The first meeting drew 15 of the region's 21 CIALs to the institute's headquarters, where it was hosted. For Santiago Fonseca, then CORPOICA director for the region, the meeting was tangible evidence of the success of the institute's CIAL programme. "Many of the CIALs present had done research on potato. The discussions on that crop were particularly valuable, both for them and for us", he says. CORPOICA has recently suggested organizing an international CIAL meeting for all the Latin American countries with an active CIAL programme.

And the idea of the *encuentro* shows every sign of spreading still further afield. Among the countries participating in the third Kellogg project, Honduras was first off the mark, organizing its first meeting at Zamorano University's EAP in 1997. Other countries may soon follow suit.

...and fiesta

After the formalities of the meeting, it's time to unwind. No agricultural fair is complete without that archetypal expression of rural culture, folk music.

Strongly assertive of regional and ethnic identity, the folk song and dance of Colombia are as varied as the peoples who make them. Thus, at Rosa, as darkness falls, an intimate band of corners, flutes, guitars and rambours strikes up and a group of singers delights the crowd with the closely harmonized Spanish-language ballads of the valleys. At Totoro, in contrast, the keening sound of the ..... , a flute-like instrument of the high Andean Indians, evoked the yearnings of a people in search of a lost identity. And when the *encuentro* was held at Piendamo, a village influenced by the nearby urban culture of Popayan, a larger, more raucous band played *salsa* and there was dancing on the village square until dawn.

Music makes a fitting end, both to the *encuentro* and to our exploration of the CIAL experience. For the CIAL movement has much to celebrate. Appropriated by rural people and absorbed into the mainstream of rural life, it has come of age, developing its own set of behavioural norms and the mechanisms for sustaining itself independently of CIAT's support. The movement's gathering strength derives from the trust placed in it by people whose previous experience of research and development has been one of alienation and powerlessness. This time it's different; *they* are in control. No longer passive listeners to an unfamiliar tune orchestrated by others, they are giving *their* music to the band. Take it away, *campesinos!*

The CIAT-IPRA Team

The CIALs

Acronyms

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